

Military Operations in the Information Age

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ACKNOWLEDGEMENTS

Thank you for the gracious introduction and kind observations. I am honoured and truly excited about being here and having the opportunity to speak to you this afternoon.

I understand that a large number of you represent the United Service Institution of India and are involved in numerous think-tank activities. I applaud your efforts and encourage you to be resolute in your labour to look ahead, consider new ideas, and try to solve some of the problems that confront not only you, but your neighbours around the world.

I hope that what I have to share with you today whets your "Appetites" and causes each of you to consider the possible implications of maintaining peace in this new era called the "Information Age". I believe this new era will present many formidable challenges for each of us. At the same time, it may also provide unprecedented opportunities for improving our abilities to preserve peace in the Asia-Pacific region.

INTRODUCTION

Before I discuss the concept of Military Operations in the Information Age, allow me a few moments to digress-I am often asked "What is the U.S. role in Asia-Pacific?" Stability in the Asia-Pacific region is Important to my nation's future economic prosperity - Asia-Pacific is our largest trading partner. We, the U.S., as a Pacific nation, are driven to ensure this region remains at relative peace-well into the next century.

U.S. PRESENCE

The wealth of diversity we enjoy in the Asia-Pacific region has led to its prominence among the world's economies. But this wealth of diversity can

Text of a talk given by General John G Lorber, Commander U.S. Pacific Air Forces to the members of the United Service Institution of India and other Senior Service Officers at New Delhi on March 22, 1996.

Journal of the United Service Institution of India, Vol CXXVI, No. 524, April-June 1996.

also be a source of trouble. I believe one would be naive to think that this region will be free of wars - It's simply a matter of when and where they will occur. An historical fact to consider: In the previous 3 millennium, only 268 years have been free of major wars. That is equivalent to on average, 7 to 8 peaceful years in each of the past 30+ centuries (*Lessons of History*, published in 1968). The "When and Where" also applies to natural disasters - over the last 50 years, our dedicated men and women have participated in 26 major humanitarian operations in the Asia-Pacific region. PACAF's people reached out to aid victims of floods, typhoons, earthquakes, volcanoes, and epidemic disease. We will do the same in the future.

Our Secretary of Defence, Dr. William Perry, recently emphasized the importance of our presence in this region. One year ago, he stated, "Dangers and potential threats (in the Asia-Pacific region) require us to maintain military forces powerful enough to be a persuasive deterrent, and if deterrence fails, powerful enough to fight and win decisively." The question still remains - how do we do this in cooperation with our friends and allies in an era of declining defence budgets?

PREDICTING THE FUTURE

Now let us turn our attention to the future. Looking into the future is something both you and I can relate to - we do it every day- it is a critical part of our jobs, but not an easy part. Casey Stengel, a famous baseball player, stated the obvious - "predictions are hard, especially about the future."

In Industry, anticipating the future and searching out new opportunities separates the successful companies from those that falter and eventually go away. The Sam Pitrodas, Sam Waltons. and Bill Gates of the world understand this critical feature - their "visions" were not limited. Mr Pitroda, your communication's giant here in India, used his ingenuity and bold foresight to revolutionize your telephone industry. He had a "vision" and the courage to pursue it. We all reaped the benefits - the economic stability of India is stronger - you are more competitive in the global economic market place. Mr Pitroda was not afraid to make a decision. If any of you have travelled in the U.S. you have probably had the opportunity to shop at a Walmart Store - it is almost considered a tourist attraction. Walmart's, Sam Walton's were the brainchild - anything and everything at affordable prices. He had the courage to step into the future with an idea without fear of making a bad decision. When asked to explain his success, he replied with just two words, "Good decisions." he was then asked how he was able to make good decisions? He answered, "experience", when asked where he got that experience, he answered, "from making bad decisions". If you step out and make decisions, some of

them will inevitably be bad ones. If you learn from that bad decision, then success will follow. Most of you are familiar with the computer software company called "Microsoft." Mr Bill Gates, its founder, had a vision of "a computer on every desk in every home." He took a personal role in convincing other computer companies to standardize their products and architecture. This fuelled the computer industry growth in the 1980s. Much of his success was due to his courage to make decisions, and to translate technical visions into market strategy. He blended his creativity with technical acumen - the rest, as they say, is history.

RECOGNIZING NEW TECHNOLOGY

The focus of these successful men was not to stay aligned with their competitor but to stay one, two, three, or even more steps ahead-to capitalize on the opportunities of the future. In my profession, the military, the same rules apply, being second best in a competition of two is not an acceptable result. If you fail to recognize a new technology, it can rapidly change the number of steps between you and the competitor, or in some cases, the adversary.

With limited resources (people and money), we all need to concentrate our efforts on future technologies that may hold the most promise to revolutionize military operations. Revolutionary technologies have made the difference in the past - the future should be no different. I believe that *Information warfare* is one of these critical new technologies.

Where should we, as militaries go? How should we get there? How do we contemplate this concept of information warfare while continuing to focus on safeguarding our freedom and security in this region? Being here today gives me the opportunity to address those questions.

HISTORY OF TECHNOLOGY

Let me begin by taking you back a few years in history. Even 5000 years ago, it was technology, the long bow (used by Egyptians), that extended the battlefield beyond hand-to-hand combat and revolutionized warfare. This type of weapon was also used by Europeans in Central and East Asia during the renaissance period. Gunpowder followed as the next revolutionary technology (gunpowder-originated in China, was manufactured in England in 1344, and used to build British empire which eventually colonized India). In the defeat of the Spanish armada in 1588, thousands of English troops on board ships were experimentally equipped with firearms. While the Spanish relied on archers— this was the beginning of Spain's downfall as a world power. The

success of the English forces played a major role in convincing military theorists that archery had become an inefficient method for waging war. For centuries, wars were fought in two distinct domains-on land or in the water. Fighting wars on land was similar to fighting on water; it was two dimensional. Submarines gave water a third dimension, and was another leap in technology. Submarine warfare had its roots in the American Civil War, but was not refined until the twentieth century. The turn of the century also brought other technological advances that made a real difference in the conduct of warfare -motorized vehicles, aircraft, and exploitation of the electromagnetic spectrum. Motorized vehicles led to tanks that were first used by the British in 1915 - this changed the strategy and tactics for conducting land warfare. Aircraft introduced the next domain for conducting war - the air. However, through many wars, two dimensional thinking resulted in air power being employed as an extension of artillery. This exemplifies that wars were fought using the same philosophy as the first cannon shot-ballistic projectiles directed against a target or target set. Bombs dropped from B-17s in World War II saturated targets with little regard to collateral damage. During the 1950s and 1960s, we were introduced to space as the fourth domain for conducting war. Over the past 30 years, technological advances in reconnaissance, communications, intelligence, and command and control gave us the ability to better know ourselves and the enemy. It improved our abilities to attack and defend all centres of gravity, to include : tactical (battle), strategic (nation), and operational (campaign). Weapons now have "brains" — they are guided by radar, laser, and infrared technology and have imbedded computers right in the weapons itself. Stealth technology eliminates the ability of the enemy to see "you". Infrared detection has taken away the cover of darkness. Precision guided munitions take the "guess work" out of hitting the target. All these technologies have changed the "face" of military operations and eliminated the mass destruction of past wars.

We can now conduct war by attacking our targets simultaneously (parallel warfare) vis-a-vis sequentially as in serial warfare (allowing enemy to adjust). Combine all these technologies with the domains of air, land, sea, and space and you significantly reduce the "fog" of war.

Since the early 1970s we have seen phenomenal advances in the way information is processed and transmitted. We have experienced unprecedented "Leaps" in the quality and quantity of information and the speed of information systems. Desktop and laptop computers have replaced large mainframes. Hand-held telephones are nearly as popular as wrist watches. If automobiles were developed at the same rate as computers, they would get 70 kilometers per litre and cost 340 rupees each. "Surfing" the internet and the world-wide web brings the enormity of all this information into perspective. All these

technological advances have produced rapid increases in our ability to process information day-to-day. It has definitely opened my eyes to the fact that those who dominate the flow of information when conducting military operations (information dominance) will have a clear advantage. They can observe the battlespace, analyze events, then make the correct decisions—those who fail to exploit this dominance will lose, it is as simple as that!

TECHNOLOGY HAS CHANGED WARFARE

In World War II, commander's monitored the war in large rooms with models representing forces that were manually moved about a map. Their movements reflected actions hours and even days old. As late as Vietnam, we were still using grease pencils on a map. In desert storm, through technological advances in space and airborne platforms (satellite surveillance, AWACS, J-STARS, data links, satellite communications), commanders and the national command authority were literally "on-scene" despite being hundreds or thousands of miles away (virtual presence). Satellite based positioning and navigation (global positioning system) and advances in precision guided munitions allowed us to attack well defined targets with surgical accuracy. Technology affected our post attack assessment capability as well for many years we used aircrew to overfly a target to photograph the attack results. This put the aircrew at risk, provided "aged" information and many times, provided no information at all. Today, through the use of space-based systems, we can get near real time assessments of target destruction. Commanders can now divert resources and avoid "overkilling" a target.

THE NEW DOMAIN - INFORMATION WARFARE

This fifth and newest dimension in warfighting, information warfare, is common to the other four (air, land, sea, and space) -although it requires its own planning, strategy, and tactics to exploit the advantage. But that is where the commonalities start to break down. Land, sea, air, and space provide a clear-cut domain in which to fight. Each can interrelate or stand alone as a battlefield. Information warfare, however, transcends the battlefield as we know it and is entwined throughout the four previous domains. Where the others have defined limits and boundaries, the information battlefield knows none. As commanders and leaders, we must recognize the challenges of this new domain and begin to develop the necessary strategy and tactics to employ and defend against the "weapons" of information warfare. We must bring information warfare into the mainstream of our doctrine, strategy, tactics, and training. This must become routine, like flying basic fighter manoeuvres to keep our aviation skills honed.

TOO MUCH INFORMATION?

There are problem areas in reaching this level of information superiority. As we become more and more technologically advanced, we quickly become saturated with information - more than a human being can assimilate. Do not be confused, man is the weak link in the application of technology. The F-16 block 5C aircraft and F-22 aircraft will collect and deliver more information to the single pilot in the cockpit than was available to commanders and planners (combined) just a few years ago. To make this information usable, we need to somehow prioritize it, do integrity checks that prove its accuracy, then display it so that the pilot can use it effectively.

It's my job as a commander to ensure the right information gets to the right user at the right time and in the right format - no small feat. Excess information is redundant and useless, and is not affordable, especially when faced with today's reduced budgets.

Information protection is the key to conducting successful military operations. It will produce a clear advantage in observing the battlespace, analyzing events, and making the right decisions. How can we achieve this (together) using an open architecture, while at the same time having the safeguards in place to protect our information domain?

INFORMATION PROTECTION

As we compete for information in military operations of the future we must be vigilant in our efforts to protect that information and enhance our own capabilities; while at the same time degrade and if required, counteract enemy capabilities. Smaller nations are using information to increase their capabilities exponentially. Some of those small nations are becoming formidable adversaries. This information boom, unfortunately, has also allowed terrorist and non-governmental groups to become a serious threat to the societies of the world as well. We learned about the importance of protecting our information in the deserts of Iraq. Last year, the USAF spent \$ 80 million on information defence. Much of that was spent on hardware, but much of it was also spent on training - a very critical aspect of information dominance. At one time, the former Soviet Union was convinced that control of the electromagnetic spectrum would guarantee victory. I contend that now, "information superiority" is critical to victory. To quote Winston Churchill, "In wartime, truth is so precious that it should always be attended by a bodyguard of lies."

Space systems will allow the United States to win the "Information Wars" of the future. Satellites will give us the disposition of forces - the

masked invasion of normandy would not be so masked today. We know the geographic limitations of a battlefield. We know what to expect from the environment. Exploiting space allows us to establish and maintain "Information Supremacy", thus enabling our fighting forces to operate and manipulate - get into the enemy's decision loop. If you can affect the information the enemy uses, then you can affect the outcome of the battle. In fact, we may even win a war without ever using a destructive weapon. During the American revolutionary war; General George Rogers Clark, Commander of the Continental forces west of the Allegheny conquered a far superior British force through information warfare. General Clark marched 130 men for more than 300 miles through a flooded countryside to capture a fort held by the British in Ohio. Upon their arrival, they found a much stronger fortification and force. General Clark marched his men around and around the fort for three days, creating the illusion of a far greater foe. He also posted snipers to eliminate British sentries and deny his adversary key information. The British believed they were outnumbered and surrendered to a small ragtag group of exhausted colonists. Although this is an excellent example of information warfare, we cannot wait until the battle is upon us to employ it. It must be an integral part of our strategy from the beginning. Space forces are central to this revolution in military operations in the information age - space will allow us to gather, process, and disseminate information on a global basis.

I have spent a lot of time talking about information and technological advances as they apply to warfare. These "weapons" are not limited in application. Just as a C-130 can airlift munitions and combat support supplies it can also deliver food, medicine and blankets in an humanitarian effort. Information warfare techniques and technology can be applied to help people. Weather satellites give us the ability to detect and predict events such as typhoons giving us valuable time to prepare or evacuate. Distribution of information to a nation where none or very little infrastructure exists is the key to establishing and maintaining viable democratic governments.

CONCLUSION

Well, I have talked long enough; the bottom line - technology and the flow of information affects us all. As we consider the many opportunities in this information age, we must remember the sum total of all the information is useless unless it equates to support for the "Good Guys" not the adversary- it must be focused and useable. The human is the weak link.

As we look at this information warfare revolution and technology explosion, we should realize the military is not necessarily the leader. In fact, we may be behind. We are counting on the innovative spirit of industry, the

commercial sector, and of the minds of forward thinkers such as yourselves, to create and apply the new technologies of the 21st century. If you are not already engaged, start today.

As we all continue to develop our base of professional knowledge we must continuously assess and factor in the application of information dominance as an essential tool of modern warfare.

Once a country falls behind in this effort, it becomes difficult to catch up-the changes are that drastic. Where should we go (with it) and how should we get there! We cannot afford to start working the information dominance dimension after an adversary fires the first shot. I believe to do so almost guarantees defeat.

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