



Senior Officer Professional Digest

Selected readings from the world's military journals

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Professional reading is a commitment to our Army's future. The Senior Officer Professional Digest (SOPD) has been designed to assist you to learn more about the issues that will shape the future of warfare. I commend the SOPD to you and ask that you make the time to read the articles and to reflect on their content.



Editor's Note

Although it is not the general policy of the SOPD to publish book reviews, periodically there are new publications, which the editorial staff believe will be of interest to our readers. Two such reviews are included in this issue.

Article Title The Art of War**Author** Frederick Kagan, Professor of Military History, USMA, West Point**Publication Details** *The New Criterion*, Volume 22, No 3, August-September, 2003, pp.1-18**Synopsis**

Kagan's article is a critical analysis of the current US transformation strategy from an historical perspective. While the author believes that US military may currently be in the best position of any force in military history, he also feels that America's armed forces face considerable risks that need to be managed correctly. His particular focus is the inter-relationship between transformation and military overstretch. Defence Secretary Rumsfeld has adopted a business management centred vision of transformation that relies on high technology weapons systems, rather than on soldiers. Ironically, as the Pentagon pursues this vision, America's armed forces are stretched further and further, risking the military dominance achieved by the US at the end of the Cold War.

The article points out that the weapons which helped the US achieve victory in the 1991 and 2003 Gulf Wars were based on a significant element of redundancy. For example, the weapons developed by the US Air Force (USAF) and US Army in the Revolution in Military Affairs (RMA) of the 1970s and 1980s saw the creation of such new technologies as stealth and precision guided munitions. Due to its advantages in these areas, the US is now so far ahead of possible competitors that it will be difficult for any single nation or group of nations to bridge the gap. Super-fighters such as the F-15 and F-16 are, respectively, the acme of air-to-air combat and air superiority aircraft. The F-14 (F/A-18 US Navy version) attempts to combine the best characteristics of the other two aircraft. Along with the A-10 ground attack aircraft, these planes dominated the skies over Iraq, to the point that the opposition air force did not even consider fighting them in the air as a serious option.

On the ground, the US Army fielded the M1 Abrams tank, the Bradley fighting vehicle and other systems such as the Multiple-Launch Rocket System (MLRS). These systems have proven to be as dominant in land warfare as the USAF has been in the air. In peacekeeping missions, the protection that the Abrams and Bradley vehicles provide to soldiers has also proven to be a significant advantage. However, taken collectively, these systems represent considerable redundancy in capability and thus,

seen from the Pentagon's current business focus, considerable inefficiency too.

While redundancy is inefficient and expensive in economic terms, in military terms it represents a considerable virtue. Last year's fighting in Iraq demonstrated the advantages it can bestow on armed forces. When weather conditions stopped the USAF from flying, the ability of the M1 and Bradleys to survive encounters with the enemy armour saved many American lives. Kagan argues that the current transformation strategy risks squandering all of the advantages conferred by redundancy. This is because transformation now focuses on Network Centric Warfare (NCW) and the development of highly efficient, networked information systems that aim to give the US the ability to strike targets from thousands of miles away with incredible degrees of accuracy.

Kagan believes that, if taken to the extreme, this strategy will result in the US forces being able to do one thing very well, thereby surrendering their current advantages in military operations across the spectrum of conflict. While a business can improve its efficiency by focussing on a few things it does well and abandoning areas where it is performing badly, military forces don't have this luxury. In the Pentagon today, the ability of a weapons system to contribute to the NCW concept has become a major selling point. The services now promote new systems and designs on the basis of their utility to NCW. The result, Kagan fears, will be an homogenisation of the armed forces, resulting in the production of the capability to identify and attack targets with precision weapons at great distances.

The major flaw in the current transformation strategy is that it is based on a misunderstanding of what an RMA is. Indeed, the term RMA is rarely heard in the Pentagon today. Kagan believes that the term RMA has been misused to the point that some critics attack the entire concept as being meaningless. However, he argues that the concept of an RMA has significant value in understanding the evolution of military theory and practise. Citing four dramatic shifts in the history of warfare:

- 1700 – 1760,
- 1813 – 1863,
- 1870 – 1915, and
- 1942 - 1991

Kagan points out that the transformation strategy being pursued by the US is based on a narrow interpretation of an RMA as an asymmetrical advantage in capabilities that opponents cannot match. He also believes

that the NCW concept is attempting to transfer this advantage indefinitely into the future.

History, however, does not support such a limited interpretation. Indeed, the historical record shows that military superiority based on technological advantages is fleeting. Technology and techniques inevitably spread, while some states obtain counteracting capabilities that neutralise asymmetrical advantage. In order to achieve the current vision of transformation, the US armed forces would need to continue to change so rapidly and so successfully that no other state could keep up, or indeed even try to. Such a goal is unrealistic. In addition, all future wars would need to be fought under conditions where striking targets precisely from great distances would result in victory and all opponents would need to be incapable of either matching this ability or preventing the US from employing it against them.

The search for efficiency and certainty is illusory. The author concludes by stating that a sound program of military transformation would seek to enlarge on America's current asymmetrical advantage in areas such as precision guided munitions (as NCW does), but not at the expense of the unique capabilities the US ground forces can currently bring to bear across the spectrum of conflict. Redundancy is inherently a virtue in warfare and all weapons systems should be designed with overlapping capabilities, spread across the services. Armed forces with such latent capabilities are able to meet new challenges that cannot now even be imagined.

Article Title The Battle of Taji and Battle Command on the Move

Authors Lieutenant Colonel Edward J. Erickson, US Army, Retd and Major General Raymond T. Odierno, US Army

Publication Details *Military Review*, Vol LXXXIII, No 4, July-August, 2003, pp.2-8

Synopsis

This article gives an account of how the 4th Infantry Division (4ID) US Army was commanded 'on the move' during the Battle of Taji on 16 April 2003. With the Battle Command on the Move (BCOTM) architecture, the commander is no longer tied to a functionally organised HQ in a fixed location. The information, planning and execution

capabilities of the HQ now come to the commander on the battlefield, wherever he might be.

Under the traditional staff system, as it evolved from the Napoleonic period, the commander was removed from a frontline location to a static HQ in the rear, with a resultant loss of situational awareness. The development of radio and other communications technologies partially addressed this problem, allowing commanders such as Guderian, Rommel and Patton to command their formations from forward locations. However, HQs were still largely static, functionally organised and frequently provided the enemy with 'soft-skinned' targets. BCOTM breaks with this traditional paradigm.

4ID has been at the forefront of the US Army's digitisation program. When Major General Odierno took command of 4ID in 2001, he tasked his staff with developing an advanced C2 system, built around a Bradley fighting vehicle and based on the ability of the Force XXI battle command brigade and below (FBCB2) system to enhance his situational awareness. When the Bradley was unable to accommodate all of the equipment required for BCOTM, another tracked command vehicle (M1068) was added. This vehicle has complementary systems such as Iridium, SECRET Internet Protocol Network and high fidelity radio. The M1068 also supplies power for the mobile command centre, which travels with a formidable security detachment including, two M1A1 tanks, a Bradley with its infantry squad, military police, communications teams and two specially equipped Blackhawk helicopters.

The article relates how the BCOTM system performed both in battle and in the stability operations that followed the fall of the Iraqi regime. BCOTM produced a highly mobile and secure environment, which gave the divisional commander unusual flexibility to decide where to place himself during combat operations. Moreover, when the line of communication for the division stretched over 400 miles from Kuwait to Mosul in Northern Iraq, the BCOTM system was able to maintain effective communications between the divisional front and rear elements. The article concludes by outlining the significant lessons learned about the BCOTM concept during operations in Iraq.

Article Title Maritime and Expeditionary Dominance: Great Britain's Legacy to 21st Century Strategy

Author Commander John Trost Kuehn, US Navy, Deputy Director , US Navy Element, US Army Command and General Staff College, Fort Leavenworth

Publication Details *Military Review*, Vol LXXXIII, No 5, September-October 2003, pp.51-55

Synopsis

This article reviews Britain's naval dominance in the 18th and 19th centuries in the light of the recent American experience in Iraq and Afghanistan. Acknowledging that the British strategy rested on a combination of maritime power and effective diplomacy, the author puts forward this case study to enliven the debate on the role of US maritime power and global leadership. In particular, he believes that studying the British case might reveal methods that might help solve some of the security challenges faced by the US in conducting coalition warfare in the 21st Century.

Drawing on historical examples, the article demonstrates that, as pursued by Great Britain over the long term, a maritime strategy proved to be remarkably flexible in meeting the nation's needs in periods of relative peace or sustained global conflict, in other words across the spectrum of conflict. The flexibility of a maritime strategy was particularly evident when Britain became involved in coalition warfare. The combination of a powerful navy and island geography allowed Britain to choose its coalition partners carefully. If the coalition land forces suffered a defeat, Britain was free to withdraw, or re-focus her efforts. Her continental foes, on the other hand, found their colonies threatened or annexed, their seaward flanks attacked and new coalition armies raised against them, all because of Britain's overwhelming maritime and economic dominance. Moreover, while British military commanders often led coalition land forces (Marlborough, Wellington, etc), the actual commitment of British troops to such ventures was relatively small.

The parallels with America's geographical position and economic dominance in the early 21st Century are clear, so too, the author believes are the lessons. America's presence in overseas military bases has been considerably reduced since the end of the Cold War. The author suggests

that remaining US bases will become increasingly vulnerable to threats such as missile attack. The answer, he believes, is to increase its reliance on strategic mobility via sea-based forces. The Hart-Rudman Commission on US National Security in the 21st Century recommended a back-to-basics approach using an opportunity-based strategy. Such a course will require some re-focusing of resources and effort but, for the US, a maritime strategy promises to be the best way to meet the strategic challenges of the future.

Article Title Ten Ways Great Leaders Lead

Author Lieutenant Colonel Christopher D. Kolenda, US Army

Publication Details *Military Review*, Vol LXXXIII, No 6, November-December 2003, pp.41-49

Synopsis

This article is based on nineteen years of observation of leadership styles and offers ten examples of excellence in leadership. The author begins with the reflection that, while it is easy to criticise one's superiors, a more productive approach is to make sure that your unit - squad, platoon or battalion - is the best it can possibly be. In this spirit he offers the following strategies:

- Clarify Expectations and Enforce Standards
- Set the example
- Celebrate Failure
- Show You Care
- Treat People with Respect
- Be Trustworthy
- Leave a Legacy of Excellence

In the body of the article, each of these leadership strategies is explained in detail. The author concludes by repeating the important truism. 'great results are merely a by-product of bringing out the best in others.'

Article Title Joint is Dead: What is Next?**Author** Ensign Christopher Briem, US Naval Reserve**Publication Details** *Proceedings*, US Naval Institute, Vol 130, No 1, January 2004, pp.10-14**Synopsis**

The author of this article believes that, in the complex security environment of the 21st century, joint operations will give way to a greater co-operation between military and civilian organisations. With opponents who are difficult to target, success in operations will depend upon the ability to blend all elements of national power. The article then develops this argument via four main points:

- **Greater Civilian Interaction** – will be necessary to meet a range of threats. With the US now dominant on the battlefield, its enemies are now looking to attack non-military targets. Civilian and military intelligences sources are currently the most integrated organisations, with a fine line between military and civilian sources. In a similar way, co-operation with NGO's, even those without state affiliation, may be required in order to bring crucial resources to bear in a way that will have a positive outcome on a military operation.
- **New Navy Roles** – each service must question its relevance in the current security environment. The US Navy should seek to engage with other services and civilian agencies to ensure defence against a range of threats.
- **Managing Interagency Co-operation** – one of the great challenges will be to get very different bureaucracies to understand each other and work together co-operatively. The development of jointness within the US services may serve as a model for how inter-agency co-operation with civilian organisations will develop. However, important questions still remain. For example, will greater inter-agency co-operation require service personnel to become expert in skills that are now civilian responsibilities?
- **Network Centric Command** – Just as network centric warfare aims to create an integrated battlespace, this may also be the only approach to ensuring cohesive inter-agency co-operation. With many civilian agencies lacking the hierarchical command

structures of military organisations, a networked solution may be the only viable way of providing good communication and guaranteeing effective targeting of resources.

The article concludes by reinforcing the point that an effective campaign against threats such as terrorism must use all the elements of national power cohesively and creatively.

Article Title Jointness, Defence Transformation and the Need for a New Joint Warfighting Profession

Author Don M. Snider, Professor of Political Science, USMA, West Point

Publication Details *Parameters*, Vol XXXIII, No 3, Autumn 2003, pp. 17-30

Synopsis

This article is a review of the progress towards jointness within the US armed forces since the passing of the Goldwater-Nichols Act of 1986. The author notes that, while there has been considerable success in developing joint warfighting concepts and the planning and execution of joint operations, there has not been a corresponding development in the creation of ready joint forces.

This uneven evolution of jointness is due, the author believes, to the failure of the US armed forces to create a joint warfighting profession. In part, this failure can be traced to the language of the Goldwater-Nichols Act itself, which the author believes constrains the development of true jointness. Another factor is the concentration on the technological aspects of force transformation, rather than developing an appropriate joint mindset within the military and civilian authorities responsible for carrying out the transformation process.

The solution put forward by the author is a Goldwater-Nichols Act II, which focuses on the development of a joint warfare profession with a joint doctrine and education command and a joint personnel command to manage careers of military personnel who have opted for a career as joint warfare professionals. The remainder of the article expands on how this structure would improve joint warfighting ability by:

- Creating a group of civilian and military professional who are innately joint,
- Developing expert knowledge in joint operations,
- Improving civil-military relations,
- Creating the necessary public sector professionals to support the process of a Goldwater-Nichols Act II,
- Reducing career disruption by limiting the number of officers going in and out of joint assignments, and
- Creating an educational and career management system that would support progress towards the development of true jointness.

The author concludes the article by making the point that, by taking such a step, the US armed forces would develop, not only a better approach to jointness, but also a better approach to defence transformation.

Article Title Rethinking the Principles of War

Authors Rear Admiral John G. Morgan and Dr Anthony D. McIvor,
Secretary of the Navy's Action Team

Publication Details *Proceedings*, US Naval Institute, Vol 129, No 10,
October 2003, pp.34-40

Synopsis

With military and civilian leaders speaking about a new kind of war or a new doctrine of war, this article asks whether it is necessary to revisit the principles of war to determine their applicability in the 21st Century. The common perception is that the principles of war are immutable. The influence of Clausewitz, Jomini and other thinkers has created the impression that 'methods change but principles are unchanging.'

However, the authors point to three factors that bring this assumption into question:

- The expansion of the battlespace,
- The lack of discrimination made by enemies, such as terrorists, between combatants and non-combatants,
- The proliferation of WMD, which has placed great power in the hands of rogue regimes and non-state actors.

Taken together these factors call for new approach to national defence.

Drawing on recent conflicts the authors discuss whether new principles, such as Will and Simultaneity, are now emerging. They also note the link between the principles of war and doctrine. As abstractions from historical experience, the existing principles of war have played an important role in ensuring that important lessons are learned and passed on. The authors suggest that, as the principles are reviewed in the light of recent military experience, some will be affirmed, some updated and a few discarded. However, this process of revision should only take place after a vigorous debate. The article concludes with the thought that, for good reasons, the military is a profession rooted in principles, however, this does not mean that those principles are sacrosanct and beyond re-evaluation and revision.

Article Title The Future of the Australian-US Security Relationship

Authors Rod Lyon and William T. Tow, Strategic Studies Institute, US Army War College

Publication Details US Army War College, Carlisle, PA, December 2003, 41 pp.

Synopsis

This important monograph by an Australian scholar (Lyon) and an American scholar based in Australia (Tow) is a timely analysis of the present and future of the Australian-American alliance. The authors concentrate on four areas:

- Strategic collaboration under ANZUS
- Australia's changing strategic policy from 'Defence of Australia' to a 'coalition first' posture
- Force structure implications for the ADF, especially its land forces, of such a 'coalition first' strategy
- The future of ANZUS.

Strategic Cooperation under ANZUS

Lyon and Tow argue that the combination of a changing security environment and US dominance in global affairs has gradually forced Australia to modify 'defence self-reliance' in favour of greater involvement in coalition operations. They point to Australian-US strategic cooperation over East Timor during the INTERFET mission of 1999-2000. They also note Australia's invocation of Article 4 of the ANZUS Treaty on 14 September 2001 following the terrorist attacks on New York

and Washington and the sending of Australian military forces to assist the US in Afghanistan and Iraq.

The monograph contrasts the positive link between these security ties and progress towards an Australian-US free trade agreement with New Zealand's ill-considered public diplomacy against the Bush Administration over the Iraq War. In short, while Australia has successfully reinvigorated ANZUS, New Zealand's approach has reinforced its ostracism from American strategic cooperation. The study notes:

US-Australian military cooperation has developed a cadence and predictability that bodes well for future joint operations. In the short space of 4 years, Australia has transformed its ANZUS relationship from one where Washington viewed Canberra primarily as a 'Pacific-centric' ally to a security relationship that is now regarded by the Bush administration as one of the significant components of US global strategy.

Australia's Changing Strategic Policy

Lyon and Tow suggest that in 2003 *'the ANZUS treaty appears to have reached new heights of relevancy'* with Australia having moved to the first tier of American allies. The authors trace the reinvigoration of ANZUS to Australia's perception that the US will remain the global leader well into the 21st century and to the impact of international events between 1997 and 2003. The latter events are identified as including the 1997 Asian financial crisis; the fall of the Suharto regime in Indonesia in 1998; the 1999 East Timor crisis; the attacks of September 11 2001 and the campaign in Afghanistan; the Bali bombings of October 2002; the 2003 war in Iraq; and Pacific instability as symbolised by Australia's intervention in the Solomons.

All of the above events have strengthened the Australian-American security relationship while simultaneously leading to the decline of Australia's 1980s-style strategic policy based on 'concentric circles' and the primacy of strategic geography. New strategic conditions since the late 1990s have elevated more global threats such as terrorism to a central position in Australian security thinking. The authors consider that Australia's strategic shift from a concentric circles/ 'Defence of Australia' geographical posture to one reflecting a more balanced approach between global and regional contingencies bodes well for the future of ANZUS. Alliance collaboration is likely to increase in specialised areas such as missile defence, UAVs and communications systems rather than bases for American forces.

Force Structure Ramifications for the ADF

As the doctrine of concentric circles has begun to disintegrate, force structure has become more fluid. In particular, the role of the Army, which in the 1980s and 1990s was the Cinderella of the armed services has now become a key factor in the evolution of Australia's 'coalition first' strategy. The authors note that in facing a 21st century spectrum of conflict, *'there is little doubt that "networked systems" of infantry, armor, artillery and air support – combined arms capability – is the key to meeting such a challenge'*. In this respect, the question of new tanks for the land force has become *'emblematic of the debate about the future of the Army'*.

The Future of ANZUS

A key factor in the future of ANZUS is America's shift away from seeing Asia as primarily an air-sea theatre to one where the role of land forces will become more significant. In this sense, the war on terror has refocused American attention on the internal dynamics of the Muslim countries of South-East Asia. As the US reconfigures its power relationships in Asia, greater cooperation with Australia can be expected. For example, Australia may be expected to shoulder a heightened strategic profile in the 'arc of crisis' from Indonesia to Melanesia. Moreover, Australia's regional role will be critical to the success of both US and ASEAN counter-terrorism efforts in South-East Asia.

Although Australian-American security cooperation is arguably at an historic high point, the authors believe closer links are still possible. This is because *'the theme of defense self-reliance has been superceded by events and new thinking in Australian security policy'*. The new security theme in the 21st century is one of strategic interdependency and accordingly *'a doctrine of interdependence must play a larger role in Australian security policy'*. However, developing successful interdependency will require good alliance management by both countries.

The monograph concludes by stating that the ANZUS alliance has become a 'reinvented relationship' for Canberra and Washington. The Australian Government's decision to prioritise the US-Australian alliance has been 'fundamentally sound' and has yielded dividends that could not be matched by a policy of 'balancing' engagement in Asia against alliance with America. For Australia, the results have been to secure a credible US extended deterrence commitment, to gain cost-effective access to the

latest American military technology, and the likelihood of winning economic-diplomatic payoffs – notably a free trade agreement.

Book Review

Wayne Michael Hall, *Stray Voltage: War in the Information Age*, Naval Institute Press, Annapolis, Maryland, 2003, 219 pp.

In this interesting and stimulating study, author Wayne Michael Hall a retired American brigadier general who directed the US Army's Intelligence XXI study, argues that because of the ascent of the digital age, the face of battle is rapidly changing. Increasingly, the future of war lies in a transformation from conflict involving narrow, kinetic warfare of attrition to the broader, systemic competition of 'knowledge war' based on digital nuance and mastery of information operations. Hall defines the phenomenon of knowledge war as *'an intense competition for valuable information and knowledge that both sides need for making better decisions faster than their adversary. The goal in this type of conflict is . . . decision dominance, which leads to an overall advantage . . . and results in a triumph of will by one side or the other'*.

According to the author, while conventional war is not yet anachronistic, asymmetric warfare represents the wave of the future. Brigadier General Hall argues that the US military must prepare for two types of armed conflicts: kinetic, conventional, force-on-force warfare and shadowy, nuance-laden, sometimes digital and largely invisible asymmetric warfare. Increasingly, the kinetic and the cyber will merge and future military operations will involve urban warfare, swarming and minituarisation alongside automation, digital manoeuvring and the use of telepresence software. While the tools of kinetic, force-on-force conflict will continue, Hall believes information operations will eventually dominate the character of 21st century conflict. He writes:

The pendulum is swinging from the kinetic to an emphasis on more nonkinetic forms of conflict . . . the asymmetric tool of information operations will supplant the heavy reliance on traditional, kinetic, and atomistic perspectives of conflict in the twentieth century. Military services must prepare for future conflicts and the inevitable transformation of war having a more invisible, intangible, cerebral nature.

Future asymmetric information operations will be borderless and devoid of sanctuaries or homeland safety. Defending infrastructure will become as important as fighting for geographical terrain. As the 'tyranny of

distance' dissipates, decision-making will become more important making future war a struggle in which social, political, military, economic, financial and informational systems are woven together to the point that none can experience perturbation without affecting the others.

Asymmetric information operations will involve fibre-optics, databases, software codes, and satellite frequencies. Eventually, asymmetric enemies of the West will develop 'cyberbots' – software programs that can collect intelligence, attack computer servers and deceive at light speed. In these conditions, 'manoeuvre of knowledge' (collaboration) and the manipulation of psyches (both individual and aggregate) will become vital in future war.

Waging successful knowledge war will require mastery of four types of information: *scanning*, *problem-solving*, *learning* and *advantaging*. Future 'cyberstrategists' will have to become experts in such areas as knowledge management and perception management. They will need advanced information warfare doctrine and an understanding of 'aggregation theory' in order to study politico-military interactions and to be able to deliver effects-based operations. An understanding of aggregation, integration and of the 'man-machine symbiosis' will be essential in waging successful knowledge warfare.

In the US context, the author outlines four pathways to knowledge warfare. These pathways are the creation of Knowledge Advantage Centres; the development of a joint asymmetric opposing force (OPFOR); the setting up of a Joint Information Operations Proving Ground; and developing an Internet replicator for training, experimentation and doctrine development.

- **Knowledge Advantage Centres:** These are envisaged as part of a national system of collaborative networks of civilian-military computing aimed at integrating information. In terms of homeland security, Knowledge Advantage Centres would operate at the national, operational and tactical levels of war and at national, state and local level and would include chemical, biological and nuclear warfare specialists.
- **Asymmetric Opposing Force:** A standing, capable, and representational joint asymmetric OPFOR using foreign languages and global threat scenarios would test commanders and their subordinates.
- **Joint Information Operations Proving Ground:** Designed for realistic training for the art of battle command, knowledge management and effects-based operations. Brigadier General Hall

argues that because the terrain of cyberspace is digital – based on fibre-optic cable, hard-disk drives and databases – it represents an arena of conflict that cannot be replicated in the physical world. A Joint Information Operations Proving Ground would prepare for digital conflict by simulating the conditions of cyberspace and virtual reality.

- **Internet Replicator:** To simulate a realistic ‘red team’, an Internet replicator would train military forces in the art of defending infrastructure from weapons of mass effect – kinetic or otherwise. The author proposes that an Internet replicator should be part of every training course for future joint warfare – developing cyberbots and counter-deception strategies. While a replicator would be costly and hard to keep up to date, such an initiative is important and could become the responsibility of US Joint Forces Command or North American Command.

Hall concludes his study by identifying the main obstacles to mastering knowledge warfare as being in the realm of education. Because the cyberwarrior will need different skills from the traditional kinetic warrior, the current industrial age American military system must be reformed. The US military system’s present weaknesses include rigid processes, a hierarchical leadership structure and a tendency to equate rank with intellect, all of which work to inhibit developing 21st century knowledge warriors.

In contrast to today’s kinetic warriors, tomorrow’s cyberwarriors must possess intuitive minds and be comfortable with intellectual creativity. Future cyberstrategists must be persons of ‘Aristotelian whole’ – at once masters of technology and philosophers of the Hegelian dialectic. As Hall puts it:

Knowledge war is different than traditional, attrition-based warfare because it requires far greater intellectual skills, a broader understanding of the social, political, economic, financial, informational and military spheres of human intercourse, and the existence of a far greater symbiotic relationship between man and machine.