

Strategic Uncertainty in National Security

Conflicting and Complementary Approaches to Managing Deep Uncertainty in Strategic Affairs for National Security

**26 June 2018
Samuel Neaman Institute
Haifa, Israel**

Organizing committee.

Prof. Yakov Ben-Haim, co-chair, Yitzhak Moda'i Chair in Technology and Economics, Technion.
Dr. Eitan Shamir, co-chair, Begin-Sadat Center for Strategic Studies (BESA).
Brig. General (ret.) Dr. Meir Finkel, IDF Dado Center for Interdisciplinary Military Studies.
Dr. Chuck Freilich, Belfer Center for Science and International Affairs, Harvard University.
Dr. Eado Hecht, IDF Command and Staff College.

Auspices. This workshop is organized under the auspices of:
Samuel Neaman Institute for National Policy Research
IDF Dado Center for Interdisciplinary Military Studies
Yitzhak Moda'i Chair in Technology and Economics, Technion

Sponsorship.

This workshop is funded by the Samuel Neaman Institute and the Yitzhak Moda'i Chair in Technology and Economics, Technion.

Website: <https://info-gap.technion.ac.il/strategic-uncertainty-in-national-security/>

Table of Contents

Background of the Workshop	3
Biographies of the Speakers	4
Doug Macgregor: Uncertainty in an Age of Persistent ISR	8
Discussion of Macgregor's presentation	15
Doron Avital: no essay.	
Discussion of Avital's presentation	22
Milo Jones: Strategic Uncertainty, Digital Technology and Formal Cause . .	28
Discussion of Jones' presentation	38
Meir Finkel: Conservatism by Choice (Stability), Innovation and Adaptation in Force Design – a Reexamination	42
Discussion of Finkel's essay	48
Rob Johnson: Decision-making in 'An Age of Uncertainty': A Critical Analysis of the British Approach to Full-Spectrum Challenges	54
Discussion of Johnson's presentation	68
Yakov Ben-Haim: What Strategic Planners Need to Know	75
Discussion of Ben-Haim's presentation	87
Concluding remarks	91

Background of the Workshop

Conference Theses and Approaches. The following approaches, among others, for managing strategic uncertainty will be presented.

1. **Flexibility.** One cannot plan for what one cannot anticipate, so one must plan for agility in responding to surprise. The emphasis is bottom-up: initiative in responding to surprise must come from the locus of action. Centralized planning or control are of limited value.
2. **Diversity.** Joint operations of diverse highly trained and carefully chosen specialists can respond to diverse challenges. The emphasis is top-down: centralized planning of specialties, thorough training for inter-operability, and coordination of their actions in real time underlie the comprehensive response to surprise.
3. **Technology.** Technological advantage, supported by sophisticated training, is the basis for Western countries to prevail over non-Western and especially non-state adversaries, regardless of the surprises they initiate.
4. **Robustness.** Strategic uncertainty is managed by identifying critical goals and formulating security policy to achieve those goals over the widest range of surprise. The goal is to optimize the confidence in achieving good enough outcomes, rather than to optimize the outcomes.

Background questions about strategic uncertainty for national security.

1. What is it?

- (a) What is strategic uncertainty? What is new about it? Did Alexander or Napoleon or Rommel face strategic uncertainty in the contemporary sense?
- (b) Can strategic uncertainty arise from small armed units, or does it only result from large military threats? In this age of instant global information and powerful weapons, isn't strategic uncertainty essentially tactical?
- (c) What are the geo-political or non-military dimensions of strategic uncertainty?
- (d) How does the assessment of strategic uncertainty impact government defense policy? How should it impact policy?
- (e) What are the strategic threats today? Terrorism, insurgency, conventional warfare? Are there regional differences: Europe, Middle East, North America, etc?

2. What to do about it?

- (a) Doctrinal responses to strategic uncertainty. Is new doctrine needed? If so, what should it be?
- (b) Force build up. What type of force is needed? Should the emphasis be on joint special operations, or on conventional broad-capability forces (land, air, marine, naval)?
- (c) What is the role of intelligence assessment in managing strategic uncertainty? Emphasis on early warning, or emphasis on situational awareness and contextual understanding?
- (d) Who is responsible for identifying strategic uncertainty? What training do they need? What authority should they have? Should they be centralized or dispersed? How do military and civilian elements interact?
- (e) Organizational responses. What are the organizational implications of strategic uncertainty? What organizational structures are needed? What communication, control, and command protocols are appropriate? What are the roles of organizational learning and planning?
- (f) Methodological responses. The sources of strategic uncertainty are themselves highly uncertain. For instance, cyber is a new strategic threat. The future hides other (as yet unknown) innovations with strategic implications. What are methodologies for managing the strategically unknown future?

Biographies of the Speakers

Douglas Macgregor

Douglas Macgregor is a decorated combat veteran, the author of five books, a PhD and the executive VP of Burke-Macgregor Group LLC, a defense and foreign policy consulting firm in Reston, VA. He was commissioned in the Regular Army in 1976 after 1 year at VMI and 4 years at West Point. Macgregor retired with the rank of Colonel in 2004. He holds an MA in comparative politics and a PhD in international relations from the University of Virginia.

Macgregor is widely known inside the U.S., Europe, Israel, China and Korea for both his leadership in the Battle of 73 Easting, the U.S. Army's largest tank battle since World War II, and for his ground breaking books on military transformation: *Breaking the Phalanx* (Praeger, 1997) and *Transformation under Fire* (Praeger, 2003). His book, *Warrior's Rage: The Great Tank Battle of 73 Easting* (Naval Institute Press, 2009) describes the 1991 action for which he was awarded a Bronze Star with "V" device for valor. His books have been translated into Hebrew, Chinese, Russian and Korean. His fifth book, *Margin of Victory: Five Battles that Changed the Face of Modern War*, is currently available from Naval Institute Press. <http://www.usni.org/store/books/history/margin-victory>

In 28 years of service Macgregor taught in the Department of Social Sciences at West Point, commanded the 1st Squadron, 4th Cavalry, and served as the Director of the Joint Operations Center at SHAPE in 1999 during the Kosovo Air Campaign. He was awarded the Defense Superior Service medal for his role in the Kosovo Air Campaign. In January 2002, Secretary of Defense Donald Rumsfeld insisted that General "Tommy" Franks meet with Colonel Macgregor on 16-17 January 2002 to hear Macgregor's concept for the attack to Baghdad. Though Macgregor's offensive concept assumed the rapid restoration of control to the Iraqi Army and no occupation his offensive scheme of maneuver was largely adopted.

Macgregor has worked as a consultant for the Office of the Secretary of the Navy, the Joint Staff, Bell Laboratories, and Raytheon Corporation on strategic roadmaps and the integration of disruptive technologies. He has testified as an expert witness before the Senate and House Armed Services Committees and appears on Fox News, BBC, CNN and PBS.

Contact: doug.macgregor@burke-macgregor.com

Doron Avital

Dr Doron Avital has a celebrated military history from the time he commanded a leading paratroopers company in the Lebanon war of 1982, to the planning and commanding of numerous complex special operations in Israel elite Special Forces unit, Sayeeret Matckal – also known as "The Unit" – all the way to holding the position of chief-commanding-officer of "The Unit" in the early 1990s. His tenure as a commander is registered as one of the most complex and shaping chapters in the history of the unit. During his service Doron Avital received numerous IDF military and special operations awards. He is considered a commander and a thinker who shaped an overall philosophy and strategy of planning, execution and command – if in the battlefield and if in the domain of special and secretive operations – that stands to this day as a leading point of reference to commanders of the IDF and to the classified security establishment of Israel. In many respects, Doron Avital's book, *Logic in Action* (in Hebrew), carries – alongside his more philosophical and political insights --- the main tenets of his philosophy and strategy of action.

In 1995, after completing his tenure as a commander of “The Unit” and equipped with a letter of recommendation from the late prime minister of Israel, Yitzchak Rabin, Doron Avital enrolled in a PhD program with the School of Philosophy of Columbia University in the City of New York, where after a few years he completed his Doctoral thesis in Logic and Philosophy. He was awarded Columbia University's Presidential Fellowship for the years 1995-2001 and taught there classes in advanced logic and analytic philosophy. Dr Avital holds in addition a BSc in Mathematics and Computer Science (1985) as well as MA (Summa Cum Laude) from the Cohen Institute for the History and Philosophy of Science and Ideas (1996), both from Tel Aviv University.

Upon returning to Israel, Dr. Avital headed the Georges Leven High-Tech Management School at Tel Aviv University, and later established and directed the BRM Institute of technology and society at the Faculty of Management. In the Hebrew University of Jerusalem, Dr Avital held the prestigious post of the Director-General of the Jewish National and University Library. Alongside his academic pursuit, Dr Avital served as a consultant and venture partner to one of Israel's leading venture capital firms, Evergreen Venture Partners.

In the domain of Home Land Security, Dr Avital implemented his military anti-terror background and experience with security and risk management, in advising some of Israel's top HLS firms, consulting in a wide array of large scale security projects, from design of overall security strategy and planning, to design of security standards – and all the way to hands-on questions of practical implementation.

With the 2009 elections, Dr Avital moved into politics, and served on behalf the Kadima party as MP in the 18th Knesset, Israel parliament. Dr Avital served on the foreign and security committee as well as the constitution committee and led the parliamentary Knesset delegation to the Council of Europe.

Milo Jones

Dr. Milo Jones is a Visiting Professor at IE University in Madrid. At IE, Milo teaches “Intelligence Tools for the Finance Professional”, “Geopolitics” and “Approaches to Complex Problems” in the MBA, Masters in Advanced Finance, Masters in Cybersecurity and Executive Education programmes.

In 2013, Stanford University Press published Milo's book, *Constructing Cassandra: Reframing Intelligence Failure at the CIA, 1947-2001*. This work, based on his PhD dissertation, traces the influence of the CIA's internal culture and identity on four major strategic surprises: the Cuban Missile Crisis, the Iranian Islamic Revolution, the collapse of the USSR, and 9/11.

In the past, Milo worked as a stockbroker in New York and as a consultant in London. He began his career by serving as an officer in the US Marine Corps, during which he graduated from the US Army's Airborne Course. In addition to his PhD from the UK's University of Kent, Milo holds an MA with Distinction in International Relations from Kent, an MBA from London Business School, and a BA from Northwestern University.

Milo is a Fellow of the Salzburg Global Seminar, a member of the International Institute for Strategic Studies, and a member of the Association of Former Intelligence Officers. He currently lives in Warsaw with his wife and daughter.

Contact: inveniam@gmail.com

Meir Finkel

Brigadier General (Res.) Meir Finkel is the Director of the Dado Center for Interdisciplinary Military Studies/IDF-J3. BG Finkel's service in the IDF (Israeli Defense Force) spanned a period of 28 years. For the first 20 years of his career he held various command positions at the IDF Armored Corps, from company to brigade, and participated in combat operations in Lebanon, the Golan Heights, Judea & Samaria and Gaza. He was commander of the 847th Armored Brigade during the Second Lebanon War (2006). Between 2007--2013 BG Finkel served as the head of the Ground Forces Doctrine and Concept Development Department. In 2014 he was appointed the Director of the Dado Center which he continues to lead as a civilian after his retirement in mid-2015. BG Finkel's academic education includes an MA in Neurobiology at the Hebrew University, Jerusalem and a PhD in Evolutionary Biology, Haifa University. He is also a graduate of Israel's National Defense College/Haifa University (MA) and completed his PhD in Political Studies in Bar-Ilan University, Ramat Gan. More recently, he received his MA in Archaeology and is currently working towards obtaining his third PhD in Prehistoric Archaeology at the Tel Aviv University. BG Finkel's book, *On Flexibility: Recovery from Technological and Doctrinal Surprise on the Battlefield* was published by Stanford University Press (2011). In addition, he has published many papers (in Hebrew) on various military and strategic issues and won three prizes for military writing.

Contact: finkel2010@gmail.com

Rob Johnson

Dr Rob Johnson is the Director of the Changing Character of War (CCW) research centre at Oxford University (www.ccw.ox.ac.uk). CCW brings together academics, policy makers and armed forces professionals in the study of war, pursuing a variety of research themes including war and the state in a connected world, violent non-state actors, strategy and war, and the moral-legal dimensions of war. Rob's primary research interests are in the history of war and strategy with a particular focus on the wider Middle East, but he is also concerned with how we conceive of future conflict environments and strategic thinking across the globe.

During Western operations in Afghanistan, Rob acted as a specialist advisor to the British, American, European and Afghan armed forces on security, stabilisation and transition. He ran 'Insight and Understanding' courses for a number of agencies both on Afghanistan and other areas of Western security interest, and worked in Zabul and Kandahar as well as the capital. He now works with General John Nicholson on the development of the Afghan security forces.

He recently published *The Great War in the Middle East: A Strategic Study* (Oxford University Press, 2016) illustrating the interaction of operations and military strategy, and relations with the government. The volume is a useful case study on how operations were managed and orchestrated to create the conditions for a strategic victory. In 2017 he published *True to Their Salt*, a history of partnering regular and irregular indigenous forces (Hurst and OUP).

He acts as an academic support to the Royal College of Defence Studies as well as other branches of professional military education in the UK and overseas.

Rob is currently assisting NATO, the British, and United States armed forces, in planning for reconfigured structures and missions, including information warfare /CEMA, intelligence, urban

operations and unconventional environments. He is part of the US Army Unified Quest project, visiting lecturer to the NATO Defence College in Rome, NATO Centres of Excellence, and the Royal College of Defence Studies.

Contact: Robert.Johnson@pmb.ox.ac.uk

Yakov Ben-Haim

Yakov Ben-Haim initiated and developed info-gap decision theory for modeling and managing deep uncertainty. Info-gap theory has impacted the fundamental understanding of uncertainty in human affairs, and is applied by scholars and practitioners around the world in engineering, biological conservation, economics, project management, climate change, natural hazard response, national security, medicine, and other areas (see info-gap.com). He has been a visiting scholar in many countries and has lectured at universities, technological and medical research institutions, public utilities and central banks. He has published more than 100 articles and 6 books. He is a professor of mechanical engineering and holds the Yitzhak Moda'i Chair in Technology and Economics at the Technion–Israel Institute of Technology.

Contact: yakov@technion.ac.il

Further information: <http://info-gap.com>

Uncertainty in an Age of Persistent ISR

Douglas Macgregor*
Burke-Macgregor Group

How do political and military leaders craft strategies to position their nation-states and armed forces for success in future conflicts and crises that are sometimes foreseeable, but difficult to explain, let alone identify? If the answer were clear-cut, uncertainty—the condition of not knowing with confidence—would not exist.

Today’s political and military leaders have no choice but to project technology and conditions into the future while they develop forces today that will be used a decade or more after their conception. For these leaders, coping with uncertainty is an unavoidable necessity when crafting military strategy and operations; and, it’s always hazardous.

In Washington, DC, however, the tasks of modernization and strategic assessment are made more difficult by the absence of political consensus regarding what precisely constitutes the United States’ vital strategic interests. More often than not, the American use of force is determined by the capability to act, rather than the strategic need to do so. The outcome is a condition of permanent uncertainty about when and where future conflict will occur and how it should be fought. In this knowledge-based age, Washington’s response is an unceasing demand for a competitive military advantage, particularly in the technologies of intelligence; surveillance and reconnaissance (ISR).ⁱ ISR is, thus, viewed as insurance against strategic, operational and tactical surprise.

Of course, understanding how ISR reduces uncertainty and influences decision-making; why decisions are quick and decisive in one setting and slow or ineffective in another involves more than just technology. Bureaucratic impediments to unity of effort across service lines, the command and control (C2) structure that employs ISR, together with the character of conflict and the personalities that wage it combine to make a profound difference:

- On 24 August 1914, a German listening post reported that the Russian First Army had slowed its advance into East Prussia. On 25 August, German aerial reconnaissance confirmed that the Russian advance was indeed slow and that the First and Second Russian Armies were too widely separated to mutually support each other. Knowing that German success depended on quick action, orders were issued to initially concentrate on the Second, and then the First, Russian Armies. As Field Marshal Hindenburg noted after the destruction of both Russian Armies, “*Without the airmen, no Tannenberg.*”ⁱⁱ
- On 14 October 1962, a U.S. U-2 aircraft took several photos showing sites for medium-range and intermediate-range ballistic nuclear missiles (MRBMs and IRBMs) under construction in Cuba. Twenty-four hours later, these images were shown to President Kennedy who immediately concluded that this development presented an intolerable threat to the United States. Thus, began the Cuban Missile Crisis, a crisis that may not have concluded favorably for the United States if not for actionable ISR before the missile sites in Cuba became fully operational.ⁱⁱⁱ
- In May 2015, a Navy F-18 pilot flying missions against ISIS expressed frustration with the conduct of air operations: “There were times I had groups of ISIS fighters in my sights, but

* The author is indebted to Mr. Stephen Burke, CEO, Burke-Macgregor Group, LLC and to Lt Gen David Deptula, USAF (ret) for their contributions to this paper.

couldn't get clearance to engage....” Lt. Gen. David Deptula, a former director of the Combined Air Operations Center (CAOC) in Afghanistan in 2001, agreed, “You’re talking about hours in some cases, which by that time the particular tactical target left the area and or the aircraft has run out of fuel. These are excessive procedures that are handing our adversary an advantage.”^{iv}

In the first two cases, ISR was instrumental in reducing the gut-wrenching feeling of uncertainty that plagues decision makers in crisis or conflict. In the third, uncertainty delayed or aborted action, an inevitability when using stand-off weapons to target irregular combatants doing their best to pass themselves off as “innocent non-combatants.”

Today, ISR’s role in shaping operational decisions at every level—tactical, operational and strategic—is more powerful than ever before. Properly employed, there is little doubt that enhanced ISR translates into a potential increase in lethality as much, if not more, than any individual platform or weapon system improvement. With these points in mind, the paper examines the impact of ISR on uncertainty from two vantage points: The first involves a look at how ISR can be technically optimized for the particular warfighting environment. The second explores how the leading role ISR plays in joint operations can be dramatically enhanced.

Optimizing ISR for Unity of Effort

In crisis or conflict, information is collected inside the battlespace through systematic observation by Soldiers, Sailors, Airmen, Marines or intelligence community operatives using direct observations, a variety of platforms, and sensors. *Surveillance* and *reconnaissance* are the methods of collection. Today, operational planning also benefits from “reach back” to Command, Defense & National intelligence libraries describing targets, threat systems, enemy unit capabilities, fighting power, high-resolution terrain, geology, and climate, as well as traffic-ability data.

When the collected information is exploited (analyzed and evaluated), the result is intelligence.^v

Based on its relevance, intelligence is disseminated to commanders and staffs with the goal of informing current operations and future plans. In this way, ISR informs command and control which, in turn, drives power projection, force protection and resource allocations in all domains. Hence, regardless of the form warfare takes, ISR must be treated as a critical, integrative battlespace function that facilitates decisive action across service lines.

These points notwithstanding, there is a tendency in the senior ranks to forget that data sets collected through surveillance and reconnaissance operations are not instantly converted into the centerpiece of ISR, “finished intelligence.” For ISR products to be useful mountains of data must be reduced to short, relevant summaries, supporting charts and target sets.

Analytical work can only be partially automated. Analysts that comprehend the enemy’s mind and capabilities must introduce qualitative factors into the assessment. In the final stages of this process, a few key leaders must unavoidably choose from a range of possibilities.

For instance, when General Eisenhower read U.S. Army Intelligence reports that emphasized the magnitude of German losses suffered in Normandy and on the Eastern Front during 1944, he concluded that the sheer scale of effort required for a German winter counteroffensive through the Ardennes made such an attack impossible. General Bradley strongly reinforced this attitude insisting that months of attrition had severely weakened the German opponent.^{vi} Both were wrong.

The potential for miscalculation is ever present. After all, surveillance and reconnaissance collection assets at every level are constrained because the data connectivity and bandwidth to move the collected data to exploitation activities and, eventually, the finished intelligence to the forces engaged in operations is often inadequate. In low intensity conflict or counterterrorism/counterinsurgency persistent ISR also demands time and assets on station.^{vii}

In other words, persistent ISR involves spatial surveillance, the monitoring of networks to identify informants and the nearby stationing of on-call Strike (manned or unmanned systems including surface-to-surface missiles) and Special Operations Forces to physically eliminate the terrorist presence. In this setting, political sensitivity to collateral damage in the form of non-combatant casualties produces a high degree of centralization that in turn creates more vertical layers of management, oversight, and filtering. The resulting intelligence is less timely (as in the F-18 case), more “consensual” (as illustrated by the Ardennes assessment) and less focused on the needs of the force on the scene that is primed to engage a fleeting enemy target.

The aforementioned problem is often made worse by the inclination inside the U.S. Armed Forces to centralize control of limited numbers of “high demand” ISR capabilities on the assumption that centralization provides the armed forces with better intelligence on a more efficient basis. The problem is that key airborne assets including signals intelligence, special mission aircraft, and tankers are in short supply to meet the growing range of mission demands.^{viii}

More to the point, in low intensity conflict or counter-insurgency/counter-terrorism, highly centralized command and control (C2) is the norm.^{ix} The weapons release decision in these ambiguous quasi-war environments remains politically sensitive and, thus, requires a higher level of authority than the captain or major in the aircraft can provide.

In addition, the organic multi-spectral ISR capability to develop the required “situational awareness” does not always exist in combination with the capabilities for tactical exploitation and precision engagement. In other words, the mix of technologies with the right software applications is not present in one platform. The result is that the flight crew cannot own the “kill chain” because the analytical tools to enable rapid engagement in real time do not exist in a single platform.

Technology offers a potential solution. ISR packages can be developed that will provide onboard correlation of multiple sensors and applications for tactical exploitation. These applications will include software for coherent change detection, feature and pattern recognition, automatic target detection and nomination, as well as complex event processing.^x These applications will throw targets into sharp relief that would have otherwise been lost in the fog of war. Mission packages designed to convert latent sensor data into actionable intelligence while still on mission ensures that targets are destroyed that would otherwise escape while pilots and crews wait for permission. Given the low dwell times for targets, the importance of moving in this direction with existing and future platforms cannot be overstated.

At the same time, depending on the nature and quality of the commander, an effective ISR structure can sometimes work against the effectiveness of the Soldier, Sailor, Airman or Marine at the sharp end of fight. Uncertainty will often prevail regardless of the intelligence presented to the commander for reasons that have nothing to do with technology or the structure of command and control (C2).

In his book, *A Short History of Financial Euphoria*, John Kenneth Galbraith, the noted economist, presidential advisor and ambassador, explored the origins of 19th and 20th Century American financial

crises and why many of the leading personalities in finance and government were unequal to the task of mastering the financial disasters they inadvertently helped to create.

Inside large institutions, Galbraith discovered, predictability trumps all other considerations in the selection of senior leaders whose mission is stability, not change. Because the exceptionally talented and dynamic candidates for senior leadership are prone to challenge the status quo, they are usually excluded from promotion to the senior ranks.^{xi}

During WW II, General Eisenhower concluded that elevating younger officers into the senior ranks based on demonstrated character, competence and intelligence may be part of the solution to this problem: “From the standpoint of both present and future effectiveness, my own conviction is that *a corps commander should be in his late forties, division commanders should be in the early forties, with an occasional man even in his thirties*. In all cases, at this stage of the war, assignments to these positions should be by demonstrated merit in battle.”^{xii}

Solving the leadership problem is beyond the scope of this paper, but the structure that integrates warfighting capabilities can be adapted to take full advantage of ISR. Adaptation entails understanding that the degree of capability integration required in the confusion and chaos of dispersed mobile warfare will not be achieved inside restrictive, hierarchical, single-Service Cold War command systems suffering from information overload and too many levels of command. In addition, all forces must also treat ISR as the means to mobilize organic, as well as external combat power that is disproportionate to the size of the force in contact.

ISR as an Integrative Battlespace Function

Regardless of how powerful the United States and its allies may be, it is always impossible to be strong everywhere at once. The reluctance of the American people and their representatives in Washington, DC to add more manpower to the U.S. Armed Forces makes the effective employment of ISR indispensable to national defense.^{xiii} Organizing the power of ISR to take maximum advantage of its influence on every level is therefore vital.

Maximizing the value and impact of ISR in high-intensity conventional warfare (HICW) is particularly important because rapid, unpredictable change is the norm making centralized control over fluid operations involving dispersed, mobile forces difficult if not impossible. These are the reasons why warfighting operations anywhere on the Eurasian landmass today depend on redundant, survivable national space-based intelligence, surveillance and reconnaissance (ISR) infrastructure combined with resilient, integrated cyber capabilities and dominance of the electromagnetic spectrum (EMS). Cyber dominance and EMS dominance are complementary.

Moreover, without EMS dominance, it is neither possible to remotely detect, characterize, or target nor connect with friendly or opposing systems to exchange, modify or delete data. In addition, both domains require their own surveillance and reconnaissance platforms, and produce their own unique intelligence products. In the EMS domain these products include the EW Intelligence Reference Library and Intelligence Mission Data. Both are used to program EW systems and to drive the development of new capabilities.^{xiv}

Today, harnessing the revolutionary impact of ISR to Joint warfighting requires the compression of contemporary C2 echelons into a flatter, multi-Service integrative C2 structure. For years, senior civilian and military leaders have talked about flattening command structures, admitting that the speed required for capability integration in modern warfare cannot be achieved inside restrictive,

hierarchical, single-Service Cold War command systems suffering from information overload and too many levels of command.^{xv} It's time for action. Here's why:

1. The contemporary speed, range and precision of modern weapons combine with phenomenal computational power to increase lethality and expand the potential battlespace beyond anything seen in the last 70 years. Events in all forms of conflict that were once sequential are now near-simultaneous.
2. On the strategic and operational levels, U.S. command, control and communications, particularly space-based capabilities, will be disrupted, if not for long periods, then, certainly long enough to unsettle commanders. Driving decisions to lower levels inside a flatter command structure with nodal combat power ameliorates these conditions.
3. Massed, precision firepower or, Strike (beyond-line-of-sight/standoff attack), facilitates operational maneuver over distance by dislocating enemy command and control (C2), crushing large concentrations of enemy forces, isolating the battlespace through interdiction and destroying enemy facilities with operational significance. The skies over U.S. Army Forces will be crowded with loitering munitions and unmanned combat aerial vehicles (aka armed drones). These agile UCAVs are really cruise missiles designed to engage beyond line-of-sight ground targets.^{xvi} The combination of the aforementioned with theater ballistic missiles, surface-to-surface missiles, rockets and self-navigating long range cruise missiles means that the division and corps structures of World War II designed to mass soldiers and fires to overwhelm opposing forces are now strategic liabilities.
4. The fusing of space-based and terrestrial ISR capabilities (long endurance unmanned systems or satellite surrogates) with the timely dissemination of analyzed intelligence through networks means the near-simultaneous application of Strike and Maneuver forces can be decisive in 21st Century warfare. Thus, the integration of aerospace, naval and ground-based Strike Forces inside maneuver formations at progressively lower levels within a Joint command and control (C-2) structure.
5. When loitering missiles are integrated into strike formations armed with precision guided rocket artillery that fires high explosive, incendiary, thermobaric-warheads including sub-munitions with self-targeting anti-tank and anti-personnel munitions, warfare as we know it changes.^{xvii} Rockets fired from just 5 BM-21 rocket launchers can devastate an area the size of New York City's Central Park (843 acres or 3.2 square miles) in minutes.^{xviii}

The new battle space described above demands change in the way U.S. ground forces fight. New formations must operate on land the way the Navy's ships operate at sea: within the range of their organic ISR and Strike (Stand-off attack) capabilities. U.S. Army ground combat forces must learn to operate inside new formations designed for autonomous networked operations informed by real-time ISR. History teaches that once the battle is joined higher headquarters only rarely influence it. The capacity for self-organization and aggressive offensive action whether or not the formation is attacking depends on informed initiative, as well as accurate, devastating firepower from survivable, armored platforms and stand-off attack systems.

Flattening the C2 structure on the JFC model is essential to this capacity if ISR is to be leveraged for accelerated decision-making in the bid to outpace future opponents. The multiplicity of higher headquarters in the chain of command not only slows decision making and increases friction, it drains the fighting formations of far too many capable soldiers.

In modern warfare, rapid, seamless integration of capabilities across Service lines is the key to unity of command. Without unity of command, there is no unity of effort. Unity of effort, speed of decision, and action demand integrated command structures midway between the strategic and tactical levels

that create and maintain a coherent Joint picture of operations. ISR is the heart of shared battle space awareness; a condition that is both technical and intellectual.

The Joint Force Command (JFC) concept depicted in the briefing moves the U.S. Armed Forces beyond the last minute lash up of single-service headquarters, or the ad hoc coordination of Federal agencies and service-based elements of integration. A force design structured and equipped for dispersed, mobile warfare operates within the framework of ISR, Strike, Maneuver (movement to positional advantage) and Sustainment (logistics).

Because C2 of geographically dispersed armed forces requires “brain to brain” as well as “box to box” connectivity, C2 structures on the operational level demands trained professionals from all of the Services. Integration within a relatively flat, joint command structure is the key to the process of combining ground Maneuver forces with Strike, ISR and sustainment capabilities from all the Services. In this operational setting, ISR not only informs Strike, Maneuver and Sustainment Forces; *ISR is the foundation for a coherent Joint view of warfare across service lines.*

At its core, the ISR-Strike-Maneuver-Sustainment Framework for operations is not just about “things.” It’s about integrating existing and future capabilities within an agile construct guided by *the human understanding that ISR helps to create.* The goal is to create a *coherent view of warfare*, (not just operations) across service lines. Within the operational framework of ISR-Strike-Maneuver-Sustainment, the planning and execution of operations become routinely integrated through multi-service command and control—common mission purposes.

Creating flatter, more agile command structures manned by officers that possess the desired elasticity of mind is a critical measure for coping with uncertainty. The reason is self-evident. No matter how prophetic we may be, the next war will probably take a shape that is different from our prewar conceptions.^{xix}

Conclusions

If the U.S. armed forces were compelled to fight today against a capable nation-state opponent (or alliance of nation-states), Americans in uniform could, for the first time since WW II and the Korean War, easily end up fighting according to someone else's time schedule and initiative. No one in today’s military has any idea what it is like to fight on someone else's clock.

More than two decades of operations against weak insurgents, opponents without armies, air defenses and air forces, has reinforced a sense of military supremacy that may be deceptive. Like the United States in the last 16 years, the French and British France were distracted by costly low-intensity conflicts. Campaigns in Africa, the Near East, and Southeast Asia obstructed military modernization in both material and intellectual terms, focusing the ground forces on small-scale tactics at the expense of honing their operational-level skills.^{xx}

This recognition suggests that decisions about how to employ ISR products, applications, capabilities and resources, as well as less complex decisions about weapon systems and platforms, may well decisively influence the outcome of future military operations against peer or near-peer opponents. To be blunt, advanced, survivable long-range reconnaissance and strike systems, manned and unmanned, armed with stand-off precision weapons and sensors, cannot operate without extensive ISR infrastructure.

If and when Washington resorts to war it implies that economic incentives were insufficient or even irrelevant to the opponents' motivations to act against US interests, and that diplomatic overtures were unsuccessful in deterring or dissuading the opponents from resorting to armed conflict. When war comes, Joint, integrated C2 that treats ISR as a warfighting function must exist inside the regional and functional unified commands to ensure unity of effort. Without the coherent view of warfare that integrated ISR can provide, a long, arduous and exhausting conflict, rather than a decisive victory, could easily ensue in a future regional conflict. This is the worst possible outcome for an American society intolerant of heavy casualties and the reduced living standards that such a war would entail.

Fortunately, the New National Defense Strategy with its focus on the growing potential for great power conflict offers the hope that Americans in and out of uniform will concentrate their minds on a future that diverges sharply from the past. The United States does not have limitless resources to do everything, everywhere all the time; *to ignore what is strategically vital in favor of what is merely strategically desirable*. Political-military objectives must of necessity be both concrete and attainable.

ISR can be instrumental in helping political and military leaders with many tasks; to alleviate uncertainty and occasionally compensate for the lack of numerical superiority, to seize the initiative, surprise and out-pace the opponent. But ISR in any form is not a substitute for strategic vision as Sir Winston Churchill told his colleagues in 1909: *"It would be very foolish to lose England in safeguarding Egypt. If we win the big battle in the decisive theater, we can put everything else straight afterwards. If we lose it, there will not be any afterwards."*^{xxi}

Colonel (ret) Douglas Macgregor, US Army is a decorated combat veteran, PhD and the author of 5 books. His most recent is *Margin of Victory*, Naval Institute Press 2016.

ENDNOTES at end of file.

Discussion of Doug Macgregor's presentation:

- Prof. Yakov Ben-Haim:** I'd like to open this talk for discussion. Please mention your name when you speak, because we are recording and as I explained we will transcribe and send the transcriptions for approval. But please mention your name so we can match names to words. Comments, questions?
- Dr. Jones:** I think I know the answer but just to reinforce my despair, can you tell me, the Lieutenant Colonel who paused before the pass, I assume he was promoted on schedule?
- Dr. Macgregor:** In fact, the RAND corporation, all through the 90s, up till 2001, ran a study of what they called units at the national training center, identifying high performance units. And there were three in the army. Now, when they ran through this study, I'll send excerpts to you, but the army was so embarrassed by it, they classified it to keep it out of everybody's hands, particularly the hill. But Rand corporation found that the worst performers as battalion commanders were destined to be brigade commanders. The worst brigade commanders were destined to be generals. They added two other attributes that were important. The Lieutenant Colonels and Brigade Commanders who were advanced had been aide-de-camps, executive officers and speech writers for four stars and three stars in the army. So they had sponsorship. And most of them taught at West Point for a few years. So those were the key attributes as RAND saw it, that identified you for promotion. Disastrous.
- Dr. Freilich:** Chuck Freilich trying here and get to the Israeli context. First, I want to say your description of the Eisenhower years was an absolute eye-opener, astounded me. Because it's of course very different from the narrative that you get from just reading general history books about the period and about D-Day and everything that went into it. But your primary message, if I understand it, is that the two primary factors or tools that we use in dealing with uncertainty are weapons capabilities actually for the purposes of deterrence and intelligence, or Israel.
- Dr. Macgregor:** Technical intelligence, things that we've captured with technology more than the qualitative assessment.
- Dr. Freilich:** Intelligence has always been a central part of Israeli military thinking and it's almost a national strategy in terms of its importance in Israel. And I think, at the risk of maybe making a few people in this room jump in their seats, I think it is grossly overstated. Not that we don't need it and not that it isn't vital, it is absolutely vital. But it's vital at the military level and it's vital as an input for decision makers but it has become a replacement for decision making. Everything is about the intelligence picture. We're quite pouring fortune into intelligence and, again, maybe it's justified but I think we have to do a much better job as making it part of a real strategic decision making process as a tool for decision making and not as almost an end result of its own. And there's also a huge emphasis on technology. And both of these things are because the national leadership has been unwilling to try and form a national strategy. Now, I'm not convinced that formulating written formal national security documents necessarily make things much better. And despite your rather critical description of the American process, I think if we're talking today, 2018, there's probably no country in the world that has a more sophisticated national security decision-making process. Now that doesn't mean that the U.S. doesn't make lots of mistakes and get it wrong very often. And I was on the national security council. I used to say jokingly that the only difference between the Israeli national security council and the American national security council is that the American's mistakes have been written better, phrased better. So you go through the process And the U.S.

today has a national security strategy and a national military strategy and a defense ... And each command comes out with its strategy and I think looking at it from Israel, it's a remarkably structured process. Does it really ... American decision making ... so I don't know that the formal processes necessarily lead to a better outcome but they certainly should improve the prospects of it, otherwise we're in a state of chaos and we are far from doing it sufficiently.

Dr. Macgregor: A couple of good points, I was in the War Plans Division of the Army staff which is ultimately the place from which most of World War II generals were picked. When you look at the people who command the armies and corps, they're almost all former members of the Army War Plans Division. And even in our time, I'm one of the few who was in that War Plans Division who wasn't promoted but we won't go into that. But the point is that we concluded on a pretty routine basis to the 1990s, that decisions to use military power were shaped more by the capability than they were by the need to do anything. Because we would come back and say "Wait a minute, what do you want to do in Somalia? What is your goal in Haiti? What are you really trying to achieve in the Balkans? Why are the Serbs suddenly enemies of the United States when we've never had a conflict with the Serbs and certainly in the last two world wars, we were allied with them". These kind of questions came up. Why are we striking the Serbs over Kosovo when the Albanian, Kosovo, the KLA, the Kosovo Liberation Army, which was kind of a Stalinist organized crime syndicate, is also cooperating directly with Osama Bin Laden and his Jihadists who were actually operating out of Albania. There were only 50 of them but they were there, to show their solidarity with their Muslim brothers. In fact, I had officers that came to me when I was directing during operations and said "Can't we just bomb these location inside Albania and act like we didn't do it? No one will ever notice", to get the Islamists. By the way, it was the French and the British who really brought this to attention and I was told shut up, we are showing the Islamic world that we, we are their friends and we care about Muslims. These kinds of things went on so when you say strategy, I think Eisenhower developed a strategy and many of these processes reach back to that era. But that was a defined opponent which is always helpful. Because then it allows you to plan against a defined enemy. That gives way in 1989, 1990 to "the world is my oyster". We just won Desert Storm, we're the greatest and Nietzsche said war makes the victor stupid. I think we came down with an acute case of stupidity in 1991. And I remember sitting in a room like this, and we had some generals over here, from Washington. I was here, majors, lieutenant colonels and some colonels and they asked us questions about Desert Storm. And everybody said, well, we did this and we did that, we blew them away and we destroyed everything. And they got to me and they said "Well you were the biggest tank battle since the second world war and you destroyed everything and you had one man killed, six wounded and only lost on Bradley. That was a brilliant performance". And I said "That, Sir, is because Desert Storm, at least from my vantage point, is closer to 1899 and Britain's fight with Sudanese tribesmen than it is a modern war."

Dr. Freilich: That must have made you very popular.

Dr. Macgregor: Yeah, I was stupid, I thought people were actually interested in professionally understanding what was true and what wasn't and looking at vulnerabilities. What I discovered was, the generals and the admirals all said "We're perfect! We demonstrated it. Our doctrine, tactics and organization will not change for 20 to 30 years". Here we are. And so now we talk about technologies but unlike the business world where if you have a new technology you tend to build a business unit around it, figure it out, how should it be exploited and then you organize to exploit it. We

do not organize on the ground to exploit new technology. We hammer the technology into the old World War II 1942 construct. Today's army is the 1942 army with very, very modest changes. And no one can convince me, I was certainly not convinced in 1991 or thereafter, that it works for the future against an enemy who can think and has capability. So there are two problems. One is the strategic level, where is the strategy? Where do we go next? You're standing in the War Plans Division. This week it's Bosnia, another year it's Kosovo, a year later it's somewhere else. Where are we going? What are we doing? 9/11 comes along, everything changes to focus on counter insurgency and counter terrorism. All of the skills and in fact the ISR architecture atrophies because it's more than adequate to deal with counterinsurgency and counter terrorism. 15 years later somebody wakes up and says, you know, look at the EW environment, look at the cyberspace environment, look at the new surface to air missiles, look at the new surface to surface missiles. Look at the structure emerging in Russia and in China. We can't compete with this old ISR architecture. But nobody will stand there and say "We can't compete with the old fore structure" either. It has to be changed from the top, down.

Dr. Hecht: By losing a war. That's the only way.

Dr. Johnson: First of all, I'm echoing the feeling that some of this is very refreshing to hear, someone from the United States with your background and experience being so critical about United States armed forces. You know, exactly what you described, I've seen for myself, only recently. You talk to American senior officers and the conversation's really about fires, a little bit of ISR and almost nothing else. And it's quite shocking. But you gave a very good call for understanding an army and trying to ... formation. And this country, ... it's got a big reputation around the warfare for being so critical and thinking about what we are and how we operate. There's a paradox that you were saying, which I thought was really interesting. The paradox is that massive large forces have a course of their own because they are, by their nature, quite threatening, they have also the capabilities that smaller armed forces do not have. And yet, what you revealed was that very large mass forces are also vulnerable because their decision making process is potentially quite slow. And you know, given that this country, here, that we're sitting in now, faced a coalition of Arab states in 1967, they were about to attack. And their weakness of the Arab forces was their inability to have a rapid decision making process or an even unified one. Coalitions are even worse at making decisions. When you're a large coalition like in Afghanistan or Iraq, I mean they're pretty hopeless about rapid decision making. And yet, the other part of the paradox, is that war is a mixture of both deliberate operations and more opportunistic ones. And it seems to me that we could get overly critical about the process of deliberate decision making which we need and which is at the strategic level, I guess, and to some extent at the operational level. And what we're trying to get is that very, very rapid, opportunistic sense of decision-making our tactical. Now, we may be lucky because tactical commanders, as they become more senior, as they go up the ranks of armed forces, we hope that they take with them a little bit of that, they retain the opportunistic sort of decision-making process. And here what you say is, that doesn't happen institution got squeezed out of them by the nature of the army they belong to. That's ... but I wonder if this solution and academics aren't supposed to propose solutions, we're just supposed to define problems for you. It made me think, that what we need is sort of like a thundercloud, like a lightning rod that strikes from the top of the cloud to the tactical. And the lightning rod is a central nervous system in decision making processes. If we were to privilege, not the commander at each level but actually privilege the decision. If

we made, if we put our architecture around the decision itself, not the individual, the person who is supposed to be responsible, would that be helpful? Or is that the idealistic pipedream that simply cannot ever exist?

Dr. Macgregor: The cultural mindset of the people you're dealing with always results in the same outcome, the million man march. In 2003, I was summoned by Newt Gingrich to go to work for Rumsfeld, to plan the advance on Baghdad, which I did. And I said "We don't need more than forty or fifty thousand troops. This should be over in a week, a week and a half. We drive around everything on two axis and go straight into Baghdad." And then he presented me, a few weeks later, with the names of the people who would command. And I looked at the list and I said "None of these people have ever been in combat, they've never been shot at. They did nothing during Desert Storm. They weren't there, they don't even know what the enemy's like". It was my experience that we could have avoided fighting most of the Arabs that we ended up killing. Because they weren't interested in defending Saddam Hussein. But when I went in to see ... and I tried to make some of these points, his answer was "Well, you know, they're fighting for their country this time. We're going in to Iraq, they're going to defend their country like anyone would". Huh? What does this guy know about Arabs? He's out of his mind. The Arab believes in his tribe, he believes in his family, in his relations, his clan, whatever you want to call it, on a local level. And the government is a source of 'goodies' with which the locals are bought off or convinced to buy in and so forth. None of that, none of it made any difference. There is Iraqi nationalism will come to the fore. It make take 90 days for us to get to Baghdad and then we'll have to lay siege to Baghdad. 'What? What do you think you're fighting? Soviet armed forces?' And remember, some of you may recall this but that was a comment that was made by a senior Israeli commander in 1956 when he saw the British and the French show up. He said "My god, what do you think you're fighting? Soviet armed forces?" There was no sense of proportionality, no understanding and the goal, at that point, there was no talk of occupation, no talk of nation building, none of that stuff, that all comes later. It was in and out. And we were supposed to leave the Iraqi army intact. What I'm trying to say is that again, there's an unwillingness to take seriously anything that they can't count. Don't you remember during Desert Storm these news conferences. "Oh, today we destroyed X number of tanks, we destroyed X number of this" and so forth. No qualitative assessment and judgment.

Prof. Ben-Haim: I would like to make a brief comment in continuation of exactly that idea that I think connects with what Chuck said earlier and that is that there is a disconnect between technology and understanding. I'm a professor at a technological institute so I'm pro-technology, they pay the rent. But technology brings, I'm talking about intelligence collection technology, by and large brings numbers. And numbers, by themselves, are not understanding. And it's bridging that gap that needs to be done together with the fact that there's tremendous uncertainty there. And the question that I would like to know the answer to is how do you train people to understand, one, the meaning of the numbers that they're facing. And two, the significance of the lack of understanding that they're inevitably going to be left with. How do you train people to deal with that richness of data and poverty of understanding?

Dr. Macgregor: The Air Force talks about this web, this kill web of unmanned assets and satellites and so forth. But they talk about sensing, networking the information and then understanding. Sensing, networking and understanding. The understanding part is problematic. In the army for instance, I'm sure Milo is familiar with this, we used to have a foreign area officer program, we still do, where we would select officers and

send them to foreign countries, to study. And we produced some really brilliant officers. All of them were subsequently passed over for promotion and retired early. "We don't need guys like that. We need action men". That was the comment that I kept hearing when I was in the War Plans Division. "Well, he's a thoughtful guy but he's not an action guy". This sort of mentality. Remember, we have no general staff system. None. We have no unified military command structures. The Joint Staff suggests things, the Chiefs of the services wield tremendous power. They sit on top of great powerful bureaucracies, with links to industry and links to congress. That's how you end up with a 715 billion dollar defense budget. Because the Secretary of Defense and the President only have so much control. The President's the Commander in Chief and in theory he has command authority. But these services are very powerful in their own right and they'll decide what it is that they're going to do and what they won't do. So breaking the power of the services is a long term prospect. But then you have to have a quality assessment. A friend of mine calls it "IQ tests for generals".

Dr. Hecht: Just two comments. One is about the question of quantitative rather than qualitative.

And again, you can look at our own experience. In '73 we knew everything in terms of quantitative. We saw everything, we knew everything, the problem was understanding what we were seeing. And I think that's the real issue with intelligence first and foremost. Sometimes too much intelligence is worse than not having intelligence at all. Because it makes you complacent and this is, in a sense, what happened to us. And we've had exercises in which we've taken the original intelligence information, disguised so that people wouldn't know what we were talking about and they kept coming back with the same answer - there's not going to be a war. So wait a minute, this is after we already had that. Why do people still come back and say no, 99 percent say "No, there's not going to be a war"? So this is the real problem. And you mention the foreign area officer thing, we don't have so many foreign areas, we live in them, for us it's a bit easier. And still we have a problem. That's one thing. The other thing though is,

Ms. Hanegbi: Excuse me, Eado, can you explain about too much intelligence?

Dr. Hecht: You have so much information that it looks like you actually understand when you don't. Just a whole list of things. So if I know the whole Syrian army, exactly where it's located, it doesn't help me decide what it's going to do. But I'm so busy looking at where it is, I see the trees and not the forest.

Mr. Tzuriel: It does help you to know what you're going to do.

Dr. Hecht: Well, partially, also.

Mr. Tzuriel: If you are the central player, then it may have a lot of influence.

Dr. Hecht: Yes, but again, sometimes it gets a bit overwhelming.

Mr. Tzuriel: If they are a player it doesn't really matter. And this is the case we face often, recently.

Dr. Hecht: I'm not saying no intelligence is good. I'm saying sometimes too much intelligence makes you complacent and then you lose your touch. Because you're looking at the trees instead of the forest. And sometimes it's better not to know.

Dr. Jones: Strategic surprises, starting with Roberta Wohlstetter studying this, "Pearl Harbor :Warning and decisions", do not originate from failure to collect. They originate in failure to ask the right questions, to sort the signal from the noise. In the intelligence cycle, problems come, not in the collection phase or even in the analysis phase. It's the tasking. And the right questions are how you best support the decision maker. Unfortunately most intelligence is about providing answers, not asking questions and

being the pain in the ass to the decision maker, frankly not to make decisions easier but harder.

Mr. Tzuriel: I think today with big data and everything, the emphasis has moved to asking questions, has it not?

Dr. Jones: I see a bigger emphasis by vendors to make the haystack bigger through collection rather than help me find the needle or figure out what the needle should even be.

Dr. Macgregor: Yes, except you're talking about the algorithms, this is what we call algorithmic warfare. And that is a part of this new kill web business that you structure the algorithms to elevate critical issues from the mass of information that allow you to focus narrowly, quickly, earlier. Now, I'm not saying it would work. I mean this is what we're trying to achieve.

Dr. Jones: To me, that is the application of tactical thinking to strategic problems. You don't kill your way out of strategic problems. You think your way out of strategic problems.

Dr. Hecht: And then you choose who to kill.

Dr. Jones: Right and then you choose what to kill. There are people who need holes in their chest but you can't say that that is our strategic goal, is to simply put holes in people's chest until the strategic problem goes away.

Dr. Macgregor: Milo, for that to happen, you need people in the command structure. I will give you a perfect example, that's Douglas MacArthur. Douglas MacArthur, during the second world war, certainly made mistakes at the beginning which is when most senior commanders make them. Particularly in ... where he suddenly saw thousands of U.S. soldiers mired in the jungle, trying to come to terms with the Japanese. They were sick, they were exhausted, they started to fall apart. He went out there and saw it and from that point forward, for the rest of the war, MacArthur went forward routinely. He never made the mistake again of simply allowing his subordinate commander the freedom of action without personally inspecting, seeing what was happening, involving himself in the operation. For the rest of the war, MacArthur is his own intelligence officer. He routinely rejects intelligence that's presented to him about the Japanese. And he makes the decision to land where the Japanese are not. And he reaches the conclusion that the best way to deal with the Japanese is to set up a defense around something important, harbor, airfield and wait for the Japanese to show up. Who will then expend themselves in pointless attacks against you. And he does this all the way across the Pacific. And in one year, Douglas MacArthur's army takes fewer casualties than we sustained in one day at Anzio Beach. Now, later on, he's talking about Hiroshima and the naval officer, because the two groups, Nimitz and MacArthur briefed each other. The naval officer shows up, unpacks his things and gives debriefing, puts the map of Hiroshima up and explains what going on. And MacArthur listens and after about ten minutes he said "Now, as I understand it, you've got the airfield?", "Oh, yes Sir, we took that.." He said "Then what are you doing in the mountains, digging out the Japanese?", "We have to go after the Japanese". He said "No, you don't. You just build the defense around the airfield and wait for the Japanese to show up and then you can kill them easily." Instead the marines were digging them out. Very aggressively, very courageously and taking very heavy casualties.

So you have to have someone who understands the enemy, in command. And that was the problem that I saw in 2003. It was a problem, contrary to what Schwarzkopf said, in 1990 and 1991. He wasn't very much help. he billed himself as a genius, told everybody that he had an IQ of 180 or something, nonsense like that. And then started building himself as an expert an Arab culture and so forth. Well, if he was,

we'd have done the job in a couple of weeks with less than 50,000 troops. But he wasn't. And so we ended up with this massive million man march again.

Dr. Hecht: Another thing is about the structure. Because in the end you need quantity. You talk about the small numbers. It's not always useful. If the other guy's as good as you, the numbers come back into play. And the problem is that once you have mass, you need more structure. It's like the train system. The train system can't run on the driver of each train doing what he wants, that way you get a lot of collisions. If you want flexibility, you need motorcycles and private cars. And then you have less structuring but also you get more traffic jams if you try to get a lot of them in the same time.

Dr. Macgregor: Yeah but you're not going to get mass .. anymore. We're not going to be a citizen soldier army. We're not going to draft hundreds of thousands of men. And remember that we're inevitably expeditioners. Which means we're limited in how much we can send and what we can send. So the idea and by the way, Putin has already done much of this with the Russian armed forces, if you look at his structure. He's junked the big divisions. It's largely large brigade groups with a couple of divisions that are only 80,000 men. It's mostly 5,000, 6,000 and these large brigade groups which is what I think we should do. But the point is that when you are in our position and you have a limited period of time during which you can deploy something, you have to figure out what it is that you want to send, what's critical, number one. Secondly, you gotta make sure that what you're sending is highly lethal and extremely survivable. You can't send weak light infantry sentry formations that can be dispatched quickly by a capable of ... adversary. But time and structure are related for us. We're in a position similar to the British Expeditionary Force in 1914. The difference is, the British Expeditionary Force in 1914, was not equipped to deal with the lethality of the battlefield. We can be equipped with that because we do see the lethality. We understand it hasn't been inflicted on us, thank god, but we actually do have a pretty clear picture of just how devastating it could be. So I understand your point but I think that's where allies have to come in. What are your allies capable? What do the allies in most cases have that we don't? Lots of infantry. So what are we trying to say? Large quantities of light infantry, sending them forward. What do they not have? They don't have the integrated air defenses, they don't have strike formations with rocket artillery, ... ammunition, surface to surface missiles. They don't have the ISR architecture that we're talking about either on a regional or global level, which is what we have. Those are the critical enablers, so it takes you to a position where you said "Look, we can't do what you're saying and send a million men inside".

Dr. Hecht: The Iranian/Russian model in Syria is working. This is what you suggested.

Prof. Ben-Haim: Thank you for a fascinating talk.

Discussion of Doron Avital's presentation

Dr. Jones: On the topic of intelligence, I would say that I have a friend at the FBI who says we may not be ready for the next 9/11 but we're ready for the next 9/11 commission.

Prof. Ben-Haim: I will continue with that thought. You talked about high standards as being a protective mechanism that's defensive for the individual, implying that one needs to moderate one's standards. You're certainly not advocating negligence, but I would like to suggest that moderating one's standards can be justified in a totally different way. When your standards are too high, when you are striving for an optimal outcome, then the number of options that you have for achieving that goal is limited. If your end state is very, very specific, the top of the mountain, then your number of options is limited. If your standards, if your goals, are more moderate, then your number of options is greater. And that's particularly important in a context of uncertainty. When your standards, when your goals are very, very high, you have limited number of options for achieving them. When your standards or goals are more moderate, you have more options and that gives you greater flexibility as surprise and uncertainty emerges.

Dr. Avital: Of course we are talking about degrees of freedom, okay?

Prof. Ben-Haim: Okay.

Dr. Avital: So think of a waiter who works in the restaurant and he handles constraints entering the buffer. And he tries to answer the constraints one after the other, according to their arrival, according to the logical order. Of course he wouldn't optimize nothing and his degrees of freedom would be limited. What works here is basically is that when the constraint of those tradeoffs enter the buffer of the decision maker, he just piles them up, he doesn't sort nothing. He piles them up until he gets to a moment in which all those constraints create a picture that forces him to make a decision. And therefore, in this respect, and that's why it's important to constantly talk about uncertainty, uncertainty becomes the asset that you are using in order to make the optimum decision.

I'll give an example. My third operation was with the Air Force. And right after the war you fought, we visited in areas not far, I had to check something. And then many years later we decided to do an operation, the real operation. And I had to fly very far to a certain point and when you fly this far, to use those wonderful, how do you call these V22 choppers? So we didn't have them back then, we didn't have this technology. So we had to make a decision between whether to conduct this operation with helicopters or Hercules. Now the tradeoff is very clear. Here you have the helicopters, they fly very slow. You have to refuel them, it's a major operation, it's a very short, limited time on the ground. But they have one big advantage. They land everywhere. Now the other the Hercules is wonderful. I pile everything in, I have a huge, not many hours on the ground but they have to land. Obviously, this was the dilemma. So what I did and what we did with the Air Force, the Air Force was very cooperative back then, was actually to use the uncertainty there and to really push the nerves of everyone one of us, including Yitzhak Rabin, to the end in order to decide which option will in the end carry the best. So for almost a year, nine months, we actually conducted an operation that had two options. We were running two options simultaneously. So think in terms of the soldiers. Here they have to pack things this way, here they have to pack things this way. Here they have to conduct the operation on the ground in this timetable, here in this timetable. And so on and so on. It was a big headache and it was a schizophrenic condition for all us. The advantage was, because one thing that you probably know, one thing in operation is

to do, is to let the condition allow you to do that. So every time that I will go to Yitzhak Rabin and show him that conducting the operation with two aircraft, we'd setup what would happen. Because nobody was on the ground. We planned an operation which nobody waits for us on the ground, it was based on knowledge that we gathered through the years and the feeling that we can do it safely at night and my confidence in the pilot. So every time Yitzhak Rabin was a little bit alert or alarmed, from the fact that we have to leave major Hercules somewhere in the middle east, I would say "Okay, no problem. We go back to the helicopters option". So in this way, using the uncertainty in terms of how would we do it in the end, basically we measured risk against risk. The only way to judge risks is to measure them one against the other. And we actually, I think a few weeks before the operation, I couldn't take it anymore and I was about to say to the Air Force – no way, let's do it. And this was a nice moment, Air Force was much more relaxed. They felt also that they can show that they are doing an operation that was never done and they tell me "Hey, let's wait" and in the end they did it with just two Hercules and we landed safely and we came back safely from the big operation.

So how do you keep degrees of freedom, to the last moment possible? The last moment for contemplation and the first moment for action, the way you time the decision, is a major thing and the logic comes from the polygon in the end as I explained.

Dr. Stern: Other than the argument that I can make about the battle of Hittin, which I think was really lost the moment that the troops started going their way, towards the remote fort, without having enough water, and considering the strategic culture of the Crusades at that time in that place, is really the reason why I think they lost to begin with. I'd like to ask you if you could maybe share with us your personal experience in the political world and tell us maybe if you think that the polygon model you presented is relevant to strategic decision-making in an upper level, in the strategic level of politicians. Because I can understand how it is, what you described in your book is that every officer is responsible for a piece of the polygon every officer is responsible for a different angle, etcetera, etcetera, and the limitations.

Dr. Avital: As to communicative risk to the others at the end optimization is done at the ...

Dr. Stern: Exactly. So how is it in the political world, as someone who is experienced? Is it still the same?

Dr. Avital: So first of all, I promised myself to go back to politics to write the next book. But I'll tell you one thing about them. One thing that is important to understand about the polygon is that the mission itself is a segment in the polygon. We used to call it in the unit, in Hebrew, דיאלוג עם המשימה, a dialogue with the mission. Because an officer that is literally glued to his mission and doesn't create this kind of dialogue with a mission in the end can bring the mission to a catastrophe. I have this wonderful slide from Waterloo. And the story of Waterloo, the story of General Grouchy that was actually literally glued to the mission, to do the mission that Napoleon gives him. He tells him "Go to find blucher and disconnect him" and his officers urge him. Was described it very nicely. They understand that the fire is in flaming, that something is going on in the battlefield and they urge the general, listen up, forget the little mission. Go to the battlefield, let's help.

Participant: Remember the "why", not the "how".

Dr. Avital: Exactly. So he insisted to be glued to the. So if he was a little bit more open then ,

Dr. Freilich: We have a critical example of this in our own history. Why didn't the Syrians continue down from the Golan in 1973? One of the explanations is they were following Soviet doctrine and they didn't know how to exploit success.

- Dr. Avital:** Yeah. I think what's important, now I'm talking as a logician. You can't avoid logic. But it's in politics or doing dishes or being in the army. So logic is present also in the in the political aspect. But in politics, what's interesting is that the interest of the participants are different than the execution. The other segment that has to do with the "what", the general context that you have to understand in politics and in the beginning when you go to politics, you're a little bit cynical. You say well, it's not, they think about irrelevant factors. But those factors are relevant when you have a bigger picture. So good politicians are needed, I'm not saying that, I wouldn't just color it in cynical terms when I say dysfunction and function. That this functionality of politics is sometimes to suspend things. Because the people in the military sometimes will just want to execute and do and we have this execution temperament. And politicians have a different temperament and on a bigger scale. We have to respect.
- Mr. Laish:** I think it's not necessarily to choose a lesser goal, a lesser target but if you are widening your spectrum on the strategic level, then you can see more targets or more goals that can lead you to the upper goal. So then you are more flexible to get, remember the "why" on a broader spectrum. And second is an interesting story. There was a debate after the last campaign in Gaza. The Egoz unit were involved in a fight, there were many soldiers wounded, including the commander and they didn't use the vest. And their commander, was a guy growing up in 'Sayeret Matcal' and I guess because of you he decided not to use them.
- Dr. Stern:** And he almost died.
- Mr. Laish:** He almost died.
- Dr. Avital:** Of course you can die. This is an ethical situation because he could have died either way. But only in way, you are protected. The officer says, well, vest, I don't care, I'm dying to go to the campaign. The other guy, that has a bigger picture says "This is not risk free and I'm telling you, if you want to get back in this battlefield ... so you have to weigh those risks and this is why I think also, you have to be very relaxed in letting the decision-making, all level, make their decision and not force a rigid doctrine from on top and then it would collapse.
- Dr. Macgregor:** I think you've touched something that doesn't come up very much in discourse, it's not a popular view but it revolves around personality. There's a very famous book called "The Power of Personality in War", written by a German general named Freytag-Loringhoven. An interesting man, that's another story, but he talks about individual personalities, personality types and the danger of essentially elevating the efficient, the competent but rigid calculating officer over or ahead of someone else. To give you a quick example of how this happens in the U.S. military and specifically the army, in March 2003, before the actual invasion of Iraq began, two-three weeks ahead of time, we had sent special operations teams into the country. One team went through Anbar Province, got up north of Fallujah, called the Group Commander, this is an Army Captain of this team and they were riding around on Humvees. They called the group commander says "Look, if you have no objections, I think we can get to Baghdad". So the group commander says "Sure, let me know, do what you do". So they end up infiltrating into Baghdad. And on the day that the great campaign was supposed to begin they called in and they said "Well, we're here on the ... river, they had just purchased falafel from the local falafel vendor and they were enjoying falafel and said "Look, if you want to tell us where Saddam is, we'll drive over and shoot him". And this word gets back to General Franks, Tommy Franks, he is furious. "I did not order this, I did not direct it. We're about to start, they could be killed". And of course these people are saying, what. People don't know what the hell they're

doing here. We could pretty much do what we want. He said "You must leave immediately". So this team that had infiltrated right into the heart of Baghdad, had to put down their falafel, get back into their Humvees and drive away from Baghdad, so that we could begin the invasion because it wasn't part of the plan.

Dr. Avital:

It's a good example because two days before the battle of Kfar Sil, basically this battle of Ras Ziton. it takes place. And basically we are 100 meters from Kfar Sil and using artillery to block the Syrians and basically I asked permission, me and my regiment commander, we asked permission to get from Kfar Sil and basically I understood that the battle of Kfar Sil is already done, we just have to slip a few tanks in and we were in the Kfar Sil we'd wake up in the morning and we are there. And the army had this plan to break this road, to do some maneuver and they already were breaking with D9s those roads and basically they wanted to cycle back everything and to go according to the plan and we were not allowed to continue.

Talking about personality, you talked about MacArthur and Eisenhower. And of course I'm reading a lot about the character in the battlefield. And there is a story about a remark that each one of them made on each other, that I don't know whether you are familiar with. Cause Eisenhower was the שליט, was a secretary for MacArthur and Eisenhower was asked what did he learn from MacArthur. He said "The only thing I learned from him was a drama lesson". And then MacArthur was asked "What do you think about Eisenhower?" and he said "the best clerk I've ever had". So you have those two major generals and those two different the personalities are completely different. One is a more organized industrious type and the other one is this great field marshal of the field. So that's interesting.

Prof. Ben-Haim: Returning to what you were saying before, Doron, to defer decision due to uncertainty. There's a paradox here. Because if one's strategy for managing uncertainty is to defer then what you're doing is relinquishing initiative. You see the paradox. So can you "polygonise" yourself out of the paradox?

Dr. Avital:

You defer the decision until the last moment in which you have to make a decision. You have contain going back to the weight . You take all those constrains you Think. You think there's a buffer of constraints. Every call for a decision is a constraint. I have to decide between to send the Mosad agent or not. I can make the decision now, But if I let those constraints pile up, until I have a better picture how they interact. I can make a wiser decision and use the uncertainty, uncertainties in order to ... of course you can, that's what I'm saying, in decision there's too early and too late. Too late, it's like a tennis player. A tennis player is always in this position. He can hit the ball too early, it means that he has decision in advance, prepared, for a ball that didn't decide yet whether it should be addressed this way or not, backhand or forehand. But if you hit the ball too late, the ball doesn't have the energy to create the outcome you want. So this too early/too late, in some sense, this is the art of war. And here we are trying to portray the logic behind this art of war. But you have to have the logic in mind and you have to have all your officers, contain the same logic. And everybody knows, they understand the optimization problem with an operation. And through those tradeoffs, they understand that if I demand too much at the expense of and so on. Then the optimization will be worked out. And I'm not saying that the optimization on the polygon works only in the level of the commander who conducts the whole polygon. It has to work in all the system, everybody has to think in terms of this logic.

Dr. Hecht:

You talked about the standards and all that. It reminds of the joke about the expert: Somebody who knows more and more about less and less. A battlefield is a place that you need to know about everything. So in fact, you can't be an expert.

- Dr. Avital:** It's this tension that all the time exists between the politicians and the man of action. Sometimes when I give this lecture, ... somebody told me. listen, you studied game theory. Okay, I took a class with the great Noble prizewinner, Israel Oman. Israel Oman all the time provide us with how to frame the Palestinian conflict or the Iranian conflict in terms of this game and they tell me, listen up, why wouldn't Israel Oman, a great game theorist, why wouldn't he make the decision for us, the government officials? So I have two answers for that. One of them I said that I got a hundred in his test in mathematical economy and I know nothing about economy, this is the first answer. The second answer that I give in my lectures example that we used to have in the unit this best shooting instructor. He was magnificent. This guy can shoot from every distance and he was the instructor. So he was our Israel Oman, he was a Noble prize winner in shooting. But we never took him to cross the border because the circumstances at the border or not the abstract circumstances that he trained in the shooting range. So it's important this distinction between theory and practice.
- Prof. Ben-Haim:** Rabbi Akiva has an answer to that also. Akiva, in מסכת פסחים (Passover Tractate of the Talmud) I think, used to tell this story, that one of Akiva's aphorisms was "Don't live in a town whose mayor is a scholar", אל תדור בעיר שראשיה תלמידי חכמים
- Mr. Tzuriel:** In Israel there is a new saying now: "Try to live in a town whose mayor is not in jail".
- Dr. Shamir:** Just for the sake of my clarity, the whole polygon which seems like a sub optimization problem, if I understand correctly, in terms of planning. To what extent do you think it fits more the model of special operations or missions, like, okay, now we are going to bomb the nuclear facilities somewhere in a foreign country and we have a year to plan, you have all this. Versus your experience, which was very a different one, leading a company of paratroopers, in a war, you have very limited information, you have to respond. You kind of know pieces of information about where the enemy is, what's his strength. But you have a very blurred and confused picture and it keeps changing all the time. It's very different challenges. How do the two fit? It's very different challenges.
- Dr. Avital:** My first question is that logic is not Of course it's like the idea of zooming, you're assuming when someone says to zoom, you attempt to zoom in, first reaction is to zoom in or to zoom, he thinks of zooming in. And sometimes to get the picture right, you have to zoom out and it's the same logical operation, you want to get the picture right. So of course there are differences between special unit that prepare a military operation for half a year, a year, to a paratrooper who walks and he is being attacked from the rear and he has to make a quick decision. But in the end, the logic is the same. But I would introduce the concept that we used to call in Hebrew "כוונת ברזל" in English i call it "iron aims". And what we meant and it's relevant for our failure in 2006, it means that whatever sophisticated planning layer you built and the mean there has to be a very basic ... You take it from the simple, everyone here knows of course about this famous RPG. I don't know if they're still using it in combat.
- Dr. Rubin:** RPG? A more advanced model. Yes, not in Israeli army, no.
- Dr. Avital:** So the RPG it used to have this very sophisticated telescope. You will give it to the special guy in the platoon because before you go to the battle, he has to really synchronize the aims. But every good sergeant in the old school take this RPG soldier and before he goes to the battle, he tells him "Listen, don't forget your iron aims. Because the first, the battle will start, the fancy telescope will brake, it will get out of synchronization and you'll have to shoot the target with this very basic iron aim." Because then the Israeli army in 2006, the technology failed in the battlefield, and

forgot those very basic iron aims and the moment the telescope was out of synchronization they lost grasp of the target, so I would say this is the answer.

Mr. Tzuriel: Just a remark, that what I'm learning from this session is what I have always expected and that is, that special ops, tactical operations are very alluring and seductive and even though, as I said, they're very tactical sometimes, even up to, sometimes they're strategic but sometimes they're tactical, up to a sport, for very good athletes. You started by saying the operation in Lebanon was a great success, of course it didn't achieve what we want. That to me says it all and it makes for great stories that usually people who deal with strategy can't come up with and can't compete with. Which explains why, very often, in many of our organizations, including the one I'm coming from, after five minutes of a strategic decision you're already into tactical stories.

Dr. Avital: I must say that I think you missed something. You know about special operation strategic when they fail. And I was visiting the Library in the name of Jimmy Carter the day Trump was elected ... two day sessions. He was sure of course strategically that Hilary would be elected, he would be prepared to have recommendations and so on. But anyway, he took us through the exhibition and in a hidden corner you had the failed rescue operation of the hostages. And it was in this corner. So I'm saying, special ops, when they fail... I want to insist again and here you have to, logic is logic. I'm telling that as a logician, ... logical considerations about tradeoffs, about the shifting frame of reference. It's of course,

Participant: It's true for all levels.

Dr. Avital: It's true for all levels, it's true and this ... I would be the first one to admit, that there some pathological practice of special operations, when they reach the higher echelon, as in our country, there's two major figures, I can talk about them for hours, Bibi and Ehud Barak, they have dire consequences. One of them, a very simple one, is the fact that the special ops commanders works against the system, it doesn't work with the army, it doesn't work with the northern command. He bypasses the northern command and if you look at our Prime Minister, he bypasses his own government all the time. He works all the time with project managers that replace the standard system. So there's no question that special ops carry, I would be the first one to admit that.

Prof. Ben-Haim: Thank you everybody for your participation.

Strategic Uncertainty, Digital Technology and Formal Cause

Dr. Milo Jones¹
Visiting Professor, IE University

Introduction and Methodology

This essay grew out of my PhD research, which focused on the internal culture and identity of the Central Intelligence Agency and the role of that culture and identity in shaping strategic surprise. That work, published with a co-author, Dr. Phillippe Silberzahn as *Constructing Cassandra: Reframing Intelligence Failure at the CIA, 1947-2001* by Stanford University Press, took a social constructivist approach to strategic surprise, insisting that surprise must be understood first as a problem of the sociology of knowledge, and only then approached as a matter of psychological bias, bureaucratic politics or “signals versus noise”. While not intended as a counsel of perfection, and not underestimating the difficulty of strategic warning, my work insisted that the intellectual shoulder-shrug embodied by the phrase “failure of imagination” be addressed. It made the case that such failures do not appear from nowhere, but arise directly from the culture and identity of the organization that experiences them. Similarly, the hypotheses allow analysts to sort effectively “signal from noise” also do not appear from nowhere, but flow from the internal culture and individual and collective identities of the analytic organizations tasked with preventing surprise. That approach has important practical implications for intelligence agencies and strategic analysts, but these are outside the scope of this essay.

Here my compass is far broader, and my methodology is that of a “technological constructivist”. It is predicated on the idea that any approach to strategic uncertainty which does not begin by attempting to grasp how societies, cultures and individual psychologies are shaped by their technologies, and then how peoples’ subconscious defines what they believe and how they act, will misunderstand the nature of contemporary strategic uncertainty.

This work (and the talk from which it flowed) is in every sense an essay, a test, an intentionally playful experiment. If it succeeds in improving the quality of your strategic questions, it will have served my purpose.

It is organized around what I call the Strategic Reaction Framework of three key judgements or questions: Reality Judgements - What is going on? Value Judgements - What does it mean? And Action Judgements - How should we react? It concludes with a geopolitical hypothesis that is not my own, but flows from this approach and that may be relevant to understanding contemporary strategic uncertainty.

Reality Judgments - What is going on?

The root of strategic uncertainty for Israel – and for every other nation today – is that the world is moving from geopolitics under analogue/electric conditions to geopolitics under digital conditions. From the pre-Westphalian age of hand-written script, to the mechanically-printed type (starting circa 1450) that helped launch the Westphalian age, to electrically-transmitted codes (circa 1850) and then to voice and picture transmission (radio & TV), society and geopolitics have been shaped and re-shaped by changing communication technologies.² Today’s strategic environment is being reshaped

² See: Mark Stahlman, “The Digital Sphere, Order and Chaos”, prepared for the US Department of Defense’s Office of Net Assessment, 2016.

again, this time by the spread of digitally-stored memories. In other words, digital technologies are now shaping and driving strategic uncertainty in all realms, and will do so at an accelerating pace for the foreseeable future. Why? Because digital technologies are what Aristotle referred to as a “Formal Cause”, i.e. they shape our choices and structure of our thinking.

As a reminder, Aristotle proposed four causes of being, or reasons to explain why things exist. Atop everything are “Final Causes” (Greek, *telos*), these are literally teleological, the sake of which a thing is done. At the other pole are “Material Causes” (Greek, *hylé*): these flow from the nature of materials, like wood or iron. Next are “Efficient Causes” (Greek, *kinoun*): these have causes just have effects, like triggering a motion to start or stop; they do not shape systems or human choices. “Formal Causes” (Greek, *eidos* or *morphos*) are arguably the most difficult causes to conceptualize.³ To take in the nature geopolitics under digital conditions, however, they must be understood. In contrast to Efficient Causes, Formal Causes do not have “effects” as most people conceive of them. Instead, Formal Causes cause structures. They are causes that when present make matter or structures *into* a particular type of thing.

This runs against many current assumptions. It means that digital technologies are not neutral; they have cultural, psychological and sociological consequences that overturn old assumptions and previous possibilities and present new ones. If you are wondering why digital technologies are not Material Causes, it is because human intellect plays a central role in them. The essence of this technological constructivist approach is to accept that in John Culkin's formulation, "We shape our tools and, thereafter, our tools shape us."

So you might ask, is this tool really shaping us so profoundly? To cite only a few statistics from the venture capitalist Mary Meeker's 2018 “Internet Trends” report⁴, the number of daily hours spent an American adult spends on digital media has gone from 2.7 in 2008 to 5.9 in 2016. Over half of that time is spent on mobile devices.

Is digital shaping only an American phenomenon? No. The global penetration of the internet has risen from about 24% of the world's population in 2009 to about 49% in 2017. Meanwhile, the global penetration of social media has risen from about 14% of the world's population in 2009 to about 33% in 2017.

I know of no projections that say it will be less, anywhere, a decade from now. As more and more of people's real existences are mediated by digital devices, their impact will deepen. When considering the future, strategic analysts should forget “virtual reality” and instead consider “The reality of the virtual”.⁵

And in “The Media”?

The most obvious way to see digital technology shaping choices, structures and content is by examining media. Recall the famous “Funeral Oration of Pericles”. It is a gem of reasoned and reasonable rhetoric: some 2800 complex, rational, and balanced words. It helped inspire me to become a US Marine. Initially an oration, Pericles words come to us as text in Thucydides' *History of the*

³ The reason that we have trouble conceptualizing Formal Cause is actually a result of the "formal cause" initiated by the printing press. McLuhan explores the change of consciousness wrought by the advent of the printed book in his 1962 book *The Gutenberg Galaxy: The Making of Typographic Man*.

⁴ Data and charts on internet use from: <https://www.kleinerperkins.com/perspectives/internet-trends-report-2018>

⁵ After Slavoj Zizek: *Manufacturing Reality: Slavoj Zizek and the Reality of the Virtual*, available at <https://www.youtube.com/watch?v=YUTgcYxXIZA>

Peloponnesian War. Now, to understand the effect of media at their most basic, ask yourself if the same message could be delivered with smoke signals, and what its impact would be? Very clearly, in some sense, the medium – text versus smoke – affects or dictates the very nature of the message sent. Now explore the impact of medium on message more deeply. By some accounts, Lincoln used the fewer than 300 words in the Gettysburg Address quite consciously. He had spent enough time in the telegraph room of the White House to understand the new electric medium, and its effects on newspapers. If the President wanted to communicate the purpose of the war directly and immediately to citizens, his speech had to be short enough for the newspapermen to transcribe on the spot and transmit *in toto* that day. (That, by the way, is why we don't have a good photograph of the speech – the poor photographer, like everyone else, expected Lincoln to give a “normal” political speech. Massachusetts Governor Edward Everett, who preceded Lincoln, spoke for two hours.) Think of the Gettysburg Address as a 19th century tweet, whereby Lincoln spoke directly to the citizenry.

In the 1920s, radio changed the textual media environment of newspapers back into an oral form. Note that Hitler, Roosevelt and Churchill were all masters of radio. After the war, television change the media environment again. Some would argue that the visual components of television “produced” at least two president, Jack Kennedy and Ronald Reagan. TV has certainly produced a springboard into politics for some entertainers. Reality TV has simply become reality. When I visit America, I sometimes feel like I stepped into the *Jerry Springer Show*. What is important, however, is to note that in each step of this technological, the emotionality of the message carried by the media increased, and its logical structure became less textual and more fragmented (or at least less linear).

What is the origin of Jerry-Spring-style chaos? Because an increasingly larger proportion of our communication is post-literate. Someone posts a picture of an injured child on Facebook or Instagram. People respond with angry or sad “emojis”. The medium constrains and shapes the message. You cannot convey, “Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal” with an emoticon or an emoji 😊!

To understand the future, there is an even more important element of digital technology. Unlike radio or television, *memory* is also built into digital media (indeed, the hierarchy of digital memory is constantly growing. Each of us turns on Big Brother in the morning, and now leaves an increasingly permanent trail of digital output and “exhaust”).

After these remarks, those of you familiar with media theory have already summoned Marshall McLuhan's famous – and to some mysterious - phrase, “The medium is the message”.

McLuhan meant that media influence both what messages are sent and especially how messages are perceived. He insisted that the hidden, subconscious effects of a medium overwhelms the content of any messages sent. This is why I assert that any approach to strategic uncertainty which does not begin by grasping how our subconscious is shaped by the technologies we use (and then how that subconscious defines what we believe and how we act) will inevitably misunderstand both its own culture and the wider world.⁶

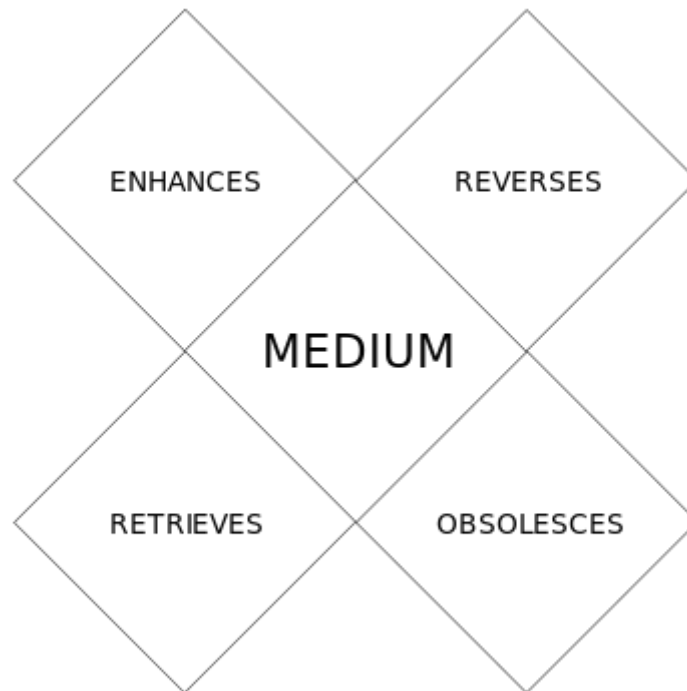
⁶ Mark Stahlman, “The Digital Sphere, Order and Chaos”, prepared for the US Department of Defense's Office of Net Assessment, 2016.

As a metaphor to understand McLuhan's approach to media think of the classic photos from the Second World War in which Allied airmen painted messages on bombs that were soon to be dropped on the Axis: they commonly had expressions like "Happy Easter Adolf!" written on them.⁷

To understand the impact of a media, McLuhan says ignore the "content" written on the bomb, and think about the impact of the bomb itself! But the bomb and its effects are usually ignored or invisible as people focus on the "content" of media.⁸

The power of this approach is amplified when one understands that McLuhan used the word "media" he meant the "technological environment", which is to say the entire matrix of the technology and its structural effects.⁹ In one of this key works, for example, *Understanding Media: The Extensions of Man* (published 1964), he considers the social and psychological impact of "media" like locomotives, light bulbs, typewriters and clothing! As the title indicates, he makes the argument that all technology are best viewed as extensions or enhancements of some human function.

His thinking about the impacts of technologies is subtle, and has nothing in common approaches dismissed as "technological determinism". In *Laws of Media* (1988), McLuhan summarized his ideas about technology via a Tetrad of Media Effects.¹⁰



Using the Tetrad, one asks of every artifact, medium, or technology, first what human function does it enhance or extend? Through this enhancement, the same technology thereby obsolesces some former medium or technology, which was used to achieve the same function earlier. Ironically, in so doing,

⁷ See, for example, the photo in <https://www.dailymail.co.uk/news/article-4571244/London-Bridge-attack-revenge-RAF-s-airstrike.html>

⁸ See Marshall McLuhan interview in *Playboy*, March 1969.

⁹ He tried to express this with the phrase "media ecology" to capture the 60s interest in the "environment" and to tell people that the world they live in isn't "nature" but is instead man-made.

¹⁰ For an explicit linkage between the media tetrad and Formal Cause, see the work posthumously prepared and co-authored by his son, Eric: Marshall McLuhan and Eric McLuhan, *Media and Formal Cause*, NeoPoiesis Press, LLC, 2011. See also: https://en.wikipedia.org/wiki/Tetrad_of_media_effects

the new medium or technology also usually retrieves some older form from the past. Finally, when pushed far enough, McLuhan maintains that the new medium or technology reverses or flips into a complementary (or contradictory) form.

As an example of McLuhan's Tetrad to probe a media/technologies' effects, consider the invention of money. When the technology of coinage was introduced in Lydia around 700 B.C., money *enhanced* trade and commerce; it *obsolesced* the barter system; it *retrieved* the conspicuous consumption of hunter-gatherer societies; and when pushed to its extreme, it *reversed* into credit, a complementary or contradictory form of money.¹¹

In the money example, it is also possible to begin to grasp how some technologies act as formal causes, shaping the structure of our societies, mentalities and choices. As for technologies' deep psychological effects on those who grow up with them and habitually use them, one need look no further than those who consider free-market capitalism as synonymous with human nature, and who are genuinely baffled by human motives that appear to transcend money (e.g. most Western attempts to understand Osama bin Laden).¹²

While there is not time to work through the entire Tetrad for digital technologies, it is worth noting that the primary human function that digital technologies enhances is memory. Digital systems become *extensions* of our memory. Later, I will explore some of the consequences of extended memories, especially by looking at what aspects of the human past digital technology may retrieve. In sum, what a technological constructivist approach reveals about strategic uncertainty for Israel (and for other nations) today is that digital technologies are changing geopolitics because cultures, societies, and human perceptions all change profoundly under "digital conditions".

Value Judgments - What does this mean?

To consider the impact on strategic uncertainty of digital technology, and try to generate some "So what?" questions, we can start with the simple observation that digital media are already changing terrorist tactics. Until around 2004, the internet had a minimal impact on terrorist tactics, perhaps providing online fora and chat-rooms. Now, according to a recent paper from the Center for Combating Terrorism at West Point, "Increasingly, thanks in part to the digital revolution, [Terrorists] can rely on what the Syrian jihadi strategist Abu Musab al-Suri called 'individual terrorism.' With the Islamic State losing territory and the al-Qa`ida network increasingly decentralized, individuals and small autonomous cells may increasingly take the initiative in both the murderous and messaging dimensions of terrorism."¹³

Digital technologies extend effects well beyond media, however. In 2013, researchers at the Oxford Martin School published a detailed study of the impact of digital technologies (including automation and artificial intelligence (AI)) on employment in the developed world.¹⁴ No sector is projected to be left untouched.

¹¹Elements of this explanation and the example of money are from Zeynep Merve Iseri & Robert K. Logan, "Laws of Media, Their Environments and Their Users: The Flip of the Artifact, Its Ground and Its Users". *Philosophies* 2016, 1(2), pages 153-161.

¹² As we relate in *Constructing Cassandra*, "Soon after the revolution, Khomeini responded to complaints about the state of Iran's economy with the retort, 'We did not make the Islamic Revolution so the Persian melon would be cheap.'" Many people will write such remarks off as "fanaticism", but even a casual reading of history suggests that such a blinkered approach to human motives is juvenile.

¹³ "The Age of Selfie Jihad: How Evolving Media Technology is Changing Terrorism" *CTC Sentinel*, November/December 2016, Volume 9, Issue 11

¹⁴ Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment: How Susceptible are Jobs to Computerization?", 2013. See especially figure 48 in that report.

Honest people can disagree with this study, and they have. But in numerous studies looking at the impact of digital technology on employment conducted since 2013, very few people are sanguine about digital's effects on the workforce. Usually the debate is not "Will digital technologies ultimately produce jobs?"; it is "Will digital technologies produce jobs for those whose jobs they take?", which is a very different political and social problem. If you are unfamiliar with EP Thompson's *The Making of the English Working Class*,¹⁵ that is not a bad place to start to understand some of the shifting identities and strategic uncertainties on offer.

The problem deepens in the so-called developing economies. In principle, politics in the rich world still revolve around the two poles of industrial life, "Right" (Capital) and "Left" (Labor), with labor usually conceived of as a factory worker. This idea is badly out-of-date. Manufacturing employment as a share of all employment peaked decades ago in developed economies. In America it peaked in 1953; in the UK, 1961; in Germany, 1970; in France, 1974; in Spain, 1979, and in Italy, 1980. In Asia, it peaked in manufacturing powerhouses like Japan in 1973; in Hong Kong, 1976; Taiwan, 1987; Korea, in 1989...and in China in 2010. Prime Minister Modi's "Made in India" campaign will have some way to travel, as manufacturing employment as a share of all employment peaked in India in 2002.

Mr. Modi, of course, is seeking to climb up the development-through-manufacturing ladder that coastal China used for the last three decades. He may not get that choice: manufacturing in a digital world simply does not need as many workers to produce as many high quality, low-cost goods as the world can consume. One of the last frontiers of highly labor-intensive manufacturing is textiles. It is where many developing economies begin to climb up the ladder of economic growth. Textiles too are now feeling the impact of digital technologies through companies like Sewbo, a firm with technology that automates garment production. Some economists believe what developing economies face is "premature de-industrialization". Digital technologies may replace the need for low cost labor before countries can even exploit that as a comparative advantage. That does not bode well for stability (especially when you consider that a birds-eye digital view of life in developed economies will only be a click away. Even if their lives are improving in absolute terms, Prospect Theory teaches that feelings of deprivation are relative to the fates of others you can see).

Now consider the impact of digital technologies beyond mere economics and employment. AI is now an explicit sphere of geopolitical competition¹⁶, and which is obviously the result of digital technologies. In China, an entire "social credit" system is being constructed to monitor and control Chinese citizens. For a glimpse of the digital future, visit Singapore: every lamppost in the city-state will soon be equipped with facial recognition cameras.

Then look at the impact of digital technologies on genetic capabilities: progress in areas ranging from genetically modified crops to personalized cancer treatments all flow from digital development. Possibilities once considered the realm of science fiction, like human genetic enhancements, are now soberly discussed by responsible people. It pains me to say this to an Israeli audience, but under the impact of the digital it is even conceivable that the 20th century's nightmare marriage of the politics and pseudo-scientific biological re-emerges. Will the Enlightenment's assertion of essential human equality bear up under the strain of these new possibilities?

¹⁵ EP Thompson, *The Making of the English Working Class*. Vintage Books, 1980.

¹⁶ See, for example, Michael Horowitz, Elsa B. Kania, Gregory C. Allen and Paul Scharre. "Strategic Competition in an Era of Artificial Intelligence", available at: <https://www.cnas.org/publications/reports/strategic-competition-in-an-era-of-artificial-intelligence>

Finally, to round out this brief (and surely incomplete) survey of what geopolitics become, consider the dual-uses of so many common digital devices. From the simplest consumer drones to the “hacking” possibilities of synthetic biology¹⁷, practitioners responsible for thinking about strategic uncertainty need to account for the rapid spread of digital technologies.

Action Judgements - Now What?

Having outlined the current and future impact of digital technology, I will now offer a few thoughts on what it means for the future of strategic uncertainty. There is only time to draw upon one part of McLuhan’s Tetrad, retrieval, and to propose that in some respects “digital retrieves the medieval”.

Some argue that contemporary strategic uncertainty is an outgrowth of well-understood cyclical factors. Digital technologies are “neutral”, they are what economists call “externalities”. Strategic analysts taking that approach might thereby assume that the recent rise of so-called right-wing populist parties in Europe (and elsewhere) is an outgrowth of the economic crisis that began in 2008. Presumably, as the cycle of economic growth returns, “populism” – and any strategic uncertainty engendered by it, will pass. Just wait: things will “get back to normal”.

In contrast, I argue that things won’t “settle down” any time soon. As we feel our way towards “geopolitics under digital conditions” the job of the strategic analyst will get harder, not easier. We are still at the “horseless carriage” stage of digital technologies, where the new technology is used and understood mostly in old ways. Enormous imagination is required to understand its effects. The lazy assumption that “we have been here before” is the greatest barrier to strategic insight.

This is because the international system is composed entirely of nations and states created under different media conditions. Our world is organized in units created in the print and electric (radio and TV) age. How will such states fare under digital conditions, in which we move back from the Westphalian system to an era that resembles the Middle Ages?

Let me present in somewhat cartoonish fashion some parallels between the Middle Ages and our own time. Do you recognize:

- The growth of a transnational aristocracy, so-called “elites” of enormous wealth, ambiguous nationality and flexible allegiances? Think of different countries’ “Golden Visa” programs, the entire offshore finance industry, and the many children of autocratic leaders who flit from country to country.
- An international climate in which states lack a monopoly on violence, or in which non-state actors are powerful enough to challenging states? Think Al Qaeda or Hezbollah. Or Google and Facebook.
- A shift in popular opinion back towards local/tribal or religious allegiances? Think much of what people call “populism” around the world. Better yet, witness the return of Medieval Islam in the form of ISIS.
- New industries and technologies challenging the “guilds” of established producers and professionals? Think Uber versus the Taxi trade. Then add driverless cars.
- The spread of new plagues/diseases? Think bird flu, or Ebola. Then consider the possibilities of a new Theodore Kaczynski, the so-called Unabomber. Instead of being a mathematician, he

¹⁷ See for example Gigi Gronvall, “The Security Implications of Synthetic Biology”, *Survival*. August–September, vol. 60 no. 4, pp. 165–180.

is a geneticist. Under digital conditions, he can try and “save the world” by making a version of HIV that spreads through mosquito bites.

- Mass migrations? Digital technologies now allows global migrants to find the best migration destinations and routes, to connect with people-smugglers, and to arrange payment from their families after they take an on-location selfie as “proof of life”. Indeed, they even rate smugglers the way you and I rate an Uber driver.¹⁸

There is no need to stop there, however. If digital *is* retrieving the medieval world, then we can expect the spread of new ideologies and religions (i.e. heresies). Digital technologies give any fanatic with a smartphone global reach, and dramatically lower other costs that attach to starting a mass movement. Yuval Harari pointed out in *Sapiens* that this is especially the case via games like Pokémon-Go, which blend the digital world and the real world, helping those with the right digital lenses to see things that non-players do not.

Americans tend to imagine the impact of heresies as confined to tragic but limited scenarios like the siege of Waco in 1993. I urge strategic analysts to study instead Hong Xiuquan. In the middle of the 19th century, he decided that he was the Chinese brother of Jesus and announced the establishment of the “Taiping Heavenly Kingdom.” The result was the Taiping Rebellion, the bloodiest war of the 19th century, with estimates of the war dead ranging from 20 to 70 million people. His followers almost toppled Qing Dynasty. If strategic analysts are to avoid failures of imagination they should at least be aware of historical precedents. At the very least, the cost of creating new cult-like affiliations is falling just as the old ones are under strain.¹⁹ For that reason alone – if geopolitics is ultimately rooted as much in what you love and fear as in geography²⁰ - then geopolitics under digital conditions equals amplified strategic uncertainty!

All of the above is speculative, simplistic and over-drawn. I am, however, trying to get strategic analysts to think (and to remember these ideas), and one way to do that is to arouse strong emotion. I will retreat to safer ground, but offer further anecdotal analogies to support the idea that digital technologies retrieve aspects of the medieval world:

- Are nation states are courting “Barons”, powerful non-state actors? Denmark now has a “Tech Ambassador” permanently stationed in three locations: Copenhagen, Beijing and Silicon Valley.²¹
- Are walls, moats and castles returning? As David Betz recently pointed out in his *Infinity Journal* article, “World of Wallcraft: The Contemporary Resurgence of Fortification Strategies”²², fixed barriers and fortifications are back. One might even imagine that a promise to build walls becomes a central plank in a winning political campaign. Donald Trump? Victor Orban?
- Robert Kaplan recently proposed the “return of Marco Polo’s world”²³ as a way of situating America’s strategic context. In the 21st century. A similar approach might understand

¹⁸ Private conversation with a FRONTEX employee.

¹⁹ In my view, all strategic analysts should be intimately familiar with processes that form group identity. Two fantastic places to start are: *The Lonely Crowd*, by David Reisman, and *Keeping Together in Time: Dance and Drill in Human History* by William McNeill.

²⁰ See “The methodology of Geopolitics” by George Friedman of Geopolitical Futures.

²¹ See: <http://techamb.um.dk/>

²² David Betz, “World of Wallcraft: The Contemporary Resurgence of Fortification Strategies” *Infinity Journal*. Volume 6, Issue 1, Winter 2018.

²³ Robert D Kaplan. *The Return of Marco Polo's World: War, Strategy, and American Interests in the Twenty-first Century*. Random House, 2018.

Beijing's "One Belt/One Road" initiative as an attempt to revive and reinvent the medieval Tang Dynasty's Silk Road. Chinese leaders have mentioned the precedent.

Finally, if I were an Israeli strategic analyst, I might ask:

- Is some 21st Century version of the medieval Persian Empire returning? How about a revival of the Ottomans? Specialists who know infinitely more than I about Iran and Turkey have suggested such historical parallels to make sense of our time.

Most Speculatively - Three Spheres?

I will conclude by proposing a final way of thinking about strategic uncertainty under digital conditions. It is also rooted in McLuhan's thought, the idea of digital technologies as a Formal Cause, and it is the most speculative of all. There is not time to do it justice, but it is worth outlining. The idea is posited by the Center for the Study of Digital Life²⁴ (CSDL). It is important because if digital technologies do have the effects that I have suggested, then those who try to analyze events without grasping how technology fundamentally shapes our worldviews will consistently focus on the wrong strategic patterns, thereby amplifying uncertainty.

This idea is that under digital conditions, three "Spheres" are forming. These spheres are the "operating systems for societies". They are akin to Samuel Huntington's "civilizations", but fewer). It is competition among these spheres – each of which has a distinct set of elites racing to make best use of digital technologies to increase their power – that will define geopolitics in our era.

What (or where) are these three sphere? To answer this you must understand that the psychological/cultural basis of each sphere is written language, a technology at the very heart of our communication and, more importantly, our mental habits²⁵. You can probably guess on that basis that the first sphere is "Western", rooted in alphabetic writing technology. Note that approached in such technological terms, "West" not only includes Europe and its former colonial offshoots (e.g. North America; Latin America; Australia), but also the Islamic world and of course Israel.

Second, there is the "Eastern Sphere", rooted in Ideo/pictographic writing technology. This is China and its attendant "Confucian" cultural branches.

The Center suggests that the West is particularly vulnerable to digital effects exactly because it has traditionally been more tolerant of chaos and especially of disruptive technologies. It is therefore, because of the spread of digital technology, in internal chaos. The East, meanwhile, appears better-suited to digital conditions, not least due to its traditional suspicion of technologies that disrupt social cohesion. Some technologies are forbidden; others are allowed, but their disruptive effects are carefully considered and their diffusion is more controlled.

What, then, is the third Sphere? It is the "Digital Sphere". It is much the newest, the least defined and the most diffuse. The Digital Sphere is formed neither by alphabetic nor Ideo/pictographic characters, but by binary writing technology. Silicon Valley is its heart, and digital technologies are generating a set of elites predisposed to accept neither traditional Western nor traditional Eastern values.

Culturally, in the Digital Sphere, Western Humanism and traditional Eastern values are being laid aside to pursue a "Post-human" or "Transhumanist" future. Economically, it promotes endless

²⁴ <http://www.digitallife.center/> In the interests of full disclosure, the author became a Fellow of the Center in July, 2018.

²⁵ Mark Stahlman, "The Digital Sphere, Order and Chaos", prepared for the Department of Defense's Office of Net Assessment, 2016.

“disruption” and “exponential growth”. In matters of security, many of its elites espouse what sounds like a digital Panopticon, with public/private-sector-enabled algorithms watching everyone as potential targets, and prescribing complete data collection as a security cure-all. Politically, it seems to edge towards neo-eugenics and the promise of digital “enhancements”, improvements, and radical life-extension. Certainly, the idea of assumed equality under the law, a keystone of democracy, comes under increasing strain in the Digital Sphere.

In Conclusion

As I said at the beginning, this essay is a probe, a test of ideas. I hope it has been stimulating. At the very least, I urge strategic analysts to consider:

- Are digital technologies as “neutral”, psychologically, culturally and sociologically, as conventional social science assumes?
- Can the new matrix of causal factors which digital technologies appear to bring about – a new structure for our choices – really be ignored?
- Is a “One World” or “Global Order” paradigm of future international relations or even the continuation of the Westphalian system itself, getting more or less likely?
- In short, is it time to start thinking about “Strategic uncertainty under digital conditions”?

Discussion of Milo Jones' presentation:

- Dr. Freilich:** Thank you for what was a fascinating presentation. I'm going to take the prerogative to ask the first question and try and push back a little.
- Dr. Jones:** Please do. I understand, that's a compliment. As I said, good intelligence officers make decisions harder, not easier. To be considered a gadfly is to be complimented.
- Dr. Freilich:** It's not a gadfly. You're making a case, you know you're not the only person making this case,
- Dr. Jones:** No, not at all.
- Dr. Freilich:** that there's a fundamental change underway. And I'm just a skeptic, especially when I hear things which sometimes sound to me like they're beginning to become a fashion or a common wisdom, that I try to and see, well maybe they're a fallacy. There's no doubt that something has changed. The speed has changed, the immediacy, the convenience of it, the scope of it.
- Dr. Jones:** The scope and the concentration of benefits. The winners. It's obviously much better to own a factory than work in a factory but at least there were people needed to work in a factory. Today, you can take 20 people and make a billion dollars.
- Dr. Freilich:** I prefer to talk about the political side. The genetic thing, I think this is a change in humanity. If we can make people live forever, that's a change in humanity.
- Dr. Jones:** And as I said, the political and the biological may be coming back together. There was a period when eugenics were respectable. Winston Churchill was a supporter of the British Eugenics Society.
- Dr. Freilich:** Let me focus just on the information side. And the information side's political side. So clearly the speed, the immediacy, the convenience. Some people make the case that the Arab spring happened at least significantly because of cellphones. In Syria, unlike the uprising in 1981, nobody knew about it for a couple of years. Here everybody, you took the cell-picture, it was on the international, on the net in seconds. To make the case that isn't just a, the different in speed and immediacy is already probably something of a qualitative change, not just a quantitative one.
- Dr. Jones:** Yeah.
- Dr. Freilich:** But if you really want to make the case that it's a fundamental change, then you have to be able to say that this wouldn't have happened or would have happened in a different way without the technology. You have to be able to say that public opinion would be formed differently today or that international relations would have some fundamentally different character. And the Khomeini revolution used the technology of the time.
- Dr. Jones:** Cassette tapes.
- Dr. Freilich:** They used cassette tapes. The French revolution used manifestos, written manifestos, okay? And the Egyptian used hieroglyphics. So these things have happened, they took longer, the war of 1812 was over for a couple of months before the troops in the field got the word and they continued fighting.
- Dr. Jones:** The Battle of New Orleans was fought after the War of 1812 was over. Thank goodness, right?
- Dr. Freilich:** Okay. The question is whether politicians are making fundamentally different decisions today or political leaders. The question is whether, yes, people are reading things differently, they're reading tweets but maybe they're reading a lot more of tweets. So maybe in the end they're reading as much as they were in the past, I don't know.
- Dr. Jones:** Is there something that different?
- Dr. Freilich:** Right.

- Dr. Jones:** I guess a technological constructivist's answer would be "The future's already arrived, there's just, unevenly distributed". So for example, I was in Ukraine, in December. Most Ukrainians don't get their news from social media, they still get it from TV.
- Dr. Freilich:** So take the digital war.
- Dr. Jones:** But so, how much of Egypt or Syria is digital today? And how many of those people grew up with digital technologies? I guess what I'm asking people thinking about strategic uncertainty to face is that as these technologies become more widespread and as more and more people grow up with them, things are going to change fundamentally. We have an education system, for example, built around the idea that you sort kids by data manufacture, put them in a room, bring someone in and they get asked questions. And if you give the right answer, you're a smart person, congratulations, move up on level. Then you ask them more questions, move up one level, etcetera. And then they reach the end of their school and oh, suddenly, oh wait, it's the quality of your questions, not the quality of your answers that matters. And answers are easier and easier to find under digital conditions. I can say to Alexa - "When was the Peloponnesian War?", Siri - "When was the Peloponnesian War?". There's no need to remember anything. Our memories are now external to our bodies and kids growing up today treat Google the way I grew up with toilets, right? It's always there when you need it but it doesn't just exist, it changes things. And so, I'm not saying digital change is completely here, but if you conceive of digital as a formal cause and at least ask what does Egypt look like when 90 percent of the people have cellphones and there's fake video not just fake text or pictures everywhere and people are moving from, I mean not only are they moving to post-literate, they're moving from illiterate straight to pictures and video. To what degree do any of our security structures or political structures stand a chance of maintaining order or the same type of order we're expecting? It's an imperfect answer to say well, gee, that world hasn't arrived yet but I am, as I say, speculating and testing and probing the idea that digital technologies might change everything, without being fully convinced. I kind of like text myself, I like things the way they were. I like to be a skeptic. But the question about the impact of technology is useful.
- Mr. Rubin:** I have a comment, not a question. It's not the first time I hear this message that we are in an unprecedented revolution in human affairs because of technology. I wouldn't call it digital, most of the people who hold a small cellphone, don't know what digital technology is. They understand the business end of the telephone. And that's what important. You can make a mental exercise thinking how would society look back in 500 years ago. People heard the news from criers. What if everyone would have a personal cryer, telling the news every five minute.
- Dr. Jones:** Which is what we have.
- Mr. Rubin:** The message, it's not important, the technology's not important. What's important is the effect. And my uneasiness about it is that everything sounds familiar. We had revolutions like that before. Even the printing press was a revolution which changed the world.
- Dr. Jones:** It gave us nationalism. Print created publics.
- Mr. Rubin:** Yes. So when I hear people predicting that the digital technology will cause the disappearance of nationalism, I ask myself, people are not changing, they are hardwired and biology takes a lot longer than technology to change. The concentration, one of the effects of the information revolution is concertation of the easiness of separation between making money and the working people. But even that is not new. But even that is not new. Because before the industrial revolution, in the

19th century, you needed a million peasants to own million peasants to be rich and then you became, with the new technology, you hired only 5,000 people and you became even richer.

Dr. Jones: Yes. No one who reads Jane Austen asks why the British army is stationed in every village, where her ideas are ...

(Speaking Together)

Dr. Jones: the officers were there to keep order and read the riot act when needed.

Dr. Rubin: I don't argue because impossible. What I'm saying, my comment is that we should perhaps be a little more humble and in our predictions and look back at human history. First at two things, it's history and the environment ... human nature. Because some things change and some things don't.

Dr. Jones: I fully acknowledge your comments. And this was a plea for a different type of humility which is in fact the humility of being willing to look back, deeply back, to cope with the immediate future.

Mr. Zarmi: I'm actually binding to your ideas but I'm challenging the – so what. Let's say we're trying to deal with this uncertainty and trying to find a strategy for the future. But when I want to set such a strategy, I want the democracy to keep on. I want my nationalism or nationality to keep on and I want my worldview to keep on. But in essence I can't really prepare the world for this change because I want a different world from that. I can educate my own kids to be prepared for this change but looking at, let's say a national organizational level, there is a real challenge to be able to kind of find your core values that can continue on, to deal with this change and what you can set aside and be prepared to change and embrace.

Dr. Jones: You've got it – how do we protect what we love under digital conditions.

Participant: But the next generation will not want that.

Dr. Jones: Conceivably, the next generation might change.

Participant: The generation you presented in this presentation would not want this nationalism and democracy. He will want something else.

Dr. Jones: Yes. How much do parents pay to get their kids in the best schools now? When it is realistic for you to say – you know what? I think I will spend the extra hundred thousand shekels and make sure my grandchild has perfect pitch. Or make sure my grandchild does a little bit better in math than everybody else. Look how much people are willing to pay now. These are realistic possibilities, at least within, they're no longer science fiction. And all I ask is if people, think about geopolitics, take at least the question seriously even if my answer about the implications is wrong.

Dr. Shamir: I just wanted a very quick kind of summary to see if I understand what your main argument or the way I explained to myself. You are saying that there is a technology that drives fundamental changes, fundamental changes in technology or technology development drives fundamental changes in economy, in political and other social factors.

Dr. Jones: Yes and it's not technologically determinist but there is at least a technological factor in culture.

Dr. Shamir: And what we're going to see is fundamental changes in all the power structure that we are familiar today.

Dr. Jones: Yes.

Dr. Shamir: So all the power structure will shift and we're going to see new power structures that we cannot even.

Dr. Jones: And we'll at least be under pressure in different places, in new ways.

Dr. Shamir: And we're going to be reshaped.

Dr. Jones: Yes. So not technologically determinist but also not the assumption that technologies are completely neutral so we can wish for whatever we want and make it, we're reshaping ourselves. It's an exchange.

Conservatism by Choice (Stability), Innovation and Adaptation in Force Design – a Reexamination

Brigadier General (res.) Dr. Meir Finkel

Introduction – The Current Situation and the Need for Reexamination

In recent years, military organizations around the world have renewed their interest in innovation. The subject was studied through a military lens in the past that defined innovation as the development of significant and extensive capabilities, sometimes called revolutions in military affairs (RMAs). Examples of such innovations between the world wars include armored warfare, aircraft carriers, strategic bombing capabilities, and amphibious landing^{xxii}. Later, the development of deep intelligence-strike capabilities was researched^{xxiii}. This research focused on the conditions that enable or constrain military innovation in peacetime.

In recent years, an American discourse on innovation has reemerged, once again concerned by the balance of power in Europe against the Russians, and trying to develop innovation that will allow its "Third Offset Strategy" to neutralize Russian advantages in manpower and deployment time (the first US offset strategy was the development of nuclear capabilities from the strategic through the tactic levels, and the second was the intelligence-strike complex meant to destroy masses of Soviet armored fighting vehicles, both representing military revolutions of a sort).

The IDF, which sees itself as an important element of the Israeli "Start-Up Nation", is trying to recreate its maneuver capabilities, to allow it to face Hezbollah's dug-in, dispersed, and wide-spread fires array against the Israeli home front. The international military discussion has recently been dealing intensely with the need for militaries to learn from innovation processes in the civilian technological world, which has surpassed the military one, and to adapt themselves to the civilian pace of change, in order to take full advantage of innovations there.

Some distinguish between significant innovation (sometimes called Value Innovation/Blue Ocean Innovation)^{xxiv}, which develops abilities on the scale of a new branch or military array, and incremental innovation that improves, sometimes significantly, the effectiveness of existing services (for instance – making intelligence and advanced fires capabilities accessible to ground forces). This discussion will focus on the second kind of innovation, and at the end, will also refer to the issue of value innovation/RMA.

Flexibility - the ability to adapt on the battlefield - has been discussed primarily in the past decade^{xxv}. The literature on this issue focuses on the ability to identify as early as possible the gap between what was anticipated before the war and what actually happens on the battlefield, to change during combat to neutralize the element of surprise as much as possible, and to adjust to the elements of the battle that were not predicted ahead of time. The literature agrees that these abilities are based on decentralized command and control, the development of creative and daring commanders, and a range of capabilities that enable improvisation and fast lessons-learned processes during combat.

The military discussion over the past few years has focused on developing innovation in force design processes in peacetime, and less on adjustments during war. The discourse does not engage at all with the third subject that I will develop here – conservatism by choice.

Much has been written about "passive" military conservatism – the conservatism inherent within military organizations because of traditions that are difficult to scrutinize critically, the deep solidarity senior officers feel towards the service/corps/branch in which they grew, the fear of junior officers of losing their positions when their branch/services are candidates for closure, and more. It is also important to note that the mirror effect of "negative innovation" exists as well, based solely on the desires of some commanders to make changes for the purpose of seeming innovative or influential.

In this article, I will define a new kind of conservatism by choice– "active" conservatism. In this type of conservatism, organizations deliberately choose not to change some of their capabilities, based on

the understanding that they offer advantages on the battlefield, and not because of the barriers to innovation mentioned above.

The argument in the article is twofold. First, a discussion that includes conservatism by choice, innovation, and adaptation leads to more appropriate and balanced thinking between the elements than one that focuses only on innovation and too little on adaptation. That is because a proper discussion consciously takes into account all of the different components of the complex military system and deals with all of them. Second, conservatism by choice that creates foundations of stability within the organization enables it to better utilize the innovations that are developed.

For the purpose of this discussion, I will treat all the components of force design as able to be developed under either a conservative or innovative concept – organization, weapon systems, doctrine, and education and training. At the end of this study, I will discuss cases of the establishment of a new branch/a significant new capability in which some or all of the components are included.

It must be emphasized that the purpose of a military organization is maximal operational effectiveness in a war whose time is unknown, and therefore most of the time innovations are not measured on their own (as often happens in the business world, even though examples of systemic problems do exist, as in the case of the Better Place company) rather in its influence on the overall effectiveness of the system in which it was integrated. Examples include the overall effectiveness of integrated combined arms land battle, Joint air strikes effort based on intelligence, the efforts to protect the home front based on the concept of detection, interception and defense and more. It is very difficult to measure this effectiveness in peacetime.

What is conservatism by choice, and why is it important for effective military action?

Historically, conservatism by choice is a situation in which human society continues to lean on technology or fixed organizational patterns as the result of thoughtful analysis and not out of constraint. For example, prehistoric societies relied on stone technologies such as the Lower Paleolithic handaxe that were suited to the kinds of animals they hunted, until their disappearance (naturally or because of extinction by humans), which didn't leave humans any choice but to develop new technologies to effectively hunt other animals that were not originally a major part of their diet. In other words, it was a preferred conservatism, not a lack of innovation^{xxvi}. This phenomenon has many similarities to the military issue at hand, given that in both cases the drive behind the conservatism is survival – conserving the strategy of action based on a certain technology of proven effectiveness, because the price of a mistake in unproven innovation is high (death from starvation or failure on the battlefield). The second similarity is that leaning on stable components that promote survival allows the development of innovation in other areas relatively safely, compared to a situation in which too many components are trying to be changed simultaneously. It is important to note that under the title conservatism by choice/stability, I include slow, limited change in various domains, but of the kind that can be defined as adjustments and improvements but not as an innovation (for instance – replacing a tank with a more advanced model).

In military history, three major areas can be identified in which conservatism by choice takes place – manpower development, organization of units for war, and command philosophy, while innovation usually takes place in weapon systems and doctrine. Two of these components, the development of manpower and the command philosophy, are deeply related to human psychology, which has not fundamentally changed in thousands of years. Thus, for example, one can analyze the success of the German armored penetration deep into Poland, France and Russia early in the Second World War as an innovative use of the tank – in division concentrations on the operational level, while optimally using communications on the tactical level -based on conservatism by choice of a decentralized command philosophy, which enabled a great freedom of action to the forces, and a doctrinal approach of combined arms warfare. It would seem that the innovation in the employment of armored forces could not have achieved strategic success without leaning on the conservative components mentioned above.

The IDF, for instance, is extremely conservative in the organization of its land units, which have not fundamentally changed since the establishment of the permanent division after the Six Day War. Discussions about transferring the center of gravity to the brigade level, strengthening it at the expense of the division, occurred several times in recent years, but in the end it was consciously rejected. At the same time, the weapon capabilities and fighting techniques of the land forces have changed substantially, while altering the headquarters' organization on all levels (division, brigade and battalion), which enabled the full utilization of significant changes in C4I capabilities, fires, new fighting platforms and more. In a partially conscious way, the IDF chose to preserve a stable anchor in the organization of its units and in mission command philosophy, in order to take full advantage of innovation in the weaponry and combat techniques that the IDF developed against irregular enemies. Similarly, when new and significant capabilities were developed to destroy large quantities of enemy armor in the tactical and operational depths (under the concept of the "offensive defense"), it included a designated organizational change, which had a relatively small effect on the basic structure of the land forces. A similar analysis of the air force will also show that it, too, uses similar methods of conservatism in certain areas like centralized control and the organization of units, on which innovation in other fields – technological and doctrinal – lean.

The last example of conservatism by choice relates to the creation and preservation of a soldier's identification with his unit. It can be seen in the long-running attachment of the British army to the regimental system, to which the soldier belongs during his entire military career and afterward in civilian life through heritage associations. The IDF is attached to the brigade system, especially in the infantry, in which a soldier's identity with his parent brigade is maintained despite transitioning into a reserve brigade with a different name and number. Conservatism in this area, which was prioritized several times in IDF history over the creation of combined arms brigades, comes from barriers that the branches themselves put up, but also from the fear of losing professionalism based on weapons systems, and an understanding of the great importance of unit heritage in the development of fighting spirit amongst soldiers.

On the other hand, one can identify examples of "over-innovation" – attempts to innovate that do not allow the exploitation of new ideas to their full potential, or hurt the overall effectiveness of the system. A civilian example is the series of reforms that took place in recent years in the Israeli education system, with every Education Minister adding his own changes on top of those of his predecessors, or canceling the innovative steps his predecessors took, well before they came to fruition and their contribution was realized (add sources).

Military history abounds with examples. In the lead-up to the 1973 Yom Kippur War, the IDF decided to close down the "old-fashioned" amphibious transport units (which were 4 or 5 years old at the time) in favor of the "miracle weapon," the Roller Bridge, before its development had been completed. Luckily, during the "Blue & White" alert during may-august 1973 before the war, the closing of these units was postponed, which ultimately allowed the IDF to begin crossing the Suez Canal immediately when the forces reached it on Oct. 16th, while the Roller Bridge was only deployed across the water 3 days later. Innovation in the realm of closing intelligence-fire cycles without properly addressing the issue of blue force location was a major factor in the many friendly-fire incidents in Operation Protective Edge in 2014. Another example is the division of the German industrial efforts in World War II into nuclear weapons, jet planes, super heavy tanks, rockets and more, which rendered producing advanced platforms (such as the Tiger Tanks) in a quantity which would meaningfully affect the war, far more difficult. The US Army Future Combat Systems project in the early 2000s sought to simultaneously change all of the land platforms, the intelligence collection systems, the battle management system, and more. The project was discontinued for a number of reasons, but it is an example of an attempt that did not come to fruition, of simultaneous over-innovation in all fields of force design.

The more a military organization leans on software-based technology as opposed to technologies based on "steel", like tanks and fighter jets, and the less hierarchical its change processes are, the easier it

will be to change and integrate innovation. The Military Intelligence Directorate/J2 (Aman) is the constantly developing new software to make the intelligence it produces accessible to the forces. The problem is that when new software comes in that the Ground Forces are supposed to use as intelligence consumers, it can take up to two years to integrate the software, during which time both the old and new systems are used in parallel until the new system is fully implemented. At the same time, a new and even better solution is already being developed, which some of the units experiment with in training. In this situation, the effect of the efforts to integrate "innovation upon innovation" can lead to a drop in overall effectiveness, the results of which can be dire should war break out.

This is also true about the Ground Forces' C2 systems, in which every update (and there were many) drags in its wake the need for even more special training to ensure its assimilation. Over the past decade, there have been several questions as to the pace and timing of assimilating the newest version, which indicates there is awareness of this issue.

To summarize so far, it seems that military organizations are trying to innovate all the time in order to adjust themselves to a changing reality, whether because of a change in the enemy himself or in technological potential that would allow them to overcome their adversaries. All the while, they are preserving components, unconsciously in my view, of unit structure, command philosophy and education and training in which they have a relatively large amount of faith in their stability and continuity. They do this so these elements serve as a stable foundation in case the innovation fails, as well as a stable basis on top of which the potential of the innovation can be fully realized (especially in the fields of weapons systems and doctrine).

In recent years one can see a growing tension between the desire to preserve organizational structure and the decentralized command approach, and the need to change them to fully exploit new capabilities being developed. Examples include the tension between the integration of "Massuah" (Beacon) battle management system as part of the Digital Army Program (DAP)^{xxvii} and the danger of harming the IDF mission command concept; the attempts to transfer to a combined arms brigade model (Combined Arms Tactical unit ATERET [2004-5], the Gideon Brigade Combat Team^{xxviii} [2017-2018]) against the challenge of integrating a variety of new weapons and capabilities into the Ground Forces; and the issue of brigade tradition and heritage.

Therefore, a professional discussion of military development should not be focused only on innovation – the ways to encourage it and its substance - but should also include a deliberate discussion about the elements that are necessary for stability and must be preserved, whether as a stable foundation for change during combat in case the innovation does not provide the expected contribution, or to allow the full exploitation of the innovation being developed.

A rebalance with an eye to the future

The process of rebalancing must be done from a systemic perspective, which means we must try and think about the role every component plays in the overall military system or sub-system (maneuver, operational fires, protection of the home front, etc.) while making a conscious decision whether, in order to achieve overall effectiveness, it is necessary to 1. Conserve it (with adjustments); 2. Integrate within it a new component, or significantly improve the current component (innovation); 3. Develop it in such a way that it will enable maximum battlefield adaptation (meaning - it will have the ability to compensate for gaps that the overall system will encounter upon engagement with the enemy, who will try to neutralize it in every way he can).

In force design, the manpower component is the most adaptive, and it is therefore recommended to develop education and training to enable commanders and soldiers to quickly identify change on the battlefield and use the resources and capabilities at hand through intelligent improvisation. To do so, the focus during education and training must change from instilling knowledge in commanders to instilling learning and thinking abilities. There is an accompanying necessity to redevelop the decentralized mission command approach and strengthen it. (Even though the IDF officially espouses mission command, in practice is atrophying). Even a commander who was well-trained to change and

adapt will not be capable of taking advantage of those skills without this command philosophy. Strengthening the mission command approach is also a key to developing bottom-up innovation and fully exploiting top-down innovations. An additional contribution of this command philosophy is that it represents a kind of "insurance policy" in case network-based capabilities (see below) are reduced because of an enemy attack upon the network.

In the realm of organizing forces for battle, even though technology theoretically allows a reduction in a unit's size while maintaining effectiveness, there is still importance in preserving the basic unit structures (platoon to division). There are different reasons at the different echelons. First, the structure of a triangular platoon gives it the ability to continue its basic functions even when one third of its components – a squad or a tank – are damaged, which would not be possible if it was comprised of only two sub-units. Second, the unit structure provides the flexibility to transition between fighting irregular enemies in which the key echelons are platoons and squads, to fighting a conventional enemy in which the key echelons are battalion and above. The basic size of a battalion (and its enhanced staff) and its composition – if structured correctly - allows for the integration of new technologies almost limitlessly; the triangular/square control structure enables C2 processes even when the digital battle management systems are disabled or disrupted as result of a damage to the network.

The existing size and hierarchy of the units should be maintained as they are, while making an important change (which is not innovation, but rather a normalization of the current situation) which will increase units' adaptability – moving to a combined arms brigade structure, which will allow a more balanced and more diverse force as a basis for adaptation during battle, and quicker integration of innovations. In this case, it is necessary to find a solution to the challenge of single service competency training in the brigade and the issue of personal identification and attachment of the soldiers.

In the case of weapons systems, it is important to differentiate between two categories. The first is the "classic" innovation – in planes, tanks, ships, missiles and shells that allow for a significant improvement in the performance of various tasks thanks to the new capabilities they were given – better penetration, shielding, range, stealth, etc. The assimilation and integration of these capabilities are generally relatively slow and restricted to units that receive the new weapons, which allows the entire system to test its ability to fully exploit these new systems and assess their overall contributions to the system's effectiveness.

The challenge is greater when we are dealing with a second type of innovation - a technological capability that has a significant effect on the entire system or on a main sub-system – a new battle management system, a new intelligence processing software, communication devices purchased on a large scale, and so on. Here the effect of the innovation is broad and immediate compared to "classic" innovations.

These capabilities must be implemented under several guidelines. First, changing headquarters to the extent necessary to maximize the utilization of new systems, with minimal changes to the basic structure of the units themselves, while preserving their size. Second, the assimilation of these significant capabilities with a risk-management approach that always takes into account the danger of the outbreak of war during the assimilation period. In other words, the assimilation of the capability will be slowed or accelerated based on the likelihood of war.

Capabilities that make intelligence accessible, the connection of intelligence to fires systems, the transmission of information between commanders and command posts through battle management systems, all operate on the basis of advanced data networks. These capabilities greatly advance the IDF, but at the same time expose it to the danger of significant degradation of capabilities if the networks are disrupted or neutralized. In order to minimize this danger, every effort must be made to preserve mission command.

Another component related to intelligence capabilities is the balance between the pace of change within AMAN, which sees itself as an innovative organization (perhaps a military parallel of Israeli hi-tech companies) and its consumers, especially those on land. The development rate in AMAN apps

intended for a major conflict -and therefore for use across the ground forces - is much higher than the rate in which they are optimally integrated into these forces. It is important to consider the delicate balance between the distribution of new software, the training of staff able to use it to process information, the ability of communication systems to transmit this information and the training of commanders to make use of it.

Doctrine (in its broad definition, including combat techniques) will have to perpetually update at a faster pace than before, because of changes on the enemy side, but also because of changes on ours. Developing commanders with learning abilities and a mission-oriented command philosophy will ensure both a quick assimilation of new doctrine and no less importantly, the development of bottom-up insights that will challenge and improve it.

Military specialists around the world see great potential in Artificial Intelligence (AI) and ground robotics, and the IDF, too, is progressing in these fields. Developing capabilities from these fields and integrating them within the IDF can significantly influence all aspects of force design, especially those that were characterized in this article as conservative by choice – training of commanders, command philosophy, and unit structure. The development and assimilation of these fields must be done with a systemic approach. This includes thinking about the components of force design and capabilities in which the IDF will decide to implement conservatism by choice, in order to allow for an optimal foundation for the full utilization of the potential innovation, as well as to minimize risks in case the potential doesn't come to fruition.

On the topic of value innovation / RMA, which naturally include a major structural change like the establishment of a new service or array, it is clear that the principles presented here need adjustments for the Joint level. Militaries will have to make sure they preserve the other branches/services so that the military system will be able to fully utilize the new service/element, while minimizing negative effects (unanticipated but possible) the new service/element has upon existing functioning components.

Summary

Throughout its existence, the IDF has been in a process of continuous change. In the past few years, an understanding has developed that there is a problem with the IDF's operational effectiveness against irregular enemies. In the meantime, technological advancements in the civilian world provide significant opportunities for military innovation.

Adding conservatism by choice into the IDF discussion around force design, which is currently focused on innovation, will allow for a better understanding both of unconscious decision-making in the past, as well as future development of force design so that specific components will be conserved. This will allow the integration of innovations and quick adaptation elsewhere in case the contribution of the innovation to operational effectiveness turns out to be insufficient.

The various applications that use the internet are based on a network with unified codes and rules, which allow for development and innovation based on that platform. Similarly, the IDF needs to preserve certain human, structural and technological components to serve as a solid foundation for innovation before conflict and for adaptation during it.

Discussion of Meir Finkel's presentation:

- Dr. Shamir:** Just a remark for the sake of clarity, Chuck and then, Eado, you'll explain for our guests, the dilemma that we have in the IDF in terms of what Meir was presenting. I'm not sure it's clear. The units were actually regimental structure, then moving them into a more combined arms and battle group that you create during operation.
- Dr. Hecht:** From 1950 till after 1967, armored and mechanized brigades were organically mixed arms. Infantry were pure. And the division until 1967, inclusive, was mission organized. There was no "division". There was the "division headquarters" and it received brigades according to whatever the task was and the brigades themselves also got mixed up if necessary. After 1967, we moved to a permanent division and we started streamlining the brigades. It ended only after 1973, which we find we're left with only pure tank, pure mechanized infantry and pure leg infantry. And the leg infantry gradually became also mechanized. And over the past 20 odd years, every once in a while somebody says "No, we have to go and remix them up again organically". What we did over the years ...
- Dr. Shamir:** We do mix them on operation, if we can.
- Dr. Hecht:** Yes. What we did was we always organized according to whatever was needed so you had companies and battalions moving back and forth all over the place. I remember reading an American who wrote that IDF is all the time balanced between beautiful choreography and total mess. Because you can never tell what unit is which unit, when, if you try to follow it. And so what they've been doing is now they're conducting a test of again mixing up infantry and tanks organically in the same brigade with all sorts of other bits and pieces.
- Participant:** And the last decision that I understand it is, correct me if I'm wrong, is not to mix brigades.
- Dr. Hecht:** There's all sorts of problems inherent to each type of organization, some of the problems are organizational, some of the problems are professional. And we've got bad experiences with both types of organizations, so which is worse?
- Dr. Finkel:** This is unconscious decision-making. It's unconscious.
- Dr. Stern:** But the idea is that they will train together and they will be working together in peace time and then in war time, you won't have to connect them, tailor them to a mission but rather that they will be used to each other. It makes sense.
- Dr. Shamir:** Except it never works in reality. But we have the British army, the Marines and the U.S. army and each, I think, has also a bit of different.
- Dr. Jones:** When I was listening to your presentation, I was thinking, have you seen the new Marines squad organization, just announced last two months. We've gone from a 13 man to a 12 man squad. But instead of a squad leader and three fire teams, we have a headquarters element within the squad, with three men, a squad leader, a drone operator and an intel guy who's there to assist the squad leader in decision-making. And then three fire teams with automatic rifle and system automatic rifle, etcetera, I forget the new terminology. But they've decided to drive this concept down to the squad level. And again, I think it's the squad under digital conditions.
- Col. Ortal:** Basically what you're saying here is that the basic organization is sort of the hardware on which our software, which is weapons and doctrine, is being ran on. And that's very logical and we know that hardware changes slowly, much more slowly than the software on top of it. Actually we have seven layers in the digital world but this philosophy kind of ignores what we've learned from a very interesting talk of Milo. That the media is changing everything, is changing ourselves. And overlooking that is missing the point. So this conservatism of choice, I see it as sticking to adaptation

with no orientation of what's going on. Because if you stick with your PC and you disregard the mobile, well, you're not in our world. This basic hardware has its limits. Some software cannot go on running on it. And so sticking with the idea of old structures, will just not work anymore. We are in time of R&A . You say that this is conscious, I don't think so. I don't think this conservatism, a choice, I think it's resisting change. All resisting of change is conscious. It's conscious because there are politics of power in organizations, Doug was very clear about that. And we know the IDF has its own politics. And in the theoretical level I don't understand your distinguishing between going on with adaptation versus innovation and the point you've made of a new space in the middle, conservatism by choice.

Dr. Finkel: So first of all, I want to differentiate between bad conservatism and good conservatism. Bad conservatism is the one that's resistant to change, okay? Conserving organization, etcetera, etcetera.

(Speaking Together)

Dr. Finkel: ... this is a good conservatism, meaning the reasons for this conservatism are not the resistance but the conscious decision that if I will change too much, innovation on innovation, this is, we are talking with you know, military actions, it can fail the whole system. So I should take in kind of, you can steps but it's kind of two steps. Now, I don't know why, maybe others can explain, military organization around the world, although major changes in technology and doctrine and enemies are sticking to the squad, platoon, company, why is that? Maybe there's something there that made them think that

Participant: That's not the way ISIS is organized, it's not the way El Qaida is organized and that's not the way Hezbollah is organized.

Dr. Finkel: Let's talk about us, the American. What I'm trying to say is that they acknowledge the need to change, they prefer to change through those two upper components. And they understand that wide enough base enable it to the never-ending process of change. Because if the organization becomes too small, let's say the firepowers enable me to shrink the battalion into one big company. We have the fires enough is in the force, instead fires and we will do the same as a battalion. Now, this organization, apart from your classical problem of injuries and the issue of two, three sub-units, they need to be able to keep fighting as a company even if you've got two platoons but one platoon is not enough from here. You'll have three to get down to two, putting that aside. They understand that if the organization is big enough, size of, let's say, a battalion and diverse enough, meaning tanks, infantry, etcetera, etcetera, they can make any kind of change that they want, basically through the headquarters but look at history. It's the same battalion, it's the same number of companies. They change one or two whatever ... now but it's still the same organization, it's robust enough to absorb any change, technological change and doctrinal change and I'm claiming that that's the reason they will stick to it. It's not because of the armored corps or the infantry corps or issues of the bad conservatism. It's a kind of, I'm trying to put on the table the good conservatism and talk about it in order to enable us to conduct a better

(Speaking Together)

Mr. Zarmi: You could also say good and bad innovations, it's just a bigger view.

Dr. Finkel: Yeah, there is a bad innovation. This is innovations ... I'm talking about bad innovations that, now, newer terminology or whatever, the generals who want to say that they are innovating, this is bad innovation. But bad innovation and bad conservatism are familiar. I'm talking about good conservatism meaning that we never talk about the things that we, we are always talking about what we want to

change. We unconsciously decide by not changing what we want to preserve. What I'm trying to say that talking purposely of preservative will enable us to build the system much better. We say, okay, I don't want to change because I don't know how or what will be the next technologies in the next decade so we stick to the battalion so that we'll be able, it will be good enough and diverse enough and its headquarters will be able to absorb any new technology that technology that we'll have. And practically, I cannot put it on a graph but the battalions changed by hundreds of percentages along the years with the new capabilities but it's the same. And it comes to basically maybe, you mentioned human psychology, understanding the mission command education and human organizational psychologically, the limits of, you know.

Dr. Jones: Do you know the book "Keeping Together in Time, Dance and Drill in Human History"? I recommend it. I'll give an example of good conservatism in the Marine Corps. We spent, still spend, an enormous amount of time teaching close order drill. And we believe that that teaches complete, instant and willing obedience to orders. But it also appears to unlock part of the lizard brain that is very effective in group bonding. And if you look at everything from religious cults to military units, close order drill and rhythmic group movement no longer fills any particular practical military function yet we believe it has psychological functions that allow a minimum efficient scale of the sort of tasks you're talking about. And I think it's a solid example of good conservatism but every time people look at our training schedule they say "Oh, my god, you're spending a quarter of boot camp making people march up and down".

Dr. Macgregor: First of all, I don't know if you have all read "On Flexibility"? Has everybody here read it? Well, it's an exceptionally brilliant work which I have been unable to sell, by the way, to the army senior leadership. But I think that there's an important piece of this puzzle that both you and Milo have touched on. If you go to Korea, where I go on business and I've done a lot of work for the Ministry of Defense, to Japan, to Germany, to Sweden, any of these places, to North America, to Silicon Valley, everyone says the same thing in private. Human capital is everything. Understand that? Human capital is everything. It's not just useful, it's everything. Aristotle understood that, wrote about it. Plato writes about in "The Republic", where he talks about the three classes, gold, silver and bronze and where people fit in and why they fit in to these classes. This is not a new concept. The problem for us, in the west, certainly since the 1930s, with FDR, it actually begin a little earlier, I think, to some extent, with Lincoln, is the egalitarian notion that everyone can be a hero, everyone is equal. No. Everyone is equal before the law, everyone is not equal. You know, LeBron James, you know who he is? The great basketball player? I could go practice basketball for the next 10 years, I will never play like LeBron James, it's impossible. I don't have his physicality, none of it. There are some things that I can do, that LeBron James probably can't and I certainly deserve to be paid as well as he is but that's another circus. But my point is, no one wants to come to terms with the reality that the success of our civilizations today, of our societies, here in Israel, in Europe, in Northeast Asia, in the North American continent, depends on identifying, cultivating, protecting, advancing and rewarding human capital, the best. People don't want to go there. Our educational system in the United States is a miserable failure because everyone is shoved through this system that says "You must all go through the same thing, you must all learn the same things". We are very resistant to the notion, well, I'm sorry but, you know, there are people over here who are going to end up as nuclear physicists, they are one out of perhaps 1,400 people, has the

capacity for it. This person, we identified him fairly early. He needs to go over here, in a special educational opportunity because he's already demonstrated remarkable mental ability and agility. And I know that, because I'm not one of them, okay? My point is that if that's the case, to go back to Milo's presentation, why are you admitting barbarians into the empire? Barbarians who are going to drag you down.

Dr. Jones: Well, the barbarians are simply the most entrepreneurial and show the greatest initiative of any people in our societies, quite frankly. They're the ones who bother to move.

We're asset stripping the world of those with initiative.

Dr. Macgregor: I disagree and I don't know of a single German or Swede or Dane or Dutchman whose told me that that's the case. In fact, they tell us its' the opposite. And I remember watching interviews.

Dr. Jones: Well, look at the number of people in silicon valley who are immigrants.

Dr. Macgregor: That's different.

Dr. Jones: Oh, is it?

Dr. Macgregor: It's very different.

Dr. Jones: It's self-selective to move

Dr. Macgregor: It's very different. Because those people who came legally, through a long and lengthy process, they were identified in their home countries as already being exceptional. And they were eagerly recruited and brought to the United States as a result. That's very different. So my point is that all of this, everything that you're talking about, depends on that high human capital. When it comes to change, you have to be prepared for what I would call disruptive, discontinuous, radical change. I think we're at that point. Now, just for your information, in the fiscal year 17, national defense authorization act, is something called "The Reconnaissance Strike Group", which I briefed to the Senate Armed Services Committee, Senator McCain, Senator Cotton with lots of experience in the army, Iraq and Afghanistan, insisted it should be modeled in simulation with the goal of eventually fielding it and experimenting with it. Initially with a battalion plus additional assets and subsequently the whole thing. It's a 6,000 man formation with 1,507 platforms, a universal Chassis that carries all the weapon systems. But this has new weapon systems in it. It integrates these ammunitions, rocket artillery, air defense capabilities, radars, all of those things, at a much lower level then has been the case in the past. So there's enormous resistance to it. Because it's designed to replace the divisions and replace the brigades with a very different kind of formation. All that these senators wanted was for the Department of Defense to take this on, seriously, evaluate it and examine it. And the Secretary of Defense, General Mattis, the Chairman of the Joint Chiefs, General Dunford, General Milley, Chief of Staff of the Army, they are all light infantrymen and they are horrified by it, want nothing to do with it.

Dr. Finkel: Why?

Dr. Macgregor: Because they want a different future. They want the super empowered individual light infantry. They want to put money into things like ironman suits, that will give the infantrymen these sort of super capabilities. There are a lot of problems with those things and one of the requirements for the Reconnaissance Strike Group is that you must use exclusively, material that is proven and works, now, today. Cannot bring in something that somebody promises you in ten years with enough investment will pay off. And they're much more interested in the other and they're arguing against it. Well, you know, we can't make these investments because in 10 years or 15 years, there will be dramatic breakthroughs and it will make everything obsolete.

But we've been down that road several times in the past and that didn't turn out to be the case. But this kind of resistance has to be broken because we're at the point where we must leap into a very different future. We are so far behind in these old structures, these old organizations and the old thinking that goes with them, that at some point, someone that you don't expect, that you don't think is going to be very innovative, will utterly annihilate you.

Mr. Laish:

If you were trying to make the point that some conservatism is ought to be a part in the military and it's alright and good, of course I agree. But the problem is – how can you tell before trying to make changes, what is too much? And if it can't because in the second Lebanon War some people argued that the IDF was confused in the way it wrote down orders, I'm not sure that was actually the case. The case was people are willing to live in dissonance. In a reality where they hear people talk, they can't make anything out of it and they go on living in their reality world and it's okay. That somebody is talking to you, you don't know what to do, and you are continue doing what you are doing. And that's the problem, it has nothing to do with conservatism. From my point of view and it's a problem always and now it's a big problem in the IDF. Which you can hear many people say things they know that don't make any sense and still everything is going on as business as usual. So, if somebody is too advanced and you can't make anything, any sense of what he's talking, that's too much, stop him. But otherwise, conservatism is the default. It's what stops the changes that must be done in any environment, especially an environment like we have today, that changes very, very quickly. And there is a very famous case in the Israeli Air Force, when the two helicopters collided and the Air Force Brigadier General said "You know what? Because we gave them, we left them with a margin for their own individual creativity. We gave them space for creativity" and everybody was shocked, how come creativity caused the death of over 70 people. Because of creativity? It has have no place in the army, in this kind of things that people can die from it. And of course he was right. If you don't leave any space for creativity, everybody will do the same and they will all die, not only 73. So it's a different thing, I don't think you can make out what is a good and bad conservatism. You have to look at each case.

Dr. Finkel:

Of course but if you, you are not talking about it. If you will, you will put it as part of the discussion, what we conserve, what we innovate, will be totally different. Today everything is talking about only innovation.

Mr. Laish:

That's a problem today?

Dr. Finkel:

No, it's not a problem. It's not a problem. What I'm trying to say that looking back on military history, you understand better the decisions, the solid decisions based on an idea just trying to conceptualize what was done and saying that in the future, when you are talking, you will say, okay, what, there will be discussion of the future ground forces of the IDF, we'll begin the discussion saying what we want to conserve and what we want to change and not only what we want to change. Because sometimes it's a better decision making and not a default, if you decide what exactly, what is the conserve and why and how this conservation and adjustment, whatever will enable you, future change in places that you don't know exactly to define when and how they will be.

Dr. Hecht:

Sometimes in order to be able to be flexible, you have to be rigid. You could move from tank to tank in the 1973 war and you could break up teams and everybody joins up and change companies and change platoons and change crewmen because there were certain things that no matter where you went, was exactly the same. No matter what Centurion tank you climbed on, the hammer was always in the same place, the

same type of shell was always in the same place. So whenever I lost a tank, well not me personally but that generation, lost a tank, he can climb up on another tank and no problem. He could immediately start fighting. That's what enabled the flexibility, it's enabled innovation, it's enabled adaptiveness. So it depends on what. The problem with the helicopter issue was that each squadron had a different method of coordinating two helicopters and you had two different helicopters from two different squadrons at the same place. So it's a question of what you change, what you have rigid, what you allow creativity. And this is what he's trying to say.

Prof. Ben-Haim: I think that one way to characterize what you're proposing was called "conservative dynamism" by Donald Schon. Conservative dynamism. So that it's sort of an evolutionary rather than revolutionary concept. You are conservative because you want to maintain functionality of a system, but you can maintain that only by changing. So that's conservative dynamism. And in response to Gur's question, well, okay, how do you know what to conserve and what to be dynamic? Part of the response is addressing the uncertainties. And the uncertainties here are twofold. The first challenge of uncertainty in conservatism by choice is that you don't know what innovations your adversary is going to come up with, which will force you to change and if you don't it in time, you're going to be in trouble. Related to that but different, you don't know what innovations that do not seem relevant actually are. And to make that clearer, the stone chopper is a good example. The stone chopper is really not a very good tool for cutting meat. A sharpened stainless steel knife is really much better.

Dr. Finkel: But there was no metallurgy.

Prof. Ben-Haim: Exactly. There was no metallurgy. So that there had to evolve technologies that at first don't seem at all related to food, metallurgical innovations so that the second challenge which is part of the answer to Gur's very difficult question, how do you know what to change and what to not change, is to scan the horizon for innovations that don't seem relevant but that entail potentials for beneficial dynamic change. Put a question mark at the end of that.

Dr. Finkel: What is the question?

Prof. Ben-Haim: Do you agree with me?

Dr. Macgregor: The missing link here is called "experimentation". And that's the thing which military establishments ferociously resist. And if they say they're experimenting, the general will make sure that the experiment is structured in a way that proves that nothing needs to change. Or if something needs to change its very mild.

Prof. Ben-Haim: You're just such an optimist, Doug.

Dr. Macgregor: You have to take it away from these people.

Dr. Finkel: maybe its success oriented. Success oriented experiment. Meaning that you're going to prove what the general decided it's going to prove. So it's not really experimental.

Dr. Macgregor: The implications for investment, for instance, are huge. If you look at military investment, you make a pie chart and the industrial approach is – Army gets this, Navy gets this, Air Force gets this, Marines gets this. That's the wrong approach. You cut it in three, you find out that probably 60 percent of your investment, or more, should go into ISR and strike. And about 30 to 40 percent should go into ground maneuver forces. Nobody wants to go there but it's pretty obvious that the revolution if you want to call it, in technology, is taking us in that direction.

Decision-making in ‘An Age of Uncertainty’: A Critical Analysis of the British Approach to Full-Spectrum Challenges

Dr Robert Johnson, University of Oxford

26 June 2018

Abstract: This paper offers an insight into the case of the United Kingdom, and its approach to what was described, in its 2010 National Security Strategy, as ‘An Age of Uncertainty’. The British decision-making process is an interesting one, but it is often studied from the point of view of strategic theory or policy-making, ignoring some of the behaviours that constrain decision-making, such as the impact of certain organisational structures and the influence of individuals. These constraints have a far greater impact than the legacy of history, which is often thought to influence British thinking very strongly. The production of written doctrine and national strategies do however give us a strong empirical basis for analysing the British approach to futures of deep uncertainty, what they perceive as the ‘full-spectrum’ of threats and challenges that lie ahead, and their international relations with the United States, Commonwealth partners, Europe and other parts of the world. This paper evaluates what assumptions underpin British thinking, their record of managing uncertainty over three decades, and what insights can be derived more generally about strategic decision-making.

The United Kingdom 2010 National Security Strategy described this era as ‘an age of uncertainty.’ The strategy combined defence and domestic security issues for the first time, and seemed to indicate some flexibility in response to changes in the threats.²⁶ The strategy documents of 2010 and 2015 also indicated that it had a diverse portfolio of ‘means’ with which to respond to its perceived threats and challenges. There was a significant emphasis on technology and anticipated technological developments. Nevertheless, there were some flaws in its robustness and significant concerns about cuts in capabilities which were at odds with its assessments of increasing instability. The common expression was for its defence forces to ‘do more with less’, while there were greater investments in its intelligence and counter-terrorism systems and services. The 2018 review, as it emerges, reiterates this, but it can be criticised for asserting aspirations over analysis of deep uncertainty. Prime Minister Theresa May refused to endorse or refute the idea that Britain was a ‘Tier 1’ military power, but indicated realism about Britain’s global status and military capabilities, expressing pragmatism in a world of more assertive major powers.²⁷

The British have exhibited an ability to shift the emphasis of their defence and security, in light of uncertainty, from counter-terrorism and, after two decades of expeditionary air and land operations in Iraq and Afghanistan, from counter-insurgency, back to state-on-state confrontation with Russia and electronic/informational threats from Russia, China, and other actors.

²⁶ Robert Johnson, ‘UK Defence Policy: The “New Canada” and “International by Design”’, in Robert Johnson and Janne Matlary, (eds.), *Britain’s Defence Policy: Coalitions, Alliances and Partnerships in the Age of Brexit* (London and New York: Palgrave, 2018).

²⁷ ‘May’s comments cast doubt on UK’s status as Tier 1 military power’, *Financial Times*, 20 May 2018. The Prime Minister had asked the Defence Secretary to justify the claim. The report alleged, ‘the prime minister said Mr Williamson needed to rethink the capabilities needed to be a modern military force and focus more on Britain’s cyber warfare capability to meet new threats, including Russia.’ On 21 June, she clarified her position: ‘The reports that you have read are not correct. We will continue to be, as we have been discussing today, that leading contributor to the [NATO] alliance, but also a leading defence nation ... We will continue to contribute in a whole variety of ways across conventional, cyber and nuclear capabilities.’ *The Guardian* (online) 21 June, 1743 hrs. <https://www.theguardian.com/politics/blog/live/2018/jun/21/> (Accessed 22 June 2018).

The British decision-making process is an interesting one, but it is often studied from the point of view of strategic theory or policy-making, ignoring some of the behaviours that constrain decision-making, such as the impact of certain organisational structures and the influence of individuals. These constraints have a far greater impact than the legacy of history, which is often thought to influence British thinking very strongly.²⁸ The paper therefore tries to show how institutional decision-making can differ from individual or group decision-making.

The production of written doctrine and national strategies give us a strong empirical basis for analysing the British approach to futures of deep uncertainty, what they perceive as the ‘full-spectrum’ of threats and challenges that lie ahead, and their international relations with the United States, Commonwealth partners, Europe and other parts of the world.

To address the conference themes, the paper therefore examines briefly the strategic level of decision-making through the British case (1c and 1d) and the implementation of its policies (2 a-e). Moreover, this paper evaluates what assumptions underpin British thinking, their record of managing uncertainty over three decades, and what insights can be derived more generally about the methodology of strategic decision-making (2f).²⁹

Who Makes British Policy and Strategy?

The primary organisation for the creation of Britain’s Strategy is the United Kingdom government, but this institution is, in fact, an amalgam of individuals, groups, units and directorates.³⁰ The Secretary of State for Defence is the minister responsible for the Ministry of Defence, but the role is constrained by the Prime Minister, the Cabinet, the Foreign and Commonwealth Office (FCO), and the Treasury in the first instance. In major decisions on defence, the minister will often find themselves compelled to consult these and other colleagues. Budgetary constraints are especially keenly felt, as large departments, such as Health, Trade, and Education, compete for the available resources. The minister is nevertheless supported by a Permanent Under-Secretary (PUS), who is a senior civil servant charged with supervision of budgets, reforms, ministry efficiency, personnel performance, organisation and departmental strategy. The ‘Permanent Secretary’, as he/she is known, is supported by a group of specialist directors, drawn from the civil service, in areas such as nuclear capability, security, procurement and finance. The management of this organisation is led by the Defence Board (and, on legal matters, the Defence Council), but, as a body they do not decide on Britain’s strategy. Instead, their strategy is really a policy that emerges from several strands and organisations.

The first source is the Prime Minister, who, in consultation with the Cabinet and advisors in the Ministry of Defence, will initiate the creation of a National Security Strategy.³¹ Advice will also be sought from the body that oversees the implementation of Britain’s Grand Strategy, namely the National Security Council (NSC). This grouping, consisting of the Prime Minister, selected Cabinet members, the intelligence service chiefs, the head of GCHQ (the Global Communications Headquarters), the military Chief of the Defence Staff, and the National Security Advisor, is responsible for the coordination of intelligence, foreign engagement, cyber security, energy and

²⁸ Paul Kennedy, *The Rise and Fall of the Great Powers* (London: Unwin Hyman, 1987).

²⁹ For a justification of a single national case study see: John Gerring, ‘Case Selection for Case Study Analysis: Qualitative and Quantitative Techniques’ in Janet M. Box-Steffensmeier, Henry E. Brady, and David Collier (eds.), *The Oxford Handbook of Political Methodology* (Oxford: Oxford University Press, 2010).

³⁰ Public Account Select Committee, ‘Who does UK national strategy? Further report’, 25/01/11, <http://www.publications.parliament.uk/pa/cm201011/cmselect/cmpubadm/713/71303.htm>. (Accessed June 2018).

³¹ The Prime Minister and the Foreign Secretary set out the broader national strategic objectives. See, for example, Tony Blair, ‘Shaping a pivotal role for Britain in the world’, Lord Mayor’s Banquet, Guildhall, London, 22 November 1999, and ‘Boris Johnson sets out post-Brexit foreign policy vision’, BBC News, 14 June 2016, <http://www.bbc.co.uk/news/uk-politics-36789125>. (accessed June 2018).

resource security, and national resilience (including the protection of ‘critical national infrastructure’).³² The NSC emulates the American model, but was only established in 2010 in an attempt to create a more efficient architecture against terrorism, growing numbers of cyber-attacks, and other anticipated, emerging threats. This is the first item of evidence that would support the idea that the British exhibit a degree of flexibility and robustness in their strategic response to uncertainty. Periodically, the government, on the Prime Minister’s initiative, will consider a defence and security review, which will coincide with the development or renewal of a national security strategy. The concurrency of the approach ensures that the ends, ways and means of Britain’s strategy are aligned, and procurement programmes are in place in good time. The delivery of the strategy is also supervised by Parliament, and subjected to intense scrutiny in a parliamentary defence select committee. Despite the apparent pluralistic nature of its formulation, Britain has had long experience of creating an appropriate strategy, and the elasticity of its approach is one of its strengths. The parliamentary system meant that policy was interrogated frequently, and sub-committees were able to scrutinise the detail. A sudden change of policy is therefore unlikely without a thorough examination of the likely consequences.

The consultative and advisory approach of British strategy formulation continues with the participation of the rest of the civilian staff of the Ministry of Defence and the individual service chiefs. Despite a longstanding tendency for ‘tribal’ loyalties towards their own service, to maximize the budgetary support they might receive, the creation of a joint warfighting capability (Joint Forces Command) and the emphasis on a ‘comprehensive’, inter-agency approach in recent operations, have led to more unity of effort and closer co-operation. Civilian staff from the Stabilisation Unit, for example, work closely with their military counterparts.

Outside of the government, there are further sources of advice, scrutiny and debate. The media have a strong presence, and many leading outlets in the UK have specialist defence correspondents eager to analyse every aspect of the government’s strategy and its spending.³³ In addition, in reflecting public concerns, the media can influence the strategic agenda, which would explain why a non-existential threat, such as terrorism, can occupy a central position in government strategic documents. This should not be exaggerated however. Strategy is characterised by enduring policies and behaviours in international affairs, while public concerns tend to be short-term. A more sustained influence would instead come from the British and international think-tanks, including The Royal United Services Institution (RUSI), the International Institute for Strategy Studies (IISS), and Chatham House, which scrutinise and advise, as well as offering platforms for leading defence spokesmen and women to amplify defence policy. Academic institutions also have a part to play, and many defence staff, civilian and military, have attended leading British universities with a strong background in strategic studies, including Oxford, Cambridge and King’s College London.

The execution of strategy, and the return loop of influence, falls not only to the Ministry of Defence but also to the Foreign and Commonwealth Office. The FCO’s pragmatic approach to diplomacy has traditionally worked well. Its commitment to a multilateral system means that Britain tends to consult and then act with the consensus of its allies, not least in the UN Security Council. It has subscribed to a number of international efforts on conflict prevention, for example, such as the UN Secretary General, Boutros-Ghali’s 1994 initiative, the Responsibility to Protect, and the R2P Pillar II agreements. British strategy spells out its support for the North Atlantic Treaty Organisation (NATO) in defence; the European Union, in economic security and mutual support; the G8 and G20 in global financial leadership, and the Commonwealth in shared commitments to democracy and human rights.

³² This post is currently held by Mark Sedwill. He is a British diplomat and civil servant who served as British Ambassador to Afghanistan (2010), and was Permanent Secretary in the Home Office (2013-17).

³³ Calculations from NATO information on member states’ defence expenditure, http://www.nato.int/cps/en/natohq/topics_49198.htm (Accessed June 2018).

Britain is the third largest financial contributor to UN peace-keeping operations and uses its wealth to honour its pledge to eradicate poverty.

Britain's strategy is not implemented therefore solely by 'hard' means, but also through so-called 'soft power'. The British Council, founded in 1934, was established with a Royal Warrant in 1940 to promote cultural understanding of Britain and to encourage the use of the English language world-wide. Today it describes itself as a language and cultural organisation, but its roots indicate that its purpose is to promote a friendly appreciation of the British. The British Council's work is closely related to another organ of soft power, that of education. Each year, thousands of foreign scholars study at British schools, colleges and universities, to equip them with both a set of skills and a positive view of the United Kingdom. The Chevening Fund, for example, assists East Asian students, emulating the success of the American Rhodes and Fulbright schemes. More direct aid, for education and relief, is orchestrated by the Department of International Development (DfID), totalling £13 billion per annum (or 0.7 per cent of annual GDP) but a number of non-governmental organisations have their own education and aid programmes. These tend to be popular amongst the British public, and the tradition of charitable giving connects citizens with particular international causes, many of which coincide with the government's defined national interests. In 2016, the public donated £9.7 billion to charities. Relief in South Sudan, for example, came from Britain as charitable donations, £200 million in government 'UK Aid' funding, and further government contributions to international aid organisations, and these complemented efforts in conflict prevention.

The sources of 'soft power' can also be found in the financial services of the City of London and in business or property investments. Insurance services, for example, provide important support to foreign governments and organisations, and create a favourable impression of Britain. Critics argue that the government lost control of financial services in the capital which were precipitated in the 2008 global financial crash, an event which required billions in bail-out packages to prevent the collapse of certain banks. There are further criticisms of the globalised nature of financial services, and the impact on London has not always been positive, with exorbitant property prices and an inflow of investment of illicit origins.

What are Britain's National Interests and How does it Protect Them against Uncertainty (1949-2015)?

The strategic priority of the United Kingdom from 1945 was to remain closely linked to the United States.³⁴ This was not, of course, automatic, despite wartime co-operation in intelligence and military affairs. The Truman administration viewed Clement Attlee's socialist government with deep suspicion and Jewish lobbyists were angry at British restrictions on migration to Palestine. Yet, despite these initial concerns, American financial generosity and the loan of 1945 made a significant difference. The quid pro quo, at least from a moral perspective, was Britain's abandonment of Palestine, withdrawal from India, and the initiation of a long process of decolonisation. Britain's commitments to Turkey and Greece were also terminated. Within a generation, it would also give up its possessions in the Gulf. Britain's global position was evidently being diminished, and Superpower influences were increasing. In Europe, however, there was no question of withdrawal, because of the Soviet threat: it was in Britain's interests to fight the Soviets, should that occur, on the continent and not on its own shores. The Americans too recognised the menace, responding with the Truman Doctrine and the Marshall Aid package. The bond between Britain and the United States grew closer as Soviet assertiveness increased. In 1949, the partnership was enshrined in NATO and has remained strong, as a 'Special Relationship', ever since.

³⁴ Robert Johnson, 'The United Kingdom's Grand Strategy' (forthcoming); Paul Schroeder, 'Historical Reality vs. Neo-Realist Theory', *International Security* (Vol. 19 (1), Summer, 1994, pp. 108-148)

There have been some threats to the relationship with the United States, but the two countries have remained aligned strategically. The idea of a Sterling Bloc, preserving its currency with fixed exchange rates in the regions where it had enjoyed considerable influence, was eroded by the dominance of the dollar and was effectively abandoned by the Bank of England in 1972. Nevertheless, the continued success of Britain's financial services tended to offset the decline in manufacturing and heavy industry, and its commercial strength was sustained by improving trade with Western Europe from the 1950s onwards. Domestically, in economic terms Britain may have lost ground to other powers, but it was far more self-assured than its critics would claim.

British defence co-operation with Western Europe, its independent atomic arsenal from 1952, and its close relationship with the United States seemed to have placed Britain in a stronger strategic situation in the 1950s than in 1945. Although there was some discussion of economic co-operation with Europe, and eventually membership of a European Economic Community, British politicians consensually viewed European integration with suspicion. Instead, Britain developed global connections through SEATO (The Southeast Asia Treaty Organisation) and CENTO (Central Treaty Organisation), the latter with Turkey, Iraq, Iran and Pakistan. The 1952 Global Strategy Paper reclaimed Britain's historic world-wide role, and placed some emphasis on the nuclear-armed V-Bomber as the weapon system that, along with the Royal Navy, gave it global influence. There was also a focus on global bases, including important stations in Cyprus and Aden, although it was the controversy over the control of the Suez Canal Zone that caused the greatest rupture in Britain's strategy because it caused a deep dispute with the United States in 1956.

The Egyptian declaration of the nationalisation of the Suez Canal provoked a strong British government reaction. The administration of Anthony Eden was convinced that the expanding communist influence was manifest in the apparently Hitlerian figure of President Gamal abd' al Nasser. Eden was personally haunted by the failure of appeasement and eager to acquire the mantle of Churchill. Yet, despite the successful Anglo-French-Israeli military operation into the Canal Zone and Sinai in 1956, the decision to intervene divided British politics and angered the United States. The Soviets capitalised on the dispute within the West, with their operations into Hungary, but the damage to British prestige and the basis of its strategy was far-reaching. Secretary Dulles refused to back the Pound and Eden was forced to announce a withdrawal, which appalled the French. The Commonwealth, with the exception of Australia, condemned Britain's actions. The trauma ran deep and Harold Macmillan, Eden's successor, tried to refocus the country on domestic policies.

Analogies have been drawn with the British intervention in Iraq in 2003, although the most important difference was Britain's alignment to American policy there, in contrast to Suez. The connection is primarily domestic, where in both cases a popular prime minister (Eden and then Tony Blair, the British Prime Minister between 1997 and 2007) foundered on a foreign policy 'adventure' of questionable legality or ethics. In strategic terms, both believed their actions were aligned with Britain's interests; that they faced an imminent and unprecedented threat; and that acting within a coalition would be sufficient justification to exonerate their actions. The instruments of strategy were limited – military tools with diplomatic preparation – but there would be no question of the full deployment of national resources. The perverse outcome of the Iraq War was a significant amount of damage to the Special Relationship. Having spent years telling the Americans that they knew better how to conduct counter-insurgency, the British lost control of Basra, which they had been allocated as an area of responsibility. Then, the Labour government withdrew British forces precisely at the moment the Americans were trying to surge forces into Iraq in order to quell popular resistance. It was an ignominious ending to a period devoid of government strategy.

Common to both the later 1950s and the aftermath of the Iraq War were continued cuts in UK defence spending and capability with a greater emphasis on nuclear or alliance strength. In the 1957 Defence Review, the government announced reductions, and a steady fall in the share of defence spending as a share of GDP. Further attempts to reduce the size and deployments of the British armed forces followed, sometimes accelerated by financial crises, such as Wilson's devaluation of the Pound in 1967. The imperative to pay for a burgeoning health service bill added further pressure to cancel defence procurement programmes (such as the F111 fighter) or to withdraw from the Gulf, Malaya and Singapore. By the 1970s, both leading political parties began embracing the idea that Britain could redefine itself as a European power, integrated into a cheaper collective defence and an economic system. Blair subsequently shared this aspiration in the 1990s. This seemed appropriate when the emphasis was on the dual Cold War conventional and nuclear defence posture, and Europe was the main theatre of operations. However, once the Soviet Union collapsed as a major threat in the 1990s, and the predominant modality of war shifted to combatting international terrorism or multi-theatre insurgency by non-state actors, then Britain could consider once again a global strategy - an aspiration Blair shared by 2003.

The enduring importance of Britain's relationship with America, rather than Europe, the need to retain a global naval expeditionary role, and the value of a military counter-terrorism specialism while holding on to a 'balanced force' for collective, conventional defence, were all justified in 1982 during the Falklands Conflict. Britain demonstrated that it possessed the capability and will to conduct a limited war of liberation against the Argentine Junta which had seized territory, in contravention of the UN Charter. It also provided an opportunity to shape Britain's external situation. Despite its orientation towards European defence, the British government quickly assembled a naval task force. And its American alliance ensured the neutrality of other South American powers and the Soviets. Its amphibious operation, despite some losses in ships and personnel, proved rapidly successful and the Falkland Islands were recovered before the arrival of winter. Critics, not least the Argentines, portrayed the British as unreconstructed imperialists, reckless in their pursuit of an outdated colonial prestige. London, however, adroitly avoided any such association, arguing clearly for the self-determination of peoples (for the Falklands islanders) and the upholding of international law (through an unambiguous UN Security Council Resolution).

In Defence Review documents the British emphasised their adherence to international law and norms. In 1980, it had captured international attention by refusing to accept the takeover of the Iranian embassy in London, and its dramatic storming by 22 SAS, its elite Special Forces, marked the United Kingdom out as a state unlikely to allow its policies to be determined by terrorists. In fact, it endured three decades of terrorism in Northern Ireland and on the mainland, against Irish Republicans, using its military and policing instruments to contain and counter violence while searching for a political resolution. There were controversies in its approach, particularly in the episode where British paratroopers had opened fire on a hostile demonstration in 1972 and when the SAS unit had caught and killed an IRA (Irish Republican Army) unit preparing a bomb attack in Gibraltar in 1988. Nevertheless, against a background of improving economic conditions, the British government successfully brokered a final peace settlement a decade later, the so-called Good Friday Agreement, which involved diplomatic engagement with Eire. It continued this theme of upholding the international order in its participation in the Gulf war against Saddam in 1990-91 to liberate Kuwait, and then in its deployment of peacekeeping forces into Bosnia. Britain demonstrated its preparedness to accept international agreements that might not necessarily be in its own national interests by the peaceful transfer of power of Hong Kong in 1997, and also diplomatically protested against the Chinese repression of pro-democracy demonstrators at Tiananmen Square in 1989, and against Burmese military actions during that decade.

A consistent theme for the United Kingdom was also its ‘prosperity agenda’ and generosity in providing international aid. Successive British governments have seen the rising GDP of the country as a key policy imperative, but equally there has been an altruistic pride in the UK’s willingness to support both Commonwealth and poorer countries. There are evident benefits for Britain in its aid packages, in terms of influence and access, but the drivers are as much to do with a sense of obligation, after its colonial history, rather than a Machiavellian foreign policy.

The divisions in Britain’s strategy were most evident in its approach to Europe. On the one hand, its membership of NATO made it an integrated power and few questioned the benefits of free trade after joining the European Common Market in 1973. The problem instead lay in the European Commission’s desire for an ever-closer political union. Pro-Europeanists argued that the Special Relationship with the US was not one of parity and that American interests diverged from Europe, a charge made more emotive by Britain’s participation in the Iraq and Afghanistan wars. They claimed that Britain could no longer think of itself as an independent global power. There had instead been the promise of an industrial boom, an increase in British invisible earnings, and the benefits of cheaper consumer products caused by an economy of scale in Europe.³⁵

In fact, none of these materialised. European co-operation in defence procurement projects proved more expensive than its American commercial links. Cheaper consumer products were available from East Asia and, less significantly, from Europe. The industrial boom failed to materialise, and instead British heavy industry declined, with all its associated social and political unrest. The service sector also thrived less on European markets, than on global ones. In purely defence terms, NATO allies in Europe spent a lot less on their armed forces or equipment, with the consequence that military interoperability declined. Worse, European powers asserted ‘national caveats’ and restrictions on operations outside of Europe. Furthermore, with the recovery of Russia in the early 2000s, newly joined Eastern European members argued that they needed to focus on the conventional threat posed by Moscow, not global interventionism under the so-called ‘Responsibility to Protect’. It is striking that Britain is regarded as one of the leading defenders of Eastern Europe with its enhanced forward presence deterrent deployments in Poland and the Baltic States. Additionally, NATO allies committed to operations in Afghanistan inconsistently and were reluctant or refused to increase their forces there. The British, with the largest European contingent, took on the troublesome province of Helmand, and fought there in brigade strength alongside the Americans. Other European countries, however, made only token deployments. If, as some critics claimed, Britain was only a European power, it was at the very least the most dedicated one from a defence perspective.

The 9/11 terrorist attacks in the United States in 2001, and subsequent Jihadist terrorism in Britain and Europe; an increasing number of cyber attacks emanating from Russia, China and their proxies; the violent aftermath of the Middle Eastern uprisings known as the Arab Spring, which produced Daesh (the so-called Islamic State movement) and its wave of barbarous attacks, all seemed to indicate a period of instability. Given these events, it was logical to expect some enhancement to Britain’s defences and the articulation of its strategy. There was certainly a strong expression of values and aspirations in the 2010 and 2015 defence reviews, with references to global reach, a continuous sea-based nuclear deterrence, new aircraft carriers to project power, an expeditionary army of two divisions and an air arm possessing the latest strike, surveillance and lift capabilities. Its armed forces work continuously in a joint posture, and the Combined Joint Expeditionary Force deployed to Eastern Europe consists of an all-arms British force within a NATO structure.

³⁵ Jim Rollo and Vanessa Rossi, ‘Aiming for New Vigour: The UK in the Global Economy’, Chatham House Briefing Paper, (London: June 2010).

In support, Britain established a national cyber security centre to augment the work of GCHQ, a government communications centre, and continued to develop its whole-of-government approach to a range of non-conventional threats. The government adheres to three principles: budgetary investment in new technologies; strategic capabilities for 2040, including a new class of nuclear submarine, new F35 fighters and cyber projection; and stronger international partnerships and coalitions, under the umbrella phrase of ‘international by design’. Committed to learning from the Iraq Enquiry and the conflict in Afghanistan, the government also placed its decision-making processes under review, and set itself the objective of regularly updating its strategy.

In a more hostile world, however, there are evident limits to the techniques of strategy that have worked historically. Government officials find that diplomacy has its limits. In the 2010s, North Korea, Iran, China and Russia have been unwilling to adhere to the injunctions of the Western powers. Critics stated that the cost of the conventional maritime forces of the carrier groups was prohibitive and appeared at odds with the investment in new technologies and counter-terrorism, which seemed more pressing. Yet, there were also doubts about the entire resilience of the United Kingdom to address combined forms of attack, from a DDOS (Deliberate Denial of Service) cyber offensive on critical financial infrastructure to the conventional destruction of forward-deployed forces and the ability of the public to stomach resulting heavy casualties. There was further confusion in 2017 when British Prime Minister Theresa May tried to reassure the British public that there would be no further expeditionary operations comparable to Iraq or Libya, while her government’s defence policy and the armed forces seemed postured entirely for that eventuality.

In 2016, the majority of the British public voted for Brexit, the departure from the European Union. The national turnout for European elections had been low for years and European officialdom in Brussels was considered too remote from the issues that mattered to the public. Despite the irritation of the ‘Remain’ lobbyists, who blamed a ‘Little Englander’ mentality, British sentiments had always been far more expansive and global. There was an inherent dislike of a large European bureaucratic bloc, which the public associated with entities like the Soviet Union, while the inherently protectionist (and agrarian) cartel within the EU sat uneasily with a country that was wedded to free market economics and consumerism. In contrast to the Commonwealth, the EU seemed less of a ‘free association’ of nations than a system that would apply punishments for non-compliance, as Ireland and Greece experienced over two decades. Moreover, the British still identified more closely with Americans, despite the unpopular wars, because of economic systems, language and culture. Above all, the majority of the British public in favouring Brexit were establishing a claim to their identity, based on a sense of history, and rejected a series of integrationist, multicultural neo-Liberal mantras. Yet the public was divided. The minority felt strongly that Britain’s future lay in Europe. The left, which had long struggled to accept an EU it associated with big business, concluded that European courts might provide a mechanism to defeat British laws that curbed the power of Trades Unions. Others saw kindred spirits in Europe that prioritised rights over economic performance. But, in essence, both sides were projecting onto Europe much older British political and ideological divisions: between free markets or socialism; rights or responsibilities; and freedom or regulation. British strategy cannot remain immune from these debates, although it is striking that NATO, including collective defence in Europe, has remained central to British strategic thinking.

Decision-Making Under Conditions of Strategic Uncertainty after 2015: The Problem of Robustness and Institutional Conformity

The Iraq War of 2003-09 had an undeniably negative impact on British policy-making.³⁶ The Iraq Enquiry, the 2.6 million-word report published in 2017, revealed, amongst its many findings, an absence of strategic education in the UK's decision-makers. One former Defence Minister admitted that there was too much optimism, and mistakes were made, some wilfully, by members of the government of the day. The conclusion, he confessed, was that: 'we should have asked more questions'. Cross government co-operation had been lacking and civil-military relations had been marred by misunderstandings. The report focused on the lack of preparedness for the reconstruction phase of the conflict. But the most egregious error was the premature withdrawal from the campaign in 2006, at the precise moment when the Americans were calling for a surge of forces. The British contribution had been to support the United States, so the decision to pull out appeared to be particularly inconsistent.

The seed of these problems had emerged earlier. The end of the Cold War, the multinational efforts to liberate Kuwait (1991) and those to resolve the Balkans conflicts (1994, 1999) produced over-optimism in successive governments. But the defence cuts they orchestrated as part of the post-Cold War 'peace dividend' meant they could not fulfil the expectations they set out for themselves in their defence reviews. In the early 2000s, the Labour government of Tony Blair emphasised its desire to align Britain's foreign policy, and thus its strategic influence, with the 'millennium goals' of eradicating poverty in the Global South, but, despite its generous aid budget, the scale of the problem and international trade restrictions made this unlikely. The Labour Foreign Secretary, Robin Cook, had claimed that Britain would pursue an 'ethical foreign policy' and immediately ran into a diplomatic storm with Israel when he argued in favour of a Palestinian state and border revisions (He resigned over the Iraq War in 2003). Britain's aspiration to sustain the international-rules based system to preserve the status quo seemed increasingly unlikely, given Russia and China's efforts to assert themselves as global powers with revisionist intent. Above all, the decision in 2003 to invade Iraq in order to eradicate a Weapons of Mass Destruction (WMD) programme and democratise the Middle East turned out to be ill-considered. The WMD programme was practically non-existent, the intelligence was deliberately manipulated to justify intervention, and the invasion created chaotic destabilisation. Curiously, when democratising movements emerged in 2011, during the so-called 'Arab Spring', Britain only reluctantly intervened in Libya as part of a coalition. The subsequent empowerment of local militias and the collapse of authority led to protracted violence there and a flood of refugees into Europe.

Prime Minister David Cameron's claim to be 'international by design' in defence policy raised more questions than it answered. The phrase implied that small nations might look to internationalise any dispute in order to obtain Britain's, and, by extension, America's backing. This was certainly the view in Scandinavia and the Baltic states in 2017, because they felt that, militarily, they could not survive without Allied intervention. The key question was about Britain's capability: how could it possibly manage all its global commitments if more than one was challenged at the same time?

There are several areas of strategic uncertainty that affect the United Kingdom's strategy. The most pressing and visible is the means with which to protect the public from acts of terrorism, not least because it is not possible to offer a complete guarantee of safety. The home-grown nature of the terrorist threat also makes domestic surveillance and privacy a contested issue, while sustaining public vigilance, a vital part of the country's defence, is difficult. Yet, the broad-based effects of terrorist attacks tend to be short-lived. Unlike France and Belgium, the British have not committed their army to the streets of major cities. Transport systems recover quickly, financial losses are addressed and the

³⁶ Justin Morris, 'How Great is Britain? Power, Responsibility and Britain's Future Global Role', *The British Journal of Politics and International Relations* Vol. 13, (2011), pp. 326-347; Jamie Gaskarth, 'Strategizing Britain's role in the world', *International Affairs* Vol. 90 (3), (2014), pp. 559-581.

British public, who are familiar with such attacks since the 1970s by the IRA, exhibit a phlegmatic defiance. The widespread popularity of the pre- Second World War slogan ‘Keep Calm and Carry On’ in the 2000s is an indicator of the public mood and emulates the expression from that era that ‘Britain Can Take It’. That is not to diminish the existence of panic and fear during incidents, or defeatism among elements of the population, but it is remarkable that the British public tend to reach for icons of defiance and resistance, like Winston Churchill’s rhetoric, when they are confronted such challenges.

A second area of strategic uncertainty is global interconnectedness, particularly when it comes to the supply chain of sensitive information and technologies. The private sector plays a key role in the development of defence and security technologies, from the software of detection and cyber penetration to the aerial development of platforms of surveillance. Private security contractors and military companies are considered a necessary element in state stabilisation and logistical support to Western forces. The burden on government resources, particularly after the economic crisis of 2008, has added to this pressure to engage with and subcontract to the private sector for a range of defence needs, from real estates to research. Maintaining the operational security of future developments will certainly be more challenging for Britain. Like many Western countries, it expects that it will possess a leading technological edge for only a short period, although new breakthroughs will occur thick and fast over.

A third area of strategic uncertainty is the development of Britain’s new nuclear capability. The Dreadnaught class of submarine will be equipped with the new generation of nuclear weapons but the costs will be prohibitive unless the UK can spread them and set aside approximately £1 billion a year for their introduction. Here the European Union’s insistence on continued payments by Britain through Brexit reveals its rather short-term view: their demanding bills paid for European integration projects, rather than strategically enabling Britain to commit to future nuclear defence costs for collective defence. Europeanists would argue that Britain needs to pay for pledges already made, but there is no doubt that the EU wanted the UK to pay for forthcoming projects too, including infrastructural development. The British argument was that, as one of the largest contributors to European defence, in contrast to many EU member states, it already had paid its share.

Another, fourth, area of strategic uncertainty relating to expenditure and defence, concerns the UK’s reserve forces. To reduce costs, the Ministry of Defence had announced that part- time volunteer forces would be more closely integrated into the regulars, and, in the event of conflict, these reserves would augment the deployed formations. A Reserve Forces Act in 1996 had provided for reserves that were in a state of ‘high-readiness’ and who could be brought onto the operational tours of Iraq and Afghanistan. Reservists did so from all three services. The problem was that the Reserves were unable to maintain the high levels of training efficiency of the regulars, and the high turnover of personnel tended to reinforce the requirement for repetition of basic proficiency levels, although some had gained valuable operational experience. Moreover, in the future, a major conflict would require most of the Reserves to be maintained in the United Kingdom in home defence and internal security roles, leaving the regulars with their anticipated shortfall.

The fifth area of concern is the constant uncertainty of the type of war they will be expected to fight. While the tactical experiences of sailors, airmen, marines and soldiers are invariably similar, their operational and strategic requirements over the last three decades have radically differed. Technological innovations can only provide part of the solution. The British forces undoubtedly enjoyed a technological superiority over the Taliban of Afghanistan and Jaish al Mahdi of Iraq, for example, but this did not make it any easier for the British to conclude the conflicts in Helmand and Basra satisfactorily. The British, in common with their NATO allies, have struggled to determine their

military posture towards cyber attacks, hybrid warfare, and information warfare. Herein lays another issue- the extent to which the US-European defence systems are integrated, from the legislation required in the event of conflict, to decision-making about the hybrid threats and what constitutes grounds for an allied military response. To this one might also add the questionable track record of conventional deterrence, although, admittedly the methodology for measuring what has been deterred remains unclear.

The sixth area of strategic uncertainty is the geostrategic balance of power, which has undoubtedly shifted since 2000. The United States remains the pre-eminent global superpower, but China's rapid economic development has created a significant challenge for the Americans, generally in terms of Chinese aspirations to participate in global affairs and specifically in the Chinese view of their exclusive sovereignty in the South and East China Seas. The first test of Chinese power politics in this new era was over the handling of North Korea, a close ally of Beijing, but also in its ability to manage diplomacy with its regional neighbours, all of whom view the Chinese claims to world power status with suspicion. The United Kingdom is not immune from American-Chinese rivalry, seeing commercial opportunities with the latter but clearly unwilling to forego its strategic relationship with the former. It finds itself in a better position than Australia, which has commercial dependencies on China but which remains an American ally. The same is true of the British view of the central and eastern European states, which are dependent on Russian hydrocarbons and consequently reluctant to criticise Moscow. Given this European temptation to accommodate Russia, it is not hard to see why the British would be reluctant to remain beholden to the EU's foreign policy.

There are significant strategic opportunities for the United Kingdom amongst the emerging states of the world. Alongside its close relationship with the Commonwealth countries, Britain may well be an important partner of a new Atlantic regionalism, which would include numerous countries including the United States, Canada, Brazil and Nigeria. Moreover e-commerce, which Britain champions, may well address many of historical and geographical restrictions, and gradually prise open the authoritarian states of Russia and China regardless of their attempts to prevent it.³⁷ The economic liberalism which the United Kingdom has championed could again prove to be a much more successful model of global influence.

The British will certainly face ongoing disputes with Europe post-Brexit, with the most likely issues being the status of Gibraltar, access to fishing zones, agricultural products, the Northern Irish border, financial sector rivalries, and the juridical authority of the European Court of Justice. It is likely these will be resolved through the normal course of political dialogue and diplomacy, much as they have been in the last 40 years.

The chief problem with British decision-making in tackling these areas of strategic uncertainty is its institutional one. Despite the value of parliamentary scrutiny and the evidently talented individuals within the defence policy-making world, there have been difficulties. These include the inertia of institutions, protected practices, and encultured identities.³⁸ Each of these, and in combination, stifle, subvert or prevent transformation. Group practices (such as conformity), and institutional decision-making can smother or transform the changes required. The result is that systems are too slow and reactive. National and institutional leaders are anxious about devolving responsibility for strategic decisions to subordinates, because of the unknown dynamic and escalatory effects the media can create, and therefore the damage to their reputations.

³⁷ Hugo Swire, 'Advancing the rule of law in China: a deeper United Kingdom-China partnership', speech at Great Britain China Centre, London, 16 March 2016.

³⁸ Christopher Elliott, *High Command: British Military Leadership in the Iraq and Afghanistan Wars* (London: Hurst, 2015), p. 45.

James de Waal, a British civil servant at the time of the Iraq War, wrote:

Faced with a challenging international and domestic political situation, policy-makers often acted with good intentions but variable results. Politicians and civil servants did not wish to be accused of interfering with military planning, and so did little to ensure that military action supported political aims. They were also apprehensive of the close relationship between the armed forces and the media, and were therefore reluctant to challenge military opinion. For their part, some senior officers showed little appreciation of the political impact of military action, while others felt their role was principally to support the institutional interests of their branch of the armed forces.³⁹

Major General Christopher Elliott, who had worked within the Ministry of Defence and advised the former Prime Minister John Major, identified problems with ‘the system’. He noted that personnel could be promoted in defence without the necessary professional and leadership skills required, through a system of seniority. He believed some political leaders, and the defence establishment, possessed a sense of invincibility, suffered from ‘wishful thinking’ and the cognitive dissonance of not wanting to confront the truth when things went wrong. He noted there was complacency and errors were overridden by dominant leaders without considering the compound consequences. He felt that military advice was often poor, filtered through agendas based on inter-service rivalry, while a frustrated civil service called for greater centralisation to prevent preferential treatment of the armed services. The Chief of Defence Staff during the Iraq War tended to act alone, without consulting his operational planning teams at the Permanent Joint Headquarters (PJHQ) or the service chiefs of the army, navy and air force.

Problems stemmed in part from a lack of appropriate education and mutual misunderstanding. Civilian staff in defence did not understand strategy or military requirements, and the military personnel had no training in statecraft and little understanding of the law, development, or the places in which they were conducting military operations. There was little emphasis or reward for moral courage, critical thinking, research, or strategic thinking (which was subordinated to operational planning and ‘activity’). The military tended to agree to all political demands without questioning them, but ‘over-promised and under-delivered.’ Elliott notes that, in their actions, the military were no longer asking questions. Nor were the political leaders.

The former UK defence minister Des Browne recalled that, after a successful and rapid military intervention in Sierra Leone to rescue hostages in 2001, the British authorities developed a sense of confidence about similar situations in the future: ‘The Government, the Services and the nation basked in the military’s reflected glory. The theory is demonstrated: expert advice is tendered, political control and decision-making are exercised; and the outcome delivered by the armed forces is excellent.’⁴⁰ ‘But’, he continued, ‘let us also consider the counterfactuals. What if the hostages had been removed at the eleventh hour to a redoubt deeper in the jungle? Or the operation had been compromised? Or if heavy casualties had been sustained by the attacking force [one soldier was killed] or the hostages? Well, none of these things happened. The result was that all could be satisfied.’ Browne’s conclusion was that anything short of success is likely to generate questions, not least of which is ‘who was to blame and who was responsible?’

Conclusions

³⁹ James de Waal, *Depending on the Right People*, London: Chatham House, 2013).

<https://www.chathamhouse.org/publications/papers/view/195630> (Accessed 11 May 2018) and Rob Johnson, NATO innovation briefing, https://twitter.com/NATO_ACT/status/918146822073397248.

⁴⁰ D. Browne, Desmond, 2013, CB, CMG, Ministry of Defence Policy Director, and Cabinet Office (2002-2004), cited in Jonathan Bailey, Richard Iron and Hew Strachan, (eds), *British Generals and Blair’s Wars* (Farnham: Ashgate, 2013), p. 274.

How well did the United Kingdom assess and project its future defence and security policy, and prepare itself, and what assessment can be made if its approach to *deep* uncertainty? There are three landmarks, around the defence reviews of 1998, 2010, and 2018, that give us a precis of the British approach. From these we can deduce some thematic evaluations.

The defence review of 1998 expected that the UK would have to conduct a low intensity counter-terrorism or peacekeeping task at the same time as one large scale and one smaller operation in separate theatres. This seemed an appropriate assessment, given the events that occurred after 1998. However, the review was based on its past experience rather than being a genuine forecast. It believed it would face a low level counter-terrorism campaign or peacekeeping duties because of its experience in Northern Ireland (where the terror campaign had been brought to an end only in 1996); its expectation of a simultaneous large scale commitment in one theatre with a smaller one in another was the product of its experience of deploying forces to the British Army of the Rhine (BAOR), at Corps strength, the Falklands Conflict and Gulf War I. In addition, the British armed forces had been involved in other MACP (Military Aid to the Civil Power) and humanitarian missions. The contradiction of the defence review, however, was an expectation, because of the end of the Cold War and the Northern Ireland terrorism campaign, of a ‘peace dividend’ of cuts and savings.

The Defence and Security Review of 2010 was not future-orientated, despite its vocabulary. There was an expectation of cuts in costs because of the 2008 financial crash. The main purpose was to reduce crippling deficit service costs in the national budget.⁴¹ Almost a decade of sluggish growth followed. The direct experience of the period after 2010 was of protracted insurgency (Afghanistan); increasing CEMA interference and financial costs; and a rise in terrorist attacks. The review ignored the threat being posed by Russia (from 2008, but evident from 2014). There was, however, a commitment to long-term investment in large scale maritime projects. These included the construction of two aircraft carriers, an additional two squadrons of land-based aircraft, and new submarines for the ‘Continuous at Sea Nuclear Deterrent’ (CASND) and conventional subsea operations. It is unclear whether these represented a British understanding that most future threats would be sea and air based, or that it believed the air-sea emphasis would enable it to maintain a global expeditionary posture.⁴²

In 2018, building on a review in 2015, the National Security Advisor, Mark Sedwill, announced a ‘fusion doctrine for defence’.⁴³ While large-scale capital commitments in procurement were continuing, the 2015 review had asserted the values which Britain would maintain and that its global expeditionary capability would be enhanced. In 2018, however, the emphasis was much more on organisation of the government and a greater stress on electronic and unconventional threats, which was, again, a response to recent developments in Russian, Chinese, North Korean and Iranian cyber-attacks, terrorist recruitment via the internet (especially social media), and the Russian state’s attempt to assassinate Russian exiles in UK soil (Litvinenko and Skripal).⁴⁴ The only assessments of deep uncertainty were those that considered future electronic threats and the geo-strategic shift of influence through economic activity to East Asia. There was little or no reference to future weapon systems, shifting alliances, or demographic changes (such as large-scale African migration to Europe). Instead, the Fusion Doctrine the UK’s policy priorities as protection of the population, promotion of prosperity and projection of influence in order to fulfil British national objectives. These objectives, or ends,

⁴¹ Malcolm Chalmers, ‘The 2015 SDSR in Context: From Boom to Bust – and Back Again?’, *RUSI Journal* Vol. 161 (1), (2016), pp. 4-12.

⁴² Nick Childs, ‘The Measure of Britain’s New Maritime Ambition’, *Survival*, Vol. 58 (1), (2016), pp. 131-150; Cdr Matt Schnappauf USN, ‘The Maritime Dimension of Britain’s New Strategy’, *War on the Rocks*, 30/11/15, <http://warontherocks.com/2015/11/the-maritime-dimension-of-britains-new-strategy/> (Accessed June 2018).

⁴³ National Security Capability Review (London: Cabinet Office, March 2018) at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/705347/6.4391_CO_National-Security-Review_web.pdf; RUSI Land Warfare Conference, 19 June 2018.

⁴⁴ National Security Capability Review, p. 5.

consisted of economic security, through prosperity and trade, and a posture of influence known as ‘global Britain’ (both a response to Brexit); enhanced national security; and cross-government co-operation (a response to traditional concerns about siloed governance, but also a criticism set out in the 2.3 million-word Iraq Enquiry led by Lord Chilcott). The fusion was to be the combined effect of influence (through communications, social policy, soft power and diplomacy), economic activity (through the private sector, regulation, development and economic levers of power), and security (border controls, covert operations, the armed forces and law enforcement).

The government set out its approach to achieving its three policy objectives (protect, promote, project) as a five step process: to determine national interests and objectives; to assess the global situation; to examine the global outlook (the closest to the notion of deep uncertainty); the design of a comprehensive strategy; and, as a distinctive British input to the world, its partners and allies, to make its defence and foreign policy a ‘catalytic contribution’. In essence, the British seek to maximise the efficiency of their response to a range of current and recent threats they perceive, but which might assist their ability to respond to challenges of deep uncertainty. The one threat identified specifically (as opposed to the generalised concerns about electronic warfare, epidemics and economic instability in the developing world) was the ‘resurgence of state-based threats, intensifying wider state competition and the erosion of the rules-based international order, [which are] making it harder to build consensus and tackle global threats.’⁴⁵ While not labelling such threats as ‘existential’, it does suggest the British government recognises the magnitude of this challenge.

The British government might need to address policy questions more rigorously at each stage in the design of policy for the realm of deep uncertainty. In thematic terms, these questions include assessments of intent, certainty, options, time, resource, constraints, parameters, and opportunities. Currently, it appears the British government, as an institution, relies more on past experience and immediate or current assessments for its ideas about the future, but builds capabilities it thinks it will need over the longer term.⁴⁶ Individuals can seek to influence or direct this, but there appears to be a pattern to British institutional behaviour that gives it an inherent, if imperfect, robustness.

⁴⁵ National Security Capability Review, p. 6; see also Christopher Layne, ‘This Time It’s Real: The End of Unipolarity and the Pax Americana’, *International Studies Quarterly*, Vol. 56 (1) (March 2012), pp. 203–213.

⁴⁶ Brock F. Tesson, ‘System Structure and State Strategy: Adding Hedging to the Menu’, *Security Studies* Vol. 21 (2), (2012), pp. 192–231.

Discussion of Rob Johnson's presentation:

BG Benjo: My thoughts about your pessimistic view of strategic is that there is no, I would say, way forward. So I will maybe think on another way to look at the strategic problem. First of all, one thing for sure, is that you cannot play strategic games if you don't have power. So maybe you don't know if maritime or tanks are still, they're relevant in the battle but one thing's for sure, if other people think that they're relevant, then make them. Meaning that on the day that you will need to play the game, you'll be in the game. And we can see that in a lot of conflicts. If you cannot be in the game nobody will recognize you as a partner, nobody will want to negotiate with you, nobody will want to make any strategic deal with you. So I think the big question is how much Britain wants to see itself as, I would say, a state of power in the world itself. And if it wants to be relevant than it has to have power. If it doesn't power than, okay, it's soft power and we know what soft power can lead to.

Dr. Johnson: A couple of thoughts. One is that, just literally before I came here, Theresa May, the Prime Minister of Britain, she was asked about what is Britain's posture, status in the world. And she said "I'm not certain we're tier one military power". And there's a twitter storm as a result about it. You know, people in the Ministry of Defense going to meltdown, like, oh, what do you mean we're not a tier one military power. And to which people like me say – what's tier one military power exactly? What is it, tier one military power? Was the North Vietnamese Army in the 1960s and in the 1970s, a tier one military power? No. So my pushback on this idea. I agree with you to an extent, if you don't mind my saying. I think if you don't have some tangible power, you're not going to get anywhere and you're certainly not going to have credibility and been taken seriously. Britain, in Europe, will be the only country, once the French aircraft carrier, cause it's pretty ancient now, begins to run out, is the only country in Europe which will have aircraft carriers. So if Europe wants to cooperate with United States, it needs Britain, right? So there's a degree of credibility because of this inherent military power. But there's also a question of how do you make decisions and how do you get the best strategy. And, again, I'm going to invoke Churchill because now everybody has so I'm going to. It's to simply say that Churchill was being briefed one afternoon in 1941 when Britain was losing the war very badly. And he was being given, by each of the aides, a list of losses, of ships that had been sunk by the U-boats, of aircraft that had been knocked out of the sky, of the fact the Japanese were about to launch a major offensive and so on. And he said "Gentlemen, we have run out of men, we've run out of munitions and we've run out of ships. We're going to have to start thinking". And I think, you know, in many ways it sums up, it defines the man but actually there's a little really true about that. You need a strategy when you're a weaker power. If you're a megapower like the United States, you probably don't need a very refined strategy. You can escalate because you have the capacity to do so. British strategy of the British empire days, didn't exist. There was no British imperial strategy. People kept saying - why hadn't he got a strategy? He didn't need one. You just sent a gunboat and deployed marines and you know, killed people and funny old thing, people sort of tend to be compliant. But you know, once Britain had lost its empire, they had a massive shock in 1956, over Suez and from that moment on, it was very, very clear, the writing was on the wall, that it could no longer operate independently. It could only have a feature, credible to some extent, within an apparatus of the North Atlantic Treaty Organization. More important than that, an alignment with the United States. And again, Churchill's great idea which he kind of borrowed from other people frankly,

was this idea that the purpose of Britain is to keep the Russians out of Europe, the Germans banned and the Americans in, that was the whole point. And we're doing badly at all of them at the moment, I can tell you that.

Dr. Shamir: But he had one deviation in the Falklands from that trajectory.

Dr. Johnson: Yeah, they had minor operation against a few so called terrorist.

Dr. Shamir: The Falklands was the closest to a real war, in a sense.

Dr. Johnson: Yes, yeah.

Dr. Shamir: Limited but.

Dr. Johnson: We've done some like ... there's been a confrontation with Indonesia, there's the Asian operations went badly, they were minor operations. Some minor operations but yes, in terms of conventional, yeah.

Dr. Shamir: State on state.

Dr. Hecht: I think that's the issue. War isn't just the big stuff.

Dr. Johnson: Sure.

Dr. Hecht: You're fighting all the time, the small stuff, Israel too, the people don't remember it. We haven't stopped fighting since 1920. Every once in a while there's a big thing and everybody looks at it and it blinds you to what's actually happening on a day to day basis. And Britain is the same. Not on its own doorstep. You mentioned Borneo, Oman, Yemen, Africa all over the place and so on. And the big stuff occurs once in a while. But you're achieving your political objectives in the little ones, because that's why you're there. You want to achieve something and you're getting there. You don't need this huge power, depending on what your objective is. And if you talk again about this lack of ability, this uncertainty, it reminds me, in 1980 or 1981, a British general stated that he doesn't know why everybody's complaining about British intelligence. They've been saying for 80 years, every year, this year there will not be a war and they only got it wrong twice. In 1914 and 1939. In 1982 they had number three. But again, what are you building for. Are you really building for 1914 when somebody else is actually doing the first fighting and you have time to build your forces during the war or are you building for what you think is important for you (in those days, Imperial Policing). And as you mentioned, these two aircraft carriers. At the same time, if you look at your ground forces...

Dr. Johnson: Yeah, not so good. Right.

Dr. Stern: So all day we've been talking about military strategy, mostly and for me, I'm a military historian, that's fine, that's great. But since you've mentioned Russia and considering the fact that you come from a European nation which is much different than a Middle Eastern nation. We have different challenges, different frames of mind, different ways of thinking. So firstly, who is your enemy? Since Russia was mentioned, terrorism is a good answer just as well. But if you're talking about Russia, the Russian threat to Europe, then historically, Great Britain has had the economic advantage. I was wondering if you could talk a little bit about strategic thinking and economic strategy in light of this threat.

Dr. Johnson: Yes. Forgive me for not, in half an hour, it's very hard to tell the whole UK strategy because it's like a 50, 60 page document. But yes, you're absolutely right. There are two components. There's the soft power component and there's obviously the more obvious economic power. And one of the issues we have in the UK, at the moment, is, you know, this idea of defining an enemy. If you define someone as an enemy you are effectively predicating that you are going to do some fighting against them. So, other than the national security advisor, who I think, labelled Russia as a challenge or a threat. He did not say "enemy" or "adversary", he said "rival" or whatever it was. And I think that's the way we like it. Nobody in Britain wants a war

with Russia, want to fight with Russia. By the same token we will not tolerate this sort of attempted poisonings. By the way, you may have heard about the Skripal case. What you're not being told are the three other murders that have occurred in London and the southeast of England, all of which have been traced to this Russian secret service. In fact, I think the Skripal case was only the last in a long line, the most obvious, the most overt and frankly the most audacious and raucous. Because if you consider 300 members of the British public were affected by that substance and if it had gone the other way, they would all now be dead. It's a particularly interesting substance by the way. Every time you touch it, it doesn't actually diminish its toxicity. So it takes a long time. Once it's in the pores of your skin, you can't get it out, so it's actually incredibly dangerous stuff. So I think there are lots of other activities. You know, Russian attempts to ... UK airspace. There's been also cyber activity, there's been lots of, now proven, bot interference with the British Brexit referendum. So we know that there's a degree of interference. I suspect all of Europe. I think the reason why so many diplomat countries responded with diplomat expulsion, wasn't because everyone said "Oh, we like the British". I think it was more that they were also having a problem and saw this as being, hey, look, this affects everyone, this stuff. So not an enemy but definitely a problem that needs to be looked at carefully. And I think the approach has been, yes, you might say, economically, Britain supported the sanctions regime that's been brought back. By the way, they're having almost no effect as far as I can see, whatsoever. They're more of a gesture, I think, than anything.

Dr. Stern: They've developed some other tools to circumvent it.

Dr. Johnson: Sure, sure they have. And they will use proxy countries to import goods and all that. I mean those are more of a kind of political thing than truly economic. If Britain really wanted to damage Russia economically, it would do so through the financial markets. And I could tell you now, it could do so tomorrow, it could do this so this afternoon if they were so minded. But the consequences of doing so would affect other countries. And therefore it's not a very attractive option, it's very much a last resort if you had to do that. But Britain currently could do a lot of damage. I'm not saying bankrupt Russia, they could do an exceptionally large mass of damage, financially, to Russia, if it wanted to. Which brings back the question, why not? And the answer, I think, there's other issues there. On the soft power front, there are things like, British council which encourage education into the UK and therefore better understanding, mutual understanding going on. We're doing that with China right now, that's why there's Russians. Large numbers of Russian children go to the boarding schools in Britain, for example and the British sort of try to facilitate that, participate in the world cup and all those things. So it's a fairly muted that kind of response at that moment but it could be a lot more serious, in fact, I think, if they wanted to. And I think the question was raised, we were in a chat about willpower. Has the British government ... got the will, all the vision, to see a little bit further on the horizon to what we might recognize as deep uncertainties opposed to just a number of variable factors that might make a difference. And I think there's the question, that's the thing we're doing.

Prof. Ben-Haim: You made the comment, the assumption, that there was an absence of strategic education among policy makers.

Dr. Johnson: Yeah, that was the Iraq inquiry.

Prof. Ben-Haim: I wonder, what should they learn? Now, I know you're in the history department so what in addition to history, should they learn to enhance their education in strategic issues?

Dr. Johnson: I should just point out, I'm a schizophrenic because I'm actually a member of the Department of Politics and International Relations and a member of the History Faculty with one other first in Oriental Studies. So I am this kind of weird, monstrous creature, Frankenstein. So how does it do it? Well, there are, there's a lot of fashion at the moment for teaching strategic studies. King's college London, stuff they're doing at Cambridge, stuff going on Axel university and my university as well. We have a chair and now it's the chair, all strategic studies. So the ... that these academic institutions exist. Within government itself there's been a much more aggressive willingness to engage with a more diverse range of people, to talk to them at least about what that might mean and how they might confront the future. So private sector been consulted, google as well have been consulted regarding future electronic systems and so on. An announcement about fusion doctrine in the UK by national security advisor how different government departments will work together to work towards a common purpose, a common free strand trinity, things that go in threes often work, it seems, really well. A trinity of objectives to protect, prosper and sort of promote, influences on. So those are the primary sort of features of it. But you could argue – well, the problem is that if we focus on learning about classical strategy, you know, we all went home and studied ..., we might miss the point about how that gets applied today. And I think it's grater demand studying strategists, not the writers but the actual doers, the likes of Eisenhower. Maybe we should look at what George W. Bush and Donald Rumsfeld were trying to do, what their rationale was. Analyze that ... as a bunch of people who were doing a certain strategy and then be clear about why we think that wasn't correct or why we thought aspects of it were, broadly right and then we can have a very interesting discussion, matched against ... theory.

Dr. Freilich: Who do you want to educate? The Prime Minister?

Dr. Johnson: It's everybody really, within government. So the problem we had, back in the late 1990s was that, and if you were somebody who quite liked humanitarian issues, you'd probably go and join DIFIN which is the Department for International Development. And if you walked into different offices, you'd find lots of people dressed in, you know, African ethnic clothes and they'd done field work in Uganda and they weren't really tooled up on why is Britain promoting aide and international development in the world, what's the strategic purpose of what you're doing? No idea, we just want to go and help people. And if you'd looked ... as the foreign office it was about, well, let's make sure there are other countries like us and do trade with us. They were very unclear about was the overall objective of the UK government and the UK strategic direction of the country. So I think what they've done is they bring all that together in saying – you know, you have to justify yourself, not on what budget you're going to draw down from the government and treasury but how you're going to use it to fulfill these national objectives. That's quite new for the British, we've never done that To quote lord Salisbury someone asked him, what's your policy? Because he was both Prime Minster and Foreign Secretary. And he said to them – Britain's objective is to float lazily down the stream, occasionally putting out boathooks to push off the bank. I mean it was this complacent, conservatism, not the nice conservatism.

Dr. Freilich: But now you're talking more about the processes as opposed to who was supposed to undergo this educational enrichment. It's going to be hard, I would assume, to get the Prime Minister to devote the time to come to an academic seminar while in office. And you may not know in advance, in some regimes it works easier but in Britain you may not know in advance who the winner of the election is going to be.

- Dr. Johnson:** That's correct.
- Dr. Freilich:** So you can't do it in advance also. There's some places in our area where you know exactly who is going to win. So the chances of being able to educate the political leaders is.
- Dr. Johnson:** Yes. You have to know in advance to some extent. And then you've got the people we work around, the civil servants is someone that we work around. You can help them, because they're going to be ... the political parties, I talk to the political parties and see what they're going to do. Now all of what I've said, of course, it always sounds very neat and tidy. It isn't, it's very messy, ... change very fast. And if the current leader of the opposition becomes Prime Minister, then everything I've just said is, goes to freefall. There is going to be no fusion strategy, nothing will have been learned from the Iraq inquiry, everything will be thrown up in the air and Britain will be charting a very new and a very uncertain course at that point.
- Dr. Freilich:** And if you use the system that you mentioned before, of the councils you're going to the "Yes, Minister" comedy series.
- Dr. Johnson:** Well, it's not as bad as that.
- Dr. Freilich:** I'm exaggerating of course, for effect. But the issue is, how do you get, it's not enough that you have somebody who is an expert to sit next to the politician. You need somebody who actually believes in the politician's views.
- Dr. Johnson:** Yeah.
- Dr. Freilich:** Because you have a purely civil servant then actually he's doing what he wants.
- Mr. Tzuriel:** That's not our experience. I am in that position exactly, we are civil servants, we are not from the, we don't belong in any way to the party or to the ideology of our minister, he knows it. We don't mix the two, he makes a point of not mixing the two, and yet, I think, there is a process he gets more and more immersed in intel, strategy and power issues all the time.
- Dr. Jones:** In principle, that's the American model, Sherman Kent, that the intelligence community in some sense stands outside and above the process. They should, but how often has that happened in practice?
- Dr. Hecht:** Yeah, but you change the CIA director every time the president changes, for that reason.
- Dr. Jones:** That does occur and that, again, that I'm saying the ideal that was proposed rather than what has always happened.
- Dr. Freilich:** But there's a difference between the intel community and the national security council where the NSA is always someone who is attuned to the president's way of thinking.
- Dr. Stern:** And also in Israel. If you ask Gur he will tell you that this is something in common.
- Dr. Freilich:** I think he has to be.
- Dr. Stern:** that this a challenge for them as well.
- Dr. Macgregor:** I think Milo's point is very important though. It's the way it's supposed to be, but in reality, over the last 25-30 years, I think we can make a pretty good case that the president ultimately gets the intelligence he wants.
- Participant:** As opposed to what he needs?
- Dr. Jones:** My book makes the case that mirror imaging is a problem in intelligence but it's more mirror imaging in the customer than it is the enemy, the so-called intelligence customer.
- Mr. Tzuriel:** It's a challenge that I do think from seeing that the Israeli intelligence does the two things that it's supposed to do. It, on the one hand, caters to the needs of the decision maker and on the other hand, points out to the decision maker what his needs or priorities should be.

- Dr. Freilich:** Except when he's told to shut up or decides to shut up on his own. For example the first Lebanon war.
- Mr. Tzuriel:** There are examples for everything but on the day to day process that I see, I've never, I don't think I've ever seen yet the intelligence told by the Prime Minister to shut up or "I don't want to hear your analysis".
I'm saying what I see in the everyday.
- Dr. Macgregor:** Listening to you talk about the attitude in London, is it fair to say that the British elites are nostalgic for the days of the post-war order and would like to cling tenaciously to it and are unhappy with the fact that it is frankly falling apart? Because depending on where you stood in 1989, 1990, it was over. That's one of the problems that we had in the United States. We didn't see what was happening, we saw what we thought we wanted. And it's an opportunity to impose a new order.
- Dr. Johnson:** That's a very good question, you've made me think actually, very carefully about just the ... a pantheon of different people I know within government, within London and those who are thinker about this, are civil servants. It's a very mixed picture. There's no doubt that some are nostalgic in the wrong sort of way about the cold war, because they felt that the stability that offered is somehow attractive. And I said, well, it doesn't feel that way if you're an Eastern European. Now it feels much better, you have the European Union and all that sort of thing. So these perspectives are kind of interesting. I think they're unrepresentative. Part of the problem in the UK right now, in almost all the London .. is the sheer lack of sense of history. It's the complete absence of historical understanding, really, rather than the other way round. And that means that decisions are often made, seemingly a priori without a real sense of reference or context. And when you point out and say well that's ... to have because that's exactly the ... in 1956 and they go – Why? What happened in 1956? And you're left going, hey, like I do, what the heck? I mean, that's amazing. So just I wanted to bring that background, if I may, with the sense of, you know, what matters as this pragmatism about questioning all the nostalgia. And it goes back to the point you were saying, Chuck, about who is making these judgments and how to educate them. So this is only the first handful of questions. There's about 40 or 50 questions that I have gathered from different individuals. And it's prompted by a remark made by a former British Defense Secretary, minister I should say, Des Browne, who, he said, in regards to the Iraq conflicts, after the success they'd had ... with a short operation in the year 2000, he said "we should have asked more questions" and the questions, I said "What kind of questions?". So I've been going around asking, what question should we be asking? Do we really understand the nature of the issue here? I mean I understand the issue, what's the nature of the issue? What's the really deep, you know, you're going to get that through some sort of dialogue with each other, you can't do that on your own. If you're a military officer, you can't say "Yeah, I don't ... have you?". You only get that through talking to someone else, usually the enemy actually. This is for the British. They want freedom of action, options, initiative and advantage. Has he got one idea or is it a coherent chain of ideas? I haven't put all of mine here but this is important to the government mainly. It is feasible, sustainable, suitable, acceptable, those four words seem to be very powerful. Does it commit the sin of being tactical? I think one of these we've done today, is actually get drawn into tactical discussions and actually, really, we shouldn't do that. We should say "That's tactical" and stop. Now there's always a dialogue between tactics and strategy. You know, I have met, I've read ... I do understand that. But I think what is not in here, which I normally put in here is - is the language we are using to describe our policy or strategy, obscuring that which

we don't wish to confront? And every time I pose that question, to people in government, they've said "Oh yeah, that's so true. We're doing that all the time." Now that made me think, okay, so this is for ..., more than we give it credit for, when it comes to trying to assess uncertainty. Are we actually, I guess that's the point you were raising about and it was raised up here again. You know, it's our own organizations that we are designing the strategy for rather than someone out there. We talk about them like that but actually what are we all doing, is we're organizing ourselves and we're talking to ourselves. And therefore the vocabulary we're using can easily get hijacked to something else. That's an illustration but there are others. I think we're going to synthetic era, Milo.

What Strategic Planners Need to Know

Yakov Ben-Haim

Yitzhak Moda'i Chair in Technology and Economics

Technion — Israel Institute of Technology

Haifa, Israel

Abstract Strategic planners need two distinct intellectual capabilities. First, extensive topical or disciplinary expertise, supported by a broad understanding of the world, is needed for dealing with complex subtleties of human affairs. Second, methodological expertise in decisions under uncertainty is needed for dealing with unique situations involving innovation, discovery, and surprise by friend or foe. Three arguments support this claim. First, the need for decision-theoretic expertise in managing uncertainty results from an inherent indeterminism in human affairs as explained by Knightian uncertainty and Shackle-Popper indeterminism. The second argument for a dichotomy of intellectual capabilities is based on the uniqueness of historical circumstance, which often motivates unprecedented behavior. This emphasizes the importance, and the limitations, of topical knowledge. Strategists need both profound understanding of human affairs, and expertise in managing surprise and uncertainty. The third reason is that consensus of intelligence assessment is demanded by decision makers, but pluralism of models is prevalent in complex uncertain environments. We propose nurturing plurality of assessment, and embedding those assessments in the analysis of robustness to uncertainty. Specifically, for any proposed policy, the analyst evaluates the robustness (of that policy) to uncertainty (plurality) of assessment. A more robust policy is preferred over a less robust policy. The analyst must have both topical expertise in the disciplines underlying the analysis, as well as decision-theoretic expertise in managing uncertainty. We demonstrate this by applying info-gap decision theory, and the concept of robust-satisficing, to intelligence analysis. An example of intelligence analysis prior to 9/11 illustrates the combination of topical and decision theoretic expertise.

1. The Claim and Its Background

Strategic planning in national security often depends extensively on intelligence assessments of potential threats and opportunities. However, Betts (2007, p.50) writes that

"the unresolvable paradoxes and barriers to analytic and decisional accuracy make some incidence of failure inevitable. Concern with intelligence failure then coincides with concern about how policy can hedge against the consequences of analytic inadequacy."

We will illustrate how the method of info-gap robust-satisficing provides a conceptual tool for the strategic planner to manage the limitations of intelligence analysis.

Strategic planners need two distinct intellectual capabilities. First, extensive topical or disciplinary expertise, supported by a broad understanding of the world, is needed for dealing with complex subtleties of human affairs. Second, methodological expertise in decisions under uncertainty is needed for dealing with unique situations involving innovation, discovery, and surprise by friend or foe.⁴⁷ In this section we briefly present three arguments for these two distinct capabilities: limitations of consensus, historical contingency, and indeterminacy in human affairs. In subsequent sections we explain and illustrate the analysis of robustness to uncertainty, based on info-gap decision theory.

⁴⁷Many ideas in this short essay are developed more fully in Ben-Haim 2016. See also Ben-Haim 2018a.

1.1. Consensus or Pluralism?

The dependence of high-level decision makers on intelligence assessment, and their limited time for deliberation, create a strong motivation for consensus — rather than pluralism — in the final products of intelligence analysis. However, Jones and Silberzahn (2014) argue that insistence on consensus, along with other factors, was a major cause of the failed assessment in the Cuban missile crisis in 1962, the Iranian revolution in 1979, the collapse of the Soviet Union 1991, and the terror attacks on 11 September 2001. The problem with consensus is that it eliminates legitimate alternative interpretations of evidence that is invariably ambiguous or incomplete.

One can rarely know the full and unique truth about an important strategic situation. One will invariably have diverse alternative models and explanations. As Betts writes (2007, p.101):

"Single best estimates can be useful, and often uncontroversial, on secondary matters or when leaders do not have well-formed views of their own already, and when their convictions are not already invested. On matters of high politics, however, producing a consensus estimate is likely to be meaningless because it either rests on negotiated mush or will be bloodily contested, in which case politicization in some measure is the essence of the enterprise."

A single specific decision needs to be made even though a single specific understanding of the situation is lacking. Decision theoretic tools are needed to reconcile this discrepancy.

If consensus is useful or sometimes even demanded by the consumer of intelligence, but if consensus is inimical to the quality of intelligence products, then what is to be done? The solution that we propose is to nurture plurality of assessment, and to embed those assessments in the analysis of robustness. Specifically, for any proposed policy, the analyst evaluates the robustness (of that policy) to uncertainty (plurality) of assessment. A more robust policy is preferred over a less robust policy. What the strategic planner provides to the high-level decision maker is a prioritization of proposed policies based on their robustness to the diversity and uncertainty of assessments. In order to do this the analyst must have both topical expertise in the disciplines underlying the analysis, as well as decision-theoretic expertise in managing uncertainty.

1.2. Historical Contingency

The second argument for this dichotomy of intellectual capabilities is based on the uniqueness of historical circumstance. Each strategic planning situation has many unique attributes of culture, geography, technology, ideology, etc. E.g. Britain's counterinsurgency (COIN) strategy in Malaya was, in many respects, quite different from its COIN in Northern Ireland, and both were different from British COIN in Kenya, Brunei, Malaysia, Radfan (Yemen) and Dhofar (in Oman).

Similarly, one day after Mohamed Bouazizi's self-emolation on 17 December 2010, Tunisia was profoundly different from one day before. The entire region was astonishingly different within a few weeks, leading to the "Arab Spring" and the fall of several autocratic regimes in the Middle East. Astonishing surprises occur, requiring expertise in decision making under uncertainty in addition to topical understanding of the specific situation.

Likewise, Erbel and Kinsey (2018) refer to the "logistic-strategic nexus" as the impact of grand strategic plans on the military logistic system, while the logistic system itself constrains strategic options. "As the term 'contingency' makes clear, this process is strongly characterised by incomplete

information and uncertainty, turning ongoing appraisals of the geostrategic environment into a series of ‘what if’ scenarios.” (p.522)

There are generic aspects of all conflicts. Nonetheless, conflicts are also characterized by the distinctive history of each national or ethnic group, the uniqueness of each specific social context, and the innovations in response to new challenges. This makes the identification of useful generic rules of strategy difficult. (Clausewitz would agree, as we will explain in section 4.) It also emphasizes both the importance, and the limitations, of topical knowledge. Strategists need both profound understanding of human affairs and societies, and expertise in managing surprise and uncertainty.

1.3. Indeterminism in Human Affairs

The third argument for expertise in managing uncertainty is based on Knightian uncertainty and Shackle-Popper indeterminism (SPI). SPI provides a generic epistemic framework for understanding historical idiosyncrasy and the prevalence of non-probabilistic Knightian uncertainty.

Knightian uncertainty characterizes the surprises that face strategic planners resulting from deception or denial by an adversary (e.g., secrets), and resulting from observations that baffle and confuse us (e.g., mysteries). The prevalence of Knightian uncertainty in human affairs is explained by Shackle-Popper indeterminism.

By ‘uncertainty’ we mean: ignorance or ambiguity or the potential for surprise. The concept of Knightian uncertainty is fundamental to our understanding of uncertainty in human affairs, and is eminently suited to the task of intelligence as discussed by Phythian (2017). Frank Knight’s concept of ‘true uncertainty’ arises from innovation and initiative of entrepreneurs. In this connection, Knight asserts that “there is no objective measure of the probability” because there is little or no experience with new innovations or initiatives from which frequencies or likelihoods can be learned.(Knight, 1921, pp.46, 120, 231–232. See also Knight, 1933, p.120.) Knightian uncertainty arises from the unbounded potential for future innovation, or simply from ignorance of the vastly complex world. Knightian uncertainty may also arise from deception or denial by an adversary.

G.L.S. Shackle (Shackle, 1972, pp.3-4, 156, 239, 401–402) and, independently, Karl Popper (Popper, 1982, pp.80–81, 109), explained a concept of indeterminism that is related to Knightian uncertainty. Human behavior depends on what people (or groups) know: if you know it will rain then you’ll take an umbrella; if you know the enemy has chemical weapons then you’ll take a gas mask. However, what will be invented or discovered tomorrow cannot, by definition, be known today. Hence tomorrow’s behavior will have an element of irreducible indeterminism today. Knightian uncertainty and Shackle-Popper indeterminism (SPI) imply a fundamental and irrevocable limitation in the ability to predict outcomes in human affairs (Ben-Haim 2007).

Knightian uncertainty and SPI result from material and conceptual innovations, inventions and discoveries that are prevalent in human history, including military affairs. They may be minor tactical innovations such as Rommel’s use of anti-aircraft weapons against tanks, or they may be major conceptual innovations like Khrushchev’s surprising decision to place nuclear missiles in Cuba.⁴⁸ Material inventions such as the tank, or doctrinal innovations such as the use of tanks in Blitzkrieg, can suddenly and astonishingly alter the operational balance of power on the battlefield. In short, circumstances change in ways that often surprise strategic planners. Macgregor writes (2016, p.71):

⁴⁸The CIA was thoroughly surprised when missiles were discovered by U-2 spy-plane flights over Cuba in October 1962. See Jones and Silberzahn, 2014.

"How the triumphant Wehrmacht of 1941 was crushed in 1944 is a story of two different military transformations. The first was a German transformation that focused on marginal, tactical changes to an existing World War I army; the second was a Soviet transformation focused on integrating and concentrating combat power on the operational level for strategic effect. Of the two, the Soviet transformation produced a decisive margin of victory."

The German transformation totally surprised the French in 1940, while the Russian transformation did the same to the Germans in 1944. Knightian uncertainty is pervasive and influential and the strategic planner needs tools for managing it.

~ ~ ~

So, what do strategic planners need to know? They need disciplinary expertise based on broad understanding of human affairs, together with decision-theoretic expertise in managing uncertainty and surprise. Info-gap robust satisficing, to be described in section 2, provides a versatile conceptual framework for managing uncertainty. An example of intelligence analysis prior to 9/11 is presented in section 3, and we conclude in section 4 by relating our claim to Clausewitz's thought.

2. Info-Gap Robust Satisficing

2.1. Generic Discussion

The decision methodology that could be called "predictive optimization" begins by identifying the best available information, understanding, and theoretical and contextual insight, including perhaps assessments of uncertainty. We will call this information our "knowledge". This knowledge entails information and understanding about friendly and adversarial capabilities, geopolitical constraints and opportunities, domestic politics, terrain, logistics, and whatever else is deemed relevant. Predictive optimization chooses the option whose knowledge-based predicted outcome is best.

Predictive optimization is usually unsatisfactory when facing strategic uncertainty because our knowledge is likely wrong in important respects, as explained by Knightian uncertainty and by Shackle-Popper indeterminism. Instead, we advocate the decision methodology of robustly satisficing⁴⁹ outcome requirements.⁵⁰

The basic idea of info-gap robust satisficing is to first identify outcomes that are essential — goals that must be achieved — and then to choose the option that will achieve those critical outcomes over the greatest range of future surprise. We use our knowledge in two ways. First, to assess the putative desirability of the alternative options, and second, to evaluate the vulnerability of those options to surprising future developments.

The robust-satisficing strategy is the one with maximal robustness against strategic uncertainty while satisfying the critical requirements. In other words, what is optimized is not the predicted quality of the outcome, but rather the immunity to error and surprise. The outcome will be satisfactory, though not necessarily optimal, over the greatest range of future deviations from our current understanding.

⁴⁹To satisfice means "To decide on and pursue a course of action that will satisfy the minimum requirements necessary to achieve a particular goal." *Oxford English Dictionary*, online version accessed 7.4.2016.

⁵⁰Further discussion of these ideas are found in Ben-Haim 2006, 2014, 2015. References to work of many scholars using info-gap robust-satisficing can be found at info-gap.com.

What constitutes a satisfactory outcome can be as modest or as demanding as one wants, though the robustness decreases as the demands increase.

The method of robust-satisficing acknowledges that objective knowledge about the world can be obtained. Nonetheless, robust-satisficing also acknowledges that vast domains of reality are unknowable and must be managed decision-theoretically in a way that differs from predictive optimization.

For instance, the predictive optimizer would prefer the option that is predicted to have the best outcome, based on current knowledge. Choice of an option with putatively less desirable outcome would be viewed as perverse or unjustified in light of the best current knowledge. In contrast, the robust satisficer would prefer the option that would achieve an outcome that is acceptable or good enough (though perhaps suboptimal) under predicted conditions and throughout the widest range of surprise or deviation of reality from current knowledge.

Knowledge often includes assessments of likelihood. In this case, the predictive optimizer may prefer the option that has the greatest predicted likelihood to succeed. Choosing an option with lower predicted likelihood of success would again be viewed as perverse or unjustified. In contrast, the robust satisficer would prefer the option that has acceptable or good enough (though perhaps suboptimal) likelihood to succeed according to current knowledge and throughout the widest range of surprise or deviation of reality from current knowledge.

2.2. Evaluating Robustness with Conceptual Proxies

The info-gap analysis of robustness depends on 3 components: our knowledge, our uncertainties, and our goals. These components are combined to prioritize our available options in terms of their robustness against uncertainty. The robustness of an option is assessed as the degree of uncertainty or error in our knowledge up to which that option would nonetheless achieve our goals. In other words, an option is highly robust if it would achieve our goals despite great surprise; robustness is low if even small surprise could prevent achievement of the goals.

In some situations we can evaluate the robustness quantitatively: using numerical data and mathematical models.⁵¹ In other situations we must rely on qualitative analysis that is often supported by analyzing conceptual proxies for robustness.⁵²

We discuss six concepts that overlap significantly with the concept of robustness against uncertainty, and that are useful in the qualitative assessment of decisions under uncertainty. Each of these six concepts emphasizes a different aspect of the overall problem, though they also overlap one another. A decision, policy, action or system is highly robust against uncertainty if it is strong in most or all of these attributes; it has low robustness if it is weak in all of them. In choosing between two options, the robust preference (if there is one) would be for the option that is stronger in more attributes. The six proxies for robustness are defined as follows.

1. *Resilience*: rapid recovery of critical functions. Failures and short-falls are likely, so one should build recovery capability to make one's solutions robust against adverse surprise.
2. *Redundancy*: multiple alternative solutions. "Two is better than one, ... and the three-

⁵¹Many examples of quantitative analysis of robustness, based on info-gap theory, have been published. See info-gap.com. See also Ben-Haim 2006, 2010.

⁵²See Ben-Haim and Demertzis, 2014; Ben-Haim, 2018b.

fold strand will not quickly break” said Solomon.⁵³ Robustness to surprise can be achieved by having alternative solutions at hand.

3. *Flexibility* (sometimes called agility): rapid modification of tools and methods. Agility, as opposed to stodginess, is often useful in recovering from surprise. A physical or organizational system, or a policy, or a decision procedure is robust to surprise if it can be modified in real time, on the fly.

4. *Adaptiveness*: adjust goals and methods in the mid- to long-term. Be willing to adjust as your knowledge changes. The thought process for managing Knightian uncertainty or Shackle-Popper indeterminism is rarely a once-through procedure. We often have to re-evaluate and revise assessments and decisions. The emphasis is on the longer time range, as distinct from on-the-spot flexibility.

5. *Margin of safety* (sometimes called preponderance): excess of the benefits (and deficiency of the drawbacks) beyond what is actually required. A margin of safety is not a maximum (or minimum); it is a buffer between adequacy and failure, a predominance in number, quality, or importance of relevant attributes.

6. *Comprehensiveness*: interdisciplinary system-wide coherence. The outcome of one’s decisions can be impacted by technology, organizational structure and capabilities, cultural attitudes and beliefs, historical context, economic constraints and opportunities, and other factors. Robust decisions will address the multi-faceted nature of the problem at hand.

7.

3. Example: Intelligence Analysis Prior to 9/11

3.1. Al Qaeda: Intelligence Background

There was extensive knowledge about Al-Qaeda prior to the terror attacks against the U.S. on 11 September 2001. Following is a brief summary that will underlie our analysis of robustness of alternative actions that the U.S. could have taken at that time.

Al-Qaeda is a militant Sunni Islamist organization founded in 1988 by Osama bin Laden, Abdullah Azzam, and other Arabs fighting against Soviet forces in Afghanistan in the 1980’s. It is a network of sometimes quite independent actors or groups operating in East Africa and the Middle East.

Al-Qaeda demands the removal of all non-Muslim influence in Muslim countries, and the eventual creation of an Islamic caliphate ruling the Muslim world based on a strict form of sharia law. In the tradition of Salafist jihad, killing non-combatants, even Muslims, is religiously sanctioned when in support of the long-range goal. Al-Qaeda’s leaders regard liberal Muslims, Shias, Sufis and other sects as heretical. Some Al-Qaeda members believe that a Christian–Jewish alliance is conspiring to destroy Islam.

Six attacks or attempted attacks are attributed to or associated with Al-Qaeda (prior to 9/11).

1. Al-Qaeda operatives bombed the Gold Mohur hotel in Aden, Yemen on 29 December 1992. U.S. troops had been staying there en route to Somalia, though the troops had left before the explosion. An Austrian tourist and a Yemeni citizen were killed. The bombers also attacked a second hotel, the Aden Movenpick, where U.S. Marines had been staying, injuring several non-Americans.

2. The World Trade Center in New York City was bombed for the first time on 26 February 1993, killing six people and injuring 1,500 others. The attack was not an official Al-Qaeda operation though the attack’s mastermind, Ramzi Yousef, trained in Al-Qaeda camps.

⁵³*Ecclesiastes*, 4: 9–12.

3. Al-Qaeda operatives bombed the U.S. embassies in Nairobi, Kenya, and Dar es Salaam, Tanzania on 7 August 1998, killing more than 200 people and injuring more than 5,000 others.
4. Al-Qaeda planned to attack the U.S. Navy guided-missile destroyer *The Sullivans* on 3 January 2000 while in port at Aden, Yemen, but the effort failed due to excessive weight on the boat that was intended to bomb the destroyer.
5. Al-Qaeda bombed the U.S. Navy guided-missile destroyer *Cole* on 12 October 2000 while at port in Aden, Yemen, killing 17 sailors.
6. A grenade was thrown at the British embassy in Yemen on 13 October 2000, blowing up an electric generator.

In 1996 the CIA set up a special “virtual station,” called Alec Station, intended to focus on Osama bin Laden. The station was in Virginia but not located in the main CIA headquarters at Langley Air Force Base. The first head of Alec Station, Michael Scheuer, reported great difficulty in convincing CIA colleagues of the seriousness of the Al-Qaeda threat to the U.S. In 1999 Scheuer sent an email directly to the Director of Central Intelligence, George Tenet, and numerous of Tenet’s deputies, warning of the Al-Qaeda threat and stating needed actions. This circumvention of the chain of command was viewed as insubordination, and Scheuer was immediately removed from Alec Station and moved to an innocuous job in the Langley library (Jones and Silberzahn, 2014).

Al-Qaeda was mentioned numerous times in the President’s Daily Brief (PDB), with a sharp rise in attention to Al-Qaeda during 2001 (prior to 11 September). The PDB of 6 August 2001, entitled “Bin Ladin Determined to Strike in US”, contains the first statement that Al-Qaeda intends to attack within the U.S., though it did not provide tactical specifics of when, where or how the attack would occur.⁵⁴ This PDB does state that Al-Qaeda “apparently maintains a support structure [in the U.S.] that could aid attacks” and states that a “clandestine source said in 1998 that a Bin Laden cell in New York was recruiting Muslim-American youth for attacks”. The PDB also states that “FBI information ... indicates patterns of suspicious activity in this country consistent with preparations for hijackings or other types of attacks ... [including] attacks with explosives.” (PDB 6 August 2001). There was scattered evidence of potentially suspicious individuals attending a flight school in Arizona, but this was not pursued (Betts, 2007, p.107).

3.2. Robustness Analysis

The info-gap concept of robustness combines 3 components: our knowledge, our goals, and our uncertainties. In qualitative applications we assess the robustness by evaluating conceptual proxies, as we explained in section 2. We now demonstrate this analysis.

Our **knowledge** is summarized in section 3.1.

The **goal** is to diminish injury or damage to people and property in the territory of the United States. The goal can be stated in varying degrees of severity, from total prevention to minor reduction. We will assume that the goal is to completely prevent, or at least to greatly reduce, injury or damage to people and property in the U.S.

The **uncertainties** are identified by reviewing our knowledge about the plans, preparations, and capabilities of Al-Qaeda to inflict injury or cause damage. Specifically, there is vast uncertainty about *who* will do *what*, *where* and *when*? The ‘*who*’ could be sleeper cells, or rapid incursion of foreign agents, or incitement of U.S. citizens or residents. The ‘*what*’ could be hijacking, planted explosives, attacks with firearms, or attacks with unusual weapons (possibly artillery or WMD), though all 6

⁵⁴A redacted version of this PDB was made available on 10 April 2004.

known Al-Qaeda attacks employed planted (or in one case thrown) conventional explosives. The ‘*where*’ could be attacks on governmental or military personnel or facilities, or prominent institutions or individuals, or possibly any site with potential for large casualties such as schools or hospitals. The ‘*when*’ could be 6 to 12 months after initial formulation of plans by Al-Qaeda, or possibly sooner or later. The first Al-Qaeda attack (Aden hotels) was in December 1992, and the sequence of subsequent attacks occurred after durations of:

- 2 months (World Trade Center)
- 5 years and 6 months (U.S. embassies in Kenya and Tanzania)
- 1 year and 5 months (*The Sullivans*)
- 10 months (*Cole*)
- 1 day (British embassy in Yemen)

Two of these incidents involved coordinated attacks at separate locations (Aden hotels and U.S. embassies), and one involved attacks separated by only 1 day (*Cole* and Yemen embassy). The last known Al-Qaeda attack was on 13 October 2000, 10 months prior to the PDB of 6 August 2001.

For conciseness we will limit our consideration to the following three **options**, on the assumption that all three will be implemented but with predominant emphasis on only one option. We must choose which option to emphasize.

1. Surveillance and reconnaissance of U.S. Muslim institutions and populations (SRM). Surveillance involves electronic and overt human monitoring, while reconnaissance involves agents who covertly gather information.
2. Enhanced border control (EBC) based on technological and manual inspection, and profiling of suspicious identity or past and present behavior of individuals seeking entry to the U.S.
3. Physical protection of vulnerable sites and individuals (PPS), entailing armed patrols, video surveillance, and communication between units.
- 4.

We now consider the 6 **proxies for robustness**.

Resilience: rapid recovery of critical functions.

1. SRM will be unable to focus on all Muslim centers or populations, so some important targets will receive low priority due to insufficient resources and due to uncertainty about where threats will originate. Recovery of surveillance is rapid when intelligence is revised by rapidly reallocating surveillance resources. Reconnaissance is slower to recover due to the time required to insert covert agents.
2. EBC can cover all official points of entry, and profiling protocols are considered efficient and can be revised fairly rapidly as experience accumulates. However, implementation of revised procedures, after failure, is slow because this requires re-training a large number of agents. Illegal entry through land or sea borders is far more difficult to detect or prevent because where or how infiltration would occur is unknown, so EBC provides little or no protection in this regard.
3. PPS cannot cover all potential sites or individuals, so some important targets will receive low priority due to insufficient resources and intelligence. Recovery during an incident is sometimes possible. Learning and recovery from one attack, in anticipation of the next attack, is possible but limited by uncertainty about what the next attack will entail.
- 4.

Redundancy: multiple alternative solutions. SRM entails electronic and human methods, both overt and covert. EBC entails redundant modes of inspection. PPS uses various protection methods. Thus all options have redundancy, each within its own domain: the U.S. Muslim community (SRM), border vulnerability (EBC), or real-time response to attack (PPS). However, which domain is most vulnerable is uncertain because of uncertainty about what threats must be managed.

Flexibility (agility): rapid modification of tools and methods. All three options entail the use of large numbers of trained agents and units. Re-assignment of agents or units to different targets is rapid in all cases (except the reconnaissance element of SRM which requires inserting covert agents). However, re-training is slow. PPS agents are somewhat more versatile and agile in response to new challenges.

Adaptiveness: adjust goals and methods in the mid- to long-term. All three options entail the use of large numbers of specialized trained agents and units. Re-training is slow and requires long durations but is feasible given the required institutions and budgets. Introduction of new technologies is feasible given appropriate budget. All options are adaptive in the long term. The difficulty is knowing what capabilities need to be strengthened in the light of uncertainty about future threats, for which past incidents are of uncertain relevance.

Margin of safety: preponderance of capabilities. Both SRM and EBC are preventive or preemptive but, unlike PPS, do not provide protection at the time of attack. SRM acquires intelligence that can alert officials or agencies thus enabling preparation and prevention, but lacks real-time response capability. PPS can sometimes delay or retard a strike, even if not preventing it, thus sometimes enabling enhanced response with additional forces. In this sense PPS has some margin of safety, but uncertainty about what specific modes of attack will occur impedes the development of an operational margin of safety. All three options have considerable “porosity”, each in its own domain, and will fail at times.

Comprehensiveness: interdisciplinary system-wide coherence. None of the options are comprehensive. SRM would be stronger in this regard if it included programs to encourage integration of Muslim communities into American society and adoption of American values, but this is not included in the current SRM option.

Proxy	SRM	EBC	PPS
Resilience	Low	Low	Medium
Redundancy	Medium	Medium	Medium
Flexibility	Low	Low	Medium
Adaptiveness	High	High	High
Margin of Safety	Low	Low	Medium
Comprehensiveness	Low	Low	Low

Table 1. Summary of proxies for robustness of three options.

The assessment of the 6 proxies for robustness, for each of the 3 options, are summarized in table 1. All three options have at least moderate redundancy (each in its own domain), and high adaptiveness, but are not strong in any of the other proxies for robustness. PPS has moderate resilience, flexibility and margin of safety, while the other options are low in these attributes. The assessment is that no single option would be robust to the uncertainties that impede the achievement of the goal, so combination is essential. Emphasis on PPS in the combined solution seems most robust to the uncertainties, especially if this emphasis would strengthen the flexibility of the PPS response.

4. Clausewitz

Our argument for supplementing disciplinary expertise with decision theoretic expertise is, in part, a response to Clausewitz's skepticism about the value of theory. His skepticism illuminates the challenge that disciplinary experts face, so we will briefly examine Clausewitz's position.

Clausewitz wrote:

"Efforts were therefore made to equip the conduct of war with principles, rules, or even systems. This did present a positive goal, but people failed to take adequate account of the endless complexities involved. As we have seen, the conduct of war branches out in almost all directions and has no definite limits; while any system, any model, has the finite nature of a synthesis: An irreconcilable conflict exists between this type of theory and actual practice." (Clausewitz, 1832, Book 2, Chapter 2, p.134)

We cannot ascribe to Clausewitz explicit recognition of Knight's concept of true uncertainty. Nonetheless, the unbounded and unstructured nature of Knightian uncertainty is implicit in Clausewitz's statement that "the conduct of war branches out in almost all directions and has no definite limits". As we have explained earlier, the prevalence of Knightian uncertainty is a major motivating factor for equipping strategists with decision theoretic capability.

Likewise, Clausewitz wrote that

"the rules and regulations [of theory] are ... absolutely useless.

"They aim at fixed values; but in war everything is uncertain, and calculations have to be made with variable quantities.

"They direct the inquiry exclusively toward physical quantities, whereas all military action is intertwined with psychological⁵⁵ forces and effects.

"They consider only unilateral action, whereas war consists of a continuous interaction of opposites." (op. cit., p.136)

Clausewitz bluntly rejects theory as "absolutely useless" for three reasons: the prevalence of uncertainty, the prominence and limitations of human mental processes, and the nature of strategic interactions with an adversary. Clausewitz would seem to call for extending the strategist's knowledge beyond a specific military discipline, or even beyond all military wisdom, to include a broad grasp of the human condition. War, writes Clausewitz, "is part of man's social existence." (op. cit., Bk 2, Chap. 3, p.149)

Finally, Clausewitz opines that

"the realm of genius ... *rises above all rules.*

"Pity the soldier who is supposed to crawl among these scraps of rules, not good enough for genius, which genius can ignore, or laugh at. No; what genius does is the best rule, and theory

⁵⁵Clausewitz did not use the word 'psychological' though, in modern parlance, that was his intention. The German original of this sentence is: "Sie richten die Betrachtung nur auf materielle Grössen, während der ganze kriegerische Akt von geistigen Kräften und Wirkungen durchzogen ist."

can do no better than show how and why this should be the case." (op.cit., p.136, original italics)

Clausewitz distinguishes between descriptive and prescriptive use of knowledge. He asserts that theory can at best describe war, but cannot reliably prescribe actions for the military commander. Only genius can hope to consistently succeed in war. Physical science can successfully predict outcomes and prescribe interventions in the realm of physical phenomena because of the time-invariance and universality of attributes of the physical world. But human affairs, including war, are fundamentally different from the inanimate physical world, as explained by Knightian uncertainty and Shackle-Popper indeterminism. Theory, says Clausewitz, can describe war, but lacks the degree of truth that would enable useful prediction and prescription for the commander. Theory fails prescriptively in war because of the prevalence of innovation, change, and surprise that underlie all human affairs, and that distinguish war from the physical world. In addition to disciplinary expertise (and genius), the military commander needs the ability to model and manage the deep uncertainties of human conflict.

5. References

1. Ben-Haim, Yakov, 2006, *Info-Gap Decision Theory: Decisions Under Severe Uncertainty*, 2nd edition, Academic Press, London.
2. Ben-Haim, 2007, Yakov, Peirce, Haack and info-gaps, in *Susan Haack, A Lady of Distinctions: The Philosopher Responds to Her Critics*, edited by Cornelis de Waal, Prometheus Books, New York.
3. Ben-Haim, Yakov, 2010, *Info-Gap Economics: An Operational Introduction*, Palgrave-Macmillan, London.
4. Ben-Haim, Yakov, 2014, Strategy selection: An info-gap methodology, *Defense & Security Analysis*, 30(2): 106–119.
5. Ben-Haim, Yakov, 2015, Dealing with uncertainty in strategic decision-making", *Parameters*, the US Army War College Quarterly, 45(3) Autumn 2015.
6. Ben-Haim, Yakov, 2016, Policy neutrality and uncertainty: An info-gap perspective, *Intelligence and National Security*, 2016, vol.31(7), pp.978–992.
7. Ben-Haim, Yakov, 2018a, Positivism and its limitations for strategic intelligence: A non-constructivist info-gap critique, *Intelligence and National Security*, 33(6): 904-917.
8. Ben-Haim, Yakov, 2018b, *Dilemmas of Wonderland: Decisions in the Age of Innovation*, Oxford University Press, Oxford.
9. Ben-Haim, Yakov and Maria Demertzis, 2016, Decision making in times of uncertainty: An info-gap perspective, *Economics*, The Open-Access, Open Assessment e-journal. <http://www.economics-ejournal.org/economics/journalarticles/2016-23>
10. Betts, Richard K., 2007, *Enemies of Intelligence: Knowledge and Power in American National Security*, Columbia University Press, New York.
11. Clausewitz, Carl von, *On War*, edited and translated by Michael Howard and Peter Paret, 1984, based on the 1832 edition, Princeton University Press, Princeton.
12. Erbel, Mark and Christopher Kinsey, 2018, Think again — supplying war: reappraising military logistics and its centrality to strategy and war, *Journal of Strategic Studies*, 41:4, 519–544.
13. Jones, Milo and Philippe Silberzahn, 2014, *Constructing Cassandra: Reframing Intelligence Failure at the CIA, 1947–2001*, Stanford University Press, Palo Alto, CA.
14. Knight, Frank H., 1921, *Risk, Uncertainty and Profit*, Hart, Schaffner and Marx, re-issued by Harper Torchbooks, New York, 1965.
15. Knight, Frank H., 1951, *The Economic Organization*, Harper Torchbooks, New York.
16. Macgregor, Douglas, 2016, *Margin of Victory: Five Battles that Changed the Face of*

Modern War, Naval Institute Press, Annapolis.

17. Phythian, Mark, 2017, Intelligence analysis and social science methods: exploring the potential for and possible limits of mutual learning, *Intelligence and National Security*, 32(5): 600–612.

18. Popper, Karl, 1982, *The Open Universe: An Argument for Indeterminism*. From the Postscript to *The Logic of Scientific Discovery*, Routledge, London.

19. President's Daily Brief (PDB), 6 August 2001, redacted version released 10 April 2004. Available at <https://www.sourcewatch.org/images/3/37/Whitehouse.pdf>, accessed 17.5.2018.

20. Ross Dennis and David Makovsky, 2010, *Myths, Illusions, and Peace: Finding a New Direction for America in the Middle East*, Penguin Books, New York.

21. Shackle, G.L.S., 1972, *Epistemics and Economics: A Critique of Economic Doctrines*, Transaction Publishers, Piscataway, New Jersey, 1992, originally published by Cambridge University Press, London.

Discussion of Yakov Ben-Haim's presentation:

- BG Benjo:** First of all, it's very interesting. My question is – how does it answer to Rumsfeld's problem after 9/11, like the four unknowns, if you know what I mean. How do I escape that? Does it help me to answer Rumsfeld, telling him, you know, to do that? The unknown that unknown?
- Prof. Ben-Haim:** Right. I'm definitely dealing with the unknown unknowns, that's where we're coming from. And without impugning Rumsfeld at all, his unknown unknowns is not a new idea. Frank Knight's concept of "true uncertainty" is what Rumsfeld called an unknown unknown. Knight was an economist, so he's talking now: I'm developing something and you're a different company, I don't know what you're developing. I have no idea if what you're developing is going to undermine my initiative. That's an unknown unknown. And what I'm proposing here is a conceptual methodology for analyzing how vulnerable you are to different types of uncertainties. We're not asking the question what might have happened or what might happen, because that's a known unknown sort of thing. We're asking the converse question, a question from the other side. How resilient am I with this option? Or how rapidly could I adjust with this option? I'm not saying adjust to what but how rapidly could it adjust? How comprehensive is this option?
- BG Benjo:** But someone has to suggest the first question saying there can be a 9/11 terrorist attack. I need to imagine, it doesn't matter what, I need something to make me ask that question in the beginning.
- Prof. Ben-Haim:** Sure. In this example, in the Al Qaida example, there were six incidents of attacks initiated or supported by Al Qaida before August 2001. So Osama was of interest and Al Qaida was a concern. There was an identified generic threat but the analysis that I did was not presumed on the idea that someone would learn how to fly an airplane in Arizona and then crash into the twin towers. That was not on the table and not on the table in my example. So I'm not doing a scenario analysis where I say – well, maybe they could do this, could I respond to this? Maybe they could do that, could I respond to that? I'm not approaching it from that point of view. Because that requires me to identify much more specifically the tactical how, when and where than Knightian uncertainty or Rumsfeld's unknown unknowns allow me to do. What I'm asking is: what are the abilities of the various options to respond to the challenges that they will face when disruptions occur? Without specifying what those disruptions are, because I don't know.
- Dr. Jones:** On the basis of just what I've seen, it's very interesting, but I might suggest you'd layer in one other thing and it's Nassim Taleb's idea of antifragility. He says there are things that are fragile, so think of the sword of Damocles, if it falls you die. There's robustness and that's the phoenix, you burn it, it rises from the ashes every time, so it's robust. But the spectrum doesn't stop there. Things are actually anti-fragile. Things that actually profit from disorder. So you cut off the Hydra's head and it grows two more. And so ideally, you'd like a layer of response that seeks strategies to profit from the disorder that you can't anticipate.
- Prof. Ben-Haim:** Okay. Yeah, in info-gap theory, which predates Taleb's message by several decades, the concept for that is called "opportuneness". Robustness is one's ability to achieve a goal despite an adverse occurrence. Opportuneness is the ability to achieve a wonderful outcome as a result of a favorable surprise. I didn't talk about opportuneness at all but Meir, if you close the door and turn the lock, I'll go through it all again from an opportuneness point of view. It could take me two or three hours. It's a complimentary idea in info-gap theory. There's the robustness function, and

usually the robustness function is what people are most interested in. Because we're risk adverse, we want to achieve critical goals, we want to be immune to adverse. Opportuneness is saying – well, actually, you know, there are wonderful possible outcomes that are much better than anticipated. How do we choose a policy that can exploit favorable opportunities?

Dr. Jones: That's the shift from tactical to strategic.

Prof. Ben-Haim: One can be both tactical and strategic in an opportuneness context and in a robustness context. We're in violent agreement, I think.

Participant: Since you are a mechanical engineer, I'm guessing there is also a quantitative model behind all, this is not only a qualitative. Are they very much different or do you recommend, which approach do you recommend? Is this qualitative enough? And secondly, can you tell us about examples where this was utilized in a real world situation, in a real governmental institution, doing this methodology.

Prof. Ben-Haim: Okay, the first question, yes, info-gap is historically quantitative and there are books out there that are just full of equations, they were meant to scare everybody and probably scared some people.

Dr. Shamir: You scared me, that's for sure.

Prof. Ben-Haim: Yeah, you're my main target.

Dr. Shamir: Yakov told me "Go and read my paper". And I opened the paper and it was full of long equations.

Prof. Ben-Haim: Yes. There is quantitative info-gap theory and it's based on mathematical theorems and equations. Whether one does quantitative analysis, or qualitative analysis like what I've done here, depends on the problem in hand. I will quote the Lord High Executioner – let the punishment fit the crime. So if you can do the math, if you're talking about a problem where one can do the math, then do it. I have a paper just published in *Military Operations Research*, a very quantitative journal, using the WEI-WUV algorithm. Well, I take the WEI-WUV and embed it mathematically in an info-gap robustness analysis. Equations, numbers, churn away. But in situations where you cannot do the math, the math just isn't subtle enough for the problem at hand, then you must do qualitative analysis. I would even say that most national security problems are much too difficult for the mathematicians. Mathematicians, you know, can count up to ten with their hands in their pocket but the difficult problems, you can't do them with math. Like this one. And then what you try and do is translate the intuitions and insights that are embedded in the theorems, into qualitative analysis. And that's what I tried to illustrate here. So you let the punishment fit the crime. In a case where you can do math, do math. In a case where you can't, don't pretend that you can.

One liner to your second question, there are many, many applications of info-gap. And if you look at info-gap.com you'll see applications in many areas. In national security, in medicine, in biological conservation, in engineering, etcetera.

Dr. Freilich: I liked very much your six dimensions of the robustness. I don't think I saw that in previous iterations, I at least don't remember. I want to know, how would you differentiate that from your criteria for assessing, for satisficing? It seems to me it might be the same one.

Prof. Ben-Haim: Right. The robustness of an option is the answer to the following question: how large a surprise can we absorb and still satisfice our goal? So when we assess the robustness and we do that by the proxies, we're answering the robustness question, we're answering the question – how big a surprise can we tolerate and still achieve our goal? The goal here was reduce injury and damage to an acceptable level. So when we evaluate the margin of safety for example, we're saying – do we have a

preponderance of capability to reduce injury and damage to an acceptable level despite the fact that we really don't know the tactical answers, how and where. So the answer to Rumsfeld's question embeds the satisficing goal. Did that respond to your question?

Dr. Freilich: I think you have to have criteria for what satisficing means and this sounds to me like they're very similar.

Prof. Ben-Haim: The proxies are assessing robustness. The robustness is how robust are you for achieving your goal which is prevent injury, would be an extreme goal.

Dr. Freilich: I understand that but what are your criteria then for satisficing?

Prof. Ben-Haim: The criteria for satisficing would be when we say in this example, we want to reduce injury and damage, how much do we need to reduce injury and damage? I didn't address that question. It may be a political question, must we eliminate all injury?

Dr. Freilich: I'm saying that these dimensions might answer that question as well, if you think about it.

Prof. Ben-Haim: Let me agree with that by saying that as you become more demanding, if you want to eliminate all injury, your proxies for robustness will be very low. If your satisficing requirement is "We don't want any really terrible catastrophes to happen", then the robustness for that will be quite large. And so there's a feedback procedure here.

Dr. Johnson: I feel reluctant to ask the question because you and I have co-written a paper on this very subject so I'm going to ask the question I think goes after this. Because you talked us through a system based on systems we currently have, which might give some indication of the sort of systems we need to start thinking about, perhaps we don't have. In a world of complexity, very dense connections, we already know that in a world of complexity, that every event now has multiple impacts. The consequences kind of shatter further from where the event starts. And it's almost simultaneity now, of attacks against our perspective countries. If you like then, multiple threat axis that don't come in one direction anymore. It won't be just one 9/11 there'll be multiple events occurring in very rapid succession. Could you comment on how this particular approach can still manage that degree of complexity, that degree of multiple impacts and detonations rather than just one singular approach?

Prof. Ben-Haim: This is a very legitimate question. And certainly the response is in a number of points. First of all would be the goal. So in Al Qaida example, given the list of six attacks which were focused although two of the attacks were separated by one day so it's sort of close cousin attacks, two of the attacks were quite similar to naval vessels. In that context you identified a fairly focused class of threats. In identifying your goals, you are identifying a category of threat and so if the category of threat is a network threat, if it's multidimensional threat, where again, I'm not doing scenario analysis where I'm positing classes of threats. Although I'm not eliminating the possibility of scenario analysis. My concern of course is that we don't know what the threats are. But in the context of a class of threats that one is considering, that's the place where you identify whether you're talking about what type of challenge you're dealing with. The second place is the evaluation of robustness to uncertainty. So that when one's thinking about, in this example, when we looked at redundancy for example, redundancy was vis-à-vis the types of uncertainties that we faced in that class of problems. And if you're talking about a different class of problems, then you're assessment of redundancy will be different. So those are the areas in the analysis that one's context comes in. And these are contextual judgments, that is

actually clear and that depends on one's contextual knowledge. And what we're trying to deal with is lacuna in one's contextual knowledge.

Dr. Rubin:

The topic here is decision making in the age of uncertainty. So my question is when did we have an age of certainty? It's always, I mean, from inside, there's always uncertainty and uncertainty because we don't know the future but we always don't know the future. Anyway, but the methodology that you presented here, I think that one thing was missing here, in my opinion, is a sensitivity check. Because that's actually the third dimension that goes into the. Because the analysis is very sensitive to the reference to the question or to the reference threat. You took an example here of how to best prepare for Al Qaida terrorists. But if you just put it in this kind of Al Qaida terrorism, based on the existing model, this is very broadband, very broadband, it's not focused. If you focus it, you will choose one type of, you may find that your whole, that the methodology works but the range of satisfaction, the range of responses is different. And then you change another, you take another one, you find it completely different. There's something that will answer one type of, one focus kind of threat, will be completely wrong for another problem. So usually, you don't know what's going to happen. The total of this should include also the sensitivity check to show how but in your example, what you got out was there is no good option because that was an answer to a very broadband of question. But if you focused on the problem you may find that in some situations you may find a very good answer.

Prof. Ben-Haim: This is a perfectly legitimate point. I'd make two responses. First of all, it was an example to try and illustrate how one assesses robustness in a qualitative context. As an example, it's not definitive, it only illustrates itself and I did it in a very stylized way in ten minutes. And if one does a different example, one will get to different conclusions. On the one hand, I wanted to do an example and on the other hand the danger in doing an example is then it gets very concrete and you look at this example and clearly, this example has limitations, because it's just an example. The second point is a little bit more conceptual. Robustness is an assessment of sensitivity so that I am looking at sensitivity. I'm calling it "robustness" which is a kind of sensitivity. What you're suggesting is the framing of the problem can be looked at from a robustness point of view. Okay, so an Alex station directed at OBL and AQ, they didn't do this of course, but this is what they might have done. But the director of National Intelligence would certainly be looking beyond what just Alex station would do, focused on Osama Ben Laden and Al Qaida. So that framework of the problem that one is looking at, is going to determine the type of analysis that you do.

Dr. Shamir:

Anymore questions? Yakov, if we are done with the questions, we go to concluding remarks. Yakov, I'm passing it to you. To manage the conclusion session of the day.

Concluding Remarks

Prof. Ben-Haim: Speakers, if you're willing, send me an email and what I would do is put the slides on the website and anyone who wants to download them, can do that. We will have, as I mentioned in various emails, we will transcribe the discussion sessions and then distribute that to all the discussants, so that everyone can make sure that they agree with what they said. And then we will publish that, together with papers by the authors, in a Samuel Neeman publication and that will be available. That's going to take a little while. But I think we'll get there eventually.

Dr. Hecht: We're talking about our ability to predict the future and as you said, it's difficult. And I think that the system that was shown in the last lecture, it doesn't stand on its own. It's all different systems trying to get to what is the reality, what is the process we can get and try to sort of use all the different methods and then find what they all agree on, what they all overlap on. That gives as close as we can get to something. But the problem's of course always time. So you can always, use all sorts of various styles in order to, how do I frame my question? Well, I've checked possibilities and this can't be so I don't have to frame, I don't have to ask about that. Once, I'm using Sherlock Holmes' method (actually, Karl Popper's method, but never mind, Sherlock Holmes is more famous). Then the constraint theory, etcetera, etcetera. So I can use it to frame the question and then I can try to fit it into the info-gap system. But the thing I always have to remember is, and when I tell it to army students, they all get all worked up – every decision you make is actually wrong. As a commander you know that. Now every decision your opponent is making, is also wrong. The question is – who is wrong-er? And if you have made your capabilities robust enough, you use enough, you do it quickly enough and powerfully enough, you make your wrong decision into the right one by changing the reality. And this is also part of the issue. Because yes, you don't really know what's happening. You sort of narrowed it down to something more or less and now you use as much power and speed as you can to change the reality and this is part of the idea. And of course you mustn't think "I'm wrong" because then you stop making decisions but that's good for telling them in courses. In reality it's a problem. And when I was working in analysis, one of the things I tried to get all my people to do, was they'd write me a paper – okay, this is what we think is happening. And I'd say, well, add the question what's wrong with what you wrote. What are the weaknesses in the paper you just handed in? What are the questions we still have to address? Because one of the seductive things that we do is say – okay, I've done all the study, these are the answers. No. Now tell me why you're wrong. What are the questions that are left? And I didn't manage to convince the system to make it part of the method.

Dr. Stern: It's part of the design system. We have the Rabbi here so Rabbi Finkel can tell us about it but this is part of the design system.

Dr. Hecht: Right. So this is what, I think in America you call it "the required information" or something, what's the abbreviation? These are the questions that come out. You're not writing an answer, you're writing a background for the next set of questions. And that sort of helps you gradually narrow the field.

Dr. Jones: You know about type 3 errors? In statistics you have type 1 errors and type 2 errors, you know what a type 3 error is? Wrong damn question.

Dr. Macgregor: You know there's one last thing you consider and having been part of this, that the decisions that are made to act strategically are not in the least evaluated carefully along the lines that we've discussed today. They just aren't. And frequently, I think the best one of all is, some of you may remember, Prime Minister Oxenstiern, he was the Prime Minister of Sweden for Gustavus Adolphus and he ran Sweden,

effectively, for Swedish kings who were crazy. And he brought his son to a council meeting with the king and he said "Now, sit here, shut up, say nothing and listen". And after it was over, he took his son out, they went around the corner in the palace and the son said "My god, the king is crazy!", he said, "These people don't know what they're doing, they're going to destroy Sweden!" And he looked at his son and he said "Son, are you surprised that the world is ruled by so little wisdom?" And this is the problem, that the major decisions are not addressed in the way that we're discussing today and that's the sad part.

Prof. Ben-Haim: On that happy note, let me thank everybody for participating and it's been great. Have a wonderful evening and pray for the future.

Endnotes for Doug Macgregor's essay

ⁱ Lieutenant General (ret) David Deptula, "ISR "Will Lead the Fight" By 2020," *Defense.AOL.Com*, 24 June 2011.

ⁱⁱ David Stone, *The Russian Army in the Great War*, (Lawrence, KS: University Press of Kansas, 2015), page 71.

ⁱⁱⁱ Robert F. Kennedy and Arthur M. Schlesinger, *Thirteen Days: A Memoir of the Cuban Missile Crisis*, (New York, NY: WW Norton & Company, Inc, 1971), page 19.

^{iv} Lucas Tomlinson, "U.S. Military Pilots Complain Hands Tied in Fight Against ISIS," *FOX News Politics*, 28 May 2015.

^v National intelligence has direct responsibilities to Department of State, the National Security Council, and, as necessary, the Departments of Commerce, and Treasury to support non-military policy-making, planning, and implementation. These are outside the domain of defense intelligence.

^{vi} John Nelson Rickard, "December 1944: Eisenhower, Bradley, and the Calculated Risk in the Ardennes," *Global War Studies*, 8 (1) 2011, pages 20 and 22.

^{vii} The proper military mission in Afghanistan is sanctuary denial. (Vigilance through spatial surveillance, networks of informants combined with the nearby stationing of a small force dedicated to physically eradicate any al Qaeda presence. In other cases *Foreign Internal Defense* may be appropriate).

^{viii} Lt Gen (ret) David Deptula, USAF and Col (ret) Michael Francisco, USAF, "Air Force ISR Operations: Hunting versus Gathering," *Air and Space Power Journal*, winter 2010, pages 14-16.

^{ix} Andrew Hill and Heath Niemi, "The Trouble with Mission Command: Flexive Command and the Future of C2," *Joint Force Quarterly* July 2017.

^x Bill Anderson, "A New Direction in Tactical Aircraft: Beyond Non-traditional ISR," *Aerospace Global.Com*, 7 March 2016.

^{xi} John Kenneth Galbraith, *A Short History of Financial Euphoria*, (New York, NY: Penguin Books, 1990), pages 5, 6.

^{xii} Andrew Rawson, *Eyes Only: The Top Secret Correspondence Between Marshall and Eisenhower 1943-1945*, (Gloucestershire, UK: Spellmount, 2012), page 205.

^{xiii} Connor O'Brien, "Senate Passes Defense Policy Bill, Setting Up Talks with House," *Politico.Com*, 18 June 2018.

^{xiv} Colonel Herbert Kemp, USAF (ret), "Rethinking the Information Paradigm: **The Future of Intelligence, Surveillance, and Reconnaissance in Contested Environments**," *The Mitchell Forum*, No. 18, February 2018, page 3.

^{xv} Nathan Hodge, "Pentagon Looks To Save \$100 Billion Over Five Years," *Wall Street Journal.Com*, 4 June 2010.

^{xvi} At least 9 nation-states including Russia, China, Israel, Turkey, Iran and India possess these precision weapon systems. The U.S. Army fields the *Switchblade*, a miniature, remotely-piloted 5.5 pound vehicle with ten kilometer range and ten minutes endurance in the air. This is a purely tactical weapon with limited utility compared with the systems discussed here.

^{xvii} Sydney Freedberg, "Russian Drone Threat: Army Seeks Ukraine Lessons," *Breaking Defense*, 14 October 2015.

<http://breakingdefense.com/2015/10/russian-drone-threat-army-seeks-ukraine-lessons/>

^{xviii} The Russian Smerch-M, a system that is proliferating, can fire many types of rockets such as the 9M55K which carries 72 unguided fin-stabilized high-explosive fragmentation sub-munitions, the 9M55K1 which carries five parachute-retarded MOTIV-3F top-attack anti-armor sub-munitions, the 9M55K4 which carries 25 anti-tank mines, the 9M55F an unitary warhead with a charge of 95,5 kg of high explosive, the 9M55S a fuel air explosive munition, and the 9M55K5 with 646 shaped charge fragmentation sub-munitions that are dispensed over the target. The BM-30 Smerch-M 9A52-2 can fire rockets with a maximum range of 90 km.

http://www.armyrecognition.com/russia_russian_army_vehicles_system_artillery_uk/9a52-2_smerch-m_bm-30_multiple_rocket_launcher_system_technical_data_sheet_information_description_u.html

^{xix} *Report of the Committee on the Lessons of the Great War*, (London, UK: The War Office, October 1942), page 42.

Robert Forczyk, *Case Red: The Collapse of France, 1940*, (Oxford, UK: Bloomsbury Publishing, 2017), pages 37-41.^{xx}

^{xxi} Robert K. Massie, *Dreadnought: Britain, Germany and the coming of the Great War*, (New York, NY: Random House, 1991), page 823.

^{xxii} Williamson Murray and Allan R. Millett, **Military Innovation in the Interwar Period** (Cambridge, England: Cambridge University Press, 1996). Other books that deals mainly with interwar innovation and reforms are David Johnson's **Fast Tanks and Heavy Bombers: Innovation in the U.S. Army 1917-1945** (Ithaca, N.Y.; London: Cornell University Press, 1998); **The Challenge of Change: Military Institutions and New Realities, 1918-1941**, eds. Harold R. Winton and David R. Mets (Lincoln, Ne.: University Press of Nebraska, 2000); **The sources of military change: culture, Politics, Technology**, eds. Theo Farrell, and Terry Terriff (London: Lynne Rienner, 2002).

^{xxiii} Dima Adamsky, *The Culture of Military Innovation* (Stanford: Stanford University Press, 2010),

^{xxiv} See Moti Baruch and Eran Ortal/ an ocean of innovation: IDF's Gideon multi-year plan and the issue of innovation. *Ma'archot* 471 (2017), 22-29

^{xxv} Williamson Murray, 2011. *Military Adaptation in War, with Fear of Change*, Cambridge University Press; Meir Finkel. 2011. *On Flexibility: Recovery from Technological and Doctrinal Surprise on the Battlefield*. Stanford University Press; Chad Serena , C. 2011. *A Revolution in Military Adaptation: the U.S Army in the Iraq War*. Washington, D.C.: Georgetown University Press.

^{xxvi} Finkel, M & Barkai R. (2018). The Acheulean Handaxe Technological Persistence: A Case of Preferred Cultural Conservatism? *Proceedings of the Prehistoric Society* 0, 2018 pp. 1–20; doi:10.1017/ppr.2018.2

^{xxvii} [http://www.defense-aerospace.com/article-view/release/62738/israel-deploys-digital-army-program-\(sep-12\).html](http://www.defense-aerospace.com/article-view/release/62738/israel-deploys-digital-army-program-(sep-12).html); <http://www.israeldefense.co.il/en/content/digital-revolution-idf>; <http://www.cambridgeforecast.org/MIDDLEEAST/ZAYAD.html>

^{xxviii} <https://i-hls.com/archives/81772>