Creative Strategic Intelligence Analysis and Decision Making Within the Elements of National Power

Proteus Futures Workshop: 14–16 August, 2007

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Creative Strategic Intelligence Analysis and Decision Making Within the Elements of National Power

Proteus Futures Workshop:
14–16 August, 2007

Creative Strategic Intelligence Analysis and Decision Making
Within the Elements of National Power

Proteus Futures Workshop: 14–16 August, 2007

Academic Workshop sponsored by:
The Proteus Management Group, USA

Hosted by the Center for Strategic Leadership
United States Army War College

U.S. ARMY WAR COLLEGE
CARLISLE BARRACKS, PENNSYLVANIA 17013

FOREWORD

Dear Colleague:

What follows is the report from the Proteus Futures Academic Workshop: "Creative Strategic Intelligence Analysis and Decision Making within the Elements of National Power." The workshop's overall goal was to provide scholars from various organizations across the Department of Defense, the interagency, academia, and private and corporate sectors the opportunity to present papers on topics and issues that explore complexity in the future global security environment and its discrete threats and opportunities, as well as to examine Proteus related new and innovative concepts, strategies, and processes to meet United States national security challenges in the 21st Century. The Proteus Management Group USA hosted this workshop from 14 to 16 August 2007 at the Collins Center for Strategic Leadership, U.S. Army War College, Carlisle Barracks, Pennsylvania. The workshop provided an opportunity to exchange ideas and to showcase studies and research that serve to develop the foresight that will be needed to cope with future uncertainty and complexity among an international audience of military, national security, and intelligence community leaders, as well as experts from academia. The focus of their effort was on the refinement, development, and application of new and emerging "futures" concepts, methods, processes, and scenarios in strategic intelligence analysis and decision making.

The workshop's purpose was to identify relevant work that will assist strategic and high-operational level decision makers, planners, and analysts within the Joint, Interagency, Intergovernmental, and Multinational community in "outside the box" consideration and critical analysis of national, military, and intelligence issues. Representatives from U.S. Government agencies, think tanks, academia, and international organizations participated. The workshop participants exchanged information regarding ongoing efforts to analyze future complexity. This report reflects their thoughts.

We thank each participant for their time, efforts, and ideas, all of which made this a successful workshop. The insights expressed in this report should greatly assist future analysts and decision makers as they look at the complex challenges that face the international community.

Sincerely,

Ms. Linda Williams and Mr. William Waddell

Co-Chairs, Proteus Management Group


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EXECUTIVE SUMMARY

Background: From 14 to 16 August 2007, the Proteus Management Group USA hosted an Academic Workshop to bring together specialists from academia, the defense and intelligence communities, and civilian organizations to share information and insights to explore Creative Strategic Intelligence Analysis and Decision Making within the Elements of National Power.

Format: The workshop format included a series of keynote presentations and panel presentations.

Participants: There were seventy-four workshop participants from a broad spectrum of organizations involved in examining strategic intelligence analysis and decision making. The exchange between individuals representing many diverse organizational cultures ensured a rich and lively discussion of alternative approaches to the analysis of these concepts.

Keynote Presentations: The workshop included a series of keynote presentations to provide a broad context within which to examine the applicability of the Proteus Insights. The presentations included the following topics:

- "Seven Revolutions" — Dr. Eric Peterson, Center for Strategic and International Studies

- "Insights from the 'Edge': Global Futures Lessons for 21st Century Intelligence" — Dr. Warren Fishbein, Global Futures Partnership

- "Creative Intelligence Analysis in Strategic Decision and Policy Making" — Dr. William Nolte, School of Public Policy, University of Maryland

- "Fighting the War of Ideas like a Real War" — Mr. Michael Waller, The Institute of World Politics

- "Fourth Generation War Evolves, Fifth Emerges and then ???" — Colonel T.X. Hammes, United States Marine Corps, Retired

- "Global "Economic Warfare;" Maintaining the "Edge:" Future Challenges to U.S. Economic Sustainability — Mr. Graham Molitor, Public Policy Forecasting, Inc

- "Strategic Thinking in a Complex World" — Ms. T. Irene Sanders, Washington Center for Complexity and Public Policy

Panel Discussions: There were five panels that addressed specific aspects of looking at alternative futures:

- Creative Strategic Approaches to Future Intelligence Analysis and Political and Diplomatic Decision Making in National and International Security Affairs

- Creative Strategic Approaches to Intelligence Analysis and Decision Making in Information Operations and Strategic Communication

- Creative Strategic Approaches to Future Intelligence Analysis and Decision Making in 21st Century Military Operations

- Creative Strategic Approaches to Future Intelligence Analysis and Decision Making in Economic Policy and Strategy

- Advanced Scientific Approaches, Strategic Scenario Development, Modeling Simulation and Gaming that enhances Intelligence Analysis, Experiential Education, Decision making and Problem Solving across the Elements of National Power.

INTRODUCTION

Overview

From 14 to 16 August 2007 the Proteus Management Group USA hosted an Academic Workshop to bring together specialists from academia, the defense community, and civilian organizations to share information and insights on analyzing future complex national security challenges.

Background

The Proteus project originated at the U.S. National Reconnaissance Office in 1999 as an advanced concepts research initiative that employed commercially proven scenario-based methodology. In the course of exploring alternate future scenarios and considering possible national security issues, the project team published their interim results in the book Proteus Insights from 2020. This book has been used as a basis to enable further strategic research and inspired the initiative of the international Proteus Consortium (U.S. Army War College [lead and project manager], National Security Agency, Office of the Director of National Intelligence [Central Intelligence Agency], National Research Council of Canada [Proteus & Foresight Canada], National Geospatial Agency, Naval Postgraduate School, and the National Reconnaissance Office). Today, the Proteus Management Group (PMG) is an international consortium and "think tank" focusing on the refinement, continued development, and practical application of the Proteus' set of established insights. These insights will:

- Assist strategic and high-operational level decision makers, planners, and analysts in "outside the box" consideration and critical analysis of national military and intelligence issues within the Joint, Interagency, Intergovernmental and Multinational (JIIM) environment;

- Help the strategic decision maker, planner, or analyst to consider values and perceptions of future target audiences by systematically looking "outside" of the values contained in Western civilization when considering the application of all elements of national power (Diplomatic, Informational, Military, and Economic);

- Identify and consider the second and third order effects and unintended consequences of policy and strategy decisions.

Workshop Objectives

The workshop's purpose was to identify relevant work that will assist strategic and high-operational level decision makers, planers and analysts within the Joint, Interagency, Intergovernmental, and Multinational community in performing "outside the box," critical analysis of national military and intelligence issues. The workshop's intent was to encourage participants to:

- Consider differing values and perceptions of future target audiences by systematically looking "outside" the values held in Western Civilization when evaluating the application of the elements of national power—diplomatic, informational, military, and economic, the so-called DIME;

- Frame complex issues holistically to identify and consider the second and third order effects and unintended consequences of policy and strategy decisions; and,

- Scan the horizon and defining the future environment to systematically identify discrete threats and capitalize on hidden opportunities.

Workshop Design

The workshop design included a series of background presentations and five panels that looked at the refinement, development, and application of the Proteus insights and other new and emerging "futures" concepts, methods, processes, and scenarios to strategic intelligence analysis and decision making. Annex A is the Workshop Agenda.

Participants

The seventy-four workshop participants represented a broad spectrum of organizations involved in examining the future uncertainty and complexity through varied lenses. The discussions between individuals representing so many diverse organizational cultures ensured a rich and lively exchange on ways to analyze and interpret future events. The

workshop also presented an opportunity to build relationships and deepen understanding among the participants. Participants left with a fuller appreciation of the perspective of attendees from other organizations. The interpersonal relationships and contacts created at this workshop will be key elements in maturing the cooperation and exchange of ideas among the membership of the Proteus community.

Report Organization

The following chapter contains summaries of the background briefings and the panel presentations. This report also contains three annexes:

1. Annex A is the workshop agenda.
2. Annex B provides a list of workshop participants.
3. Annex C contains brief biographical sketches of the workshop presenters.


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PRESENTATIONS

Introductory Remarks

Major General David Huntoon, the U.S. Army War College Commandant, opened the workshop. He provided a brief description of the resident USAWC class, and also described the other institutes that are located in Carlisle. He encouraged the group to take advantage of the Strategic Studies Institute and also to visit the Army Historical Education Center.

Mr. Bill Waddell, Co-Chair of the Proteus Management Group, welcomed the participants and introducing the distinguished visitors, guest speakers, and panel chairpersons. After introductions, he gave a brief overview of the overall Proteus Management Group effort, which he followed with the workshop purpose and objectives.

Background Briefing: Tuesday, 14 August – "Seven Revolutions"

Dr. Erik Peterson, Senior Vice President, Center for Strategic and International Studies, introduced and discussed the "Seven Revolutions to Year 2025." He shared the importance of leadership responsibilities and the capacity to plan and lead strategically in a complex world. What will 2025 be like? Will it be a better world? Are we better equipped to manage the change? How dangerous of a world will it be?

In the year 2025, leadership will be challenged, as the world will be more connected and leaders will have less opportunity to think beyond their short-term priorities and immediate responsibilities. There are three overarching principles: 1) rapid and aggressive adaptation, 2) no problem will be solved the same way, and 3) the task is not to see the future, but to enable it. He noted that there are seven key factors that must be taken into consideration: Population and Demographics change, Resource Management and Environment Stewardship, Technological Innovation and Diffusion, Information, Global Economic Integration, the nature and mode of Conflicts, and the Challenge of Governance.

Since the days of Julius Caesar, population has grown exponentially from 150-200 million to almost 6.6 billion today. The rate of growth varies by fertility and length of life. Dr. Peterson predicts that over the next twenty years, 80 percent of the world's population growth will occur in those countries least capable of supporting it—politically, environmentally, and/or economically. Population will change by region, as the developed world will contract and the underdeveloped countries will continue to grow. For example, Russia's population is shrinking and could threaten stability in that region. Key considerations are migration and the increasing global generation gap.

Resource Management will be impacted by this projected population growth, changing consumption patterns and by increased standards of living in mega population countries such as China, India, and others. The most critical strategic resources will be food, water, and energy. The food challenge will be to double food production with the constraints of limited land, land degradation, water shortage, and potentially, global warming. Water will be the next big strategic resource after oil, with the potential to spark conflicts; the world needs to double water production. Global demand for energy will grow significantly in Asia, primarily for the Indian and Chinese economies. There needs to be more aggressive efforts to become less dependent on oil, coal, and gas hydrocarbon products.

The next twenty-five years will generate significant changes in technology, particularly computation (deep and pervasive), nano-technology, genetics, and biotechnology. The key point with technology is that it will continue to provide benefits and opportunities, but it will present new threats as well.

The information and knowledge management revolution is requiring us to relearn and relearn again. It's not "how," but it's "what" we learn as people become knowledge proficient versus knowledge deprived. People will ask, "What is true?" as one chooses their information source, whether it's CNN or al Jazeera.

Technology advances have enabled the process of economic integration in today's "global" marketplace. Dr. Peterson mentioned that Brazil, Russia, India, and China (BRIC) will have a larger output than the

aggregate level of the G-6 countries (United States, Japan, Germany, United Kingdom, France, and Italy) by the year 2050. BRIC economic growth could exacerbate the problem of growing income inequity in the world.

Conflicts will continue to change, as 9/11 demonstrated the shift from conventional to asymmetric warfare, and the future shows a shifting from asymmetric weapons to Weapons of Mass Destruction (WMD). Non-proliferation technology has eroded, creating concerns among nation-states as non-state actors build their capacity to carry out acts of violence. It was noted that Cold War arsenals are only part of the portfolio to address WMD, and modern militaries must rebuild their capacities to adapt to the new threats.

How do we organize ourselves (Governance) to meet these challenges as the world continues to move beyond a Westphalian nation-state model to a more diverse group of actors, including the private sector and NGOs?

In summary, Dr, Petersen emphasized that looking at all seven revolutions provides a host of opportunities and threats. When looking at hyper promise and hyper peril, leadership is the key determinant. Effective strategic leadership will be essential.

The presentation is available at < http://7revs.csis.org/ >.

Luncheon Address: "Insights from the 'Edge': Global Futures Lessons for 21st Century Intelligence"

Dr. Warren Fishbein, Global Futures Partnership, indicated at the outset of his presentation that he believes that the opportunity to speak may help cement emerging ties between his group, Global Futures Partnership (GFP), and the Proteus Management Group. He noted that Proteus is doing similar activities to that of the Global Futures Partnership in using scenario processes to scope out long term futures designed to identify needed changes in intelligence.

Dr. Fishbein noted that the broad topic to be considered was "creative strategic intelligence and decision making as elements of national power."

He chose to focus his remarks on intelligence analysis. Promoting creative strategic intelligence requires changing fundamental processes inside and outside the intelligence community. His group, much like Proteus, addresses this and other questions related to global and national security. Global Futures has brought together leading thinkers and members of the intelligence community to generate conclusions and implications. In the presentation title, "Edge," refers to an edge organization, which is a large institution working to connect the parent body with the broader environment in which it resides. The GFP seeks out provocative ideas challenging conventional methods of analysis. It arose as a grass-roots movement in the mid '90s exploring new approaches to emerging scenarios following the end of the Cold War.

Following 9/11, GFP changed direction, doing fewer scenario projects and more seminar and workshops. This new direction brought in a variety of experts. In 2004, Global Futures truly went global/multinational by holding a conference in Rome. Representation from numerous intelligence services addressed transnational threats through unclassified means. It culminated with the creation of the Global Futures Forum, the first multinational, multi-sector, intelligence-based community for unclassified, strategic-level discussions on global issues. The forum has gained a great deal of interest from prominent intelligence and security experts.

In the past fifteen years, many changes in global security have occurred that required dramatic changes in the intelligence paradigm. Global Futures brings unique ideas, reflecting a diverse view, from the intelligence world's perspective. These changes are driven by globalization, the information revolution, and other similar factors. When compared to the intelligence focus during the Cold War, the importance of non-traditional security issues—non-state network actors, such as terrorists and international traffickers, and systemic threats such as global disease and economic instability. These challenges differ significantly from traditional issues in several aspects.

First, while state actors have boundaries, histories, and cultures, non-state actors are hidden and mutable. Second, non-state actors do not have the constraints that state actors have and thus have a greater potential to

act quickly and in unexpected ways. Third, non-traditional threats bring the emergence of a new range of challenges, with unfamiliar concepts like emergent phenomena and second and third order impacts. These threats require a deep cultural understanding of various factors along with a need for systemic, interdisciplinary thinking.

Changes have also occurred in the informational environment, shifting away from government-produced classified information to non-state issues and the need to look at information generated outside the government sphere. There has been a technology driven explosion of published information about security issues. This wider range of information sources has benefited policy-making officials by giving them a better understanding of non-traditional issues. Global Futures has addressed these new challenges summarized in five categories: Strategic, Intuitive, Critical, Collaborative, and Connected.

Intelligence needs to be more Strategic in the face of global uncertainty and complexity and thus requires us to look at long-term threats and the big picture. Creation of an on-going intelligence dialogue is necessary to get policy makers involved in the process. GFP discussions indicate that the effective use of strategic thinking involves changes in organizational expectations and practice.

Intuitive Intelligence is a short-term strategic approach that looks at analysis as a formal process complemented by more holistic and creative understanding. Analysis means the breaking down of issues into cause and effects using logic and theory and then tying these together to explain and predict. Analysis in a non-state realm with poorly delineated actors, complex interaction, and abundant informational noise may produce misleading results.

An alternative is individual intuition or "sense making," a more open-ended processing of information. Some believe that intuitive judgment is actually a better guide to complex situations than formal analysis. There is support for the idea that the combined intuitions of a diverse group are complementary and provide the most accurate understanding of complex problems. The feeling is that more complex threats require more sophisticated analytic techniques and that creativity needs to be

reinforced using brainstorming and mind-stretching exercises. Other forum discussions think the actual physical environment of the analysis should be changed; more collaborative group judgment methods and aggregative techniques should be used to exploit the "wisdom of crowds."

The Critical Approach to intelligence is a willingness to challenge intelligence to avoid errors. Errors are due in part to fundamental uncertainties and biases that warp perceptions and lead to overconfidence. To address this problem "Alternative Analysis" has arisen that uses several analytical techniques designed to surface and challenge biases and assumptions. The GFP work reveals a need to adapt the alternative analysis to the new global threats. New approaches are needed that incorporate assumption checking and challenging into the intelligence process. The concept of a "high reliability organization," which promotes self-critical dialogue believing something can or will go wrong, may need to be considered by the intelligence community.

The fourth insight is that we need more Collaboration. Analysts agree on the need to work more closely with collectors and with the policy community. Global Futures believes, based on opinions gathered at conferences, that effective collaboration requires adjustments in culture and incentives, and not just on exhortation and technology. One disincentive is the "production system," which gives rewards for individual production rather than for a common effort with a blend of perspectives. What is needed is community building as a programmatic objective. Group Facilitation, by a select, sharing cadre who promote dialogue, will achieve significant output.

The fifth insight is for more Connectivity, the counterpart of collaboration, but with those outside the intelligence community. For GFP, outreaches as well as strategic thinking are important objectives. Their thinking is that many security challenges lie outside the state military/political/diplomatic spheres and require the input of nongovernmental experts. Connectivity—meaning global or multinational connectivity—is used instead of outreach. Intelligence analysts must connect to stay abreast of global developments and changes; they must sift collaboratively through literature and sustain relationships that may become vital in the

future. These global connections involve broader challenges based on varied intelligence business practices.

Dr. Fishbein briefly discussed the Global Futures Forum as an outgrowth of the International Conference on Intelligence Analysis held in Rome 2004. Consensus at that conference was that continuing unclassified intelligence cooperation and collaborative outreach to global source expertise were necessary to effectively address transnational threats. Over thirty countries are now involved, but membership is limited to NATO and Commonwealth countries and a handful of others. Involvement by nongovernmental experts is stimulating more dialogue, with the focus on unclassified interaction to develop a broad, multinational dialogue, which can only be done on an unclassified level. The forum also has topically focused "communities of interest," blending intelligence and security experts from various sectors. The Global Futures forum promotes a more strategic and intuitive approach to intelligence, creating a diverse pool of knowledge. Greater global connectivity is a goal that will link smaller, less-endowed groups with U.S. resources and contacts. It will be a truly multinational venture. In this complex, explosive environment, small outward-focused groups at the fringes of organizations can make unique contributions to achieving this objective.

Panel #1: Creative Strategic Approaches to Future Intelligence Analysis and Political and Diplomatic Decision Making in National and International Security Affairs

Professor Cindy Ayers, Visiting National Security Agency Professor at the Center for Strategic Leadership, chaired the first panel.

"Ahmadinejad: A Dangerous Reflection of a World View"

Professor Cynthia Ayers introduced her subject with the scenario of a Nightmare on Planet Earth. In her proposed scenario, Russia launches two satellites for Iran (2005/2006) reportedly for "surveillance." There are explosions on each coast of the U.S., several on the Hawaiian Islands, and others throughout Europe, Israel, Japan, and Australia, all within thirty minutes. There is no electricity, TV, cars, radios, phones, or generators, and water supplies have been cut. Just as the gravity of the

situation begins to sink in, Mahmoud Ahmadinejad announces that al Mahdi, the last male descendent of the last prophet has returned and will address the world within twenty-four hours, and on behalf of Al Mahdi, Ahmadinejad indicates it is the duty of all who wish to please Allah to help al-Mahdi usher in the period known as "THE END OF TIME."

How did we get here? Professor Ayers suggests the facts have been present since 1979 and the initiation of Khomeini's objectives: Islamic Rule over Iran, expanding Islamic Rule to the entire Middle East, exporting of the revolution for Global Islamic domination, and the initiation of the apocalypse—long a part of Islam. As part of the apocalyptic cast, al-Mahdi (the Savior or "Guided One") will return in the last days to unify the community of Muslims, fight the Dajjal (Anti-Christ), establish Islam as the global religion, and rule the world for seven to nine years. True believers are to seek out martyrdom for jihad, as jihad must be global and continue until judgment day. Judgment Day is to be preceded by a cataclysmic, nuclear end of the material world.

Professor Ayers asserted that Global Jihad and Islamic "Just War" must have a "just cause," "proper intent," "be declared by the right authority," must be a last resort," have a "reasonable hope of success," and exhibit "proportionality and discrimination." Refusal of a non-Islamic political entity to acknowledge the sovereignty of Islam along with the imperative to extend the boundaries of the territory of Islam creates the "just cause." The promotion of peace through the spread of Islam is per se a "proper intent." The ruler of Muslims, a prophet or head of the Islamic State or individual designated by Allah or al-Mahdi, must convey an "invitation to convert" to the ruler of infidels (the opposition with the right authority to speak for the entire nation) with a simultaneous or subsequent "declaration of resolve." Upon the lack of a response, the ruler of Muslims has only three choices: to accept conversion, accept or decline an offer of tribute or declare, "just war." War is to be the last resort, but the last resort has been defined to exist when non-Muslims hinder efforts "to spread the word" or when the ruler of infidels rejects an invitation to convert or submit to Islam. A just war must have a reasonable hope of success, considering manpower, equipment, weapons, and capabilities of Muslim forces prior to making the invitation; and when the invitation is made, the leader must be able to win. The resulting excessive enemy

casualties and suffering are believed to be a direct result of the recalcitrance of the infidel leader. Thus there is proportionality and discrimination by default.

Professor Ayers pointed to facts in existence since June 2005 to document support for the apocalyptic scenario proposed at the beginning of her presentation. She begins with Ahmadinejad's election in June 2005—which was followed by his statement that al-Mahdi would return in two years—the October 2005 launch of a satellite using a Russian rocket, and a January 2006 trip to Damascus to attend a "terrorist conference." In April 2006, several missiles were "tested" and "unveiled," threats were made to the Straits of Hormuz, Israel, and other locations, and the month ended with an announcement of nuclear capability as well as plans to launch another satellite. In May 2006, Ahmadinejad sent a letter to President Bush that specifically asked, "Will you not accept this invitation? That is, a genuine return to the teachings of prophets, to monotheism and justice, to preserve human dignity and obedience to the Almighty and his prophets?" Also in May, Ahmadinejad made a trip to Indonesia, Javier Solana announced his intention to prepare a "bold package" of incentives, and Ahmadinejad announced that he was writing a letter to the Pope. Iran dismissed an offer by the Secretary of State to negotiate directly with Iran if enrichment is stopped. In June 2006, Hezbollah escalated its attacks on Israel, Hamas ended its sixteen-month truce and vowed an "earthquake in Zionist cities." and Solana delivered his package of "incentives." Iran responded that it would "offer its changes" on August 22, 2006. The EU, G-8, and Solana sought a response by the G-8 meeting set in July, but Iran repeatedly asserted it would respond on 22 August. Abu Bakar Bahir in Indonesia also called on Bush to convert.

On July 12, 2006 Hezbollah kidnapped two Israeli soldiers and the Israeli/Hezbollah war began. Chancellor Merkel received a letter from Ahmadinejad, which she publicly rejected. Ahmadinejad threatened that "If tomorrow a resolution is released against the Islamic Republic, then the P5+1 [incentives] package will no longer be an issue." The next day, July 31st, the UN Security Council passed a Resolution with "mandatory and binding" requirements for Iran to comply or sanctions would be imposed and gave Iran until the end of August to suspend uranium enrichment.

In August, Ahmadinejad offered a personal interview to Mike Wallace, which was taped and aired on "60 Minutes." Ahmadinejad told Wallace that he expected Mr. Bush to give up, and those who did not accept an invitation will not have a good ending. Professor Ayers considers this the Offer of Tribute. The Declaration of Resolve followed, by way of Iran's announcement of the commencement of war games, code named "Blow of Zolfaghar," referring to the sword al-Mahdi will carry, followed by Ahmadinejad's rejection of Solana's package on 22 August.

In summary, President Bush received an invitation to convert from both Shi'a and Sunni leaders, which represented the Unification of the Muslims. While in Indonesia, Ahmadinejad made a declaration of resolve and proclaimed he was the "ruler" of the Muslim world. The coalition of nations offered a package of incentives, which Ahmadinejad assumed was an offer of tribute in submission to Islam; he could accept this as an offer of tribute and comply with the UN Security Council demands, or he could declare war. Ahmadinejad told Iranians Allah had told him to expect victory and that the infidels will not harm him and that "only one more step remains before Iran attains the Summit of Nuclear Technology." He warned Europe and the United States that they will "pay" for backing Israel. In November 2006, Ahmadinejad wrote a letter to the American people stating "I am confident that you, the American people, will play an instrumental role in the establishment of justice and spirituality throughout the world. The promise of the Almighty and His prophets will certainly be realized, justice and Truth will prevail and all nations will live a true life in a climate replete with love, compassion and fraternity. …The U.S.… should not choose irreversible paths." In December 2006, Ahmadinejad announced a "divine promise "that Israel and the United States will "vanish like the pharaohs" and wrote a letter to the Pope. Professor Ayers proposes these actions document the road to a Nuclear Tehran.

"Proteus Implications of Intelligence Scotomas in Central and South America"

John Alexander, Senior Fellow with the Joint Special Operations University presented his paper on the shortfalls of U.S. policy in South and Central America. He claimed the policy of "fighting wars abroad

so they don't come here" is inapplicable to South America, as the war is already here. He explored the dangers that are festering close to the United States yet remain largely unnoticed in this country. He argued that an undeclared war has already been ignited. However, our national policies focus on two peripheral aspects of the problem, illegal immigration into the United States and drug exportation and its multifarious relationships with terrorist organizations. Unless there are catastrophic incidents occurring in Central or South America, people in the United States rarely pay attention to that area of the world. Politically, the United States focuses much greater attention on Europe, Asia, and the Middle East than on our southern neighbors. With the exception of some exploitation of low-cost labor in some sectors, we are also more deeply engaged commercially with other trading partners. While elements of U.S. Southern Command and the Intelligence Community are engaged across the continent, both policy makers and the general U.S. population tend to ignore the region.

The issues are complex and transcend several domains, including economic, energy, global environment, shifting demographics, internal political stability, organized crime, and philosophical shifts. Internal national problems with transnational implications abound. While border tensions exist in several areas, none is likely to lead to full-scale invasions of one country by another. Of paramount concern should be egregious economic disparity, which is epidemic and has a direct impact on the United States.

He highlighted issues that are arising and should be of great concern for our future well-being, including cocaine production in the Andean Ridge, organized crime, increases in activity of the Sindero in Peru, the leftist governments that have been elected, and the tri-border area of Brazil, Paraguay, and Argentina. He presented a path leading from the Middle East through South American into Mexico and then the United States. He documented a direct connection wherein the profits for illegal drugs sold in the United States fund the terrorists we have to attack. The terrorists have superior intelligence, better logistics, and better command and control over all of South and Central American than even the United States.

Alexander argued that the issues plaguing our southern neighbors would have significant impacts on our future. The United States can ill afford to consciously allow these scotomas to exist unabated. New and complex social arrangements will continue to emerge, but the war has already begun.

"Global Terrorism under a Nuclear Umbrella: The Nightmare"

Dr. Ely Karmon, International Policy Institute for Counter-terrorism and the Institutes for Policy and Strategy, Israel, presented his thoughts on the progression of a Nuclear Iran. He titled his presentation "Global Terrorism under a Nuclear Umbrella: the Nightmare." He began with a historical listing of major events since 1979 that lead to what he perceives as an alliance between Iran, Syria, Hezbollah, and Hamas and the al-Qaeda network. He argues there are five similarities between the groups; each has strong ideologists, strong leadership, common enemies, no morals against aggression and single state support. The "watershed" events on the path of this alliance were the November 4, 1979 Iranian taking of the 44 American diplomats held hostage for 444 days and the November 20, 1979 seizure of the Grand Mosque of Mecca by Sunni Radicals; both occurred without punishment. Dr. Karmon noted that major historical events since 1979 have documented simultaneous paths of terrorism by Iran and the Sunni Radicals. Other major events identified were the Iran-Iraq War and the Lebanon War, both of which expelled the United States and others from the area, the attacks on Spain and France, and the first Palestinian Intifada, all of which went unpunished. Other major events followed, such as the use of Hamas to interrupt the Israel and Palestine talks in 1991, Iran-supported suicide bombing in 1993 after the Oslo Agreements, and the 1993 crisis in Somalia—the first major victory for al-Qaeda. This was followed by a Taliban victory, with al-Qaeda assistance, in Afghanistan and the attack on the USS Cole in 2000, again without any U.S. response. He argued that 9/11 was an exceptional success for al-Qaeda and Sunni Islamism. In 2005, pro-Iranian Shi'a parties come to power in Iran, and Sunni Baathists, Islamists, and al-Qaeda achieved destabilization in Iraq. In 2006, Hamas won elections in Iran, and al-Qaeda continued to support bombings in western friendly European

countries. Finally, the 2nd Lebanon War strengthened the Arab and Muslim relationship.

In conclusion, he argued that Iran has practically paid no price for its terrorism and subversion since 1979. Iran views the United States as weak in Iraq, while it has established Islamism in Iraq, Lebanon, and Palestine with a substantial impact in Egypt and Jordan. Iran also sees Russia and China as weak. Iran has publicly grown its long-range missile capability through domestic production and foreign procurement. So he asks, "What is to stop a nuclear Iran?"

"Exploitable Socio-Political Barriers: al-Qa'ida's Faces in West Africa"

Dr. Stacy Bergstrom Haldi provided an overview of al-Qa'ida's strategy in West Africa and its past attempts to establish a presence. Al-Qa'ida's main interests lie in the strategic importance of the region's oil, because it is of value to the United States. Nigeria is the largest oil producer in the region, followed by Mauritania and Mali. The tendency is to focus on what al-Qa'ida wants versus what al-Qa'ida can actually achieve.

Al-Qa'ida made mistakes in their strategic assessment; it is flawed. They must seek to form a neo-fundamentalist base; something they can work with. Nigeria is a main target because it is believed that, as Nigeria goes, so goes the rest of West Africa.

Osama Bin Laden knows this. He supported a failed overthrow in 2003. He knows the United States is oil dependent and that Nigeria is an ally of the United States. In addition, Nigeria's population is one half Muslim, and there are large Muslim populations in other West African countries as well, which he hopes will allow him to make inroads. In addition, the country has a history of political uprisings, which is an ideal operational environment for al-Qa'ida. Bin Laden is looking to establish a solid operational base and eventually extend control of other areas in the region.

What does al-Qa'ida need to do to achieve success? There are three general strategies. First, forge ties with existing governments. An example is the Taliban in Afghanistan and Sudan. The second strategy is to forge ties with existing groups. The best example of this is the Salafist Group

for Preaching and Combat (GSPC)/Al-Qaeda in the Islamic Maghreb (AQIM) connection, a tie that al-Qa'ida hoped would provide a foothold in the region. There are several drawbacks to this strategy. The interests between terrorist groups are never identical; the GSPC nationalists focus internally on the Nigerian country and government, while al-Qa'ida looks at interests on a global level. There may also be personality and leadership issues that may or may not be resolved because of strong beliefs and even stronger egos. Communications might also cause problems. Classical Arabic is not widely spoken; perceptions of Arab racism inhibit the ability of sub-Saharan Africans to identify with the Arabo-centric Islamic movement. Long established Sufi brotherhoods are continuing to resist the Sunni fundamentalism movement that has grown in North Africa. The third strategy is to recruit and establish its own network in the region. This is a difficult, time-consuming strategy that must also avoid the pitfalls of the other strategies. Recruiting and retaining fundamentalists with a limited, local focus, for a network that thinks globally requires developing a new mindset.

Dr. Haldi used Nigeria as an historical example of the difficulties of forming solid ties in this region. Al-Qa'ida tried to recruit the Nigerian Taliban to attack American targets. It didn't happen because they were fundamentalists who stayed within small groups and/or tribes. They created their own small world mindset instead of looking at the large, global world. Al-Qa'ida has not been able to convince the fundamentalists to focus at this new, larger scale. The politics of the region are local, and al-Qa'ida must sell the idea that their approach is the solution to the local problems.

The operating environment for al-Qa'ida is also a difficult one. These include poverty, corruption, and the previously mentioned linguistic problems. These West African peoples are just trying to survive, and this does not make them good candidates to become terrorists. In addition, racially it is a situation of black vs. Arab, not necessarily a good fit. Al-Qa'ida faces many pitfalls and may not be successful in West Africa even with continued attempts to transform the populace to their way of thinking.

"The Future of the Middle East in 2040: A Forecast of Drivers of Stability"

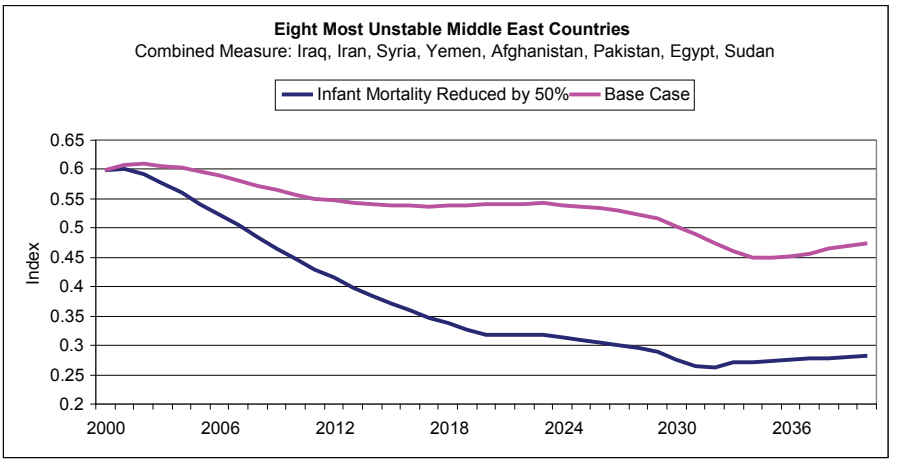
Awash in dictators, theocrats, and tribal demigods, the Middle East remains a region void of stability noted Tom Ferleman from IBM. Conflicted by limited natural resources, environmental problems, and burgeoning social demands, the Middle East is now faced with the consequences of nuclear energy. Yet, the values of stability are remote when mistrust, violence, and intolerance dominate the landscape. Until recently, historical patterns helped keep the ramifications of instability within the confines of the Middle East; however, distance and disengagement no longer provide the mechanisms for relating to this troubled region. Shortsighted western engagement and an intense demand for oil, its only true export, have brought the region's anger to the doorsteps of most capitals.

Mr. Ferleman's presentation applies a "framework forecasting" method using the International Futures (IFs) model developed by Barry Hughes of Denver University to forecast drivers of stability in the Middle East out to the year 2040. Formulations were estimated for each variable of stability, using the five independent variables existing in the IF model: democracy, infant mortality rate relative to global average, trade openness as indicated by exports plus imports as a percentage of gross domestic product (GDP), GDP per capita at purchasing power parity, and the average number of years of education of population at least twenty-five years old. While most futures research uses basic linear extrapolation in order to examine future environments, the IF model uses a causal-loop architecture in order to measure the degree of change that multiple interacting variables will have on each other under various scenarios.

The results of this study illustrate how countries presently considered as a threat to the United States, may become the most stable, that is, become more democratic, by 2040, including Iran and Lebanon. These encouraging conditions are offset by the perpetuation of conditions that helped bring about al Qaeda. Indications are that increased military spending in the region, even among Western-friendly nations, may not improve stability. A better balance in spending and assistance may help

to ensure hope, provide for the common needs of the population, and consequently improve stability.

While it is difficult to rapidly improve a country's or region's GDP, or levels of democracy, lowering the infant death rate over the next three decades proves to be a robust and high leverage policy alternative to mitigate collective dissent.



In the above graph, he analyzed how a 50% reduction in the infant mortality might affect stability, and compared the output with a base case analysis. The result showed a dramatic increase in stability for even the most unstable countries. With a 60% spread between the base case and the reduced infant mortality scenario by 2040, it is apparent that the return on investment is quite high. Contrasting this option with other perceived methods of improving stability, such as increased military spending, strengthens the argument for this policy intervention.

If Syria reduced infant mortality by 50%, it would increase stability by 60%, yet if they increased military spending, it would have almost no impact on stability. By 2040, the result from additional defense spending would be only a marginal 6% increase in stability. Extending this example by increasing spending on nuclear weapons by 50%, with the presumption that the previous increase in military spending would be allocated to the acquisition of these weapons, we concluded that this too would only produce a 7% increase in stability by 2040.

In conclusion, it is clear that the Middle East has little resemblance to the Western World. Military spending, as discussed in his paper, will not affect the stability in this region. Powerful militaries will not provide the positive influence necessary for positive regional change, suggesting that positive change is not obtained from overt expressions of power. A better balance of spending and assistance will help ensure hope, provide for the common needs of population, and consequently improve stability.

"The Complexity of North American Perimeter Security: Moving Backward?"

Dr. Matthew Mingus briefly introduced the concept of North American perimeter security, which has been a topic of political and academic discussion for well over a decade; however, American policies and practices following the events of September 11, 2001, have largely taken this policy discussion off the table. He noted that this border is unique. In particular, Canada-U.S. trade represents the largest bilateral trading relationship the world has ever known—over $1.5 billion a day in trade crosses this border. The current perceived challenge is thus "sealing" a border, yet keeping it "fluid." Dr. Mingus' recommends that we should de-emphasize the focus on the U.S.- Canada border and shift focus to the border between North America and other foreign nations.

Much of the academic discussion of this topic has been linear in nature and has focused on one or two key variables rather than taking a more holistic approach, as embodied in complexity studies and the Proteus Insights. In addition, much of the existing literature on this topic comes from politicians and former politicians. This means that it reflects perceived political realities, but it may also be rooted in ideology and posturing more than in the reality of the security situation or the true value (or lack thereof) of the perimeter security model.

The Canada-U.S. relationship as a solid partnership is less stable than our short-term impressions lead us to believe. Both nations have changed dramatically over time, remaining very stable over the past fifty years, making it easy to take the partnership for granted. North American Perimeter Security deals not only with the Canadian border but also with Mexico. Each of the three nations has a different culture and system of

government. All three are becoming more decentralized, and this has perimeter security implications. Visitation, immigration, and refugee status become more difficult as these systems become increasingly differentiated.

North American Perimeter Security should, in the realm of protection from foreign powers, look more like the European approach. Cooperation in a given area, maritime monitoring, for instance, should be pursued and built on over time. More areas of cooperation could later be added. There must be movement from simple cooperation to true cooperation with multilateral enforcement of immigration, customs, and security policies. An individual could go to Alberta, Canada, the same as going into New Jersey. This would eliminate the internal Canada-U.S. border. The real checks would be further inland, ongoing, rather than at border crossings.

Canada and the U.S. are sharing the largest trading relationship of any two nations in the world. If North American energy independence is pursued, the relationship will grow. This harmony will solidify and strengthen the basis for tomorrow's regional security alliance. There is a connection of trade and security in North America and the continued expansion of NORAD into a bi-national command structure joining Northern Command and Canadian Command also shows promise.

Canada has a much larger landmass than the U.S. but only 8% of North America's population. Some 90% of Canada's population lives within 100 miles of the U.S. border, and there are plenty of hiding places throughout the country. This situation is ideal for many insurgents and terrorist groups. To control our border is one thing, but seeking perimeter security on other borders may be more important. If the internal border requirement was dropped, and the two nations shared information on who was entering our common perimeter, we would probably have more information than before on who might be seeking sanctuary in Canada.

After 9/11, a change occurred when a contract was financed with Boeing Co. called the Secure Border Initiative network (SBI net). Costs have grown dramatically, and success might be difficult if not impossible. If we are able to monitor the tremendous number of documented border

crossings, when and where do we intervene? Do we stop everyone or use recognition software to stop documented terrorists? There are many question marks. We must worry about the details, because in this high tech age, serious security threats can be carried in a backpack. Dr. Mingus asked, "Can we honestly believe that we can secure a 6000-mile border?"

There is a relevant truth to the North American Perimeter unique to Canada's culture. The Canadians have long feared losing their identities and their culture. Some believe it to be Yankee Imperialism and the first step in an American takeover. In the 9/11 attacks, the Canadian's lost bank assets and hundreds of citizens in the twin tower. Progress could have been made to strengthen the perimeter security concept, but it was setback by the President posting National Guard troops on the borders, based on misinformation, and eliminating the "world's longest undefended border."

Cross border regions have formed with the potential to provide a more locally grounded intelligence system that could be an excellent replacement for a physical border. There is true significance in teaming, and it has occurred in the far west, termed Cascadia. In the Great Lakes region there are numerous bi-national organizations. An example of this is the Great Lakes Commission, which is specific in purpose. The Niagara-Buffalo region focuses on tourism, and Ontario-New York on trade, while Atlantica—the New England states—has well-developed organizations with representatives meeting regularly.

Language since 9/11 has focused on border security, with U.S. debates on strengthening our Southern and Northern borders. We can build on the European Union model and limit collaboration to two or three core issues. We must, however, key on terrorism while dispelling the idea that this collaboration is a front merely for social policies or other such concerns. Some collaboration has occurred, creating refugee, immigration, and visa policies. These are key steps for a movement toward perimeter security, but much more work must be done if we are to realize some level of success.

Dinner Address: "Creative Intelligence Analysis in Strategic Decision and Policy Making"

Dr. William Nolte, School of Public Policy, University of Maryland, discussed "Creative Intelligence Analysis in Strategic Decision and Policy Making." Edward Kaufman's book "The Regulars" emphasized that investment in the future was through its people. The military traditionally has done well in bringing its best and brightest through various levels of education and professional development. The 9/11 Commission report emphasized the need to build innovation and imagination in future intelligence gathering; however, that is rather daunting in bureaucratic organizations like the IRS and Law Enforcement that drive out innovation but focus on standardization. The Intelligence community is challenged far more today than ever before.

The information environment has changed over the past twenty years. There are new laws in effect, and the sheer volume of information being collected makes it very difficult to manage. In the old days, there was more collaboration between analysts to connect the dots, but the situation has changed. In the 1990's, there was a shift to more volume-based analysis. The daily input of the Internet has exponentially exploded information creation. In one day, the NSA collects information as large as the Library of Congress. The question is: How do we cope with this?

Increasing the number of analysts still hasn't solved the problem of mass information flows. During the mid 1990's, there was a shift to "Do More with Less," which further exacerbated the problem. There are close to two hundred risk analysts in the State Department's Bureau of Intelligence and Research. They possess advanced language skills and take their respective areas' cultures very seriously. The Bureau realizes that culture-centric behavior and skills are just as important as volume-based analysis, but that still is not enough.

To meet the challenge of mass information flows, there are potentially three areas to focus on: (1) overcoming bureaucracies, (2) open source information sharing, and (3) security.

Intelligence efforts in the 21st Century will be "information"-based, migrating away from the "secrets"-based concepts of the 20th century.

Intelligence must align itself with the boom in Information Technology in order to keep pace; the National Security Agency will have the brunt of this effort over the next six to eight years and will struggle to keep up with the information flow. Another opportunity is for the Intelligence Community to look at more external metrics versus internal metrics in enhancing their processes; however, it takes bureaucracies a lot of courage to step outside the box. Open information sharing is extremely critical in the Homeland environment between all the different federal, state, and local authorities. Not so long ago, state and local agencies wanted to get access to national intelligence, but access was denied due to clearance levels. Even when provided, the intelligence was either untimely or irrelevant. Additionally, there is the problem of sheer volume and velocity of the information provided. All in all, it has become quite a complex information sharing environment. In the security arena, counter intelligence is largely ignored due to volume. This type of work may be considered creepy, but it's got to be done, and done well. Previously, these security teams used paper storage, had small amounts of volume, and a small set of users; however, all that has changed dramatically with the information boom.

How do we do intelligence in the 21st Century? We must not focus on NSA, CIA, etc., but stay away from institutional survival tendencies. The new institutional thinking should move toward networks and away from production cycles.

In summary, despite all these shortcomings, the U.S. Intelligence community is unique and does reasonably well. With the revolution in information technology and knowledge management, the U.S. needs to rethink its intelligence efforts, improve training, and re-tool for the future.

Background Briefing: Wednesday, 15 August - "Fighting the War of Ideas like a 'Real' War"

Dr. J. Michael Waller, Institute of World Politics, spoke on "Fighting the War of Ideas like a 'Real' War," the title of his book published in 2007. Dr. Waller stated that our strategic warfare must include ideological and psychological weapons and that information warfare is no less important than diplomacy or attacks. He began with several examples of instances

throughout history where leaders of our nation used the press to their advantage. Today, however, we consider it anti-American to use information warfare, to feed stories to the press, in spite of the fact it may not be illegal. He alleges that Americans, including those in our government legal offices, have allowed this thought to impose unnecessary restrictions on us, while the terrorists groups and others use it to their advantage. In this global information world, the United States is being fought effectively in the press, and we are not fighting back. The lack of a response is in large part due to the cumbersome bureaucracy surrounding approval processes and also due to the fact that those with approval authority are out of touch with foreign cultures. Therefore, no favorable information is being released. With no favorable information being released, terrorist groups control the press and in turn the world's thoughts.

Dr. Waller stated that "journalists can keep secrets better than others," and he pointed again to moments in history where they were used to assist the United States in its efforts. He suggested that we should involve journalists in writing a policy for Information Operations (INFO OPS) just as they were employed in developing the recent counter-terrorism manual. Waller does not suggest we feed stories to the press or lie to them, rather he proposes we give them information and let them find the story. Providing facts or some info to the public so journalists have something to follow up could lead to rewards for the United States. The U.S. Government collects information every day that could be used in its pursuit of discrediting the terrorists, but it is incapable of responding quickly or in a correct cultural manner. He argues that information, released correctly, would allow the press to create the story, thus allowing the press the opportunity to find information or a story that would be inappropriate for the government itself to release. Waller alleges that public information has been used in foreign lands by comedians and talk show hosts to discredit the terrorists—some of these people have lost their lives because of their pressing the message—and he argues that even more information needs to get to the public so there can be more dialogue. Words, images, and messages are the weapons that will win influence.

Dr. Waller stressed that INFO OPS has to consider whom the message is directed to and why before one determines what is to be used. Culture is of extreme importance in the release of information. The U.S. tends to

think of information in terms of New York and Washington, but these centers are far from the global world of ideas. The information needs to be directed at local people in their local language. We won't win the war with only the support of our own people. The United States needs to use information to discredit and marginalize extremists by dividing them from one another and from their support bases.

Dr. Waller addressed the concern that INFO OPS will become covert ops, one of the main fears behind engaging in information operations. He argues that these operations aren't covert, as only the Department of State is barred from INFO OPS, not the Department of Defense. The real fear is that information will be misinterpreted. But the failure to engage in information warfare leaves the United States with only responsive actions. Waller pointed out that, in the United States, we are not afraid to use the press to discredit or mistreat our own, such as covering failures, trials, and hearings. Specifically, he pointed to the thrashing political opponents give each other during campaigns as a way to eliminate them from the field. He suggests if we did to al-Qaeda what we do to each other, we'd be further ahead in global opinion.

In conclusion, he stated, we are losing a fight we can win. It's a propaganda war that the United States needs to be engaged in for national purposes. We need to take the ideological fight to the enemy along with public diplomacy tools.

Panel #2: Creative Strategic Approaches to Intelligence Analysis and Decision Making in Information Operations and Strategic Communication

Professor Dennis Murphy chaired the second panel. He set the stage with a few words regarding the importance (and the inherent difficulty) of wielding information as power. He noted that Richard Holbrooke, former U.S. Ambassador to the UN, summed up the frustration by asking the question, "How can a man in a cave out-communicate the world's leading communication society?" The answer lies in understanding the information environment of today.

He indicated that one needs to go back to the Reagan administration to find the most succinct and pointed mention of information as an element of power in formal government documents. Subsequent national security documents allude to different aspects of information, but lack a specific strategy or definition. Still, it is generally accepted in the United States Government today that information is an element of national power along with diplomatic, military, and economic power, and that information is woven through the other elements, since their activities will have an informational impact. Given this dearth of official language, Dr. Dan Kuehl and Dr. Bob Nielson, in "Evolutionary Change in Revolutionary Times: A Case for a New National Security Education Program," National Security Strategy Quarterly (Autumn 1999), proffered the following definition of the information element: "use of information content and technology as strategic instruments to shape fundamental political, economic, military and cultural forces on a long-term basis to affect the global behavior of governments, supra-governmental organizations, and societies to support national security."

Information as power is wielded in a complex environment consisting of the physical, information, and cognitive domains.

In a speech here to the War College class in March 2006 then Secretary of Defense Donald Rumsfeld said:

> *If I were grading, I would say we probably deserve a D or a D-plus as a country as to how well we're doing in the battle of ideas that's taking place in the world today. And I'm not going to suggest that it's easy, but we have not found the formula as a country.*

…A rather remarkable statement, considering that the National Strategy for Combating Terrorism identified "extremist ideology" as (in Clausewitzian terms) the center of gravity of what is likely a generational struggle. But to understand the dilemma facing the United States and its allies, one must consider today's information environment. That environment enables non-traditional players who often use cheap, ubiquitous communications means to transmit their messages with immediacy and with world-wide coverage and impact. These actors, often uninhibited by the need to be truthful, are also free of any bureaucracy

that demands clearance and approval of public statements. And so, the United States finds itself responding to adversaries' messages rather than proactively and effectively telling our own story. A start point for discussion must recognize that this environment will not change to favor nation-states. Professor Murphy provided a few illustrative examples.

First and most obvious is the fact that terrorist groups are networked. Sunni extremist groups use mul¬tiple websites to solicit donations. Terrorists recruit, conduct knowledge management (e.g. the "Encyclopedia of Jihad"), and conduct per¬ception management and disruptive attacks on the web. There will continue to be increased sophistication of existing uses of information technology (IT) and greater emphasis on IT for both disruptive and destructive attacks.

He highlighted the power and ubiquity of the cell phone. There are numerous examples of cell phone SMS (text) messaging shaping political campaigns and mobilizing and revolutionizing politics. Text messaging is the medium of choice in overseas countries. It bypasses mass media and mobi¬lizes an already persuaded populace as a means of lightweight engagement. An example includes the popular uprising in Spain after the subway bombings, where text messaging rose 40% above normal within two days of the attacks. Cell phones currently contain the technology to text, provide news, video, sound, voice, radio, and internet. Mobile is pervasive in the third world. Some 97% of Tanza¬nians have access to mobile phones. Mobile coverage exists throughout Uganda. There are 100 million handsets in sub-Saharan Africa. Radio is the only media device more prevalent than mobile. Small laptops add to the mobile tech phenomena.

Our children and grandchildren will likely straddle two worlds: the real world and the virtual world of "web 3.0," reflective of the Internet world of 2nd Life and others. 2nd Life is attractive as an opportunity to socialize where there is no need to compete, and it can be exploited as a tool for learning. Web 3.0 is generally about being inside a 3D world that is low-cost and emotive. Multinational corporations see a movement (that is here now) where they will plan and execute business plans in the 3D Internet world.

Today's mainstream media has changed significantly. Professor Murphy noted that, where newspapers once competed for knowledge as a scarce resource, today that scarce resource is the reader's (or listeners, in the case of broadcast media) attention. He opined that perhaps that is why increasing numbers of young adults turn to Jon Stewart's "The Daily Show" for their news. He pointed out that, ironically, mainstream media now turns increasingly to bloggers for their stories, and the most respected bloggers require multiple sources to verify accuracy. At the same time, the mainstream media, acting as the watchdog of government, is the first to cry "foul" when the United States attempts to wield information as power. He noted that it only takes a mention of that emotive term "propaganda" and its perceived clash with the democratic ideals of a free press to cause political leaders to cringe, huddle, and surrender that battlefield.

He concluded by noting that it becomes apparent that the United States, while a military superpower, is not an information superpower. In this world, the U.S. military can no longer expect to have a strategy dependent on information superiority. In fact, it can only expect to achieve information dominance for a limited period of time in a very localized area. The United States should, however, be expected to effectively manage this information environment.

"Truth, Perception, and Consequences."

Ms. Christine MacNulty, Applied Futures, began by noting that her interest in long-term strategy came about due to her perception that there was a lack of strategic planning or even a lack of strategy. She attributed this lack of strategic planning to the fact that we fail to understand other cultures. She believes studies of cultures are available in a piecemeal fashion, but no single collection of data has been developed and institutionalized for each culture. Ms. MacNulty opined that we are seriously lacking cultural information for an effective strategy. She suggested that we need to understand the cognitive domain of others in order to form an effective long-term strategy and to win global wars. She does not claim that this would provide a 100% solution, nor does she strives for a 100% solution, but she stated that an 80% formula for understanding and influencing other cultures would be extremely beneficial for our armed services and even our diplomats.

Strategy is dependent on what we are creating a strategy for; hence, she looked at what we are up against in the future and found that most "warfare" is going to be or is being conducted by non-state players, with changing, flowing relationships between terrorists and insurgent groups. In planning strategy, she looked to define Truth, but found truth is different for everyone depending on their assumptions. So, is there really a ground truth? Probably not, as there is no real agreement on many subjects, and in the physical world, the way people perceive even the same material object is different, based on experience and expectation. But she surmised that perceptions are more important than truth in intelligence operations and strategic operations. She believes that perceptions are most important because once you have seen something, you don't un-see it; it stays with you, and its blocks your ability to see anything else.

She argued that cognitive warfare is the area where our efforts could prove most successful. If we observe the right things and understand what is happening with people, situations and relationships, and connections thereto, we could better control situations. To be successful we must obtain the ability to understand and visualize and think like the enemy, understand his doctrine, anticipate his thoughts and behavior, and develop the capability to get inside the enemy's mind and decision cycles. We need insight into the cultural underpinnings of decision making and communicating, into their centers of influence, sources of vulnerability, levels of collaboration with all media networks, and their indigenous patterns of communication. We need to understand their culture and how it, their mindsets, mental models, and ultimately their perceptions influence them.

In other words, what we need to understand the cognitive domain is the stories we tell ourselves that enable us to make sense of the world. Those stories are based on our culture, history, mindsets, and experiences. We need to understand the metaphors and language used, such as words and the way we use them, images, symbols, intonations, gestures, jargon, humor, and their blogs. We need to understand their religion, stories, fears, myths, history, metaphors, values, and hopes.

Ms. MacNulty then suggested that this information be put into what she calls a Cultural-Cognitive Systems Analysis (CCSA), a nexus of three

key disciplines, that she believes have not been brought together before in a consistent and coherent manner. This comprehensive approach could be used to ensure we are providing the right information, addressing the message to the right people, and using the information in an appropriate manner that will enhance our position rather than hinder it.

Ms. MacNulty concluded that once we understand these factors we should be informed sufficiently to understand and predict or explain enemy actions. This, she believes, gets us away from strictly tactical planning and responsive actions and into strategic/operational/tactical courses of action and a joint IO/IW IPB process, and it provides empirically based analysis to target network statistics, identify leverage points, and conduct network damage calculations. It also provides services such as training packages, reusable cases, cultural dimension knowledge bases, and planning and analysis packages, among other things, to use as future decision aids.

"A 21st Century Model for Communication in the Global War of Ideas"

Dr. Steven R. Corman, Arizona State University, spoke on the implications of what he calls the "old" message influence model and the new Pragmatic Complexity Model (PCOM) of communication. The old model is the linear, telephone type of conversation, which he referred to as the message influence model. This model he believes is constrained by the communicator's skill and the fidelity of and reliability of the "signals" used. There is also an expectation of success. The message influence model implies there is a simple, clear, and consistent message that can be reinforced by repetition and adjusted through Q and A. However, the model fails in this new environment of global communication because there are no passive, single receivers, intent and motive can't be presumed, and there is no opportunity for clarification by Q and A, so the context becomes more important.

Communication is not really under the control of any one person or set of events. Control, interpersonal relationships, behaviors, and what a person thinks control communication, and the new pragmatic complexity model takes this into consideration by looking at what can go wrong, and what will disrupt the intended communication. The new

model plans for contingencies, or for communication failure. Emphasis is now on, how could this message fail and how should I plan for those events? By combining all the factors in a message, regardless how well planned, the wrong interpretation could be made. As part of the new complex communication, you look at the things that can't be controlled.

This is not a very straightforward method and calls for multiple sets of factors to be applied before a message is sent out. Strategy and contingency planning would have to be components of the review of the message, as well. The fundamental principle is interactive communication rather than linear.

"The Limits of Information: Thinking about the Possible"

Dr. Jonathan E. Czarnecki, U.S. Naval War College, presented a theory about the emergence of information overload in the era of the Information Age and how its effect could cause the destruction of the organization that finds itself in this predicament. Analyzing the nature of information from both macro and micro perspectives, he noted that the macro perspective lives in the Einsteinian world of relativistic physics, whereas the micro perspective takes on the characteristics of quantum physics. Relativistic physics is deterministic and can be relied upon to give an answer with certainty, whereas quantum physics lives in the strange world of duality governed by both particle and wave properties of an entity dependent on the observer.

To arrive at reasonable conclusions about the effects of information overload, Dr. Czarnecki developed the notion of information and how it appears to be an essential ingredient of living systems themselves. Life is puzzling because most closed systems tend to give way to entropy or disorder, whereas to exist, life must create order. It does so by ingesting energy, mass, and information and thus creates negative entropy or "negentropy" in the process. So even though the universe as a whole is a closed system, life, for it to be, exists in a local region that borrows the mass, energy, and information it needs from the global closed system. Consequently, he posited that the "the more open the system, the more 'life' or order potentially can be generated." This is the bottom line of Dr. Czarnecki's argument. In order to not fall into disorder, organizations

must remain open systems that import the necessary ingredients to sustain their lives.

With ample reference to information theorists such as Claude Shannon and Charles Seife and the Standard Model of Physics for such theory via the Copenhagen and Many Worlds Interpretations, Dr. Czarnecki painted a vivid description of how in modern times with the looming Third Wave of Alvin Toffler, organizations can become paralyzed under the weight and instantaneous eruption of information overload. Citing seventeen events in the last fifteen years, from Kuwait to Haiti to Kosovo and to Iraq; the failures associated with these events, where information was available in enormous quantities, gives credence to the conclusion that organizations can be crushed when they do not know how to digest and divest the information to ensure actionable intelligence in a tight Observe, Orient, Decide, and Act (OODA) loop. In contrast, the German Army in World War II was decentralized enough and understood the commander's intent well enough, to get inside the Allied OODA loop.

To resolve the modern predicament of enormous volumes of information produced by technology that itself creates even more information and specialists to maintain it, Dr. Czarnecki suggested that modern staffs must move from the classical way in which they have conducted themselves in the past (the deterministic model of cause and effect) and adopt the modern theory (not as physicists, but as practitioners) of the new quantum sciences of the micro world with "ideas like entanglement, superposition, 'spooky action at a distance,' and coherence/de-coherence." To be successful, organizations (and specifically U.S. Intelligence and military actions) must be as open as possible and not insular, lest they collapse.

"The Sword and the Network; One Year Later in Blending Body, Mind, and Technology"

Tim Rosenberg, White Wolf Security, refined the vision and scope of his presentation last year. These revisions referred to the efficacy of combined cyber/physical operations and exercises as well as insights into Second Life, metaverses, gaming, and visualization. With enhancements to the body/mind/spirit model of the previous year, Mr. Rosenberg

demonstrated the connectedness and convergence of both the cyber and physical domains of attack scenarios.

Mr. Rosenberg provided a few words of caution up front to try to demystify Cyberspace. He stated that it is just another terrain without the need for new rules and constructs. He uses the same rules and analysis that he applies to physical combat and pleads that we should stop asking if cyber attack is an "act of war." Using a plausible situation in which terrorists are using computers and the network to their advantage, he suggested how the network can be used against itself. In this way, the computer is the target not the person using it. Thus, through what might be a typical scenario, Mr. Rosenberg combines the physical and cyber realms into a duality of sorts, where friendly forces clandestinely take down the terrorist intrusion detection systems that monitor his safe house and turn camera and computer against the terrorist so that friendly forces can monitor his actions. Through the use of this cyber model, forces can "train as they fight and fight as they train."

Following the above scenario, Mr. Rosenberg expounded on a variety of metaverses and visualization tools that are rapidly gaining in popularity and scope. The first of these was Second Life, a 3-D virtual world built and owned by its residents, which now number more that 8.8 million. To gain insight into this metaverse, he suggested one ought to read Snow Crash by Neal Stephenson or visit http://www.secondlife.com/. He also introduced a visualization system known as ANVISS (Advanced Network Visualization System), which is a powerful geo-mapping tool, which can be used by network defenders as a network log analysis tool.

Lastly, Mr. Rosenberg summarized Cyber Exercises as real-time, force-on-force systems that contain scoring for teams and individuals and which bridge the gap between the cyber and the physical worlds through sophisticated use of radio frequency identification (RFID), smart cards, wireless VoIP (voice over IP) on personal digital assistants, and IP surveillance cameras.

Luncheon Address: "Fourth Generation War Evolves, Fifth Emerges, and then???"

Colonel (Ret) T.X. Hammes, United States Marine Corps, summarized the 4th Generation War (4GW) and looked at the 5th Generation Warfare (5GW), arguing that that they currently co-exist. He believes the United States needs to find a way not only to catch up, but to also figure out how to get onboard with the exponential changes coming with the 5GW and thereafter.

Colonel Hammes suggested that refinement is needed, and what has to change, initially, is the U.S. mindset. He believes the 5GW is incubating now. He suggested that the 5GW political makeup is not concentrated on nation-states but on causes and organizations and influential groups. 5GW economics consists of a smaller and smaller number of entities generating larger amounts of wealth. Socially, the loyalty of the citizenry is to a cause and not to the nation. For example, Green Peace members find they have more in common with others overseas than with their neighbors in the United States. 5GW technology, a fifth element, finds the United States still operating in a 2ndGeneration Warfare (2GW) mindset.

Globalization has enabled groups to disrupt the flow of information through physical and cyber attacks, disrupt material due to known concentration of assets without proper security, such as at our major ports, and finally to attack our people through use of common and inexpensive materials readily available in the marketplace. Colonel Hammes argued that the 5GW nightmare is made up of a super-empowered individual or small group, with loyalty to his/her cause, and with increasing power due to knowledge of available off-the-shelf materials and technology. This, he alleges, has been evident already on many occasions in the United States, and he cited the anthrax attack on Capitol Hill as an example. That incident was created internally, for whatever cause, by what he believes—due to the fact no one has broken the secrecy of the event—to be a small number of people. He argued that there is a clear feasibility of a worldwide smallpox virus in our not so distant future. The availability of components, the make-up of the smallpox gene, which is posted on the internet with common access, an eventual low cost of production and easy dissemination capacities will be accessible to the smallest group

or even the poorest individual, in a short time. The distance between innovation and maturation has decreased substantially, and he fears we are not keeping up. Change is exponential, not linear, yet he believes the United States is still thinking in linear terms.

Colonel Hammes suggests that the United States is trying to get to 3rd Generation Warfare (3GW) (Combined Arms) but is still bogged down in the 2GW (response by branches of the military), and in spite of lots of money and the creation of new departments by our government, we have not yet arrived at the 4GW (response of combined government). Meanwhile, the 5GW requires all of society to be involved in the response. He concedes there are parts of U.S. society involved in 5GW defenses and software, but at this point they have not been incorporated into the government, nor has the government reached a point of actually participating in such efforts.

Colonel Hammes proposed that DoD have more eyes on the issue and be engaged in the monitoring of open-source software and networks within every aspect of society. He suggested that one asset we currently have with tentacles in all of society is the National Guard, and more use of the National Guard in the security effort should be considered. The National Guard is not only a military asset, but the very makeup of the Guard includes those with connections to their communities through numerous other programs and events. A large community watch program exists within the National Guard, and at a minimum, it should be a force under consideration for use as a security asset.

Panel #3: Future Strategic and Operational Intelligence Challenges:

This panel was split into two groups and made simultaneous presentations. Panel 3A was chaired by Mr. Frank Hoffman, Center for Emerging Threats and Opportunities (CETO), United States Marine Corps, and Dr. Steven Metz from the Strategic Studies Institute (SSI), U.S. Army War College, chaired Panel 3B.

Panel #3A

"Complex Irregular Warfare"

Mr. Frank Hoffman gave a wake-up call to everyone with regard to the nature of warfare in the 21st Century. With frequent references to books and authors as the backdrop for making his case, he outlined the future security environment, future challenges, and implications for what will undoubtedly become the hybrid warfare of the future. Technology trends in this future are accelerating, converging, and disrupting, such that "guns, genes, and gigabytes" will influence the fate of human society. The biggest challenges will come from what he called "identity based conflict" where the identities are both religious and ethnic and where wars will be waged in ways that are now either forbidden or unimagined.

Mr. Hoffman effectively used a National Defense Strategy "quad chart" that initially put warfare neatly in four corners—irregular, catastrophic, disruptive, and traditional—with definitions for each. However, as the future unfolds, the distinction among these types of warfare becomes less distinct, and he surmises that hybrid wars will emerge by choosing from a menu of complex challenges that these categories contain. The modes of war will become blurred, and "unconventional strategies will blunt the impact of American power," as quoted from the book *War Made New* by Max Boot. Peppered with perspectives from China, Russia, and India, the notion of war without limits and multi-variant/hybrid war becomes more global in concept. Other insights to the nature of future irregular war were provided by references to Great Britain and Australia as well as to such authors as John Arquilla—particularly his article "The End of War as We Knew It."

By plotting S-curves over time from the mid-1600's to the present, Mr. Hoffman outlined the generations of war. He stated that we are currently in the 4th Generation of warfare and postulates that there may be a 5th emerging form of warfare. He refers to Hezbollah as a prototype hybrid, which uses both regular and guerrilla troops. Hamas, Syria, Iran, and Pakistan offer similar contexts. Quoting again from John Arquilla, defeating these hybrids "is going to require some innovative thinking." Hybrid warfare, Mr. Hoffman states, will have inherent competitions—

the fight for legitimacy, the security competition, and the battle for perception dominance.

Finally, Mr. Hoffman highlighted the impact that religion, urbanization, and virtualization will have on the battle for perceptions. He concluded that we must prepare for "another bloody century" inflamed by faith and blood.

"Unintended Consequences of Unmanned Warfare"

Mr. Matt Armstrong, University of Southern California, considered the effects of using robots across the spectrum from teleoperation (direct control by humans) to near-autonomy, where robots make their own decisions within the bounds of the mission. The acceptance of robots has yet to be reckoned with entirely, but he provided many examples from the history of warfare where the technology of war evolved from directly "looking in the face" of the adversary to a series of implementations where warriors could stand back further from the enemy as pikes, gunpowder, and missiles would increasingly allow.

But there is a price to pay, as Mr. Armstrong suggested, between allowing robots to do the last "three feet" of war, thus assuming the status of strategic corporal, and conveying the personal side of "intent" as only humans can. Robots do not put on sheik's clothing to become more like the villager and they do not smile and take a knee to defuse a delicate situation as his examples point out. Much of modern war has just as much to do with controlling information as it does with killing the enemy. Citing three episodes of information control, he portrayed the U.S. as having a checkered history; for example, when it shot down an Iranian aircraft (due to human error). What becomes of information control when robots assume autonomous operation in a similar situation?

Mr. Armstrong reflected on the origin of the notion of robots from this term chosen in Karel Čapek's 1921 play, *RUR (Rossum's Universal Robots)*. The robot in the story became successful as it evolved to become less human, without emotion, without compassion. This can be both a blessing and a curse, depending on the application, and the author reflected on incidents at Abu Ghraib where robotic guards may have acted more humanely than humans. On the other hand, robots may increase the commoditization of death, as the standoff distance between robot and

the warrior makes it easier to tolerate the loss of enemy human life when only robots are lost on the friendly side. Thus, much must be considered. Ethics vs. perceptions must be considered while robots continue to be introduced on the battlefield—the "unintended consequences of unmanned warfare."

Quoting Giulio Douhet from 1921, "Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur," Mr. Armstrong suggested that robots on the battlefield will continue to garner acceptance over time as their benefits are demonstrated. What must be considered during this evolution, however, is that today's war is not like yesterday's, and one must consider robotic weapons in their informational context when in irregular situations. One must also consider the potential to further obscure the reality of conflict from policy makers as the prosecution of war is handed off to machines that do not come back in flag-draped coffins.

"Chinese Military Operations Research: Considering the Impact of Culture, "Speculative Philosophy," and Quantitative Analysis on Chinese Military Assessments"

Mr. Jason E. Bruzdzinski, The MITRE Corporation, examined the evolution of Chinese Military Operations Research (MOR) from Sun Tzu to the present. For almost all of the past 2500 years, Chinese MOR has been based on qualitative analysis. This qualitative approach to military operations is deeply rooted in the Chinese culture, as might be expected from such a long period of application. In Western societies, however, a quantitative approach to MOR emerged about a century ago and has been a basis for western military operations since WWI.

The emergence of quantitative MOR in China can be traced to a single person, Qian Xuesen. He was born in 1911 and came to the U.S. in 1935, where he studied at MIT and later Caltech, also having served in the U.S. Army. In the 1950's he was deported to China on suspicion of spying, and even though he allegedly took none of his research papers with him, his knowledge of western thinking and application of operations research had a huge impact and ignited the area of quantitative MOR in China. As might be expected, there have sometimes been clashes between the

older qualitative view versus the introduction of western quantitative operations research, but the development of much of the Chinese defense research and development centers today can be traced to the modern approach introduced by Qian Xuesen.

Today MOR in China is revealing itself in a number of national laboratories, academies, and professional organizations. In addition, two national level programs, the High Technology Research and Development Program of China and the National Key Basic Research and Development Program, have core scientific aims based on an analytical approach. Chinese programs are beginning to look more western in their application of operations research as well as in the modern institutions that are coming into being, from its national defense university to its military engineering science society. The recent emergence of such military capabilities as the ability to intercept low earth orbit satellites can be attributed to a formal Chinese framework for MOR.

Mr. Bruzdzinski expressed his view that the Chinese tend to view MOR as the bridge that links military science with military systems engineering. He presented the three-layered view of Qian Xuesen that "in military science there is military study at the basic level of theory, military operations research at the level of technical theory and military systems engineering at the level of applied technology." From all of the above and his presentation, Mr. Bruzdzinski cautioned western societies that the "potential exists for miscalculation, surprise, and intelligence failure" with regard to observing China's application of MOR. China was late in applying MOR and may apply it differently than the west might expect, he noted, because of the heavy influence of culture and the historic application of qualitative analysis. He suggested that to avoid miscalculation, the United States should study the culture of China and how it applies Military Operations Research.

Panel #3B

"Rethinking Insurgency"

Dr. Steve Metz, Strategic Studies Institute, U.S. Army War College stated that Insurgency is now coming back in vogue. Before 2001, it was

thought of as a Cold War concept and was not of interest. This rebirth in insurgency is a result of renewed interest caused by the new Army/Marine Doctrine and the Joint Doctrine. Some are concerned about the approach to relearning insurgency. You cannot just take what we knew from the past, dust it off, and use it again. For this reason, Dr. Metz is concerned that our present and future military missions may be on the wrong track. That opinion is based on two reasons. One is an outdated conceptualization of our strategic objective. The old conceptualization was that insurgency was a variant of war arising from evil people to advance their own interests. The strategic objective was to gain full control and "victory."

Contemporary Insurgency, by its nature, is part of complex conflicts produced by flawed cultural systems. The problem is that insurgency is a piece of broader systemic problems and cannot be treated as a separate issue. We must rethink our approach because there is a persistent underestimation of what it takes to prosecute insurgency.

The new insurgencies deal with more participants than the old concept. In addition to the traditional players, there are also "Third Forces" composed of militias, organized crime, and private military corporations. Also there are "Fourth Forces," which include transnational media, transnational corporations, and non-governmental and international organizations. It appears the playing field has broadened considerably. Although insurgency was looked at as political, new reasons are psychological rather than political; that is, reasons may look political but arise from much deeper causes. For example, insurgents' participation is empowering, providing psychological fulfillment, personal identity, and income: a way of life. If insurgency is missing, the results are disillusionment and bored individuals who may turn to militias or organized crime.

Dr. Metz then discussed Strategic Variegation looking at three models. The first is "Maoist." This approach has been the standard; it attains parity by winning over "undecideds" and, ultimately, seizes state power militarily. Examples include China, Vietnam, Angola, and Mozambique. The weaknesses of this approach are that success requires state sponsorship and there is a chance for military defeat. The second model is "Parasitic." This model is one of the evolution of grievance to greed. It starts out looking like a political movement but becomes quasi-political, more like

organized crime seeking operating space to extract resources. This model also has several weak points. It needs a power vacuum to coalesce, may be vulnerable to delegitimization, and could alienate the population. Examples of this are Columbia, Sierra Leone, Liberia, and the Congo. The third model is the "Terrorist" model. It seeks to win by sustained psychological contact to wear down and exhaust the will of the state. It is never Maoist seeking state control. Examples of this type are South Africa, Iraq, and Palestine. This model shows the changing nature of control. Traditional insurgency was physical; now it is a combination strategy for punishment or retribution.

Dr. Metz's presentation then turned to implications. He believes that the United States has a one-size-fits-all mentality about insurgency and counterinsurgency. Our assumptions in these areas are fragile. We assume we can sustain the necessary effort, but a danger point is hit after about three years when the insurgency has not weakened. We believe that partners can simultaneously thwart and reform insurgency. We believe that strengthening the government can lead to stability. There is an "Iron Rule" for Counterinsurgency that the government has the advantage in military Battlespace, but not in the psychological and political areas. Hence, insurgents seek to make the military realm less important and the psychological/political more so. This idea suggests that those governments that are less receptive to political/psychological pressures will be most effective. In other words, non-democracies will be better at countering insurgents.

Counterinsurgency is hard, expensive, and risky to our strategic culture. We have a habit of tinkering with other societies but we fail to take the next step to re-engineer them. Unless we take that next step and do it right, demanding deep change from our partners, we should not do it at all. It will do more harm than good. He concluded that insurgent victory poses less of a threat to U.S. interests then involvement in a protracted counterinsurgency campaign.

"Developing Military Force Structure Concepts and Choices for 21st Century Operations"

Mr. Christopher Wright, in his presentation, indicated that if the best mix and scope of capabilities is to be achieved and maintained, there is a

need to improve the understanding and description of military capabilities and capacities for 21st Century operations,. The appearance of new forms of conflict, sometimes expressed as "irregular," "unconventional," and "disruptive," have brought the need to develop counters that involve tools and concepts very different from traditional military force. Yet the ability of the most senior decision makers to perceive the right mix and extent of these new capabilities may be confounded by a lack of understanding of the new capabilities' capacities and limitations and by an inability to weigh what mix of traditional and new capabilities is appropriate. New analysis is needed to depict the current capability, limitations, and risks in capabilities for the new forms of conflict. New analysis also is needed to help inform decisions concerning the mix of traditional and new forms of capability in the face of significant resource constraints.

There is a great deal of difficulty in appreciating the actual combat potential of an apparently well-understood current weapons system or organization. It is easy to understand how entirely new forms of capability can be very hard to understand. How much "computer network attack" capability do we have, for example? How much might we need? What are the force structure elements for "computer network attack"? How many squadrons or brigades do we have, and how many are enough?

Evolution and change in military force structure have been ongoing across recorded history, but especially in the immediate aftermath of the Cold War. Concepts such as "cadre divisions" and "triple round-out" divisions were seriously studied; new units intended to provide a means to regenerate large conventional ground forces during a period of protracted warning, attendant to the re-emergence of some threatening "new Slavic union" that might have followed the collapse of the USSR. New force structure elements are probably also needed now, and we need to be able to describe them and their output in ways that will facilitate tradeoffs with existing capabilities and concepts. Bottom line, in today's military, we are looking at forces that are multi-roled and multi-functioned to meet present/future needs.

How might we decide what mix of capabilities is needed now and set up options for senior decision makers? One fairly simple way that presents itself as a starting point is a budget-driven method. Each force

structure component has some set of resource costs—personnel end strength, investment costs, and recurring operational costs. It is possible to estimate the costs, direct and some indirect, for mixes of different force structure packages that will fit within a projected funding envelope. This approach would invite the leadership to compare equal cost options and look at whatever output measures and capacity statements were available to help decide what mix of capabilities might offer the best hedge against perceived threats.

There is a natural resistance to "budget-driven" decision making. Military planners typically seek to begin with "requirements" and try to force the greatest possible efficiency in meeting as many of these so-called requirements as possible. The Defense Department's new experiments in **Capabilities Based Planning (CBP)** takes an analogous approach, seeking to maximize efficiency and output by delegating tradeoff analysis to selected **portfolio** managers, who are seen as more expert on the details than the top headquarters staffs and better able to identify the right offsets. This new tool is known as **Capabilities Portfolio Management (CPM)**.

The Defense Department understands that the largest tradeoffs decisions—mixes of land, sea, air, space, and cyberspace capabilities—are beyond any simple mathematical determination. The risk is that inertia will sustain costly traditional forces and a consequent failure to add sufficient new capabilities may leave us weak in meeting real challenges that may prove more harmful than the traditional challenges of old. Accordingly, there is a need for innovative thinking and new analytical tools that can better illustrate capabilities, capacities, and risks in the new forms of conflict. Will we be well informed enough to make the right choices?

"Raising the Bar: Creating and Nurturing Adaptability to Deal with the Changing Face of War"

Mr. Donald Vandergrift introduced his presentation with a discussion of the current and emerging military operating environment. He noted that we must look to dealing with the changing face of war and preparing leaders to deal with those changes. Generations of war have moved from "State vs. State," the only legal form of war, to non-state war, with highly

irregular/partisan/guerilla warfare, terrorism, and criminal organizations. War has changed from linear to non-linear in nature, and we must educate people on how to deal with fighting this new modern war. We need to set the correct environment and give the right people, in the right place, the right capabilities to make the correct decisions about war.

In these modern times, there is more and more complexity in the types of threats. The "Adaptive Leader" must be able to deal with more than one threat at a time. He noted that there are seventeen focus areas, which leads to a parallel, systemic evolution. New career paths need to be changed to adapt/accommodate these new focuses.

People-Centric Warfare addresses investing in people as an operating system. Our army is still structured to work operationally on a large scale, but it needs to be modified to have the flexibility to operate in small-scale contingencies. At what level does this flexibility occur and with what "freedom of action"? We have been characterized by having free thinkers at the political level; it needs to become politically tolerable to have free thinkers "junior" level, not just at the strategic level.

Mr. Vandergrift believes that there are a number of barriers that exist to change. Our military is organized for mobilization and has lax requirements in some educational institutions that make it too easy to become an officer. A level of mistrust of the military still exists in some public sectors. He sees a need to effect change/reform in order to raise the bar on the Reserve Officers' Training Corps (ROTC) program. Historically, the Army's response to their shortfalls in junior and field grade officers was to commission more (less stringent standards), promote more, and promote earlier. It was a production line that had strategic, operational, and tactical impacts. In reality, experience went down, quality suffered, competence suffered, and ultimately retention pays for it. Education and training need to change.

Change for the military is now identified as increased cognitive skills education, that is, more mental prep: cognitive, emotional, knowledge development, and improved perceptual processing. The Basic Officer Leader Course (BOLC) I establishes the foundation in cognitive skills: "how to think." BOLC II, "Culturalize," brings together those who passed

through the "gate of commissioning," and creates bonds. In BOLC III, new officers receive specialized training, and from there will continue their education with On the Job Training (OJT) or from further specialized schools. This focused action plan centers on cognitive development.

In a Learning Organization, cadets find answers. If cadets suffer the emotional trauma of failing, it is in a face-saving environment. When answers are discovered, it is more meaningful to cadets. To help with the cadet learning curve, teachers have been assisted by several tools. Tactical decision games have been identified as a key. Intensive individual assessment, feedback, and development planning have also been utilized. Also, force on force, free play exercises have proven successful.

In conclusion, we are presently looking at a 2nd generation army with 3rd generation personnel. The evolution to a 4th generation of war has begun pushing more demands and requirements to lowest possible levels. Merging this with traditional levels of war decision making can have a positive impact on strategy. Frederick Taylor, on his evolution of training and evaluation processes, states that we must focus on fundamentals: academics first, with a crawl, walk, and run approach. The Army is adapting by climate, not by culture. The culture must evolve slightly ahead of other institutional changes in order to be in place. We need to nurture traits of desirable behavior and to make certain changes to ensure success. The hardest part is to develop the details of a strategic step-by-step plan for how to move from here to there.

Background Briefing: Wednesday Afternoon, 15 August – Global "Economic Warfare;" Maintaining the "Edge:" Future Strategic Challenges to U.S. Economic Sustainability

Mr. Graham T.T. Molitor, President, Public Policy Forecasting, provided an enlightening discussion on the future strategic challenges to U.S. economic sustainability. Economic performance, particularly in a rapidly globalizing marketplace, becomes an indispensable adjunct of national power, prominence, and survival. Prowess in economics and national security go relatively hand-in-hand and will shape the future for the United States. Countries with winning strategies over the past twenty-five years include Sweden, Japan, and Singapore, while China

and India loom as the future powerhouses competing with the United States. The United States will continue to decline as an economic power as others grow in tomorrow's global landscape unless it changes its policy and focus.

Economic warfare underscores that the survival of the fittest can be a combative foray. Survival also means preserving vital assets for both sides of international trade and commerce. Means of production and business represent huge investments not to be devastated and squandered by destructive acts. History shows a wide range of conflicts, and the future promises a wide range of disorder, to include ethnic/sectarian based extremism, terrorist attacks, insurgencies, resource disputes, water wars, etc. The way ahead is fraught with uncertainties that require global vigilance, even while nations make their way toward globalization of commerce and stability.

Trends indicate that the United States is losing its global position, with a declining share of world trade volume, increased job outsourcing, fewer scientists and engineers as compared to competitor nations, etc. The United States must take steps to prevent further decline by increasing innovation with resolve and determination. U.S. economic development policy must be based on visionary thinking and planning; it holds enormous potential to enhance human conditions and to change where entire economies are headed. Leaders need to look to more conscious and aggressive long-range thinking and planning versus the shorter range as evidenced recently. Economic development is derived from and driven by scientific and technological advances.

Looming over the course of this millennium are prospects for at least five new major economic centers of activity that will shape and transform things yet to come. The "Big Five" eras expected for the United States are Leisure (year 2015), Life Sciences (year 2100), Meta-materials (between years 2100-2300), Fusion Energy (between years 2250-2500), and New Space Age (beyond year 2500). Technological and organizational advances will further reduce time on the job, creating the demand for increased leisure time activities. The Life Sciences, or biotechnology, will see innovative genetics and significant changes. Meta-materials will see advances in nanotechnologies and particle detection. Fusion Energy, or

the New Atomic Age, will see succession of resources to meet energy demands as the world runs out of fossil fuels and petroleum. The New Space Age will provide increased space travel and new technologies. The United States needs to be in position to take competitive advantage of these opportunities, and that requires deliberation and the development and setting of realistic national goals and the appropriate strategies to realize those goals.

Global trade volume grew twenty-five fold between 1950 and 2007 and continues to grow at an even faster pace in the world's rapid globalization. Currently, China is ranked seventh and expected to catch up rapidly with leading export nations such as the Euro area, the United States, Germany, United Kingdom, and Japan. China continues to grow among the world's industrialized nations due to its vast population and low labor costs. China already has an export-led, high-growth economy, and it is rapidly becoming a consumer-oriented economy. Added to vehicles and fuels, the vast array of goods and services, ranging from public works development to car washing establishments, shows the tremendous potential one sector has on the Chinese economy, not to mention the other sectors that will explode once China improves its mobility and transportation infrastructure. Looking at GDP, China is growing rapidly and India is not too far behind, likely jumping to second and third place behind the United States in affecting the world landscape.

Country by country, alignments and collaboration in international commerce are heading toward a triumvirate of regional blocs. These convenient trade arrangements are likely to continue enlarging their reach both within their trading blocs and inter-regionally. European nations head the list of nations currently garnering the largest percent. The next bloc of aligned trading partners includes the United States, Canada, and Mexico—and may soon include Latin and South America. The fastest growing is the Asian Pacific rim, which includes several powerhouses: Japan, China, Australia, South Korea, Singapore, and others.

Pondering the demographic future, a key question is: how long will China retain the status of the world's most populous nation? Demographics forecasts project India overtaking China in the not-too-distant future, and the United States will drop to sixth or seventh. Not only will India and

China top the largest list of countries, but other nations, such as Nigeria, Indonesia, Brazil, and possibly Pakistan, are destined to move toward the top of the list. The last four countries are likely to impose new major power relationships in the years ahead. The major populations of the world are mostly crowded into vast urban sprawls or mega-cities; most of these are situated close to shores and giant rivers. Agriculture, bolstered by full-blown ago-biotech, potentially could make vast farmlands available for settlement. Multi-sited biotech food factories already have been sited to supply nearby sizeable communities.

Is the United States losing its technological edge? Recent studies show that Asian nations account for the overwhelming share of global engineering talent that has slipped away. Both China and India produce far greater numbers of engineering and technical graduates as compared to the United States. The sheer size of the U.S. investment dedicated to science and technology overwhelms all nations, with Japan ranking second and with China lower.

Panel #4: Creative Strategic Approaches to Future Intelligence Analysis and Decision Making in Economic Policy and Strategy

Dr. Marvin Cetron, President, Forecasting International, chaired Panel #4.

"Tigers and Dragons and the Effect on the Eagle in the Future"

Dr. Marvin Cetron discussed the emerging growth of China and India and the effects of that growth on the United States. India is a democracy; China is not, and it has no intention of becoming one in the near future.

Economy - China is the world's third largest trading nation behind the United States and Japan. India is not even in the top twenty. India still imports more than it exports, while China is a major net exporter. China is building important trade alliances throughout Latin America; Sino-Latin trade grew 991% between 2001 and 2005. China has built its economy on manufacturing (53% of GDP), India on services (61% of GDP). China's manufacturing output grew by 27.7% and India's grew by 8.2% in 2005.

Demographics and Literacy - China's population is aging while India's is growing younger. In China, 11% of the population is over 60; by 2040, 28% will be over 60. In India, the number over 60 will not reach 11% until 2025. India's population grows by about 1.4% per year, China's by only 0.6%. In 2020, there will be more Indians than Chinese. As to literacy, no less than 91% of Chinese can read and write well enough to meet UNESCO literacy standards. Only 61% of Indians are literate, even by India's standards, which are much less stringent. Some 48% of Indian women and girls were literate in the 2001 census, up from 40% a decade earlier. English training is not going as quickly as expected in China, especially in preparation for the Olympics. Virtually all educated Indians speak English, which remains the international language of business and science.

Workforce and Compensation - Only 1.3 million Indians, out of a working-age population of 400 million, are employed in the so-called "new economy," the information technology and business process industries. In India, some 250 million people survive on less than $1 per day. In China, 150 million live on less than $1 per day. About 150 million displaced Chinese peasants roam from city to city looking for work. The difference between the rich and poor is getting wider in China but narrower in India. Western companies once outsourced only routine tasks to Asia. Many now are sending high-end professional functions such as R&D to India and China, particularly in computers, software, and pharmaceuticals.

Financial Indicators - China has managed to privatize or eliminate half of its 300 million inefficient state-owned companies in the last ten years and 45% of the jobs (about 45 million) they supported. Indian privatization remains hesitant and half-hearted. China's public debt is 22% of GDP, compared with 53% in India. Inflation is 1.5% in China (2005), compared with 5.3% in India. India's per capita GDP is $3,800 (2005) while China's is $7,700 (purchasing power parity). Chinese banks hold $500 million in non-performing loans, even after two corrections of 8% each in 2007. To prevent failure of the country's largest bank, the institution was opened to foreign investment.

Energy, Technology, and the Environment - In pursuit of oil and gas, China also is trading heavily with Myanmar, Sudan, Iran, and other countries that Washington views as pariah states, while India is importing oil from Iran; this is undermining American security policies. India has put at least one public internet connection in every village in the country, giving them free access to the world's flow of ideas, while China heavily censors the net. The environment is suffering in both countries. Some 80% of China's major rivers are so polluted that fish cannot survive in them. In India, air pollution causes an estimated 2.5 million premature deaths annually, and water pollution kills 1.5 million pre-school children each year.

Opacity - a combination of corrupt business practices, the legal system, economic policies, accounting guidelines, and the regulatory framework, acts as a hidden tax on the economy. India pays foreign investors a risk premium of roughly 719 basis points on the money it borrows; China pays 1,316 basis points more than the most transparent countries do. India's "vigilance commissions" are reducing corruption in that country; China has yet to get a handle on this problem. There were 87,000 riots in China in 2005, many in protest of corrupt business deals by local officials.

Insurgencies - India now has thriving communist insurgencies—unrelated to the nominally communist political parties—in the so-called "Naxalite" (Maoist) belt in the eastern and southern parts of the country—this in addition to a host of regional, tribal, and Islamist militant groups in Jammu, Kashmir, and other parts of the country. The Muslim insurgency in Kashmir has killed some 80,000 people in the last fifteen years. The communist Naxalite rebellion in Andhra Pradesh and nearby states has killed perhaps 6,000 over twenty years, 700 in 2005 alone. One group, the Naga National Council (now operating as the National Socialist Council of Nagaland, (NSCN)), has been fighting almost continuously since 1946, despite a formal truce signed with the Indian government in 1997. The Chinese government has often referred to Uyghur nationalists as "terrorists" and has received more global support for their own "war on terror" since 9/11. However, human rights organizations have become concerned that this "war on terror" is being used by the Chinese government as a pretext to repress ethnic Uyghurs. Uyghur exile groups

also claim that the Chinese government is suppressing Uyghur culture and religion, and responding to demands for independence with human rights violations.

Forward Outlook - Both countries are developing blue-water navies and other forces capable of projecting force outside their territory. India seems content to defend its borders and shipping lanes. China's forces are designed to dominate the region and to be taken seriously around the world. On world matters, China has become more active in the Darfur region of western Sudan and now supports intervention. In Iran, China backs nuclear restraints; they want the United States out of Iraq. China's oil consumption is up 30% this year and there is a growing demand for concrete, steel, and other resources. The economic prospects in the short-term (5 years) show China in the lead; however, India leads in the long-term (over 5 years). Finally, expect China and India to work very closely together, as major corporations in India are moving their headquarters to China. Flights between India and China have tripled every year for the past three years.

"The Impact of Global Economic Parity on the United States"

Mr. David Coffman, Business Valuations and Strategies, presented his thoughts on "The Impact of Global Economic Parity on the United States." Economic parity is measured by the perceptions of the pool of potential immigrants and has two primary components that create the gap—standard of living and level of opportunity. The reasons fueling immigration include the lack of economic parity, gap awareness, and the individual's ability to emigrate from both a political and economic perspective.

Potential sources of immigration come from developed, developing, and primitive or repressed countries. The vast majority come from developing countries, since the large gap justifies the cost of emigration, the local population is globally aware, and emigration is possible, although it may not be easy. Trends show the pool of developing countries is shrinking as well as the overall gap. Why is this happening? There is widespread economic growth, increased global trade, and the increased mobility of capital funds around the world. This phenomenon has several second- and

third-order effects on the United States, which Mr. Coffman reviewed in five key areas.

- Immigration - The United States will see fewer people emigrating, then the U.S. population will stabilize, and then start to decline. Over 60% off the U.S. population growth will come from immigration over the next fifty years. As the population declines, there will be fewer workers to fill low-skill, low-wage, and entry-level jobs; 35% of certain job categories will experience worker shortages without immigrants.
- Education – Many students will come to the United States for education, but fewer will stay as they return back to their homelands or other areas of opportunity. As a result, there will be a shortage of qualified service and technology workers, and the offshore outsourcing of these skill sets will become necessary.
- Service Economy – The shortage of low-skill and entry-level workers will create second- and third-order effects. Wages and prices will rise and impact the service industry, a critical component of the U.S. economy. Service providers will be operating at capacity and unable to expand. Many will fail due to a lack of workers in the pool and increasing wages. Demand for services will fall, and customers will find ways to cope.
- Capital Markets – These markets will become more global, as there will be fewer restrictions, more established markets, more consistent transparent reporting, and increased global growth opportunities for those able to take advantage. As a result, U.S. government securities may not be a safe haven as increased demand tightens credit markets, interest rates increase, and inflation increases as deficits are funded with new currency.
- Economic Growth – Growth will slow as population stagnates. The service economy will either collapse, or contraction will cause a severe recession. The recession will cause deficits, increasing the U.S. national debt, and there will be fewer foreign sources to fund U.S. debt.

In summary, how can the United States prepare for this economic parity? First, government can do no harm with limited intervention. Second, the private sector needs to re-engineer its business models to

meet the changing needs. Third, innovative and entrepreneurial small businesses must replace the failed small businesses that don't innovate. Last, individuals must increase their skill base and keep re-learning newer technologies.

"Russia: The Impact of Organized Crime and Terrorism on Global Economic Stability"

Mr. Brian Bruh of Brian Bruh and Associates discussed the financial aspects of international organized crime, with an emphasis on Russia, to include aspects of terrorist financing. The questions he posed were "What is organized crime?" and "Does Russia sponsor crime?"

The original FBI definition of Organized Crime was that it must be Italians with names ending in e, o, u, or i. It included the five families, and it had the ability to corrupt, had structure and hierarchy with assigned territories, and even had money-producing criminal enterprises. Narcotics dealing was considered taboo. Early Russian organized crime in the United States featured "Bust-outs," including bank fraud and identity schemes and diesel and gasoline tax fraud schemes; it also featured violence and viciousness.

The U.S. Department of State's 2007 International Narcotics Control Strategy Report noted that Russia's financial system does not attract a significant portion of legal or illegal depositors, and therefore, Russia is not considered an important regional financial center. Criminal elements from Russia and neighboring countries continue to use Russia's financial system to launder money because of familiarity with the language, culture, and economic system. Experts believe the laundered funds are not from drugs, but rather from domestic criminal or quasi-criminal activity.

Despite making progress in combating financial crime, Russia remains vulnerable to such activity because of its vast natural resources, the pervasiveness of organized crime, and a high level of corruption. Other reasons for vulnerability to money laundering and other crime are porous borders, a weak banking system, and low public confidence in the banking system. Russia has passed legislation that could enable it to pursue and prosecute financial crime. Their legislation obligates banking and non-

banking financial institutions to monitor and report certain types of transactions, keep records, and identify their customers. Russia has set up systems, but it rarely follows them or ensures they work effectively. Some officials fear reprisal from organized crime, so corruption runs rampant. Recent indicators show that organized crime is rising within Russia. Examples include increased killings of bankers, businessman, and journalists, murder abroad, massive corruption in the tax agencies, and investigations against only select people and organizations.

Not all governments are effective in combating international crime and terrorism. Bermuda, such a tiny island, has over 3,000 financial institutions that are somewhat loosely regulated. In countries like Mexico, Switzerland, Liechtenstein, Austria, Luxembourg, and Germany, it's not a crime for a financial planner to take large commissions for transactions. There are many ways to transfer funds in this global economy, but efforts need to be made to improve the prevention of money laundering and to uncover it before it contributes to the financing of terrorism.

In summary, aside for reasons arising from corruption and crime, there are serious opposing forces in governments and financial institutions to prevent and expose money laundering. Financial systems must move funds rapidly and safely, and governments are always under pressure to let them. Having said that, governments are failing to devote sufficient expert resources and take effective actions to prevent and uncover money laundering, including the financing of terrorism. We must look at the accomplishments of governments to deter, expose, and attack the proceeds of organized crime, including terrorist financing, i.e. international cooperation, successful prosecutions, jail time, and the seizure and forfeiture of assets. With respect to the growing effect that Russian organized crime can and does have on the United States' and world economy, it is best to quote Garry Kasparov, former world chess champion and head of a pro-democracy opposition organization in Russia: "We in the Russian opposition have been saying for a long time that our problem would soon be the world's problem. The mafia knows no borders. Nuclear terror is not out of the question if it fits in with the Kremlin business agenda."

Background Briefing: Thursday, 16 August - "Strategic Thinking in a Complex World"

Ms. T. Irene Sanders, Executive Director of the Washington Center for Complexity and Public Policy, discussed the application of insights from chaos theory and complexity to strategic thinking. She discussed the FutureScape ® visual thinking tool used to enhance strategic thinking for major corporations, non-profit organizations, and governments worldwide.

Over the last thirty years, rapid advances in high-speed computing, computer graphics, and computer modeling technologies have given scientists powerful tools to assist in deriving insights. Complexity Science is the new science of change. What is complexity? Complexity arises when an increasing number of independent variables begin interacting in interdependent and unpredictable ways such as traffic, weather, and the stock market. Complexity Science is a growing body of interdisciplinary knowledge and a new vocabulary about the structure, behavior, and dynamics of change in Complex Adaptive Systems. Complex Adaptive Systems are open evolutionary systems that continuously process and incorporate new information to survive; the system must adapt to the change. Self-organizing stable structures, such as the brain (and whirlpools), are constantly processing and incorporating new information. Knowing the rules is important in shifting the behavior. The simple rules of emergent behavior are flocking, herding, and swarming. The swarm theory involves simple rules allowing the pattern to easily form.

How do you swarm a swarm? This involves big-picture thinking and analysis, dispersed real-time intelligence—UAVs, satellites, human intelligence, boots on the ground—deployment through the system, and the use of asymmetrical advantages. In counterinsurgency knowledge, our temptation is to use history the way a drunk uses a lamppost, for support rather than illumination. There are many methods available, but do they recognize the properties of complex adaptive systems? What kind of knowledge about the system is provided by the method?

Ms. Sanders related the intelligence community with a brain in search of a mind. She asked two important questions. Is our Intelligence

Community a healthy evolving complex adaptive system? What does it mean to lead or to fight a complex adaptive system? As Bill Gates has noted, "complexity gets in the way of change." In comparing the models of data visualization versus visual thinking, the human mind is still the most powerful information processor available. Data visualization involves forecasting, while visual thinking tools involve hindsight, insight, and foresight.

FutureScape ® is a tool for tapping the collective intelligence of an organization or group. It can provide a weather map of the larger environment as well as visualize connections, patterns, and relationships. The benefits of FutureScape ® are that it supports non-linear thinking, helps to identify emerging conditions and opportunities, addresses clusters of issues and questions; it applies the hindsight of the past, provides insight to the present and foresight to the future, and results in direction setting. The outcomes of FutureScape ® are big-picture thinking, pattern-recognition, a representation of an emerging, evolving future, nonlinear connections, asymmetric features, synthesis, and analysis.

She quoted Sun Tzu: "What everyone knows is what has already happened or become obvious. What the aware individual knows is what has not yet taken shape, what has not yet occurred. Everyone says victory in battle is good, but if you see the subtle and notice the hidden so as to seize victory where there is no form, that is really good."

In summary, complexity represents a fundamental shift in thinking, a new worldview, a theory-driven framework for thinking about the nature of the world we live in and the systems we seek to influence. To be an effective 21st Century leader, one must understand and develop the skills of complexity thinking.

Panel #5: Advanced Scientific Approaches, Strategic Scenario Development, Modeling, Simulation, and Gaming that enhance Intelligence Analysis, Experiential Education, Decision Making and Problem Solving across the Elements of National Power

This panel was split into two groups and made simultaneous presentations. Panel 5A was chaired by Mr. Timothy Smith, Office of

Naval Intelligence, and Mr. John Rovegno of the Proteus Management Group chaired Panel 5B.

Panel 5 A

"Teaching the Holistically Integrative Analysis of International Change: a Commentary on the Proper Teaching of Emergent Futures Analysis"

Dr. Guntram Werther, Professor of International Politics and Economics at Western International University, presented a view of what is necessary for achieving competent, emerging international futures forecasting. Dr. Werther began by noting that, in general, societies do not change serendipitously, there are some indicators that change will happen. However, exactly when change will occur is very difficult to quantify. According to Dr. Werther, "the ripening is apparent but we do not know when the fruit thereof will fall."

He urged students of the forecasting of international change to take a more holistic approach to analyzing the process. Although a qualitative approach to this topic was usually taken in the past, the 20th Century has ushered in quantitative methods and specialization, as opposed to a broad and general education that, he argues, is best qualified to see "patterns." It is pattern sensing (and eventually absorption into "flow") that gives the necessary tools to the true student of holistic integrated change analysis. It is better to think in patterns, as opposed to models, like economics, that are based on numbers.

Dr. Werther points to multiple, historic figures for sage advice in this arena. For example, Aristotle said "the good critic in general is the man with a general education [who is] …versed in the practical business of life." Dr. Werther pointed to many new technological tools at our disposal, but these tools, he says, "lack the ability to holistically assess." As the United States tries to face international problems that are increasingly and dynamically complex systems, it nonetheless finds itself unable to model the problem set and "cannot predict their consequences within embedded complex adaptive systems dynamics." One solution is to be properly grounded in many disciplines so that a holistic view of the problem can be envisioned.

Dr. Werther builds the foundation for his thesis on certain competencies necessary to solve the multi-cultural, human dynamic change process. One is the cross-cultural, multidisciplinary, and historical competence that he terms "layering the onion." Another is "interpenetration," which provides an understanding of relationships and patterns with their concomitant supports and weaknesses. Still other competencies involve learning how change happens among complex systems, to include "normal" change, and gaining a grasp of how bias plays a role in complex change systems. Dr. Werther stated that holistic integration of all of these competencies is "never straight-line thinking." A proper education in many disciplines is required for such complex integration. Such an education, he reflected, can be hard to come by in the modern educational value system, which prefers the kind of specialization that can impede holistic pattern recognition.

In Dr. Werther's opinion, the student of holistic change analysis and forecasting must "put in the mind" the way things flow; they "must learn to see flows." This, he says, is the critical shift for students and therefore "at truly predictive levels…it is a study in synchronous flows…this last capacity…was a trained mind within a found talent." Among his students, he observes that "some…are seeing flows," but, "they either see it or they don't. "

"Rethinking Thinking: Three Methods for Achieving More Creative, Responsive Strategic Intelligence Analysis"

Dr. Barton Kunstler, consultant and educator, analyzed three organizational models that can usefully be applied to Homeland Security, the Departments of State or Defense, and other agencies for creating foresight of ideas, and promoting positive results. The three formats essentially take the form of social networks that themselves are governed by the same mathematical laws applicable to electronic networks. Three common properties of all networks are nodes, connections to nodes (communications paths), and speed of information dissemination. He concluded his presentation by discussing how the efficiency of the networks can be improved by such measures as content quality and structural agility.

Each of these three organizational models has the objective of achieving more creative and responsive strategic intelligence analysis. The models are the Hothouse Effect (THHE), the Cleisthenian Model (CM), and the Converging Uni-Modal Approach (CUMA). Each has its own benefits, and each stems from or is analogous to historical examples, be it ancient Greece, medieval Europe, or Thomas Edison's laboratory. Each can be characterized by common attributes, with variations on that attribute, such as functionality, duties, allegiance, and hierarchy. For example, in the CM model, leadership duties in the organization (composed of varying cultures) rotate daily such that each day has a different president or chairman. This is unlike the THHE model where leadership is determined by skill sets, or the CUMA model whose leader emerges only when needed. Similarly, allegiance in the CM model is multiple, since the constituents come from multiple sources, whereas the THHE organization is dedicated to creativity or to the project (the Edison lab for example) and the CUMA organization owes its allegiance to the vision of the organization.

The basic objective of Dr. Kunstler's enquiry is to find an answer to the following question: "Is there a set of organizational conditions that, by its very nature, liberates the creative and cognitive energies of its members and, most particularly, of the knowledge workers of the intelligence services?" Finding the answer (or perhaps more than one) could help attain a reordering of the intelligence services to better elicit information by speeding up the transmission of the information, giving more freedom to the information workers at the discovery level (the "muckers" in the Edison lab), and creating atmospheres in organizations that are more motivating, self-organizing, and empowering; all of which could yield better results.

Ultimately, the objective is to apply the right dynamics for organizations to counter the effects of bad actors, be they terrorists or drug cartels. These organizations have their own organizational models, such as being "hydra-headed" or operating as independent cells. The hope is that by exploring new models and cultures for our intelligence services, either through challenging current standard operating procedures or radically transforming the internal culture of our knowledge-based organizations, a better network can ensue to counter the bad actor groups.

"Predictive Network-Centric Intelligence: Toward a Total-Systems Transformation of Analysis and Assessment"

Mr. Timothy J. Smith, Office of Naval Intelligence, proposed that a national all-source analysis system be put into place in virtually a 24/7 operation to avert and respond to national threats. In this fashion, a multi-dimensional network could achieve predictive capabilities surpassing today's standard. Most intelligence failures, he argues, arise from the analytic phase of the intelligence cycle. The proposed methodological model would fuse both the "right and left brain" functions to allow for the creative and critical thinking activities needed to solve the whole intelligence picture. He additionally asserts that no new tools or products are needed, but rather that the teams of analysts would be hyper-networked in a way that generates an increase in performance due to a higher degree of collaboration.

Mr. Smith builds his model around team collaboration. Each team is interdisciplinary, interpersonal, interdepartmental, and interagency. Each team, therefore, achieves multidimensional synergy. Each team also comprises sub-teams, which are further broken down into workgroups. Teams are co-led by facilitators who are skilled at managing agendas that can overcome "groupthink" and by intelligence managers who are expert at intelligence production within their domains. Teams can be seen as having intelligence subject matter experts, academic scholars, methodologists, theoreticians, and technicians. The confluence of these disparate disciplines results in highly cognitive brainstorming and hypotheses constructs.

A sequence ensues in which situations are modeled, operations research tools are applied, and analyzing techniques are generated to formalize the intelligence situation at hand and subject the model to rigorous hypothesis testing through simulation experimentation. The synthesis that follows produces intelligence assessment reports, computational simulation models, and simulation data sets.

Each of the nodes on the network, at every agency and department, is known as an Intelligence Training, Assessment, and Simulation Center (ITASC). Mr. Smith sees the networking of 24-hour ITASC nodes as a

revolutionary transformation that produces a unified national intelligence laboratory system with one ITASC serving as a national hub. Integrating all ITASCs with voice, data, and simulation, in effect, creates the national intelligence-warning network necessary for the 21st Century. Such 21st-Century computational collaboration, Mr. Smith argues, can provide predictive power superior to any previous capability.

Panel 5B

"A Model for Collecting and Analyzing Open Source Information in Universities and Research Institutes for the Purpose of Identifying and Analyzing Over the Horizon Threats and Vulnerabilities"

Dr. William G. Perry, Western Carolina University, began by identifying the threat of active targeting of our universities and research institutes by foreign intelligence services. He believes our capacity for identifying vulnerabilities and threats that are associated with students, faculty, and researchers is lacking. The information needed, however, to recognize potential threat vectors that seek to exploit our vulnerabilities may be publicly available for analysis.

He outlined a model that could be used to identify emerging threats that are already associated with the intrinsic vulnerabilities in our open system. He recognizes that agencies of the federal government may be limited, however, university or state employees may be in a better position to collect, assemble, and analyze open source information related to institutions without significant restrictions. For example, a tenured university professor would be able to collect and analyze open source directory information, sensitive on-campus research, and program information for the purpose of conducting research in the field of "risk analysis." Such an effort would be considered as service-related activities or research.

He proposed that open source information gathered and crystallized, be given to professional intelligence analysts to combine with classified information and used to identify threats and vulnerabilities. As an instructive real-world example, he presented the following hypothetical scenario:

A state-supported university hires a professor from an aggressive nation that is a strategic competitor of the United States. Information related to the hiring of the professor is publicly available. The professor begins to work on a survey to be administered to each State Director of Homeland Security. The purpose of the survey is to determine the opinions of the state directors as to the degree of their state's "readiness." The work being done by the professor is also publicly available. Combining the two early signals (country of origin and the sensitive nature of the topic) could generate a warning and active monitoring by an appropriate law enforcement agency. The professor in the example gathers the raw data and tabulates the results. The professor then returns to his country of origin in a time frame closely associated with that of summarizing the results. Information related to the travel request/authorization of the professor is available in an open source. All three of the signals (country of origin, the sensitive nature of the project and the budget request to his native country), when fused in a model might may then be elevated to a critical level for further analysis, monitoring, or action.

Most universities and research institutes actively promote diversity, resulting in opportunities and financial support for research and travel is readily provided to foreign nationals. This financial support also provides vast amounts of money for supporting critical research in areas such as nanotechnologies, computing and photonics, infrastructure protection, etc., which underscores the target rich environment in which potential risks become reality. Additionally, foreign interests are seeking students who are earning dollars while employed by universities and research institutes to gain and transfer critical knowledge and technology.

His description of a proposed model contains distinct variables that are associated with threat vectors identified from historical databases and then dynamically fused to gain valuable insights. That raw data would need to be structured. He suggested the National Security Threat List is a good place to begin to develop distinct items that should be monitored. Any items relating to terrorism, proliferation, espionage, the national information infrastructure, or threats to the government from foreign intelligence activities should be included as components in the model. Each element contained in the model would need to be structured. The data needs to be discrete, labeled, and of an appropriate type.

Threat indicators could be selectively branded, dynamically weighted, fused, statistically treated, and used as a lens to focus Intelligence Community resources. An estimate or judgment would be made based upon a scale used by the Intelligence Communities that consists of "Remote," "Unlikely," "Even chance," "Probably," "Likely," "Almost certainly." (These were taken from the National Intelligence Estimate, July 2007. This represents a sense of the probability of a development or event.)

Dr. Perry's theory is that relevant open source information that is publicly available at universities could be identified, gathered, and structured. Data sets could then be combined with other sources both "open" and "classified." This gathering and processing of large quantities of data could be done using specialized software known as neural network software.

A neural network software model could be constructed to analyze and process raw data collected or mined from open sources. Weighted independent variables associated with threats could be used to generate output that would identify likely targets and vulnerabilities to help isolate potential threat vectors to more effectively deploy limited counterintelligence resources. Neural network software mimics the way human neural networks function, however, Prof. Perry proposed an artificial neural network to build a statistical model using structured data points to predict the probability of future behavior. The more accurate the data sets used to "learn" by the neural network software engine, the more accurate the projections that can be made. Outcomes would be stated in terms of probability.

Neural network software works best for analysis with complex prediction problems that are associated with non-linear relationships among data or variables. Neural networks excel in classification problems for decision-making. Neural networks seek to combine contributors to future outcomes by examining the strengths of connections among contributing components. Some of the computing functions associated with a neural network software model would include classification, pattern and sequence recognition, filtering, and further analysis to yield a signal flow that can be used for decision making. A neural network for

the analysis of open source information would need to be trained with structured data and then be used or applied as classifiers of new data. Neural networks are trained with sample data sets and values that are pre-set (even with built-in investigator bias). A neural network model could eventually be converted into a "run-time" application that can accept data from multiple data streams. The ultimate outcome would be a computer application that automates data analysis.

He noted that his goal is to create a neural network software model that would indicate an emerging threat against our nation's critical information assets and technology. The best way to successfully build such a model might be to use what is known as a "genetic training method." It allows the artificial neural network model to "learn" which independent variables are most important (establish synaptic weights) to the model.

Dr. Perry provided the following possible data set structures related to basic open source information items contained in a university directory.

A formal computer security plan – An information security specialist would judge the quality of a university or college's computer security plan. An institution without a robust information security plan is vulnerable. A scale for rating an institution's security plan might be: "1" (none), "2" (weak), "3" (minimal), "4" (strong) and "5" (very robust).

An information security education plan for employees – The best computer security plan can be published and on-the-record. However, if employees are unaware of the organization's "security best practices," all sensitive data is vulnerable. Mistakes could be made in processing and maintaining the data. Employees should be able to identify an information security breach. An information security specialist can rank an institution's education plan.

Criticality of the information or technology – A universe of sensitive national security information is the target of foreign espionage. Each unit of vital information or science that is known to be a target should be rated. "Nanotechnologies," for example, might be rated higher than "Marine Systems Technology." A five-point scale might be used: 1 (Minimal), 2 (Confidential), 3 (Secret), 4 (Top Secret) and 5 (Compartmented).

Place of Birth – Faculty, staff, or student's place of birth or 'country of origin' might be a key variable in the model. A foreign-born student from a nation known to be unfriendly to the United States would receive a higher threat rating than one from a trusted ally.

Foreign Linkages – Many colleges and universities maintain international links. Some of these links are with strategic competitors of the United States. The relationship is used by unfriendly foreign intelligence services to enhance their operations in the United States. A scale provided to weight threat potential might appear as follows: 1 (no foreign links), 2 (informal foreign links), 3 (moderate foreign linkages), 4 (formal and active foreign linkages), 5 (substantial foreign linkages with strategic U.S. competitors).

Foreign Travel Authorizations – Requests (for mainly faculty and some students) to support foreign travel are obtained within the line items of a university's budget. The records, in most instances, are public. A scale used to evaluate foreign travel authorizations might appear as follows: 1 (of no concern), 2 (of little concern), 3 (of moderate concern), 4 (of significant concern), and 5 (of serious concern).

Domestic Travel Authorizations – Travel requests for students and staff are among the first line items that are cancelled when funding runs short, consequently, they are closely scrutinized and part of the public record. Travel to a city with a diplomatic facility by a faculty member or graduate assistant whose country of origin is a competitor of the U.S. might be of concern. This is particularly true if person is an information security specialist or computer scientist specializing in encryption technology.

Visa Activity – Applications for visas for travel by colleges and universities should be routinely assessed and analyzed by the model. The intelligence community may wish to limit the scope of what is analyzed (i.e. monitor only visa requests to countries of origin known to engage in espionage).

"Counterfactual Reasoning and Structured Scenario Fusion: How to Integrate Multiple Independent Estimates into a Single Projection"

Dr. Noel Hendrickson, James Madison University, offered specific principles that analysts can apply to integrate independent estimates with greater rigor and reliability. He argued that integrating distinct estimates is precarious because one cannot simply combine individual results. Each estimate has its own unique purposes and assumptions. Thus, in synthesizing estimates, these different assumptions may conflict. For example, a projection about the consequences of a nuclear Iran might have made assumptions about our being able to purchase oil from Venezuela, and projections about the consequences of an even more hostile Latin America might have made assumptions about our abilities to purchase oil from Iran. But, each of these assumptions would not make sense if the possibility imagined in the other scenario came to pass. Therefore, an analyst who seeks to fuse independent scenario estimates risks not only mutually undermining assumptions but also basic logical fallacies. Hence, there needs to be a way to do *Structured Scenario Fusion*: a formal method for integrating multiple independent estimates into a single projection.

Counterfactual reasoning has been a subject of some major recent academic investigation. Unfortunately, none of those projects directly engaged the difficult challenge of how to integrate independently formed assessments. In response, he proposed the first formal theory of scenario fusion, which draws from the resources of all projects. He proposed that the challenge of scenario fusion is directly related to another aspect of counterfactual reasoning, selecting intermediate states. In counterfactual reasoning, once the antecedent conditions have been properly specified, analysts have to fill in the details for the period between those antecedent conditions and the time of the outcome they seek to discover. In selecting those intermediate states, they have to draw from what is already independently projected for that time period, much like one has to do in fusing scenarios. Several strategies have been developed for testing whether a particular projected event is reasonably incorporated. He explored the arguments for and against each technique, and from the results, created a full method for structured scenario fusion. With this method, analysts can bring together independent estimates without affirming conflicting assumptions or committing logical fallacies.

Dr. Hendrickson described his eight principles for structured scenario fusion preparation. He argued that counterfactual reasoning would more directly address some challenges of future analysis because conditional statements are less uncertain than categorical ones. In general, counterfactual reasoning more directly addresses core challenges of futures analysis in intelligence with much greater event specificity, more rigorous reasoning methods, more focus on specific possibilities of interest, and more detail to pass on to senior analysts to use in constructing actionable assessments for the ultimate decision-making customer.

In conclusion, he acknowledged that counterfactual reasoning is not a substitute for forecasting or futuring, but is meant to complement them in contexts (like intelligence analysis) where more than "high level" assessments are an essential part of the process.

"Apologies to Clausewitz: The New Trinity"

Mr. Alfred Elkins, Joint Warfighting Analysis Center, addressed a new approach for a changing world. The U.S. military should have a hand in exploring this new approach: setting conditions at the operational level. Finding the right persons, at the right time, in the correct mix to accomplish a mission will be paramount in the future. This new approach is an inventive and fundamentally different proposal than "achieving effects"; it leverages complex systems thinking, cognitive science, advancements in technology, and novel practices and organizations. The notion of setting conditions involves perturbating an environment and exploring or exploiting the disturbances long before a context arises that makes the need for such action obvious.

The decision method introduced is called VAST (Vantage Point, Aperture, Scale, and Timeframe) and incorporates its elements for utility in the three types of decision environments:

- Solving a problem
- Dealing with an evolving context
- Setting conditions for later exploration and/or exploitation

Vantage Point is the set of points of view, in addition to his own, that the decision maker will take into consideration in making decisions. **Aperture** is the range of feedback that the decision maker is prepared to consider. Analogous to a lens, it's an indication of the decision maker's approach to leadership at any given time. A wide aperture indicates a micro- or control approach, concentrating on a wide range of details and on the path to the objective, with less concentration on the long-term objective. **Scale** can be interpreted as the size and scope of the operation—the number of forces and missions, the geographic size of the area under consideration—or the level of war: tactical, operational, or strategic. **Timeframe** is a window in time representing the period of execution that results from a decision, or a set of decisions.

VAST helps decision makers by aiding in associating large amounts of feedback. By definition, the accumulation of actions and consequences both share responsibility for the setting of conditions. Normally, we arbitrarily choose a contextual time and space as a starting point—the initial conditions, the ones we have "set." "**Setting conditions**" refers to the ability of the force to directly explore or exploit conditions that it has established by dropping a pebble into the water and watching the ripples, together with the interaction of those ripples with other intended and unintended augmenting, countering, and crossing ripples from other players in the political, military, economic, social, and informational circles. Associating the feedback in a meaningful way would help our force to distinguish the signal of the conditions they set from the noise of all other conditions. Using the VAST framework would help achieve this association.

Setting conditions, would require the Joint Force (and, in a perfect world, all government entities) to be explicitly organized to routinely prepare for coping with uncertainty while simultaneously preparing for the possibility of exercising control during period of combat or other life- and property-threatening emergency. What does it mean to be "organized?" In cases of interest to us, it is both "who has control over what" and "what is being done." A central theme of the proposed organization structure is that the structure, in and of itself, is a means of increasing performance. This new Joint force operational-level organization would be oriented around achieving goals, rather than around integrating spatial domains

and assets. The operational-level force today is characterized by a decades-old spatially and asset-oriented component commander design that focuses on responding to taskings in the face of more certain conditions (where the set of desired and possible outcomes are bounded, possibly even controllable, even if those conditions are abundantly complex). It is, without a doubt, an Olympic-quality responder force. But are its current methods for conducting operations, for decision making, and for organizing at the operational level efficient and effective for periods when neither combat nor other emergent imperatives are expected or predicted? Is it possible to design a Joint force that would be able to better prepare itself and its combat and non-combat colleagues for infinitely uncertain futures?

Highly uncertain time periods require leaders with different C2 and organizational skills, different from those who would lead during complex combat operations. At the operational level, where "execution happens," leaders are required who excel during uncertainty, adapt to changing circumstances, and yet still think about, and are able to execute, the setting of conditions for future possibilities. Such individuals do this in spite of *widely varying*:

- Personnel abilities, training, experience, personality, and inventiveness
- Technology that may not work, or may be insufficient or inappropriate
- Timeframes and contexts
- Tasking from higher authority (or non-existent tasking)
- Methods and competency of accomplishment
- Requirements to integrate with other groups that are organized differently from the military

Not every organization has such individuals. But an organizational design is possible that both compensates for problems with and leverages the advantages of this range of situations and elements. This design uses themes as organizational elements: access, information, persistence, and projection. Regardless of the state of an environment (spatial or temporal),

from peace to war and everything in between, the themes are applicable and create a force that is both more efficient and more effective.

This presentation argued for a new organizational design called "Thematics," which is based on themes that are universal to every human endeavor. This designed organization seeks early and continuous "intervention" at the operational level in ways that are not consistent with policy, strategy, and tactics. The thematically designed organization must value continuous interventions in the environment at the risk of not seeing effects until the future—a future we cannot accurately predict or control. For our futures, we must set conditions locally to optimize behavior to be effective in the future. This ultimately will make a more efficient force, especially in operational projections beyond D-90.

The conditions-setting approach to conducting operations, the VAST decision-making framework, and the Thematic organizational structure constitute a new trinity and offer the joint operational-level force an advantage in a level of war in which art and science coexist, but in which art has been less valued.

"Future Decision: The Three Dynamics of Society: Knowledge, Society, Economy"

Mr. Bruce LaDuke presented three dynamics that contribute to the current state of any society or social division:

1. Knowledge Advance – The Center is Knowledge Creation
2. Social Context – The Center is the Balance of Interests
3. Economy (Includes education as a feeder pool for industry and industry itself) – The Center is Supply and Demand

When any one of these dynamics is weak, or when synergies between these dynamics are weak, a variety of social imbalances emerge that cause conflict.

He noted that knowledge advance has arisen as a driver of change in our world. As knowledge advances logarithmically, it is also converging. The final end of a simultaneous advance and convergence is known as singularity. Singularity will be realized as artificial knowledge creation and

will be the culmination of our increasing understanding of knowledge-working models.

As we move toward a single model of knowledge working, there will be signposts along the path, some of which are obstacles that will need to be overcome. For example, there will be an escalating conflict between open source and intellectual property.

Eventually, a single knowledge-working model will emerge that is based on roles for working knowledge and not on the knowledge itself. The culmination of understanding these roles is clarity of the knowledge creation process, which is the key to knowledge working, future knowledge models, and to the convergence/singularity.

But as knowledge continues to advance, creating new knowledge, it is putting pressure on social systems and industry, forming new sentiments and new threats. As such, the term "Transformation" is being popularized as a reaction to increasing knowledge advancement. If any of the three areas receives too much emphasis, social issues will develop. Social transformation implies a complete rework of social systems to help them keep pace with advancing knowledge. In the process, a new form of community, governance, and leadership is emerging.

Industry is also being battered by change and volatility stemming from knowledge advance. Industrial transformation will demand the integration or converging of industrial disciplines and practices. Industrial integration, because it is more efficient and effective and because it enables swift transformation, will become a requirement for success within industry.

He concludes that strategic foresight is rooted in sound decision making, which must reflect four attributes:

1. Based on exhaustive information gathering and structuring of questions
2. Clear triggers for communication or performance
3. Transformational as needed
4. Socially-balanced

Workshop Wrap-up

Mr. Bill Waddell, Co-Chair of the Proteus Management Group, thanked the attendees and presenters for coming and for their contributions and support during the past year. He informed the audience that the PMG has laid the initial ground work for a third workshop in August 2008 and encouraged all workshop participants to help by providing input for topic areas and papers for next year's workshop agenda. He also asked each to share their important work and ideas on how to improve the group's effort for the upcoming year.

In conclusion, he provided a recap of the workshop and the way ahead for the Proteus Management Group. He outlined the following FY 08 PMG initiatives:

Intelligence Futures Common Core Curriculum Development. These blocks of instruction will supplement core curricula at National and DoD Intelligence colleges and universities. Modules will be centered on teaching tomorrow's mid- to senior-level analysts and planners how to handle uncertainty and think creatively and critically about future complexity.

Publication of key Proteus related Topical Works. The goal is to provide leading authors and subject matter experts across the communities an opportunity to publish research on new and emerging futures concepts. These articles, papers, and monographs will be featured on the PMG website and included in other professional publications.

Complexity Gaming Enterprise (CGE). This effort will gather and discuss ideas from the various user communities on the possibility of expanding the use of serious gaming to assist modeling and simulation for intelligence analysis, planning, and decision making and education. As a parallel effort, the PMG is working to further develop the Protean Media and interactive Role Playing Simulation that will provide a wide audience with hands-on opportunities to experience the application of the Proteus insights.

PMG Website. The PMG will continue to collaborate, to post papers and articles, and to provide links to Proteus-related areas of interest on

this site. The newest website upgrade will be implemented soon, and members can register and log on to the site at https://www.carlisle.army.mil/proteus. The PMG website will be fully collaborative and will soon include a blog/bulletin capability. The PMG staff will continue to place helpful links and information, papers, articles, and studies focused on future complexity and geo-strategic challenges. Membership registration is available on the site.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APPENDIX A – AGENDA

Proteus Futures Academic Workshop 2007

Creative Strategic Intelligence Analysis and Decision Making Within the Elements of National Power

Time	Event
Tuesday, 14 August 2007 – Collins Hall	
0730–0845	Participant Arrival, Workshop Registration and Continental Breakfast
0845–0900	Commandant's Welcome, Major General David Huntoon, USAWC
0900–0915	Admin and Proteus Workshop Overview. Mr. Bill Waddell, Proteus Management Group
0945–1115	"Seven Revolutions" Dr. Eric Peterson, Center for International and Strategic Studies
1130–1230	Lunch, "Insights from the 'Edge:' Global Futures Lessons for the 21st Century Intelligence," Dr. Warren Fishbein, Global Futures Partnership (Ardennes Room)
1245–1700	Panel #1: Creative Strategic Approaches to Future Intelligence Analysis and Political and Diplomatic Decision Making in National and International Security Affairs, Chair: Professor Cindy Ayers • "Ahmadinejad: A Dangerous Reflection of a World View," Professor Cynthia Ayers, Visiting NSA Professor, CSL, USAWC • "Proteus Implications of Intelligence Scotomas in Central and South America," Dr. John Alexander, Senior Fellow, Joint Special Operations University

Time	Event
	• "Global Terrorism under a Nuclear Umbrella: The Nightmare," Dr. Ely Karmon, The Institute for Counter-Terrorism, Israel
	• "Exploitable Socio-Political Barriers al-Qa'ida Faces in West Africa," Dr. Stacy Bergstrom Haldi
	• "The Future of the Middle East in 2040: A Forecast of Drivers of Stability," Mr. Thomas Ferleman, IBM
	• "The Complexity of North American Perimeter Security: Moving Backward?," Dr. Matthew Mingus, Western Michigan University
1800–2100	Cocktails and Dinner "Creative Intelligence Analysis in Strategic Decision and Policy Making," Dr. William Nolte, School of Public Policy, University of Maryland (Letort View Community Center)

Wednesday, 15 August 2007 – Collins Hall

0730–0800	Continental Breakfast (3rd Floor)
0800–0845	"Strategic Communication and Public Diplomacy Future National Challenges: 'Fighting the War of Ideas Like a Real War,'" Dr. Michael Waller, The Institute of World Politics
0900–1150	Panel #2: Creative Strategic Approaches to Intelligence Analysis and Decision Making in Information Operations and Strategic Communication, Chair, Professor Dennis Murphy, CSL, USAWC
	• "Truth, Perception and Consequences," Ms. Christine MacNulty, Applied Futures LLC.
	• "A 21st Century Model for Communication in the Global War of Ideas," Dr. Steven Corman, Arizona State University

Time	Event
	• "The Limits of Information: Thinking about the Possible," Dr. Jonathan E. Czarnecki, Naval War College, Monterey Programs Office • "The Sword and the Network; One year later in Blending Body, Mind, and Technology," Mr. Tim Rosenberg; White Wolf Security
1130–1300	Lunch, "Fourth Generation War Evolves, Fifth Emerges and Then???," Guest Speaker COL (Ret) TX Hammes (Ardennes Room)
1300–1500	Panel # 3A/B: Creative Strategic Approaches to Future Intelligence Analysis and Decision Making in 21st Century Military Operations, Chairs: Mr. Frank Hoffman, Center for Emerging Threats and Opportunities (CETO), USMC and Mr. Peter Wilson, RAND (18th/22nd) Panel # 3A: • "Complex Irregular Warfare," Mr. Frank Hoffman, Center for Emerging Threats and Opportunities (CETO), USMC • "Unintended Consequences of Unmanned Warfare," Mr. Matthew Armstrong, University of Southern California • "Chinese Military Operations Research: Considering the Impact of Culture, 'Speculative Philosophy' and Quantitative Analysis on Chinese Military Assessments," Mr. Jason E. Bruzdzinski, MITRE Corporation Panel # 3B: • "Rethinking Insurgency" Dr. Steven Metz, Strategic Studies Institute, U.S. Army War College

Time	Event
	• "Developing Military Force Structure Concepts and Choices for 21st Century Operations," Mr. Christopher Wright, Johns Hopkins University Applied Physics Laboratory (APL)
	• "Raising the Bar: Creating and Nurturing Adaptability to Deal with the Changing Face of War," Mr. Don Vandergriff, Army Capabilities Integration Center
1515–1600	Global "Economic Warfare;" Maintaining the "Edge:" Future Strategic Challenges to U.S. Economic Sustainability, Mr. Graham Molitor, Public Policy Forecasting Inc.
1600–1800	Panel #4: Creative Strategic Approaches to Future Intelligence Analysis and Decision Making in Economic Policy and Strategy," Chair, Dr. Marvin Cetron, Forecasting International
	• "Tigers and Dragons and the Effect on the Eagle in the Future," Dr. Marvin Cetron, Forecasting International
	• "The Impact of Global Economic Parity on the United States," Mr. David Coffman, Business Valuations & Strategies
	• "Russia: The Impact of Organized Crime and Terrorism on Global Economic Stability," Mr. Brian Bruh, Brian Bruh Associates
1800–2100	Dinner in Carlisle (on your own)

Thursday, 16 August 2007 – Collins Hall

0730–0800	Continental Breakfast (3rd Floor)
0800–0850	"Strategic Thinking in a Complex World," Ms. T. Irene Sanders, Washington Center for Complexity and Public Policy

Time	Event
0900–1140	Panel # 5A/B: (18th /22nd Conference Rooms, 2nd Floor): Advanced Scientific Approaches, Strategic Scenario Development, Modeling Simulation and Gaming that enhances Intelligence Analysis, Experiential Education, Decision Making and Problem Solving across the Elements of National Power, Chairs: Mr. Timothy Smith, Office of Naval Intelligence and Mr. John Rovegno, PMG (18th /22nd Conference Rooms, 2nd Floor) Panel #5A: • "Teaching the Holistically Integrative Analysis of International Change: a Commentary on the Proper Teaching Emergent Futures Analysis," Dr. Guntram Werther • "Rethinking Thinking: Three Methods for Achieving More Creative, Responsive Strategic Intelligence Analysis," Dr. Barton Kunstler, Educational Consultant • "Predictive Network-Centric Intelligence: Toward a Total-Systems Transformation of Analysis and Assessment," Mr. Timothy Smith, Office of Naval Intelligence Panel #5B: • "A Model for Collecting and Analyzing Open Source Information in Universities and Research Institutes for the Purpose of Identifying and Analyzing Over the Horizon Threats and Vulnerabilities," Dr. William Perry, Western Carolina University • "Counterfactual Reasoning and Structured Scenario Fusion: How to Integrate Multiple Independent Estimates into a Single Projection," Dr. Noel Hendrickson, James Madison University • "Apologies to Clausewitz: The New Trinity," Mr. Alfred Elkins, Joint Warfighting Analysis Center

Time	Event
	• "Future Decision: The Three Dynamics of Society: Knowledge, Society, Economy," Mr. Bruce LaDuke, Instant innovations, LLC
1125–1215	Panel Wrap-up, Ms. Linda Williams, and Mr. Bill Waddell, PMG
1215–1300	Light Lunch (Ardennes)

APPENDIX B – ATTENDEES

PROTEUS FUTURES ACADEMIC WORKSHOP 2007

Creative Strategic Intelligence Analysis and Decision Making Within the Elements of National Power

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APPENDIX C – BIOGRAPHICAL SKETCHES

PROTEUS FUTURES ACADEMIC WORKSHOP 2007

Creative Strategic Intelligence Analysis and Decision Making Within the Elements of National Power

Dr. John B. Alexander

Dr. John B. Alexander is a senior fellow with the Joint Special Operations University. For more than a decade, Dr. Alexander has been a leading advocate for the development of non-lethal weapons. At Los Alamos National Laboratory, he organized and chaired six major conferences on non-lethal weapons, served as a U.S. Delegate to four NATO studies on the topic, and was a member of the first Council on Foreign Relations study that led to creation of the Joint Non-Lethal Weapons Directorate. He wrote many of the seminal articles on non-lethal weapons and was a member of the National Research Council Committee for Assessment of Non-Lethal Weapons Science and Technology.

Dr. Alexander entered the U.S. Army as a private in 1956 and rose through the ranks to Sergeant First Class. He later attended Officer Candidate School and retired as a Colonel of Infantry in 1988. During his varied career, he held many key positions in special operations, intelligence, and research and development. Academically, he holds an M.A. from Pepperdine University, and a Ph.D. from Walden University. He has also attended the Anderson School of Management at UCLA, the Sloan School of Management at MIT, and the Kennedy School of Government general officer program "National and International Security for Senior Executives" at Harvard University.

Mr. Matthew Armstrong

Mr. Armstrong writes on public diplomacy, irregular warfare and terrorism, civil-military relations, and private military companies at his website, http://mountainrunner.us. At the request of the Department of Homeland Security, Science and Technology Directorate, he organized and moderated two panels for the May 2007 Homeland Security Science and Technology Stakeholders Conference. He has published journal articles as well book chapters on private military companies and public diplomacy in the age of information warfare.

Mr. Armstrong earned a B.A. in International Relations from the University of Southern California (USC). He has done postgraduate work at the University of Wales, Aberystwyth, where he studied U.S. Intelligence, Contemporary European Security, and the Middle East. He will be awarded his M.A. in International Relations from USC in December 2007.

Professor Cynthia E. Ayers

Professor Cynthia Ayers is the National Security Agency's (NSA) Visiting Professor of Information Superiority at the Center for Strategic Leadership, U.S. Army War College, where she teaches senior officers of all U.S. military services (reserve and active duty) as well as officers from allied foreign military units. She is currently assisting Dr. Gheorghe Tecuci, Director of the Learning Agents Center at George Mason University, in an effort to develop a cognitive assistant for intelligence analysts. Dr. Tecuci and Professor Ayers co-teach a course entitled Military Applications of Artificial Intelligence: Intelligence Analysis. She also participates in the Army War College's annual Strategic Decision Making Exercise as a counterterrorism subject matter expert. Professor Ayers has had over thirty years of experience in federal service, all within the field of intelligence and mostly overseas, but her most recent assignment prior to her arrival at the U.S. Army War College was that of NSA Representative to the Director of Central Intelligence's Counterterrorism Center (2000-2002).

Ms. Ayers has a B.S. in Applied Science and an M.A. in Public Administration from Troy State University. She is currently completing

her doctoral studies at Walden University in Homeland Security Policy Analysis, focusing on counterterrorism.

Mr. Brian Bruh

Mr. Bruh served twenty-eight years in federal law enforcement, where he held the most senior of positions. He was the first Director of the Defense Criminal Investigative Service, a worldwide agency responsible for preventing, detecting, and rooting out fraud and corruption in the Department of Defense, and was also the first Director of the Financial Crimes Enforcement Network (FinCEN). After his retirement from the federal government, he served for two years on an Advisory Board of the Central Intelligence Agency. He is a senior advisor for law enforcement matters to the U.S. Treasury Department and to the U.S. Department of Defense for anti-terrorism, money laundering, and other matters. On behalf of the U.S. Treasury Department as well as certain private international organizations, he provides guidance to foreign law enforcement and tax agencies.

Mr. Bruh earned a B.S. from New York University in Economics Statistics. He did post graduate work in Accounting at the New York University Graduate School of Business.

Mr. Jason E. Bruzdzinski

Mr. Jason E. Bruzdzinski, a Senior Professional Staff Member of the National Intelligence Division at the MITRE Corporation, supports the U.S. Government on defense policy, military strategy, and intelligence matters by providing consultative and technical support on a variety of national security challenges. His expertise draws upon more than fifteen years of experience working with senior officials in the U.S. government, the U.S. military, the private sector and academia. Mr. Bruzdzinski is also regarded as a leading authority on Chinese military affairs.

Concurrent with his civilian career, Mr. Bruzdzinski serves at the rank of Lieutenant Commander as a Special Duty Officer in the U.S. Navy Reserve. He earned an A.B. in Government from St. Lawrence University

in New York State and holds an M.A in National Security Studies from Georgetown University's Edmund A. Walsh School of Foreign Service.

Dr. Marvin J. Cetron

Dr. Marvin Cetron is the founder and president of Forecasting International and has been identified as one of the foremost forecaster-futurists in the world. As a pioneer in corporate, industry, demographic, and lifestyle forecasting, he has structured Forecasting International to provide industry and government with the benefits and insights of an international group of experts in the fields of management techniques, technological forecasting, corporate strategic planning, technology assessment, R & D planning, project selections, resource allocation, economics, marketing, and the behavioral sciences. He has written numerous articles, papers, and publications and three dozen books. During his twenty-year career in research and development, planning, and forecasting with the U.S. Navy, Dr. Cetron was in charge of the design, development, and implementation of the most comprehensive technological forecast in the United States. He has extensive experience with government agencies, foreign governments, and industry.

Dr. Cetron has a B.S. in Industrial Engineering from Pennsylvania State University, an M.S. in Production Management from Columbia University, and a Ph.D. in Research and Development Management from American University.

Mr. David E. Coffman

David E. Coffman is a sole proprietor specializing in small business valuation services and business planning consulting services. His varied career includes public accounting, economic development, corporate accounting, small business ownership, and teaching.

Mr. Coffman holds a B.S. in Business Administration with Honors from Bloomsburg University, Pennsylvania. Additionally, he holds certifications as a Certified Public Accountant and a Certified Valuation Analyst, and he is accredited in Business Valuation.

Dr. Steven R. Corman

Dr. Steven R. Corman is a professor at the Hugh Downs School of Human Communication at Arizona State University. He is also the Chief Technology Officer, Crawdad Technologies, LLC (an ASU Technology spin-out). He has also been a Visiting Professor, Fakultät für Informatik, Universität Karlsruhe, Germany.

Dr. Corman earned a B.S. in Communication from Illinois State University. His graduate degrees are from the University of Illinois at Urbana-Champaign and include an M.A. in Communication and a Ph.D. in Communication Theory; his dissertation was The Reticulation of Communication Networks.

Dr. Jonathan E. Czarnecki

Dr. Jon Czarnecki, currently Professor for Joint Maritime Operations, Naval War College, Monterey Programs Office, is a retired colonel of the United States Army and Army National Guard. He has worked in politics, with the private sector, and in the Department of Defense. Dr. Czarnecki worked extensively in manpower management, resource management and force planning, and long-range strategic planning for the Department of the Army and the National Guard Bureau. Dr. Czarnecki has consulted on and taught strategic planning, futures research, and systems analysis to international and United States national security uniformed and civilian students. In addition to his teaching, Dr. Czarnecki is developing an applied theory and statistical model of Joint Operations. He is initiating a new research program concerning the collision of information technology and human cognitive limits in military operations.

He holds masters' and doctorate degrees from the State University of New York at Buffalo in Political Science and has written on futures research, strategic planning, joint operations, and environmental policy. Dr. Czarnecki is a distinguished graduate of the Armed Forces Staff College and the Naval War College; he is also a graduate of the Army War College's Defense Strategy Program.

CDR Alfred Elkins, USN (Retired)

CDR Al Elkins is a senior analyst with the Joint Warfare Analysis Center, where he identifies, harvests, and generates future initiatives for the center. He finished his 28-year surface warfare career as a systems analyst at the Chief of Naval Operations Strategic Studies Group. His work now focuses on how national power can be employed today, analogous to a series of investments, for as-yet unimagined future scenarios. While he was on active duty, CDR Elkins wrote the concept of operations for the Navy's Littoral Combat Ship, had a day named in his honor by the mayor of San Francisco for his efforts as the city's Base Transition Coordinator, and conducted the initial photographic analysis of the maiden voyage of the Soviet TYPHOON SSBN. Before he joined the Navy, he was a journalist, working on daily newspapers and freelancing.

CDR Elkins holds a Bachelors degree from the University of Florida in Journalism and earned a Masters in National Security and Strategic Studies from the U.S. Naval War College. He has done graduate work at the University of California, Berkeley and spent a summer studying complex systems at the Santa Fe Institute.

Mr. Thomas Ferleman

Thomas Ferleman is a Senior Managing Consultant with IBM Global Business Services. He has provided strategy-level consulting to the United Nations, the Joint Chiefs of Staff, the U.S. Army, the U.S. Air Force, the Missile Defense Agency, Defense Intelligence Agency, and the President's Commission on Critical Infrastructure Protection.

He is currently pursuing a Doctorate of Strategic Leadership from Regent University. His dissertation is International Futures: Forecasting Global Patterns, Defining Alternatives, and Mitigating Risk. He holds a Master of Business Administration, a Masters of Science in Management, and a B.S. in Government and Politics from the University of Maryland, University College.

Dr. Warren Fishbein

Warren Fishbein is Deputy Director of the CIA's Global Futures Partnership (GFP), which for over a decade has organized projects for the Agency and the intelligence community aimed at catalyzing new thinking about security and intelligence issues. He is currently focused on GFP's initiative to develop the Global Futures Forum, a multinational, multi-sector community engaging in unclassified dialogue and research on transnational security challenges. Dr. Fishbein has twenty-five years of experience in intelligence, working on such issues as Atlantic security, analytic methods, and intelligence futures. He is the co-author, along with Greg Treverton of RAND, of the Kent Center Occasional Paper, Making Sense of Transnational Threats.

Dr. Fishbein holds a doctorate in political science from the Massachusetts Institute of Technology.

Dr. Stacy Bergstrom Haldi

Stacy Bergstrom Haldi is the author of Why Wars Widen: A Theory of Predation and Balancing, as well as various articles, op eds, and book reviews. She taught Strategy and Policy for the U.S. Naval War College for seven years, as well as international relations and political theory for Gettysburg College. She currently works for the U.S. government. She earned her Ph.D. in International Relations from the University of Chicago in 2000.

Colonel Thomas X. Hammes, USMC (Retired)

Colonel Hammes served at all levels in the operating forces to include command of a rifle company, weapons company, intelligence company, infantry battalion, and the Chemical Biological Incident Response Force during his thirty years in the Marine Corps. He participated in stabilization operations in Somalia and Iraq as well as training insurgents in various places. He never served in the Pentagon, Headquarters Marine Corps, or a Joint Staff.

Colonel Hammes earned a B.S. from the U.S. Naval Academy and then attended the Basic School, U.S. Army Infantry Officers Advanced Course, Marine Corps Command and Staff College, and the Canadian National Defense College. He also spent one year on a Research Fellowship with the Mershon Center for Strategic Studies. His final tour in the Marine Corps was as Senior Military Fellow at the Institute for National Strategic Studies, National Defense University. He is the author of The Sling and the Stone: On War in the Twenty-First Century and numerous articles and opinion pieces. He is currently reading for a D.Phil. in Modern History at Oxford University.

Dr. Noel Hendrickson

Dr. Noel Hendrickson is on the faculty of James Madison University, where he developed and now teaches a series of four courses on advanced reasoning methods for intelligence analysis (Hypothesis Testing, Causal Analysis, Counterfactual Reasoning, and Strategy Assessment). These courses serve as the "critical thinking" component of JMU's Information Analysis major, which is designed to educate future intelligence analysts. His dissertation and early research focused on reasoning strategies for analyzing agents and their intentions, and the structure and explanation of contingencies in human decision and action. More recently, his work has focused on developing new methods of analysis for intelligence. For example, he is currently developing a normative theory of counterfactual reasoning: a more precise mechanism for assessing alternate scenarios and their consequences that builds on current academic work on counterfactuals in political science, history, psychology, logic, and analytic philosophy. His publications include a series of papers in action theory, counterfactual reasoning, and (as a co-author) The Elements of Critical Thinking (forthcoming from Rowman and Littlefield).

Dr. Hendrickson earned a B.A. in Philosophy at San Jose State. His graduate work was done at the University of Wisconsin where he earned an M.A. and a Ph.D. in Philosophy.

Lieutenant Colonel Frank Hoffman, USMC Reserve (Ret)

LtCol Frank G. Hoffman is a Research Fellow at the Center for Emerging Threats and Opportunities (CETO) in Quantico, VA, and is a non-resident Senior Fellow of the Foreign Policy Research Institute. His military career includes twenty-four years as a Marine infantry officer and several tours at Headquarters Marine Corps and the Pentagon. He has served on the staff of two Congressional Commissions, including the Commission on Roles and Missions of the Armed Services, and the U.S. National Security Commission/21st Century (Hart-Rudman Commission). He also served on three Defense Science Boards, including the 2004 Defense Science Board for Post-Conflict Stability Operations.

LtCol Hoffman is a graduate of the University of Pennsylvania (Wharton School, B.S. Economics, 1978), and George Mason University (M.Ed., 1992). He graduated from the Naval War College with highest distinction (1995). He holds the Navy Commendation Medal (gold star in lieu of second award), Navy Achievement Medal, and the Department of the Navy Civilian Superior Service Medal (1998).

Dr Ely Karmon

Dr. Ely Karmon is a Senior Research Scholar at the International Policy Institute for Counter-terrorism, and since 2003, also at The Institute for Policy and Strategy, The Interdisciplinary Center, Herzliya, Israel. From 1970 to 1990 he served as advisor and researcher in international relations at the Prime Minister's Ministry in Israel. He is also an Advisor to the Israeli Ministry of Defense, and his fields of research include political violence and extremism, international terrorism, WMD terrorism, ethnic conflicts, anti-Semitism and racism, Middle Eastern security, and Israeli regional strategy. He is a member of the International Permanent Observatory (IPO) on Security Measures During Majors Events at the United Nations Interregional Crime and Justice Research Institute (UNICRI), Turin, Italy. He is a member of the Atlantic Forum of Israel. Dr. Karmon is involved in NATO workshops on terrorism and on the Mediterranean Dialogue. Has written extensively on international terrorism and has participated to numerous international conferences.

His book, Coalitions between Terrorist Organizations: Revolutionaries, Nationalists, Islamists, was published, May 2005 by Brill Academic Publishers (Leiden and Boston).

Dr. Karmon has a B.A. in English and French Culture from the Hebrew University, Jerusalem. He took a Licence in International Relations from the Institut d'Etudes Politiques and a Licence in Bantu languages from the Ecole de Langues Orientales, Paris. He earned his Ph.D. at the Department of Political Science at Haifa University. His Ph.D. thesis deals with Coalitions of Terrorist Organizations: 1968 - 1990.

Dr. Barton Kunstler

Dr. Barton Kunstler is a consultant and educator and the author of The Hothouse Effect, published by the American Management Association. The book addresses the development of high-performing groups driven by creative interactions at all levels of organizational complexity. Dr. Kunstler has published numerous journal articles and book chapters on technology, leadership, creativity, eCommerce, and education and has frequently presented on these topics. He has been featured on several TV shows and written a regular column about future-oriented issues in Massachusetts's Metrowest Daily News. The Hothouse Effect has garnered attention from organizations worldwide, including the U.S. Embassy in Ankara, Saatchi & Saatchi, The Economist, My Business magazine, the American Red Cross, USA Today, and the U.S. Forest Service, it has been translated—as a whole or in parts—into numerous languages. He recently co-edited a special issue of On the Horizon dedicated to presenting and analyzing institutional strategic approaches to online learning in higher education. Dr. Kunstler has worked as a full professor and program director at the Lesley University School of Management in Cambridge, Massachusetts, and as Director of the Graduate Communication Management program at Emerson College in Boston, where he developed innovative programs that promote high-level analytic, strategic, and communication skills in organizational settings.

Dr. Kunstler earned his Bachelor's degree at SUNY at Stony Brook (1971) and his doctorate in Classics at Boston University (1983).

Mr. Bruce LaDuke

Mr. Bruce LaDuke is a question consultant and an expert in knowledge creation, performance, integration, change management, knowledge management, and social transformation. He is the author of Directional Categorization, which is a new and powerful mind tool akin to brainstorming, mind mapping, or lateral thinking. Digital Categorization is focused on the question/definition cycle of knowledge creation. Mr. LaDuke is also an expert in industrial performance, knowledge management, and communications and has a wealth of knowledge on virtually any business topic. Mr. LaDuke is conversant on topics like nanotechnology, molecular manufacturing, the convergence, singularity, possible futures, and others.

Mr. LaDuke earned a B.F.A. in Graphic Design/Advertising from Ball State University.

Ms. Christine A. R. MacNulty, FRSA

Ms. Christine MacNulty has more than thirty-five years experience in long-term strategic planning for cultural change, technology forecasting, and technology assessment. She consults at to the most senior levels within the Department of Defense. Her current DoD projects bring together her knowledge of strategy, cultures, and cognition to help in understanding our adversaries in order to develop non-traditional operations, information operations, and strategic communications. For her contribution to British industry, she was elected a Fellow of the prestigious Royal Society of Arts, Manufactures and Commerce. She has authored numerous papers and is a very popular conference speaker. She has co-authored of two books: Industrial Applications of Technology Forecasting, and, Network-Centric Operations: Translating Principles into Practice (to be published in 2007). She is the founding President and CEO of Applied Futures, a consultancy based near Washington, D.C.

She holds a B.S. in Mathematics from the University of London and has done postgraduate work at the George Washington University.

Dr. Steven Metz

Dr. Steven Metz is Chairman of the Regional Strategy and Planning Department and Research Professor of National Security Affairs at the Strategic Studies Institute (SSI). He has been with SSI since 1993, previously serving as Henry L. Stimson Professor of Military Studies and SSI's Director of Research. Dr. Metz has also been on the faculty of the Air War College, the U.S. Army Command and General Staff College, and several universities. He has been an advisor to political campaigns and elements of the intelligence community; served on many national security policy task forces; testified in both houses of Congress; and spoken on military and security issues around the world. He is the author of more than 100 publications including articles in journals such as Washington Quarterly, Joint Force Quarterly, The National Interest, Defence Studies, and Current History. Dr. Metz's research has taken him to 30 countries, including Iraq immediately after the collapse of the Hussein regime. He currently serves on the RAND Corporation Insurgency Board and is at work on two books: Iraq and the Evolution of American Strategy and Perdition's Gate: Insurgency in the 21st Century.

Dr. Metz earned his Bachelor and Masters degrees in international relations from the University of South Carolina. He holds a Ph.D. from the Johns Hopkins University.

Dr. Matthew S. Mingus

Dr. Matthew Mingus is an Associate Professor of Public Administration and Doctoral Director in the School of Public Affairs and Administration, Western Michigan University, where he has taught since 1998. He primarily teaches the history of public administration, organizational behavior and change, and research methods. His research agenda has increasingly focused on Canada-U.S. relations and comparative administration, with a focus on governance and network theory.

He earned a B.A, summa cum laude, from the University of Denver. His postgraduate degrees include an M.P.A. from the University of Victoria in British Columbia, and a Ph.D. in Public Administration from the University Of Colorado Graduate School Of Public Affairs.

Dr. Mingus was the inaugural Fulbright Research Chair in Public Policy, Governance, and Public Administration at the University of Ottawa in Fall 2005 and is also a Truman Scholar (1986 – Colorado). His Fulbright research focused on democratic reform efforts at the provincial and federal levels in Canada.

Mr. Graham T. T. Molitor

Mr. Molitor, an authority on forecasting government policy, is president of Public Policy Forecasting, and former vice president/legal counsel of the World Future Society. He headed lobbying staffs at General Mills and Nabisco, chaired a legislative Commission on the Future, directed research for the White House Conference on the Industrial World Ahead, served on the White House Social Indicators Committee, headed research for both of Vice President Rockefeller's presidential campaigns and played part-time roles in two other presidential campaigns, worked as a legal counsel in the U.S. Congress, and served with the Assistant Chief of Staff at the Pentagon. He served in elective, appointive, or advisory capacities on assignments ranging from the White House to local government. Mr. Molitor's expertise spans the government policy issue spectrum, and his unique predictive skills are based on broad experience as a lawyer, lobbyist, political campaign strategist, university professor, author, encyclopedist, forecaster/futurist, and business owner/executive.

Mr. Molitor received a B.S. from the University of Washington and his Bachelor of Law from the American University.

Professor Dennis M. Murphy

Dennis M. Murphy is Professor of Information Operations and Information in Warfare and Director of the Information in Warfare Group at Center for Strategic Leadership, U.S. Army War College, where he teaches information operations and strategic communication elective courses and conducts workshops focused on the information element of power. Professor Murphy served in a variety of command and staff positions over his twenty-seven years of U.S. Army service and was an associate professor at West Point. He was the first George C. Marshall Fellow for Political-Military and Diplomatic Gaming at the Department

of State's Foreign Service Institute in 1999. His work in information operations (IO) and strategic communication includes a tour as senior observer-trainer for the Battle Command Training Program, where he trained NATO multinational forces on IO prior to their initial deployment to Bosnia. He is widely published in Military Review, the Field Artillery Journal, the Foreign Service Journal, and NECWORKS Journal.

Professor Murphy earned a B.S. from the United States Military Academy and an M.S. in Mechanical Engineering from Pennsylvania State University.

Dr. William M. Nolte

Dr. William M. Nolte is currently a Research Professor at the School of Public Policy, University of Maryland. Previously he served as the Director of Education and Training in the office of the Director of National Intelligence and the Chancellor of the National Intelligence University. He was also the Deputy Assistant Director of Central Intelligence, Central Intelligence Agency, for analysis and production, where he supported the Director in coordinating the analytic programs of the agencies of the United States intelligence community. The focus of his efforts was the integration of a range of programs developing the tools and techniques to be used by future generations of intelligence analysts. Earlier assignments include both analytic and managerial positions, including tours as senior intelligence advisor to National Security Agency's (NSA) director of operations and as NSA's liaison to the National Archives. During the Clinton administration, he created and led NSA's reinvention laboratory for analysis and reporting.

Dr. Nolte earned a B.A. in History from La Salle University. In addition to his Ph.D. in History from the University of Maryland, he has done additional graduate work in management and information management at the University of Maryland and completed the Intelligence and Policy Seminar at the John F. Kennedy School, Harvard University.

Dr. William G. Perry

Dr. William Perry is a professor of computer information systems in the College of Business at Western Carolina University. He teaches advanced computer networking and information security. Dr. Perry has written a number of books and articles. His most recent book, Developing Professional Information Security Competencies, is to be published by Delmar in 2007. He is a former U.S. Naval officer and has experience in counterintelligence and threat assessment. He has coordinated and participated in various security-related workshops involving the FBI, the Central Intelligence Agency, and the U.S. State Department. Dr. Perry also served as editor on two books related to the intelligence community and has made national presentations on protecting the nation's critical infrastructure.

Dr. Perry earned his B.A. at the University of South Florida. He completed his graduate work at the University of North Dakota where he earned his M.A. and Ph.D.

Mr. Erik Peterson

Mr. Erik Peterson is senior vice president at the Center for Strategic and International Studies (CSIS) and director of the Seven Revolutions Initiative, a broad-based effort to forecast key trends out to the year 2025. He also holds the William A. Schreyer Chair in Global Analysis, an endowed position named in honor of the Merrill Lynch chairman emeritus and CSIS Executive Committee member. Prior to coming to CSIS, he was the director of research at Kissinger Associates.

He holds an M.B.A. in International Finance from the Wharton School at the University of Pennsylvania, an M.A. in International Law and Economics from the School of Advanced International Studies at the Johns Hopkins University, and a B.A. from Colby College. He holds the Certificate of Eastern European Studies from the University of Fribourg in Switzerland and the Certificate in International Legal Studies from The Hague Academy of International Law in the Netherlands. His areas of expertise are geopolitical and country risk assessment, international

trade and finance, international business strategy, and global strategic planning.

Mr. Timothy S. Rosenberg, JD

Mr. Tim Rosenberg is an information security specialist with a strong legal background. Tim is the President and CEO of White Wolf Consulting, a company designed to produce and deliver Information Protection training to a wide variety of clients. He has been an Associate Research Professor at the George Washington University, where he taught Information Warfare and Computer Security courses as well as an Adjunct for Georgetown University's Security Studies Program. Tim has presented material at a variety of international conferences and has also been a guest lecturer at the U.S. Military Academy at West Point, the Army War College Center for Strategic Leadership, and the Villanova University School of Law.

Mr. Rosenberg has a B.S. from Indiana University of Pennsylvania and earned a Jurist Doctor from the Villanova University School of Law. He was admitted to the Pennsylvania Bar in 1997.

T. Irene Sanders

T. Irene Sanders, executive director of the Washington Center for Complexity and Public Policy and author of Strategic Thinking and the New Science: Planning in the Midst of Chaos, Complexity and Change (The Free Press), pioneered the application of insights from chaos theory and complexity to strategic thinking—the most essential skill in today's fast-paced global environment. She developed the FutureScape® visual thinking tool now being used to enhance strategic thinking and planning sessions and scenario-building exercises for major corporations, nonprofit organizations and governments worldwide. Her work has been featured in a wide-range of publications including: Art Education, The Christian Science Monitor, Continental, Foresight, Investor's Business Daily, Management Review, InnerEdge, The Rocky Mountain News, Urban Land, The Washington Post as well as the forthcoming books, The Third-Lens: Multi-ontology Sense-making and Strategic Decision-making (Ashgate, 2007) and New Urbanism and Beyond (Rizzoli, 2008).

The Washington Center for Complexity & Public Policy conducts research and education programs that promote complexity science literacy and the development and implementation of new approaches to public policymaking. As Thought Leaders, the Center's work is based on the premise that complex systems research provides a new sense-making framework for developing insight about the present and foresight about the future. Its work is focused at the intersection of strategic thinking & planning, futures research, intelligence analysis and public policymaking.

Mr. Timothy J. Smith

Mr. Smith is a career analyst and methodologist with the Office of Naval Intelligence (ONI). He has served as an intelligence watch officer, an integration analyst in SPEAR, ONI's air warfare team, and as a Modeling and Simulation Coordinator and Analytic Methodologist. He actively supports the ODNI policy of modernizing Intelligence Community (IC) assessment methodology, and is devising a methodology of interdisciplinary 'computational collaboration' in intelligence assessment laboratories. This methodology and its rationale are the topic of his 2006 Galileo Award-winning paper Predictive Network-Centric Intelligence: Toward a Total-Systems Transformation of Analysis and Assessment.

Mr. Smith has a B.A. in International Order and Conflict from the University of Maryland and is pursuing further graduate studies.

Mr. Donald E. Vandergriff

Mr. Donald E. Vandergriff is an analyst at the Army Capabilities Integration Center in Washington, D.C. He previously taught military science at Georgetown University and leadership in the Masters of Leadership Excellence program at the Center of Professional Development, also at Georgetown University. Additionally, he is a professor at the American Military University. He has had extensive experience in the field with the Army. After he transferred from the Marine Corps to the Army National Guard, he initially served as a cavalry platoon leader in the 278th Armored Cavalry Regiment (TNARNG). Upon entering

active duty, he served in the Republic of Korea, at the National Training Center, and in the Middle East and Germany.

He has his undergraduate degree in Education from the University of Tennessee, a graduate degree in Military History from American Military University, and has begun his Ph.D. studies in Military History at the University of North Carolina, Chapel Hill. He has lectured extensively on military effectiveness and cultural impacts in the United States and Europe. He has also been the subject of several articles that deal with military effectiveness and military transformation, including features in the Washington Post, The Atlantic Monthly, The New Yorker Magazine, The National Journal, Government Executive Magazine, The Washington Monthly, Army Times, Stars and Stripes, Norfolk News-Gazette and Pittsburgh Star.

Mr. William O. Waddell

Mr. Bill Waddell is the director of the Command and Control Group in the Center for Strategic Leadership's Science and Technology Division and is also a Co-Chair for the emerging Proteus Management Group. He has been on the faculty of the U.S. Army War College since December 1994, teaching Command and Control systems and applications, Military Crisis Action Planning, Information Operations and Command and Control Warfare, and Network Centric Warfare. He is responsible for the oversight and maintenance of the Global Command and Control System at USAWC, the development of the Joint Robotics program, the War College's participation in the Defense Information Systems Agency's Network Centric Enterprise Services program, and the application of collaboration and collaborative systems into the Army War College's academic and exercise program. In his personal life Mr. Waddell is the Northeast Regional Director for the international ALERT Cadet program, dedicated to teaching character to young men ages 8-17.

Mr. Waddell is a retired Naval Aviator. He has a B.S. in Education from the University of Wisconsin, Lacrosse. He earned an M.A. in Strategic Studies from the Naval War College and an M.A. from Salve Regina University in International Relations.

Dr. J. Michael Waller

Dr. Waller holds the Walter and Leonore Annenberg Chair in International Communication and directs the graduate programs on public diplomacy and political warfare at the Institute of World Politics. He was a founding editor of Demokratizatsiya: The Journal of Post-Soviet Democratization, published in cooperation with the American University and Moscow State University. Dr. Waller was a member of the staff of the U.S. House of Representatives and the U.S. Senate, served on the White House Task Force on Central America, and has served as a consultant to the U.S. Information Agency, the U.S. Agency for International Development, and to the Office of the Secretary of Defense in support of Operation Enduring Freedom. In 2006, he received a citation from the Director of the FBI for "exceptional service in the public interest."

Dr. Waller earned his undergraduate degree at George Washington University where he was elected Phi Beta Kappa. He was John M. Olin Fellow at Boston University where he took his M.A. He received his Ph.D. from Boston University's, Institute for the Study of Conflict, Ideology, and Policy, where he was the recipient of the University Professors Alumni Award for Best Dissertation.

Dr. Guntram Werther

Dr. Guntram Werther is Professor of International Politics and Economics at Western International University and is newly affiliated with Thunderbird—the Garvin School of International Management. Since 1986, he has studied comparative conflict styles and mirroring management approaches of governments dealing with ethnic national self-determination movements and, since 1992, worked on developing holistically integrative analysis techniques for better predicting emerging trends and patterns of international change. Dr. Werther's "profiling international change processes" approach is an integratively holistic and socio-psychologically grounded approach to understanding how change happens within and among different societies. It has been used successfully and extensively within corporate venues.

Dr. Werther earned a B.S. in Wildlife Management from the University of Arizona (Tucson) in 1974. He received his doctorate in Comparative Politics from Washington University in St. Louis in 1990, where his dissertation was defended "with distinction," and was twice nominated as the best work in comparative politics nationally.

Ms. Linda Williams

Ms. Linda Williams is the Vice Chancellor of the National Intelligence University (NIU) and Deputy Chief Learning Officer in the office of the Assistant Deputy Director of National Intelligence for Education and Training (ADDNI/E&T). The ADDNI/E&T, on behalf of the Director of National Intelligence, directs the community's office of education and training and concurrently coordinates the education, training, and related research programs of the United States Intelligence Community as the Chancellor of the NIU. Prior to joining the office of the ADDNI/E&T, Ms. Williams served as the program manager for analytic tools and the Chief Technology Officer for the office of the Assistant Director of Central Intelligence for Analysis and Production (ADCI/AP). She managed the Analytic Tools program, led the Analytic Research Network in developing the Analytic Research Agenda, and coordinated information sharing for the ADCI/AP.

Ms. Williams has served over twenty-nine years in the Intelligence Community in a variety of managerial, budgetary, liaison, and technical positions. She is certified as an Intelligence Community Officer. Ms. Williams holds a B.A. in Russian from Florida State University, a B.S. in Computer Science from the University of Maryland, University College, and a Masters of Strategic Studies from the U.S. Army War College.

Mr. Christopher C. Wright

Mr. Wright is a National Security Studies Fellow in the National Security Analysis Department of the Johns Hopkins University Applied Physics Laboratory (APL). In this position he has been responsible for guiding and undertaking analyses on topics ranging from airborne electronic attack force mix to tactical communications network sufficiency. Before joining APL, Mr. Wright served in the federal government for

over thirty-four years, the last fifteen as a member of the Senior Executive Service. He was Director, Force Structure Analysis Division, and Director, Tactical Air Forces Division, in the Office of the Director, Program Analysis and Evaluation, Office of the Secretary of Defense, from 1990 to 2005. He received the Presidential Rank Award of Meritorious Federal Executive in 2000. During his government career he served in exchange assignments in the United Kingdom and Australia and also served as a member of a U.S. arms control negotiations team in Vienna, Austria. He holds a B.A. from Harvard College and an M.S. from the Massachusetts Institute of Technology.


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