

## **Proteus Implications of Intelligence Scotomas in Central and South America**

John Alexander

This paper explores a danger that is festering close to the United States yet remains largely submerged from public awareness in this country. It will argue that an undeclared war has already been ignited. However, our national policies focus on two peripheral aspects of the problem; illegal immigration into the US and drug exportation while annotating multifarious relationships with terrorism. Unless there are catastrophic incidents occurring in Central or South America, people in the United States rarely pay attention to that are of the world. Politically we focus much higher attention on Europe, Asia, and the Middle East than to 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 US Southern Command and the Intelligence Community are engaged across the continent, both policy makers and the general US 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 that is epidemic and impacts the United States directly.

The paper highlights examples of 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.

The paper notes that these, and other issues, plague our southern neighbors and will have significant impact on our future. We can ill afford to consciously allow these scotomas to exist unabated. New and complex social arrangements will continue to emerge.

## Unintended Consequences of Unmanned Warfare

Matthew Armstrong

This paper examines the unintended consequences of unmanned warfare, specifically new options available to decision makers, and the likelihood of unintended consequences. The evolution of remotely controlled warfare to semi- and fully-autonomous warfighting vehicles only serves to further insulate decision makers from the cost and impact of kinetic conflict, a reality already in evidence today. This paper focuses on kill vehicles with little attention on surveillance vehicles.

Historically, insurgent and terrorist groups have relied on support systems restricted to their geographic neighborhood. However global communications and transportation have transformed “local” into an ideological neighborhood that spans the globe. Success in modern irregular warfare requires acknowledging, understanding, and targeting the extended support systems of the enemy, a task that may actually be more important than targeting the enemy himself (i.e. shutting down recruitment, turning emotional and physical supporter against the insurgent, etc.). We are realizing that the force multiplier effect of engaging (“winning”) “local” support is more critical today than ever before.

Peter W. Singer noted we must look forward to future media reporting on unmanned warfare and potential enemy propaganda which is possible from the inevitable collateral damage. However upstream we must consider how their availability may impact decisions on use of force at the most fundamental levels as well as downstream results. It is important to anticipate how robots will shape the ideological battlespace that leads to direct and indirect support of the enemy especially as the domestic cost of kinetic action decreases, increasing the likelihood of use.

This paper addresses the following questions:

How will unmanned, semi- and fully-autonomous vehicles support the requirements of counterinsurgency and irregular warfare? Implicit in the question is Future Combat System’s adaptability to requirements of irregular warfare and choices it provides to decision makers

Can we examine the 2<sup>nd</sup> order effects of private security companies in Iraq today for hints on the future of robot war?

Will a need compartmentalize use of kill vehicles appear to hedge against automated kinetic action that could be propaganda bonuses for the enemy?

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

Jason E. Bruzdzinski

This essay examines the origins, development and implications of China’s unique approach to military operations research (MOR). The study benefits greatly from the use of primary source (Chinese language) reference materials – much of which appears previously unexploited by Western researchers – and begins to address an enormous gap that currently exists in Western understanding about Chinese MOR. Presently, no comparable unclassified examination of this subject exists in English.

For more than 2,500 years, the Chinese have emphasized *qualitative* analysis for MOR and assessments to advise decision-making, inform planning and enable the exploration of new theories and concepts. However, despite an ancient record of advanced military scholarship, *quantitative* analysis did not become a core methodology for Chinese military operations research until the late 20th century. Stunningly, evidence shows that the introduction of modern MOR theory in China is largely attributable to the contributions of a single individual who returned to China after gaining much of his operations research knowledge from education and experience in the United States. Since this time, China has been actively working to develop, reform and apply its own unique approach to MOR. However, the mixing of China’s traditional, *qualitative* approaches with the internationally-accepted *quantitative* methods developed by the United States, England and the former Soviet Union has created friction and considerable debate within China’s MOR community. This debate is ongoing and serves as a driver for the reconsideration and reform of traditional Chinese MOR methods. However, China’s propensity to emphasize and apply *qualitative* factors in MOR persists. This is evident from the content of a surprisingly large and expanding body of literature published from 1985 to present. In the early 21<sup>st</sup> century, in the West, it remains the case that relatively little is known about how the Chinese consider and apply *qualitative* and *quantitative* factors together for MOR despite the existence of a large pool of primary source data that could offer potentially significant insights. Indeed, much Western speculation about Chinese MOR appears to “mirror image” Western philosophies and cognitive processes, while failing to adequately consider China’s unique culture and its profound influence on how the Chinese view and solve complex problems. Careful study of China’s MOR philosophy and methodologies can allow Westerners to better understand China’s unique approaches to and the results from MOR as it is applied for studies, assessments, predictions, and for advising national security decision-making. The paper argues that an appreciation will be necessary for the US Government to avoid misperceptions, miscalculations and strategic surprises in its relationship with the People’s Republic of China.

# **The Impact of Global Economic Parity on the United States**

David E. Coffman

This paper examines the effects of increasing global economic parity on the United States. As freedom and free enterprise spread throughout the world many third-world countries will be significantly improving their residents' standard of living over the next few decades. India, China, and Mexico are examples of countries that are improving rapidly. Eastern European countries will benefit from the increasing influence of the European Union. The paper addresses the following topics:

## **Immigration**

- Fewer people will emigrate to US
- US population will stabilize then begin to decline
- Fewer workers to fill low-skill and entry level retail & service jobs

## **Education**

- US will continue to educate the world, but fewer graduates will stay here
- Exacerbating the existing shortage of qualified science and technology workers
- Offshore outsourcing of this work will become necessary

## **Retail & Service Economy**

- Currently accounts for more than 60 percent of US economic activity
- Service economy will contract and possibly collapse
- Shortage of workers to fill lower level jobs
  - Wages will rise
  - Service prices will increase
  - Service providers will be operating at capacity and will be unable to take on new customers
  - Due to lack of workers and high wages some service providers will go out of business.
  - Their customers will not be able to replace them.
  - Demand for services will fall due to higher prices and scarcity of providers
  - Customers will cope by
    - Doing it themselves
    - Using services less often

## **Economic Growth**

- Overall economic growth will slow as population growth slows
- Contraction or collapse of service economy will cause a severe, long-term recession
- The recession will create deficits and increase the US national debt
- Currently more than 60 percent of US debt is held by foreigners
- Fewer foreign investors will want to invest in US debt causing
  - Tightening of credit markets
  - Higher interest rates
  - Higher inflation because US will issue more currency to fund deficits

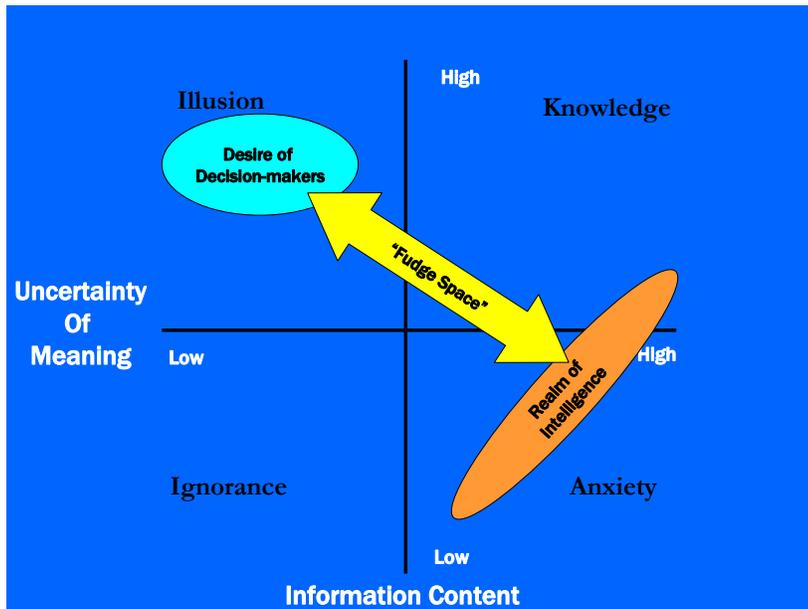
# The Limits of Information: Thinking about the Possible

Dr. Jonathan E. Czarnecki

This paper describes the information-uncertainty paradox and uses recent operations to illustrate the paradox, provides a visual means of depicting the problem (shown below), discusses the national security implications, and provides both technical and, more importantly, behavioral ways to adjust to this new reality.

The conventional method of envisioning information is of a pyramid ascending from data to wisdom. Recent research in physics, mathematics and information theory indicate that the conventional view may be wrong. Instead, there is strong evidence that data and meaning, which make up the joint military doctrinal definition of information, are different but correlated, and subject to Heisenberg uncertainty. In short a paradox exists in which information and uncertainty are intrinsically intertwined; the more data one gets, the more uncertainty one has about its meaning. For national security purposes, this new approach to information requires a reformation in the strategic, operational and tactical views especially towards command and control, and intelligence.

The paper argues that every national security challenge in recent years has involved a breakdown in command and control and/or intelligence systems. This is no accident. It is a reflection of the collision of incredible information technology advances with the limits of human comprehension of that technology's products. The collision cannot be avoided.



## Apologies to Clausewitz: A New Trinity

CDR Alfred Elkins, USN (Retired)

This paper makes a case for revising how to plan and execute, how to think about that revised method, and how the operational-level forces should organize. In the physical and non-physical networks of the altruistic and the insidious – as well as everything in between – the US should have a hand in exploring a new approach, that of setting conditions at the operational level. This 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 perturbing an environment, and exploring or exploiting those 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, and less concentration on the long-term objective. A narrow aperture indicates a macro or command approach, focusing on relatively few details while maintaining a clear focus on the future 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, strategic. Timeframe is a window in time representing the period of execution that results from a decision, or a set of decisions. VAST also 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, and 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.

The paper argues for a new organizational design called Thematics which is based on themes that are universal to every human endeavor. The thematically designed organization seeks early and continuous “intervention” at the operational level, in ways that are not inconsistent with policy, strategy and tactics. The thematically designed organization must *value* continuous interventions (exploration and exploitation) in the environment at the risk of not seeing “effects” until the future – a future we can neither accurately predict nor control.

The conditions-setting approach to conducting operations, the VAST decision-making framework, and the Thematic organizational structure that stresses “execution today for conditions tomorrow for future results you have loosely defined” are 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. Overtly incorporating the demon uncertainty, and a way ahead in its murkiness, renews the artfulness – yes, artfulness – of the force.

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

**Thomas Ferleman and Dennis Walters**

This paper 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. The paper used publicly available information for forecasting trends and modeling the future and includes data from the United Nations (UN), World Resource Institute (WRI), the World Bank, CIA and other research centers and institutions. 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.

This paper illustrates how countries presently considered as a threat to the United States may become the most stable by 2040, including Iran and Lebanon. These bright initial conditions are offset by the perpetuation of conditions that helped bring about Al Qaeda. Forecasts show that increased military spending in the region even among western-friendly nations may not improve stability. While a better balance in spending and assistance may help to ensure hope, provide for the common needs of the population, and consequently improve stability.

The paper notes that 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 is a robust and high leverage policy alternative to mitigate collective dissent. The paper demonstrates 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. The paper notes that contrasting this option with other perceived methods of improving stability such as increased military spending strengthens the argument for this policy intervention.

## **Exploitable Socio-Political Barriers al-Qa'ida Faces in West Africa**

Stacy Bergstrom Haldi

The paper provides an overview of al-Qa'ida's strategy in West Africa and past attempts to establish a presence, highlighting both what al-Qa'ida hopes to achieve and what is known of al-Qa'ida's understanding of the operational environment. Fortunately for Africa, al-Qa'ida's assessment of the situation is flawed in key aspects. The paper outlines the facets of the West African mosaic that are most problematic for al-Qa'ida in particular, and Islamic extremism more generally. Classical Arabic is not widely-spoken, perceptions of Arab racism inhibit the ability of sub-Saharan Africans to identify with an Arabo-centric Islamic movement, long-established Sufi brotherhoods are responding to the challenge of Sunni fundamentalism, and limited political success, notably in Nigeria and Mauritania, combined with a tendency to blame national leaders instead of the US for domestic problems, blunt the appeal of Islamic fundamentalism as a revolutionary ideology. The analysis pays particular attention to indigenous factors that can be exploited by influence operations, although this paper refrains from recommending specific actions or operations.

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

Dr. Noel Hendrickson

This paper offers *specific principles that analysts can apply to integrate independent estimates with greater rigor and reliability*. 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 being able 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. Furthermore, at an even more basic level, logicians studying counterfactuals have long known that it is a simple fallacy to reason from 'If A were to occur, then B would occur' and 'If C were to occur, then D would occur' to 'If A & B were to occur, then C & D would occur'. 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. Philosophers have explored the truth conditions of counterfactual statements, as well as the logical relations between them. Historians and political scientists have developed procedures for counterfactual thought experiments to test causal hypotheses. And, social and cognitive psychologists have described the most common human counterfactual thinking processes. Unfortunately, none of these projects have directly engaged the difficult challenge of how to integrate independently formed assessments. In response, the paper proposes the first formal theory of scenario fusion, which draws from the resources of all three projects. In particular, it demonstrates 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 including employing probabilistic relevance, causal efficacy, and supporting counterfactuals. The paper explores the arguments for and against each technique, and draw from the results to create a full method for structured scenario fusion. With it, analysts can bring together independent estimates without affirming conflicting assumptions or committing logical fallacies.

## **“Rethinking Thinking: Three Methods for Achieving More Creative, Responsive Strategic Intelligence Analysis”**

Barton Kunstler

This paper proposes three inter-related models that, taken together, represent an alternative to traditional approaches to foresight analysis. The Cleisthenian Model (CM) takes its name from the ancient Athenian politician Cleisthenes who in 506 B.C. devised a new constitution for the city-state, a scheme radical in its democratic and integrative character. Cleisthenes' system placed each citizen within an interlocking grid of 10 civic associations and 3 regions of natural allegiance, thus guaranteeing that each person would be working with members of groups with whom they normally shared no common interest as well those with whom they shared traditional interests. This integrated system transformed authority relations within Athens, and propelled Athens to cultural and military leadership of the Greek world.

The second approach, the Hothouse Effect (THHE), refers to the factors and methods of highly creative groups as they've been evidenced throughout history and in modern organizations. THHE found 36 consistent variables common to groups that experienced an explosion of often world-changing creativity. THHE offers a unique model of organizational development and intellectual capital best suited to teams that operate at particularly high level of cognitive efficiency. It also reinforces the Cleisthenian Model by emphasizing multiple functions for all individuals in the group, critical self-analysis of disciplines and methodologies, and attention to internal dynamics that demand a more dynamic, open processing of ideas than do traditional organizational structures.

The Converging Uni-Modal Approach (CUMA) resides within a single individual or several individuals working closely together. The notion of 'convergence' becomes operative when one such initiative converges with another. Although the individuals involved will generally represent an organization of some kind, the exercise of foresight emerges out of the inspiration of individuals rather than a pre-designed procedure, thus enabling the individuals to operate unencumbered by institutional structures.

The paper notes that all three systems can be described by recourse to the science of networks, which demonstrates recurring patterns in the formation of information networks in organic, inorganic, and abstract systems. The CM provides for intensive cross-linking of hubs so that the usual power laws governing networks are violated in favor of a more sustained inter-penetration of perspectives stemming from each hub. THHE also violates the power laws by cultivating methods for enriching the output of all hubs within a network, and, in effect, increasing the signal output and signal-to-noise ratio of messages traveling along the links. CUMA focuses on the most strategically placed hubs and looks for their ability to galvanize links with the greatest potential differential between the other hubs in the network.

Taken together, the three models can radically transform the internal culture of a knowledge-based organization, be it Homeland Security, think tanks, analytic groups within entities such as the Defense and State Departments, or groups – such as interim governments – charged with fusing a new governing entity out of widely disparate interests. They all rest, to an extent, on the general notion of galvanizing systems' latent intellectual capital, and all represent a challenge to standard operating procedures (SOPs) in most organizations. The paper concludes that their value lies not only in the opportunities for implementing suggestions derived from the models, but from the inherent critiques they engender of SOPs, wherever they may be identified.

# Future Decisions: The Dynamics of Society: Knowledge, Social Context, and Economy

Bruce LaDuke

This paper argues that there are 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.

The paper notes 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 sign posts 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 logarithmically, it is putting pressure on social systems and industry. As such, the term “Transformation” is being popularized and is a reaction to increasing knowledge advance.

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.

The paper concludes that strategic foresight is rooted in sound decision making and requires four components. Holistic decisions must be:

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

## **Truth, Perception and Consequences**

Christine A. R. MacNulty, FRSA

This monograph focuses on the key elements of understanding cultures: the stories our cultures develop to make sense and meaning from the world; the metaphors we use and how those help to frame perception, and the nature and determinants of our mindsets. These are illustrated with historical examples from over the last fifty years.

Finally, the monograph outlines a limited number of critical cultural-cognitive dimensions that can be used to evaluate an adversary – including his values and motivations – so that we can anticipate his actions and better determine how to influence them. It also suggests a check list of other things that we can do to enhance our cultural awareness and understanding, and the kinds of further research that are needed.

## **The Complexity of North American Perimeter Security: Moving Backward?**

Matthew S. Mingus

This paper briefly introduces the concept of North American perimeter security, provides an overview of how policies implemented since Fall 2001 have impacted movement toward a perimeter security approach, and finally examines the concept of perimeter security with regard to the Proteus insights. This third part of the paper is somewhat conceptual and speculative, thereby outlining a path for future research on this topic. The longer term research agenda is to gain solid input from relevant officials regarding ideas advanced in the presentation, study possible security weaknesses of setting perimeter security aside in favor of increased isolationism; and outline a logic model for assessing the future need to adopt a perimeter security approach. This would be pursued through a series of key informant interviews and several more grassroots futures workshops.

## **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**

William G. Perry, Ph.D.

This paper outlines a model that can be used to identify emerging threats that can combine with the intrinsic vulnerabilities of our open system. We live in an asymmetric threat environment. Among the threats is the active targeting of our universities and research institutes by foreign intelligence services. Unfortunately the means for identifying vulnerabilities and threats associated with students, faculty and researchers are lacking. Yet, the information needed to identify the potential threat vectors that seek to exploit our vulnerabilities is publicly available. Agencies of the federal government may be limited by statute or other sensitivities from actively fusing or developing a knowledge base that can be used to recognize over-the-horizon threats and vulnerabilities. University or state employees, however, are able to collect, assemble and analyze open source information without legal restriction.

The role of a university professor is described as a 'three-legged stool'. An academic career is built upon teaching, service and research. A tenured university professor would be able to use publicly available information associated with sensitive on-campus research for the purpose of risk analysis. Such an effort may be considered as either service or research.

The work of professional analysts would likely be facilitated if a rich source of information could be crystallized and made available for query to assess threats and vulnerabilities. Weak signals that are detected early could be weighted and then escalated as the fusion of additional data becomes available. The paper will expand upon the nature of the open source information that is publicly available for analysis in universities and research institutes. The paper will demonstrate how such information might be fused and weighted for use as an analytical tool.

## **The Sword and the Network: One Year Later in Blending Body, Mind and Technology**

Tim Rosenberg, JD

This paper will discuss how to bring Computer Network Attack (CAN) and Computer Network Defense (CND) into a martial training and operational setting. Furthermore, once the martial CNA/CND foundation is complete, the traditional aspects of Body Mind Spirit (BMS) training will be added into the CNA/CND space for complete integration. This paper presents the first concepts of a combined warrior training program. It describes the results of several White Wolf Security meetings looking to address some of the basic, fundamental questions and issues around an integrated training program. The original idea of body, mind, spirit and technology has been distilled down to body, technology and citta (mind/heart/spirit). In winter, 2007, a combined cyber/physical tactical mission was demonstrated. Since then, the demonstration has been repeated several times for a wide variety of audiences. Likewise cyber attack and defend exercises have been designed to put the teams through protracted digital attack scenarios, causing stress to the technology, the body and the spirit. These exercises, while digital in focus, are designed around technologies that demonstrate the convergence of the cyber and the physical realms.

The paper discusses White Wolf Security's development of tools and training that emphasize the connectedness of things across their respective domains instead of treating them as stove-piped individual topics. The final section of the paper presents a combined cyber/physical attack scenario as well as the findings of a year spent in identifying methods, tools and technologies that can be immediately deployed to teach and operate in a combined environment.

## **Predictive, Network-Centric Intelligence: Toward a Total-Systems Transformation of Analysis and Assessment**

Timothy J. Smith

This essay argues that intelligence assessment could achieve substantial predictive power, to a degree that greatly exceeds today's standards. This paper demonstrates both the need for such a revolution in capability and the feasibility of achieving it, and outlines a strategic program plan to do so. The paper examines ways to modernize and transform United States intelligence analysis and assessment capabilities, and to integrate the intelligence community (IC) into a seamless distributed architecture of analytic collaboration based on shared tools and data. The paper argues that there are highly practical and affordable means available which substantially to reduce the risk, rate and severity of intelligence failures. No new technology is required, or any vast new collection capability. Intelligence failure has been shown to arise primarily in the analytic phase of the intelligence cycle, and in decision-makers' use of the analytic product. Here, both the problems and the solutions are largely cognitive and methodological. Intelligence failure arises from inadequate organizational processes for both creative and critical thinking – the 'right- and left-brain' functions. The paper reasons that what is required for reliable warning and maximally effective decision support is a simultaneous improvement in capabilities at opposite ends of the spectrum: in imaginative hypothesis generation, on the one hand, and in rigorous hypothesis-testing on the other. There is no mechanical formula for enhancing creativity. However, modern business has found a highly fruitful technique of 'off-site' events that involve collaborative teaming and facilitated brainstorming. Interdisciplinary teaming breaks the hold of groupthink and stimulates dynamic interchanges as participants learn new perspectives on old problems. Brainstorming frees people from fear of criticism, and professional facilitation energizes the team and propels high tempos. The result is a fertile environment for 'thinking outside the box' and exploring possible new connections among 'dots'.

The paper notes that team collaboration would offer rich benefits in expanding the range of adversary actions and alternative futures that are considered. However, it cannot subject hypotheses to truly rigorous tests. The only method for that lies in scientific experimentation. The scientific tool for experimentation where one cannot run real-world tests is modeling and simulation (M&S). Formal models demand that we specify all our assumptions and beliefs about actors, groups, environments, relationships, and behaviors. Simulation explores the implications of these assumptions, comparing the outputs with theoretical predictions and real-world data. Discrepancies dictate that something has to give; there is an error in our assumptions. This then forces re-analysis. It is, in fact, the only way to compel strategic re-assessment short of war. Team collaboration and computational M&S could be combined into a mutually reinforcing cycle that would operate not as a circle but as a spiral – an organizational learning spiral. Both processes can be combined in an all-source fusion analysis laboratory built around two rooms. The 'right hemisphere' of the lab would be an 'electronic meeting room' for interagency off-sites by IC analysts (regional and

functional subject-matter experts

The paper proposes that this lab be called the Intelligence Training, Assessment and Simulation Center (ITASC), and that the entire learning spiral be called 'computational collaboration'. This ITASC would constitute the core node for what could become an IC-wide architecture of such labs, one in every all-source and single-source agency and command. Computational collaboration could enable wide-ranging and highly dynamic intelligence preparation of the battlespace that explores multiple alternative contingencies and responses in the years and months leading up to hostilities, and then surges to rapid optempo in the weeks and days just before and during conflict. This capability would provide the kind of planning foresight the armed services have not seen since the renowned predictive assessments produced through tabletop wargaming at the Naval War College in the 1920s-30s. 21st-century computational collaboration, however, can provide predictive power superior to that of the 1930s by at least an order of magnitude.

## **Teaching The Holistically Integrative Analysis Of International Change: A Commentary On The Proper Teaching Of Emergent Futures Analysis**

Guntram F. A. Werther

This paper presents a holistic and interpenetrated argument, folded in as sequences of learning competencies to be achieved, which address core analysis and learning issues. All major classic learning and analysis traditions - from whatever culture - enfolded a holistic, interpenetrated complex systems view of human affairs and of emerging trends forecasting involving them, wherein broad learning was a preamble to success. Quoting current and historic experts to make this point, the monograph directs attention to what is necessary for achieving competent emerging international futures forecasting.

This paper presents examples of how to do this, listing some sources, as seems useful. Proceeding initially mainly from a Western science and philosophy tradition – on the supposition that the primary audience stems from this learning tradition – the presentation folds in other views and methods, addresses useful secular comparative science insights into complex systems analysis, and moves to build the foundations of a competent analyst who deals in societal flows, their dynamics, and in emergent flows. This is mostly a qualitative endeavor, for reasons stated. Synchrony among these traditions is attempted.

The paper addresses ideas about when and how mathematical and modeling treatment of emerging international futures forecasting may be useful, and why. The monograph does not substantially address advanced complex systems dynamics forecasting issues, since they cannot be taught per se, but are learned through doing. Learning what it is necessary to learn about complex systems change dynamics in human affairs is not easy: complex system's change and their emergences being, of their nature, nuanced and complex. The requirements, as the author understands them, are presented in the paper.

## **Developing Military Force Structure Concepts and Choices for 21<sup>st</sup> Century Operations**

Christopher Wright

This paper argues that there is a need to improve the understanding and description of military capabilities and capacities for 21<sup>st</sup> Century operations if the best mix and scope of capabilities are to be achieved and maintained. The appearance of new forms of conflict, sometimes expressed as “irregular”, “unconventional”, and “disruptive”, has 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.

The Department of Defense understands that the largest tradeoff 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. The paper concludes that there is a need for innovative thinking and new analytical tools that can better illustrate capabilities, capacities, and risks in new forms of conflict.