Senior Officer Professional Digest

Selected readings from the world's military journals

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Land Warfare Studies Centre

The CA's Introduction

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.

P.F. LEAHY
Lieutenant General
Chief of Army

Article	**'Seeing Baghdad, Thinking Saigon'**
Author	Stephen Biddle
Publication Details	*Foreign Affairs*, vol. 85, Issue 2, March–April 2006, pp. 2–14, <http://www.foreignaffairs.org/20060301faessay85201/stephen-biddle/seeing-baghdad-thinking-saigon.html >

SYNOPSIS

Biddle argues that if the debate in Washington is Vietnam redux, the war in Iraq is not. In 2006 (as in 1969) Washington's strategy is built around winning hearts and minds while handing off more and more of the fighting to indigenous forces. However, the parallel does not hold. The current struggle is not a Maoist 'people's war' of national liberation; it is a communal civil war with very different dynamics. Washington must stop shifting the responsibility for the country's security to others and instead threaten to manipulate the military balance of power among the Sunnis, Shiites, and Kurds in order to force them to come to a durable compromise.

Biddle notes that the four provinces that make up the country's Sunni heartland account for fully 85 per cent of all insurgent attacks; Iraq's other 14 provinces, where almost 60 percent of the Iraqi population lives, account for only 15 percent of the violence. Most of the violence is aimed at the Iraqi police and military, which recruit disproportionately from among Shiites and Kurds. If the war in Iraq were chiefly a class-based or nationalist war, the violence would run along national, class, or ideological lines; however, Biddle maintains that this is not the case. The Sunnis are not fighting for Shiite hearts and minds; they are fighting for Sunni self-interest, and hardly need a manifesto to rally supporters. The uprisings led by Muqtada al-Sadr's Shiite militias in Baghdad and Najaf have been an exception to this general pattern, he argues, but it is the exception that confirms the rule. Winning hearts and minds is crucial to defeating a people's rebellion that promises good governance, but in a communal civil war such as that in Iraq, it is a lost cause, he argues. Further, in a communal civil war, rapid democratisation can further polarise already antagonistic sectarian groups

The biggest problem created by treating Iraq like Vietnam is what Biddle calls Iraqization—the main component of the current US military strategy. In a people's war it undermines the nationalist component of insurgent resistance, but in a communal civil war, it throws gasoline on the fire. Iraq's Sunnis perceive the 'national' army and police force as Shiite-Kurdish militia and, he argues, they have a point. Biddle claims that a national army that effectively excluded Sunnis would make any constitutional deal irrelevant. On the other hand, the inclusion of Sunnis would entail penetration by insurgents. Segregating the Sunnis could trigger an unstable, unofficial partition of the country into separate Sunni, Shiite and Kurdish enclaves.

The war is about resolving the communal security problems that divide Iraqis via constitutional compromise, and it is too early to give up on this goal. Thus the efforts by US Ambassador Zalmay Khalilzad to broker a constitutional deal are crucial to success. However, critical departures from current strategy are necessary:

- Washington must slow down the expansion of the Iraqi national military and police. This leaves the United States no choice but to continue providing enough US forces to cap the violence in Iraq.

- The United States must bring pressure to bear on the parties in the constitutional negotiations, including the prospect of a US–trained and supported Shiite–Kurdish force to compel the Sunnis to come to the negotiating table.

The only way to break the logjam is to change the parties' relative comfort with the status quo by drastically raising the costs of their failure to negotiate. Today, however, Washington is doing just the opposite, fielding an ethnically mixed military as quickly as possible with or without a stable constitutional deal in place. Iraqization gives Washington no more sway with the Shiites or the Kurds because it involves keeping US troops in Iraq until these groups can defend themselves, regardless of whether they negotiate seriously in the meantime. Washington should avoid setting any more arbitrary deadlines for democratisation. In a people's war, early electoral deadlines can make sense; in a communal civil war, they are dangerous. At a minimum, Washington should stop making matters worse. Understanding the war in Iraq as a communal civil

war cannot guarantee success, but without this understanding failure is far too likely.

Article	**'Dude, Where's My Civil War?'**
Author	Ralph Peters
Publication Details	*New York Post*, 5 March 2006

SYNOPSIS

Peters claims to have been driving around the streets and alleyways of Baghdad looking for the civil war that the *New York Times* declared, but he writes, 'I just can't find it. Maybe actually being on the ground in Iraq prevents me from seeing it. Perhaps the view's clearer from Manhattan', he chides, and concludes, 'It could be that my background as an intelligence officer didn't give me the right skills'.

Instead of a civil war, argues Peters, something very different happened because of the bombing of the Golden Mosque in Samarra. The attempt to stir up Sunni–Shia strife, and the subsequent spate of violent attacks, caused popular support for the US presence to spike upward. He claims that, 'In place of civil war that elements in our media declared, I saw full streets, open shops, traffic jams, donkey carts, Muslim holiday flags—and children everywhere, waving as our Humvees passed'. To Peters the presence of children in the streets is the best possible indicator of a low threat level.

It wasn't the Age of Aquarius, he says; the people still had serious concerns, security being first on their list. Iraqis want the Americans to crack down harder on the foreign terrorists and to disarm the local militias. They don't like and don't support the militias, Shia or Sunni, that are nothing more than armed gangs, Peters states. Help is on its way, if slowly. The Iraqi Army has confounded its Western critics, performing extremely well last week. The Iraqi forces aren't fully competent yet, and the population doesn't yet have much confidence in them, but all of this takes time.

So why, Peters asks, were we told that Iraq was irreversibly in the throes of a civil war when it wasn't remotely true? 'I think the answers are straightforward'. First, some parties in the West were anxious to believe the worst about Iraq. They've staked their reputations on Iraq's failure. However, there's no way we can let irresponsible journalists off the hook—or their parent organisations. Many journalists are, indeed, brave and conscientious; yet some in Baghdad (working for 'prestigious' publications) aren't out on the city streets the way they pretend to be. Whenever you see a column filed from Baghdad by a high profile journalist with a 'contribution' by a local Iraqi, it means this: the Iraqi went out and got the story, while the journalist stayed in his or her room. And the Iraqi stringers have cracked the code: the Americans don't pay for good news. So they exaggerate the bad. 'I'm just afraid', he concludes, 'that some of our journalists don't want to know the truth any more'.

Article	**'What the QDR *should* say'**
Author	Michael G. Vickers
Publication Details	*Armed Forces Journal*, vol. 143, no. 7, February 2006, pp. 18–21, <http://www.armedforcesjournal.com/story.php?F=1456168_0206>

SYNOPSIS

In this article, the author examines the 2006 Quadrennial Defense Review (QDR) in the light of its 1997 and 2001 predecessors. Vickers asserts that the current QDR must be distinguished from earlier versions because it is the first QDR to be conducted while the United States is at war. Consequently, the primary focus of the current QDR addresses the operational demands of that war ahead of more distant and contingent challenges. The author asserts that this QDR is unique in its recognition that key elements of the strategy for the Global War on Terrorism (GWOT) transcend the authorities and responsibilities of the US Defense Department.

He contends that the key criteria against which the QDR should be evaluated are:

- Has the QDR provided the capabilities to prevail in the GWOT?
- Has it addressed adequately the full range of challenges likely to confront the United States between 2005 and 2025?
- Has sufficient action been taken on both the investment and divestment sides to realign the department's capability mix with current and emerging challenges?
- More fundamentally, has the QDR achieved its principal purpose of serving as a catalyst of long-term change?

The primary focus on the immediate challenge of the GWOT, which is characterised by irregular land warfare, implies the necessity for the US to re-balance its force structure. The author argues that capabilities that are insufficiently supplied are special operations forces (SOF) and general-purpose ground forces with greater irregular warfare capabilities. Conversely, the US is currently oversupplied with attack fighters, general purpose ground forces (oriented towards traditional conflict) and major surface combatants.

Vickers believes that the QDR makes appropriate decisions in this regard through authorising the significant expansion of US SOF and the raising for them of a dedicated UAV capability. Conversely, he concludes that the force-planning construct designed to guarantee swift, simultaneous victories against two adversaries in major conventional operations (MCOs) is now out of alignment with the emergent security environment. He argues for the urgent development of a revised force-planning construct.

Finally, Vickers concludes that the process started by the 2006 QDR must be extended across the entire US national- and homeland-security establishment to facilitate effective integrated operations across departmental and agency boundaries.

Article	**'Did the Pentagon Get the Quadrennial Defense Review Right?'**
Author	Michele A. Flournoy
Publication Details	*The Washington Quarterly*, vol. 29, no. 2, Spring 2006, pp. 67–84

SYNOPSIS

This article provides four criteria against which the author argues the 2006 Quadrennial Defense Review (QDR) should be judged. They are:

1. Does the QDR provide a sound framework for setting strategic priorities for the Department of Defense?
2. Does the QDR reshape US armed forces in ways that better prepare them to meet 21st-century threats?
3. Does the QDR promote initiatives to enhance the capabilities of inter-agency and international partners, who are instrumental to the US ability to accomplish its strategic objectives?
4. Did the QDR process develop a political strategy to secure the support of key stakeholders inside and outside of the Defense Department?

Flournoy concludes that the 2006 QDR failed to match expectations in each of these areas. Indeed, she argues that the QDR is most appropriately considered as two separate reviews. The first part of the QDR focuses on strategy and planning constructs and yielded important refinements to the way the Defense Department conceptualises US military missions in the post–11 September 2001 security environment. However, the second part of the 2006 QDR is a budget-driven program review that failed to make difficult decisions regarding investment and divestment in major programs.

The author asserts that the QDR lost its strategic focus for two reasons. Firstly, the replacement of Paul Wolfowitz by Gordon England as Deputy Secretary of Defense in May 2005 disrupted the continuity and focus of the Review process. Secondly, the announcement of significant cuts to the defense budget during the review imposed unexpected fiscal pressure

on the process. The developments undermined the resolve of the QDR team to recommend significant recapitalisation programs, as these had to be offset by program cuts. Tough financial decisions were postponed until beyond the 2008 budget year. This apparent lack of focus was compounded by the abrogation of personal control over the review by Secretary Rumsfeld.

Notwithstanding these criticisms, the author does commend some aspects of the Review. In particular, she concedes that the 2006 QDR is the first to deal in any meaningful way with the Homeland Security mission of the Department of Defense. Flournoy also commends the renewed emphasis on enhancing the capabilities of key partners in the Global War on Terrorism. This process involves greater efforts to build capacity in allied security forces as well as enhancements to the deployable operational capabilities of other US government agencies.

Article	**'Small Wars Revisited: The United States and Non-traditional Wars'**
Author	Frank G. Hoffman, US Marine Corps Combat Development Command
Publication Details	*The Journal of Strategic Studies*, vol. 28, no. 6, December 2005, pp. 913–39

SYNOPSIS

Hoffman's article discusses aspects of America's experience in small or non-traditional wars. The author notes that, while the United States has had considerable experience with such conflicts, it has not had great success. The article includes a useful discussion about the character of this type of war, noting that they 'defy simple characterisation or understanding.' Theorists have struggled to come to terms with these conflicts, but new concepts such as 4th Generation Warfare do little to throw light on the subject. Hoffman concludes his discussion of the terminology by quoting Clausewitz, who wrote 'all wars are things of the same nature'. On that basis, Hoffman retains the use of the term small wars throughout the article.

The primary reason that the US military establishment is not good at fighting small wars is, the author believes, its unsuitability for fighting such wars. Essentially, American military culture has difficulties with irregular warfare, preferring to engage in large-scale, conventional conflicts. Hoffman also notes that the 'new' small wars have some distinct characteristics, such as the existence of failed or failing states, increased urbanisation, new types of actors, the capabilities that communications give to terrorists and insurgents, and the influence that religion now has in these conflicts. Countering these 'new' factors, Hoffman says that several aspects of small war have remained constant, including the primacy of politics, the low utility of purely military solutions in such conflicts, the difficulty of defending against insurgent tactics and the importance of cultural understanding in reaching a solution.

For Hoffman, the implication of all these factors, both new and old, is the need for patience, tightly integrated civil-military policies and programs, unity of effort, and the application of acute cultural intelligence to the problem. Hoffman concludes the article by noting that 'The problem for today's strategist or policy maker is determining exactly what has changed, and how the various means of statecraft need to be adapted to the specific contingency at hand.'

Article	**'Inter-agency Operations: The Marine Speciality of this Century'**
Author	COL Matthew Bogdanos, USMCR
Publication Details	*Marine Corps Gazette*, vol. 90, Issue 3, March 2006, pp. 60–65

SYNOPSIS

In this article the author details his participation in a US Joint Inter-agency task force aimed at counter-terrorism (JIATF-CT) from late 2001. The author describes the difficulties encountered in Afghanistan of inter-agency operations, including the many bureaucratic problems that arose between the various agencies involved and how they were overcome. For example, he notes how the JIATF-CT had to develop a culture in which

the mission itself, not the ownership of the mission, was the primary aim. Initially, this concept ran counter to the organisational approach of some of the agencies involved. Other issues, such as command, remained an almost perennial problem because, under the existing guidelines, the Department of Defense was unable to task other agencies of the US Government. However, despite these problems, there were many successes. By facilitating direct access to each agency's databases, the JIATF-CT was able to establish an unprecedented information flow of both Defense and non-Defense generated data.

While noting the progress of US inter-agency operations over the past few years, Bogdanos believes that there is need for action in three areas:

- a lack of guidance for inter-agency operations at the national level
- the absence of information-sharing standards
- the requirement for effective, published doctrine.

In the light of his experiences, the author concludes the article by providing four recommendations specific to the Marine Corps:

- The establishment of a general officer-level inter-agency steering group that would guide USMC inter-agency policy, review and initiate inter-agency proposals, and establish doctrine to guide USMC inter-agency operations

- The development of inter-agency doctrine (this recommendation is accompanied by the observation that inter-agency operations are currently at the same state as joint operations were in 1986 before Congress passed the Goldwater-Nichols Act)

- The USMC should expand its culture of education to include training and education in inter-agency operations

- Finally, the author suggests that the USMC should revise its table of organisation to include positions for inter-agency specialist officers on staffs at the regimental and higher levels.

Article	**'Air–Ground Integration'**
Author	CPT Shawn Hatch, US Army
Publication Details	*Armor*, vol. CXV, no. 2, March–April 2006, pp. 60–64

SYNOPSIS

This article considers employment of aviation assets in the urban combat environment. The author begins by noting that aviation doctrine is traditionally concerned with the linear battlefields in relatively open terrain where isolation and bypassing of hostile forces is a valid option. However, in the light of experience in Iraq, the author believes that aviation assets can be a significant force multiplier, although doctrine for the employment of aviation in Iraq has been slow to evolve.

By using the existing US Army doctrinal roles and missions for combined arms operations in urban terrain as a guide, the author believes that the employment of aviation assets can be divided into four main categories:

- assess and shape
- dominate
- transition
- stability and support.

Hatch also notes that within this categorisation of roles and missions there is room for both further clarification and expansion. The article then discusses each of these categories, with specific reference to operations in Iraq.

The remainder of the article discusses aspects of mission planning, such as: the employment of liaison officers; aircraft station times; and the need to adopt flight techniques other than hovering, which make helicopters extremely vulnerable in urban terrain. The author also considers how aviation tactics can be matched to those of the ground forces that they are cooperating with. The importance of altitude as a planning factor for aviation assets in an urban environment is also considered. Another aspect discussed in detail is how air–ground synchronisation can be achieved, especially ensuring that both components share a common operational picture. While this area presents difficult problems, some

relatively simple ideas (such as the use of grid patterns and sketch maps of the urban terrain) have proven to be effective.

The final section of the article suggests some ideas for improvements that would increase air–ground synchronisation. These ideas include:

- the development of standardised identification charts for vehicles
- the employment of common nicknames for difficult to pronounce roads or localities
- the use of real-time streaming video broadcasted to all units involved in an operation.

The article concludes by noting that aviation assets have a vital role to play in urban operations, especially when ground and air forces take the time to plan and synchronise their operations.

Article	**'Planning for Success: the Challenges of Applying Operational Art in Post-Conflict Afghanistan'**
Author	Howard G. Coombs and General Rick Hillier
Publication Details	*Canadian Military Journal,* vol. 6, no. 3, Autumn 2005, pp. 5–13, < http://www.journal.forces.gc.ca/engraph/Vol6/no3/03-Thought_e.asp >

SYNOPSIS

Coombs and Hillier argue that the Canadian Forces (CF) approach to the operational art has developed through peace support operations dating back to the Canadian–led UN Emergency Force in Egypt in 1956. Today, however, the goal of intervention is no longer simply a cessation of violence, but also about reconstruction, renewal and development, leading to functioning nation states. Military campaigns must assist with creating the conditions for a durable, lasting peace in joint, multinational and multi-agency environments, and numerous state and non-state actors must be involved. The military contribution to this goal has become exceedingly complex, particularly in post-conflict environments such as Afghanistan.

In Afghanistan in early 2004, the primary focus of the International Security Assistance Force (ISAF) was the development of a strategic framework supporting the harmonisation of international community efforts in the reconstruction and development of Afghanistan. This involved reviewing the mandates of all the major organisations in Afghanistan and compiling a list of the objectives of each of these agencies to come up with an investment management framework. The five independent but interrelated themes were developed into strategic lines of operation—security, Islamic republic governance, rule of law, building social and human capital, and national economy and infrastructure. These lines were incorporated into national priority programs, for which the unifying principle was that donor-aid should be allocated through the national budget process so that the capabilities of Afghan institutions could be consistently and systematically increased. These programs were designed to move Afghanistan to a position of sustainable development. The logical next stage was the creation of a national concept for structured regional development.

The greatest challenge, however, to the re-establishment of Afghanistan was the lack of confidence in nation-building efforts by the international community and the Afghan populace. Four centrifugal forces were identified. First, the political dissension of regional leaders advocating the primacy of local interests; second, disruptive non-government armed forces; third, the Afghans themselves, with little national unity; fourth, regionally based narco-economies with global ramifications. Against these centrifugal forces the Afghan Transitional Authority and the international community acted without coordination and, lacking a secure environment, failed in their tasks.

The Coalition forces that were coordinating reconstruction efforts were Provincial Reconstruction Teams (PRT). They were the ones capable of making the linkages to create interest and shared ownership amongst all the agencies. In many ways, it became the role of the military commander to create a sense of inevitability about desired outcomes amongst all participating agencies. Hillier and Coombs assert that the most significant lesson of modern peace-support operations is that an intervention by outside forces does not necessarily lead to a strategically certain result or a complete cessation of hostilities. Military activities must orchestrate the

elements of success that are applicable to the problem, and they must synthesise the information to devise approaches that will create the conditions necessary to create victory.

Article	**'Reinventing Humanity: The Future of Machine-Human Intelligence'**
Author	Ray Kurzweil
Publication Details	*The Futurist*, vol. 40, Issue 2, March–April, 2006, pp. 39–46

SYNOPSIS

Ray Kurzweil is a technological optimist who believes that, 'We stand on the threshold of the most profound and transformative event in the history of humanity, the "Singularity"'. Kurzweil sees the Singularity as near-future period where the 'pace of technological change will be so fast and far-reaching that human existence on this planet will be irreversibly altered. We will combine our brainpower (the knowledge, skills, and personality quirks that make us human) with computer power in order to think, reason, communicate and create in ways we can scarcely even contemplate today'. For Kurzweil, three 'overlapping revolutions in genetics, nano-technology and robotics' will usher in a 'period of tremendous change'.

The 'genetic revolution' will 'extend biology and correct its obvious flaws (such as our vulnerability to disease)'. Kurweil claims that we can see the beginnings of the medical revolution today in the growing range of 'tools' made available by 'genetic biotechnology'. These tools are improving the rate and safety of pharmaceutical research and development, and providing the basis for 'discovering the precise biochemical pathways that underlie both disease and aging processes'. Kurzweil sees a time where designer drugs will 'carry out precise missions at the molecular level'. He concludes his review of the 'genetic revolution with the following list of possibilities:

> Accelerating progress in biotechnology will enable us to reprogram our genes and metabolic processes to propel the fields of genomics (influencing genes), proteomics (understanding and influencing the

> role of proteins), gene therapy (suppressing gene expression as well as adding new genetic information), rational drug design (formulating drugs that target precise changes in disease and aging processes), as well as the therapeutic cloning of rejuvenated cells, tissues, and organs.

The 'nano-technology revolution' promises 'the tools to rebuild the physical world, our bodies, and our brains, molecular fragment by molecular fragment and potentially atom by atom'. Combined with the 'genetic revolution' this will allow us to 'do a great deal more than simply treat disease. Ultimately, nano-technology will enable us to redesign and rebuild not only our bodies and brains, but also the world with which we interact. The full realisation of nano-technology, however, will lag behind the biotechnology revolution by about one decade. By the mid- to late-2020s, the effects of the nano-technology revolution will be widespread and obvious.'

Kurzweil sees the most important and radical application of nanobots (miniature robots) will be to 'expand our minds through the merger of biological and nonbiological, or 'machine' intelligence… This process will allow us to greatly boost our pattern-recognition abilities, memories, and overall thinking capacity, as well as to directly interface with powerful forms of computer intelligence. The technology will also provide wireless communication from one brain to another.' He sees that warfare will move toward 'nanobot-based weapons, as well as cyber-weapons'.

The third, and most important, theme of Kurweil's Singularity is the robotic revolution. Here he refers to 'strong artificial intelligence' in which there will be 'the creation of computer thinking ability that exceeds the thinking ability of humans'. He argues that:

> By the end of this century, computational or mechanical intelligence will be trillions of trillions of times more powerful than unaided human brain power. I argue that computer, or as I call it nonbiological intelligence, should still be considered human since it is fully derived from human-machine civilisation and will be based, at least in part, on a human-made version of a fully functional human

> brain. The merger of these two worlds of intelligence is not merely a merger of biological and mechanical thinking mediums, but also (and more importantly) a merger of method and organisational thinking that will expand our minds in virtually every imaginable way.'

While Kurzweil is an optimist, his article also contains cautions about the development of 'defensive technologies'.

> We are at the critical stage where we need to directly implement defensive technologies for nano-technology during the late-teen years of this century. I believe that a narrow relinquishment of the development of certain capabilities needs to be part of our ethical response to the dangers of twenty-first-century technological challenges. For example, Bill Joy and I wrote a joint op-ed piece in *the New York Times* recently, criticizing the publication of the 1918 flu genome on the Web because it constitutes a dangerous blueprint.'

For Kurweil, as the Singularity approaches 'we will have to reconsider our ideas about the nature of human life and redesign our human institutions'.

Article	**'Patriot Fratricides: The Human Dimension Lessons of Operation Iraqi Freedom'**
Author	Dr John K. Hawley, Chief of the Army Research Laboratory, Texas
Publication Details	*Field Artillery*, vol. 11, no. 1, January–Feburary 2006, pp. 18–19, < http://sill-www.army.mil/famag/2006/JAN_FEB_2006/JAN_FEB_06_PAGES_18_19.pdf >

SYNOPSIS

In 2004, during Operation *Iraqi Freedom*, the US Army's Patriot missile system destroyed two friendly aircraft: a British Tornado and a US Navy F-18. Dr Hawley's article examines the role automation and the man-machine interface as factors that contributed to these friendly-fire

incidents. His article offers insights into network design and operator-training that have implications for network-centric operations. The underlying theme is that these fratricide incidents provide early lessons for finding the right balance between human intervention and automation in networked combat systems.

Hawley's central conclusion is that 'soldiers and not an automated system must be the ultimate decision-makers in air and missile defence engagements'. He notes that the Defense Science Board investigation recommended that the 'Patriot system should migrate to more of a man-in-the-loop philosophy versus a fully automated philosophy' and that concurrently training should be 'upgraded to support this…protocol'. Hawley notes that putting human decision-makers into the control loop does not mean returning to the past—'the [Patriot] environment is too complex for that simplistic solution'. Instead, he argues that it is necessary to acknowledge that the role of traditional operators has evolved to become 'supervisors of automated processes' and this should be reflected in system design, training and professional development.

Hawley then moves on to compare the findings of the investigations into the Patriot system with those learned and incorporated by the US Navy following the *USS Vincennes* incident in 1988. Here situational awareness was the key factor in determining quality of a decision made in battle. Hawley believes that command and situational awareness is 'built on in-depth technical and tactical expertise'. Consequently, 'marginally skilled or apprentice operator-controllers cannot develop the situational awareness necessary for effective supervisory control, regardless of the sophistication of the battle command hardware suite provided to them'. In training, the more sophisticated 'operator-controller' must learn to balance 'faith' in the sophistication of the technology against a sense of 'mistrust' that errors can occur that require human intervention in the decision cycle.

Hawley concludes that, after three decades of research, artificial intelligence that seeks to develop thinking skills in machines has yet to reveal a viable solution. So, the challenge of ensuring proper human oversight in networked systems will remain, as will the need for system design and training to keep pace with the technology.

Article	**'Technology: Force Multiplier for Special Operations'**
Author	Dale G. Uhler
Publication Details	*Joint Forces Quarterly*, Issue 40, 1st Quarter 2006, pp. 54–59, < http://www.dtic.mil/doctrine/jel/jfq_pubs/4012.pdf >

SYNOPSIS

Dale Uhler is an acquisition executive with the US Special Operations Command (USSOCOM). Uhler's article outlines the streamlined development and acquisition processes that USSOCOM has developed to maximise commercial technologies and modify technology applications to meet the needs of Special Operations Forces (SOF).

The article begins by outlining the four areas central to technology development in USSOCOM: the warrior-as-platform concept, sensor technology, advanced power and energy, and support systems.

- The first area of development (the 'warrior-as-platform' concept) focuses on 'the individual and the mission equipment carried'. This concept is further broken down into seven main tasks: survivability, sustainability, lethality, situational awareness, manoeuvrability, communications, and physical performance. One example of technology development under lethality is 'low-weight, low-volume directed energy systems'.

- The second development area, sensors, focuses on developing sensors for 'manned and unmanned platforms, remote and fixed site placement, man-portable sensors, and sensors for identification and tagging, tracking and locating (TTL)'.

- The third area of development is advanced power and energy. This concept focuses on 'small, light-weight, inexpensive, high-performance, high-power, durable, rechargeable power sources that are versatile enough to power a variety of equipment'.

- The final area, support systems, is divided into three categories 'command, control, communications, computers, and intelligence systems; information operations systems; and mobility platforms.

Uhler then describes the processes by which the Command equips and supports the SOF. The first, and preferred option, is to find a commercial-off-the-shelf (COTS) solution. The second, low-risk, option is 'competitive prototyping, allowing two or more companies to develop prototypes for users to test'. The Command uses a process called spiral development to create and improve new technology. It has been found that this approach to research and development gives the SOF access to technology that is either adapted to the 'latest changes in terrorist tactics or evolves ahead of the enemy and exploit areas they believe are safe'.

Providing current and future technology to the SOF is the responsibility of the Special Operations Acquisition and Logistics Centre of USSOCOM. The Centre has four development programs:

- The first is the Special Operations Technology Development program that has a long-term planning horizon and focuses on technologies that may have potential but are not yet mature enough to field.

- The Special Operations Science and Technology program complements the technology development area through advanced engineering development, rapid prototyping, demonstration and evaluation of developmental prototypes in operational environments.

- The Advanced Technology Directorate provides technical support to the Small Business Innovation Research program. This program is a federally mandated program that 'allows small business to conduct exploratory and advanced development engineering' to support government.

- The Special Operations Medical Technology program focuses on physiological, informational studies and non-system developments to protect, enhance, and restore the health of SOF personnel.

The article highlights the fact that 'the military has become much more a user that a developer of technology, and little of the technology used by SOF is developed in-house. The robust USSOCOM technology harvesting programs access technologies of special operations interest regardless of source'.

Article	**'What's Next for Nanotechnology'**
Author	J. Storrs Hall
Publication Details	*The Futurist*, vol. 39, no. 4, July–August 2005, pp. 28–32

SYNOPSIS

J. Storrs Hall is chief scientist of Nanorex Inc. and a Fellow of the Molecular Engineering Research Institute. This article outlines the five stages of nano-technology development, the potential of nano-technology, and the limitations of nano-technology.

Hall begins by aligning himself with the original definition of nano-technology. He believes it is that process of 'designing and building machines in which every atom and chemical bond is specified precisely. It involves building machines whose parts are of molecular size, but more importantly, of atomic precision: Each atom and bond in the finished part is called for specifically in its design, just as are the parts in the machinery of a cell.' Hall then outlines the five stages of nano-tech development, noting that current knowledge is at 'Stage I', the ability to 'image at the atomic scale, with scanning probe microscopes and a very limited ability to manipulate—i.e., by pushing things around with the same scanning probes, much like feeling something with a stick'. 'Stage V'—the final stage—is where the ability to make parts from simple molecules becomes general:

> In other words, instead of designing a part from the building blocks, it is custom designed atom by atom. It's the difference between a machine made of actual Lego blocks and one made of custom-designed parts made with the same technology used to make Lego blocks. This is considerably more challenging, technically. It is also the stage where the more remarkable capabilities of nano-technology will appear.

In terms of the most likely capabilities that nano-technology will allow, Hall believes that nano-technology could provide a range of possibilities, such as the ability to 'turn sewage into breakfast'; 'transcontinental flying cars are … a distinct possibility; 'all senses virtual reality, done by

injecting signals into your sensory nerves or brain'; 'towers not just miles high, but hundreds of miles high, are quite feasible'; and a 'countertop synthesiser or 'matter printer' will revolutionise the way you acquire household objects and food'. On the other hand, nano-technology is unlikely to turn 'lead into gold' or provide 'psychic powers'.

The author acknowledges that many people fear nano-tech may run 'amok or fall into the wrong hands'. However, he argues that 'if nano-technology is developed evenly so that the mainstream, in general, has the same level of capability as rogue states and rogue groups, there will be no great problem. Nano-tech threats that would be catastrophic to a world equipped only with conventional bulk technology will instead simply be spills to be mopped up, fires to put out—generally preventable with ordinary hygiene and maintenance.' Hall concludes,

> In 1869, when Jules Verne wrote *Twenty Thousand Leagues Under the Sea*, seagoing submarines were science fiction. In 1900, flying machines were science fiction. In 1950, space travel was science fiction. Today, an account of the future involving molecular manufacturing and nano-machines could be considered science fiction, but an account of the future without them is fantasy.

Hall ends by noting that 'Scientists in general make poor futurists. The job of a scientist is to establish facts by careful experimentation, documentation, and repeated testing until that fact is as certifiable as human inquiry can make it. If futurists waited for the kind of verification that scientists require, they'd be historians'. He argues that imagination is required to capitalise on the potential of nano-technology.

Article	**'The Last Exit From Iraq'**
Author	Joel Rayburn
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SYNOPSIS

Rayburn points out that the United Sates was not the first country in the last one hundred years to occupy Iraq. That distinction belongs to the

United Kingdom, which seized the provinces of Basra, Baghdad, and Mosul from the Ottoman Empire at the end of World War I and formally took control of the new country in 1920, under a mandate from the League of Nations. Some have noted the parallels between the US and UK experience, but few have focused on the ignominious end of the UK's reign and its lessons for today.

The British occupation of Iraq drew heavy criticism at home almost from its inception. In 1920, a large scale Shiite insurgency cost the British more than 2000 casualties and domestic pressure to withdraw from Iraq began to build. Eventually, by early 1927, the UK had pulled most of its soldiers out of Iraq, leaving a few Royal Air Force squadrons and a battalion of Indian infantry to defend the country alongside a fledgling Iraqi army of only 9000 men. This withdrawal left Iraq unable to resist either the Wahhabi invasion or the Kurdish insurgency.

The British Government's premature announcement of Iraqi independence, Rayburn argues, actually undermined security by causing the various factions to begin positioning themselves for a civil war once the British left. When the mandate actually ended in 1932, Iraq's British-built institutions began, one by one, to collapse. With the occupiers gone, Iraq's Sunni Arab elite used the army not to defend the state against foreign invaders, but to suppress Iraq's Assyrians, Kurds, and Shiites. By the 1940s, Iraq, one of the least Sunni of all Arab states, had become a bulwark of the 'Sunni spirit of domination'. When war broke out in Europe, Baghdad opened back channels to the Axis powers, and it finally offered up the country to Hitler in 1941. Faced with the prospect of an Axis stronghold on their line of communications to India, the British were forces to invade Iraq once again—an occupation that lasted until 1948.

Like the US-led Coalition today, the UK in the 1920s began its Iraq project by pledging long-term support for Iraq's defence and development. In the ensuring years, the British encountered a set of problems similar to those facing today's Coalition: deep ethnic and sectarian divisions, an internal Iraqi power struggle, the infiltration of Salafi terrorists from neighbouring countries, active insurgencies carried on by minority groups, and hostile regional powers across the borders.

Thus Washington now finds itself facing roughly the same question that London faced between 1925 and 1927: should it leave Iraq, or continue until its project there has fulfilled its aims? The British came to assume that an independent Iraq would somehow muddle along and if it did not, the consequences would not affect the British. To avoid a similar result today, Rayburn argues, the US Government and its allies must confront what the UK's premature withdrawal achieved: disaster both for Iraq and its occupier. Having left the work of the mandate undone, the British were forced to return and attempt to finish the job nine misery-filled years later. The US can ill-afford to do the same.