**Blue Ribbon Panel on Forward Engagement**

BLUE RIBBON PANEL ON FORWARD ENGAGEMENT
WASHINGTON, D.C. 20515

May 4, 2005

Joint Congressional Task Force on
Responsiveness to Future Challenges
United States Congress
Washington, D.C. 20515

Dear Chairman:

We are pleased to submit to you the attached "Final Report of the Blue Ribbon Panel on Forward Engagement."

Upon appointment of the panel membership in January 2005, we began a review of the findings of past forward engagement panels. Previous panels looked at future issues in similar ways; however, we are the first panel to examine how members of Congress could better orient themselves to deal with these future issues, and more specifically, how members from both the House and the Senate could address these issues in different manners. In order to adequately examine all relevant issues, we formed several working groups: Governance, Economics, Security and Science and Technology. These groups used a variety of forecasting techniques to critically examine potential future issues relating to those areas. By outlining the range of issues that concern the future, we were able to provide effective recommendations regarding the type of Congressional organizations that would best tackle these issues.

This report explores the concept of "forward engagement," and the complexity that the future presents to lawmakers. It examines how Congress currently does not address this complexity and suggests possible solutions for addressing future contingencies of interest. By doing this, we hope to improve the U.S. government's ability to track and begin to plan for events and trends that seem far off today, but may become current issues in the future. By utilizing these techniques, the U.S. government may afford itself the ability to be proactive with regards to issues of the future, rather than continuing to be reactive. As a means to institutionalizing this ability, the Panel recommends a House Annual Commission on Forward Engagement, as well as a Senate Annual Commission on Forward Engagement, be formed to address the current lack of future orientation of existing Congressional committees. These Special Commissions would be tasked with planning and implementing Congressional Forward Engagement Sessions, the result of which is a Forward Agenda for the Congress.

This report should be read as a work in progress. Feedback is not only welcome, but requested. Our objective is to make government more flexible and agile, and thus better able to respond to the issues that experts see on the horizon.

Please forward all comments and questions to the undersigned. We thank you in advance for your feedback.

Sincerely,

Cassandra Aulner
Chair

Enclosure

# Final Report of the Blue Ribbon Panel on Forward Engagement

## Joint Congressional Task Force on Responsiveness to Future Challenges

**May 2005**

[SIMULATION: For Classroom Purposes Only]

# Blue Ribbon Panel on Forward Engagement

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**Blue Ribbon Panel on Forward Engagement**

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# EXECUTIVE SUMMARY

The United States Congress must keep pace with a growing number of far-reaching, complex, major developments. Issues such as nanotechnology, space weaponization, nuclear terrorism, monetary devaluation, antibiotic resistance, and quantum computing are all examples of emerging topics that will come to impact the country as a whole and, inherently, will have far-reaching consequences in the long-term. These issues are developing and interacting at an increasing rate and present a fundamental challenge to the Congress by spanning traditional boundaries of governance. The problem facing Congress is how to transcend the myopic, short-term view of the government and adopt a more long-term, forward thinking posture. In its current arrangement, Congress is unable to be proactive about potential long-term issues, leaving it confined to a reactionary posture when events do occur. This problem is compounded by the fact that these issues transcend simple categorical boundaries (economics, governance, security and science and technology) making decisions about how to respond more difficult. The Legislative Branch of government is an 18th century organization struggling to keep pace with 21st century technology. Congress must evolve to operate within this new, complex, accelerated world in order to preserve the sovereign power and representation of the American people.

Recognizing the need for Congress to prepare for, and react to, these complex events, the **Joint Congressional Task Force on Responsiveness to Future Challenges** convened the second **Blue Ribbon Panel on Forward Engagement** in the spring of 2005 to produce the **Final Report of the Blue Ribbon Panel on Forward Engagement**. The Panel's mission was to make recommendations for how the Congress might best address future complexity by creating forward-thinking bodies in both the House and the Senate. After using a variety of forecasting methods to develop a range of complex future events, known as Future Contingencies of Interest (FCIs), the Panel was able to identify institutional changes that could help the Congress address these future events.

To this end, the Panel recommends the creation of a House Annual Commission on Forward Engagement as well as a Senate Annual Commission on Forward Engagement to address the current lack of future orientation of existing Congressional committees. These committees will be composed of representatives from their respective chambers of Congress. The Special Commissions will each be tasked with planning and running the "Congressional Forward Engagement Sessions" (CFES), which will take place in January, at the start of each Congressional Session. Upon the conclusion of the CFES, the Commissions shall be tasked with fleshing out the findings of the hearings, considering the inputs of Members of Congress, and using the outcomes of the CFES to compile a Forward Agenda for Congress. Both Houses will be required to come to an agreement on the prioritization of Future Contingencies of Interest through the drafting of individual reports. Drawing from each report, a July Conference will create a new and final unclassified report to be distributed to each Member of Congress, the media and the public. The report will not make policy recommendations; it will summarize the findings of the Forward Engagement Session and incorporate follow-up findings.

Through an aggressive public outreach program, the work of the committee will be accessible to a wide audience that includes the Congress, the United States

Government, and the public at-large. The goal of such research is *not* to advocate a particular point of view on an issue, or to support particular legislation. Instead, the aim is to rise above the partisan, political fights of today and take an eye towards the important issues of tomorrow that, ultimately, will transcend such political and partisan boundaries. While the committee will deliberate and ultimately decide on issues before the current Congress, it is imperative that its focus should always be kept on the future. It is the position of this panel that both HACFE and SACFE, as well as the CFES are necessary to engage the rapidly approaching future that our nation will face and that such institutional structures are the best way to help the Congress stay abreast of the rapidly changing that world in which we live.

# INTRODUCTION

The members of this panel have come together at the request of the Joint Congressional Task Force on Responsiveness to Future Challenges to make recommendations for a system that will equip both the House and the Senate to more effectively forecast and respond to developments that may become major concerns in the future. Our mission was borne out of the realization, made clear in part by the September 11th Commission's findings that the Congress is not able to keep pace with our rapidly changing world. It is not enough, however, to merely state that the world is changing at an accelerated rate. A portion of this report has been dedicated to illustrating this change more clearly. The limitations imposed by Congress' inability to think in the long-term undermines Congress' effectiveness and results in reactive policies that may come too late.

Our final report follows the interim report[1] prepared by the Fall 2004 panel and addresses the concerns raised during its review. One notable concern was that the unicameral approach proposed by the interim report did not take into account the different interests of the House and the Senate. We address this concern by creating two bodies within Congress, one in the House and one in the Senate, that will enable legislators to be more aware of and responsive to longer-term issues.

With this task in mind, the Final Report of the Forward Engagement Spring 2005 Panel recommends the creation of a House Annual Commission on Forward Engagement as well as a Senate Annual Commission on Forward Engagement to address the current lack of future orientation of existing Congressional committees. These Special Commissions would be tasked with planning and implementing Congressional Forward Engagement Sessions, the result of which is a Forward Agenda for the Congress. Forward Engagement is an analytical method for thinking systematically about the future, in order to enhance the capacity of Congress to respond to long-term events or circumstances. Forward Engagement utilizes effective forecasting mechanisms to identify contingencies that are likely to arise in the future. The process allows policymakers to be proactive, rather than reactive, to those situations that can be reasonably anticipated. With better preparation for potential future challenges, policymakers can more astutely develop policy options and allocate resources for a number of critical future concerns.

[1] *Interim Report of the Blue Ribbon Panel on Forward Engagement*, Joint Congressional Task Force on Responsiveness to Future Challenges, 13 December 2004.

## What are Future Contingencies of Interest (FCIs)?

The study of and subsequent policy regarding Forward Engagement are based upon perceived Future Contingencies of Interest (FCIs). These foundational elements of analysis are characterized as those issues that will have a profound effect upon human experience as it pertains to science and technology, governance, security, and economics.[2] Further, these FCIs are broad enough that their effects cross the borders that separate these four fields. For example, the issue of water scarcity has implications in all four fields: water scarcity provides a substantial impetus to use technology to find a solution; it will quickly become a huge issue for governments in both affected and unaffected areas; wars over fresh water will become more prevalent and; the dearth of fresh drinking water will adversely affect human economic capital. This multivalence makes FCIs extremely difficult to solve, especially if they have already manifested themselves, and thus extraordinarily important to deal with now.

## Why are FCIs Important?

Not only do FCIs affect these four fields on a national level, but in an increasingly globalized world, their effects spread throughout the region and, in some cases, the world. To take our example further, water scarcity is not a problem that is confined to individual states. Indeed, those states that control a river's head-waters will possess increasing regional power. In those regions where water is growing scarce, those countries that control the water will be in increasing danger of attack by those without it. The water-rich countries will also be able to use the water as a political tool to further their goals. Thus, the political and security implications of water scarcity could destabilize the region and where instability ensues, American interests are jeopardized. This is how an FCI's effects can become global.

There are two conceptual categories into which FCIs fall. The first involves projections and extrapolations of current trends to a point in the future where the issue will have to be addressed. These types of FCIs include the continuation of current AIDS infection rates in Africa and Asia; the privatization of war; and the proliferation of nuclear weapons. The second category utilizes more independent thinking to arrive at FCIs that fundamentally challenge the powers of adjustment. For example, the supposed increasing overlap of church and state could threaten the classically American secular makeup. For example, druggists have begun to refuse to fill prescriptions for legal forms of birth control solely on account of personal ethics and conscience. This may be a harbinger of a new type of American polity and society. Another FCI that fits in this category is the prospect of common political zones in North America, Asia, or greater Europe. These zones could become necessary in order to balance the growing power of China, or in order to meet the needs of the global economic and political system at the time. Such a contingency would engender such issues as the sovereignty of the current states in those possible zones, minority rights in a much larger polity, and the blending of often disparate cultures and histories. Other FCIs extend the boundary of what humanity has experienced heretofore. For example, experimentation with the nexus between technology and human life could produce a living being that is, at its essence, melded with machine. A related issue is the possibility that life can be created in a laboratory

[2] A more detailed discussion of FCIs can be found in the Appendix.

from very basic ingredients. These scenarios raise questions of bio-ethics, citizenship, proprietary rights to life and technology, and so forth.

This report has become necessary because the Congress is unsuited to deal with the FCIs that will emerge in the future. It has become clear over the past decade that the legislative branch in this country requires changes that will equip it to deal not only with FCIs that are the result of the extrapolation of current trends, but also with those that are slightly beyond the horizon of human experience.

## Illustrative Example of an FCI

### The Weakening of the Nation-State

To further illustrate the concept of an FCI, the following sections will provide a brief case study of the weakening of the traditional nation-state unit due to globalization. This case study will give a brief summary of the FCI and show how this particular FCI has far-reaching and interconnected effects in all four areas: governance, security, economics, and science and technology.

Globalization is one of the single most influential forces affecting the world today. As an economic force its effects are far-reaching. To the same extent, globalization is also a political force that has created some unintended effects in the governance and security realms. Globalization has blurred boundaries, and weakened the power of the nation-state. Although globalization is a trend that has been occurring for two decades, some of its consequences are just beginning to become apparent. This case study will look at one of those potential consequences: the weakening of the nation state.

States that have a high quality of governance and a well-established rule of law will have the capacity to deal with the challenges that globalization will present to their governing authority. Developed nations, like the United States and Europe, with a deep-seated interest in the economic benefits of globalization will not find themselves significantly weakened. These countries are those whose companies will become the transnational conglomerates that control the power in a globalized world. It is easier for those countries that are economic leaders, especially in technology and communications, to adapt their governance to an increasingly globalized world.

Nations that do not have competent, established governing structures in place, a group that includes most if not all developing nations, will find it difficult to maintain state authority. As corporations and other non-state actors become major players on the world stage, countries that are not able to exert influence in the global market will find themselves to be pawns in the hands of others. Not only will developing nations lose economically, but they will become more unstable as they lose the ability to effectively govern. The Global Trends 2015 report predicts that "States with ineffective and incompetent governance not only will fail to benefit from globalization, but in some instances will spawn conflicts at home and abroad, ensuring an even wider gap between regional winners and losers than exists today."[3]

[3] *Global Trends 2015: A Dialogue About the Future With Nongovernment Experts*, National Intelligence Council, December 2002. < http://www.cia.gov/cia/reports/globaltrends2015/index.html> Accessed 4/20/05.

The weakening of the nation state has consequences in all four of the areas of study designated in this class:

**Governance**

A breakdown of authority of the nation-state, especially in underdeveloped countries will result in new governing structures in these regions. These structures may be religious, militaristic, or tribal. The Global Trends 2015 report predicts that "In many of these countries, non-state actors will become more important than governments in providing services, such as health clinics and schools. In the weakest of these countries, communal, criminal, or terrorist groups will seek control of government institutions and/or territory."

**Security**

As regions experience a breakdown of the authority of the nation-state, these areas will become increasingly unstable. This could lead to conflicts over territory or identity. Also, a weakened governmental structure may lead to an influx of terrorists into unstable countries.

**Economics**

The driving force behind this FCI is economic in nature. The countries whose multi-national corporations are reaping the rewards of a global market will be the same countries whose governing authority remains intact. Instability in regions whose states are experiencing a breakdown in governing authority will likely only further the disparity between developed nations and developing countries.

**Science and Technology**

As non-state actors become more powerful, it is likely they will have a greater influence on global policies and agreements. If corporations become the major global players, and economics and the bottom-line for these corporations are their determining factors, it may be more difficult to forge global agreements to fight problems, such global warming or the spread of the AIDS epidemic.

## Forward Engagement in the Legislative and Executive Branches

Forward engagement in policymaking requires concerted efforts by both the legislative and executive branches. Ownership of the future by a single branch of government enfeebles the constitutional principle that the legislative and executive branches are coequal partners in government. Ceding the ability to shape future events to the executive would mean ceding the sovereignty of the people to a bureaucracy less directly influenced by the public will.

Previous panels have studied and issued reports addressing the capability of the executive branch to make forward-looking policies. Their findings indicate that an overall lack of forward engagement or forward thinking in policymaking. The panels focused mainly on the executive branch, identifying various factors hampering forward thinking in this branch, such as a lack of interconnectivity between agencies, as well as excessive bureaucracy and stovepiping. The panels then devised various recommendations to help the executive branch overcome this deficit.

A lack of forward engagement in policymaking persists today. The executive branch has begun to recognize some of these problems and has made efforts to address them. A recent example was provided by Homeland Security Secretary Michael Chertoff, who delineated his new strategy for helping the Department of Homeland Security look beyond immediate concerns.[4]

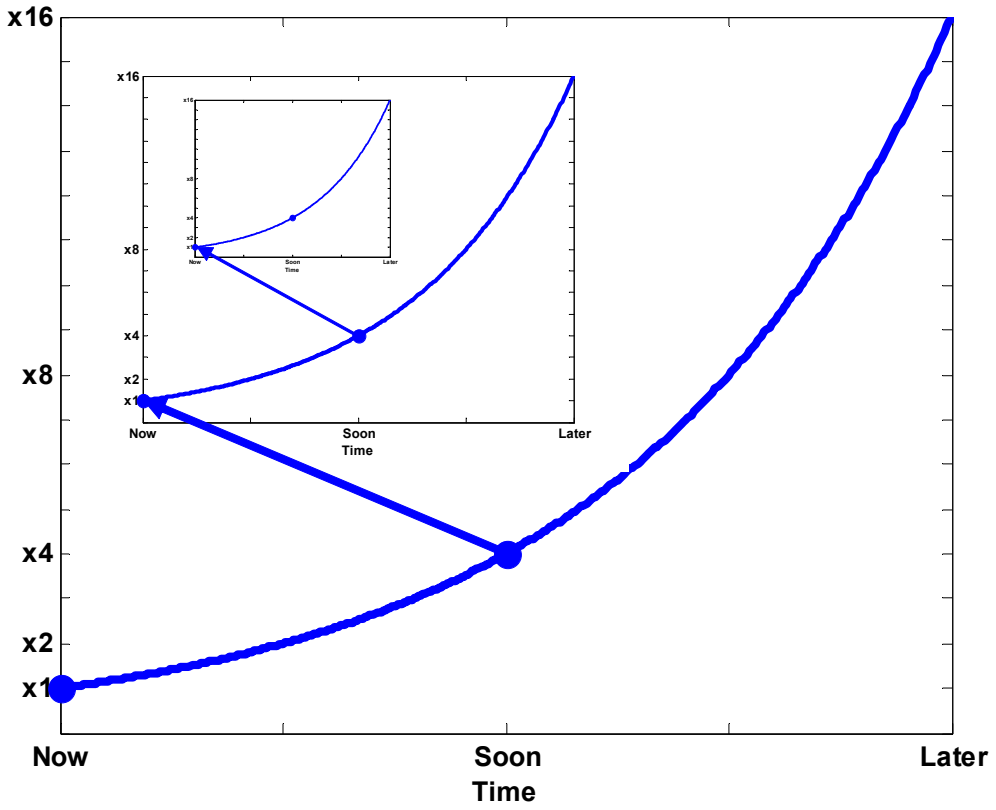
This panel recognizes the vital role of the executive branch in forward engagement, and commends the work of previous panels to enhance forward engagement in that branch of government. The focus of the Spring 2005 report, however, is on enhancing forward engagement in the legislative branch. The lack of focus on the executive branch should not be construed as a judgment on the role of the executive branch in forward engagement. The Blue Ribbon Panel acknowledges and reaffirms the importance of forward engagement in the executive branch. However, because this area is outside of the purview of the Blue Ribbon Panel's mandate, this report will concentrate on making recommendations for addressing forward engagement through the U.S. Congress.

## Accelerating Rate of Change

We are all time travelers forever advancing into the future. As we advance, our surroundings and culture change at a rate that can be measured against physical, biological, or social clocks. The vibration of a Cesium atom in an atomic clock is the best standard against which to measure change, but the rotation of the Earth and the aging of our bodies will serve just as well. Those alive today are witnessing, in the course of their lifetimes, what many perceive as ever accelerating change. The same might also have been said of our forebears at least as far back as the beginning of the industrial age. Figure 1 illustrates the paradigm of accelerating change. As the base of civilization grows, the rate at which it grows also increases. With the paradigm of accelerating change in action, at any time, the base of civilization is both larger than ever before and growing faster than ever before. It is as if our civilization were following an exponential curve with a rate of change that is proportional to the base of our accumulated accomplishments. Continuing this proportional growth from one generation to the next ultimately results in dizzying rates of change in absolute terms. Our parents and grandparents may have struggled to cope with accelerating change in their eras, but the challenges of the next generation are always greater. Indeed, we may be nearing the time when the adaptability of human beings and their institutions may be fundamentally challenged.

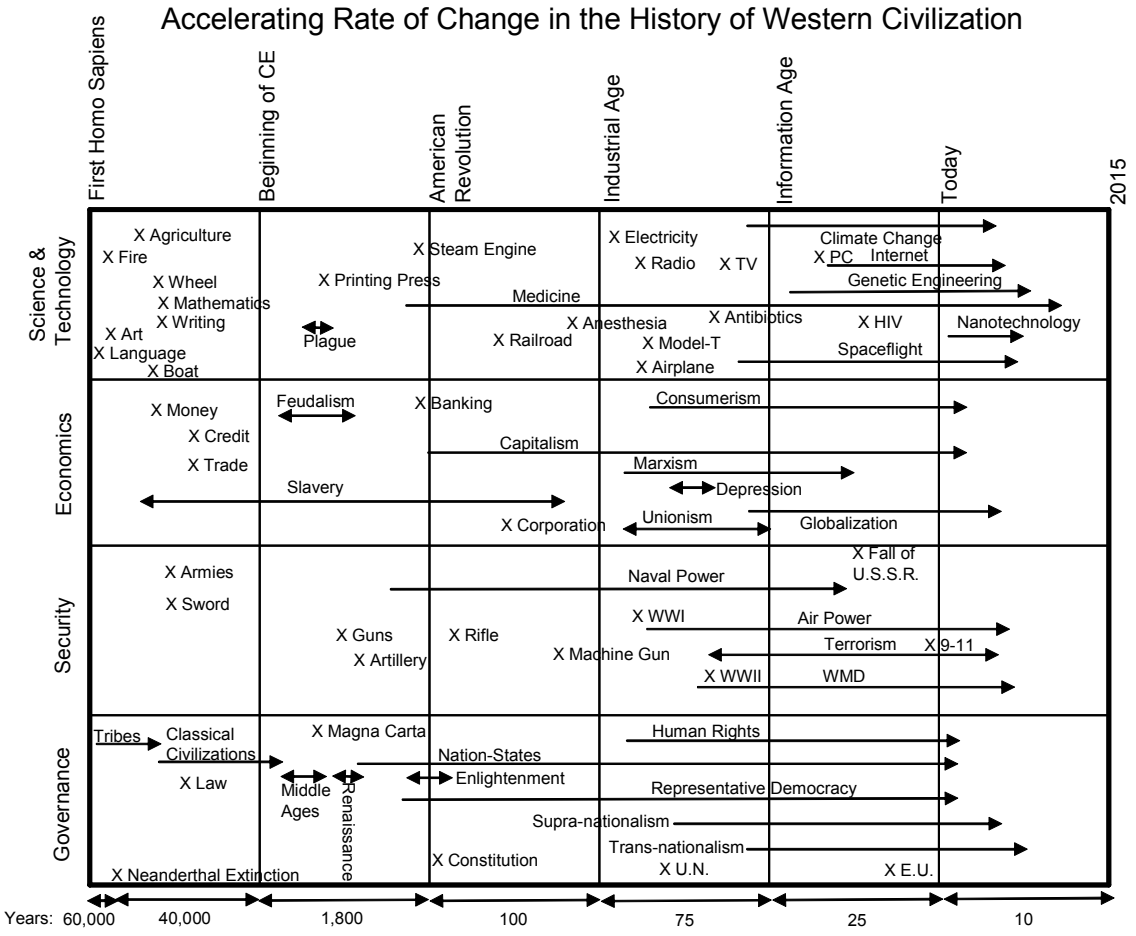
[4]In a March 16, 2005 speech, Chertoff outlined a strategy of risk management: "in terms of these three variables – threat, vulnerability, consequence. We seek to prioritize according to these variables, to fashion a series of preventive and protective steps that increase security at multiple levels." The speech can be found at <http://www.dhs.gov/dhspublic/display?content=4391>.

**Figure 1. Paradigm of Accelerating Change**




Human history includes periods of evolutionary change and periods of revolutionary change. Many steps forward are taken, with a few steps back; however, viewed on a large scale, human history follows the paradigm of accelerating change. Figure 2 shows the significant trends (arrows) and innovations ("X") in the history of Western Civilization from the dawn of modern man (*homo sapiens sapiens*), at least 100,000 years ago, to the present moment. Modern man existed as hunter-gathers sharing the world with Neanderthals for the first 60% of their history. Agriculture enabled early man to subsist more efficiently and early man organized into larger and more efficient social groups. The paradigm of accelerated change now comes into play. Progress builds upon progress, with more innovations being packed into shorter epochs of time. Hierarchical urban civilizations emerge in the most recent 30% of human history. The industrial age begins during the most recent 0.1% of human history, followed by the information age in the most recent 0.02%. Viewed at a fine scale, the human condition would appear to progress by both revolution and evolution. At the coarser scale of Figure 2, the impacts of many innovations superimpose and blend to form a curve of change resembling that of Figure 1.

**Figure 2. Accelerating Change in Human History.**

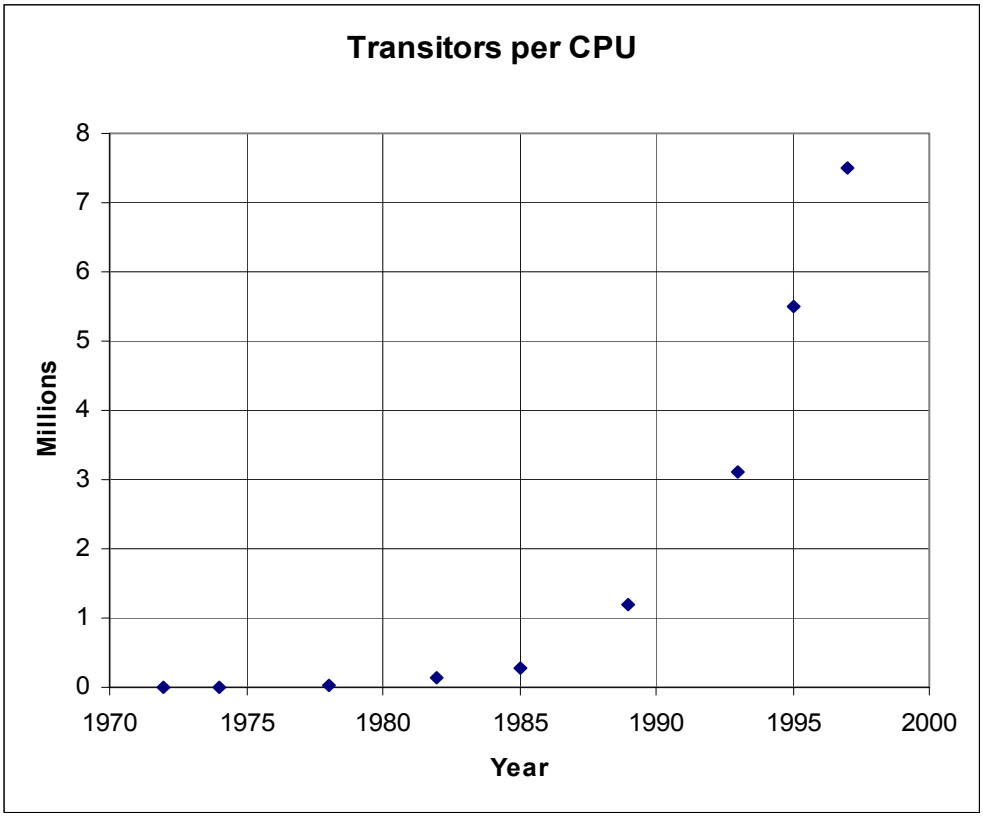



Much of the progress of civilization has been driven by technology. Technology, broadly defined as the recorded knowledge of how to make tools, is the DNA of civilization[5]. The evolution of technology is analogous to biological evolution in several respects. Just as biological innovation is built upon the existing genetic base, technological innovation is built upon the existing technical base. Technology enables technological innovation and accelerates change, as the paradigm of accelerating change dictates. Biological evolution is similarly driven and is also subject to the paradigm of accelerating change; although, we do not notice this change during our lifetimes, as biological evolution acts over the 4.5 billion year age of the Earth rather than the 100,000 year age of man.

Moore's Law (Figure 3) for the growth in the number of transistors that can be packed on an integrated circuit is the standard example of evolution and accelerating change in technology. Trends, like Moore's Law continue until they encounter insurmountable and fundamental limits, or are reaccelerated with the emergence of new revolutionary technologies. Moore's law, in fact, got its start with the invention of the integrated circuit and may undergo its next revolution with the advent of quantum computing.

[5] Kurzweil, R., **The Age of Spiritual Machines**, Penguin Books, New York, NY, 1999.

**Figure 3. Moore's Law at Work for Intel.**[6]




The next 10 years, or 0.01% of our history, may be witness to continued evolutionary change, in analogy to Moore's Law, or revolutionary or catastrophic change. In either case, the increasing pace of change and the increasing complexity of the modern world will challenge the abilities of our institutions to guide and manage change.

Just as technology has historically been responsible for an accelerating rate of change, this trend will persist as technology continues to exponentially increase the rate of change in the future. Technology will beget new forms of technology, which will fundamentally alter the scope of human relationships at the individual and societal levels, and will also revolutionize mankind's relationship to technology and its surrounding environment. Whereas, nature once exclusively governed the destiny of man, those roles have since changed. While nature continues to demonstrate its resiliency through tsunamis, climate change, and resistant and adaptive bacterium and viruses, man is increasingly becoming the primary arbiter of our planetary destiny. Since the dawn of the nuclear era, man has had the capability to bring life on this planet to an end. Due to advances in biotechnology, we are now able to alter the unique qualities of living organisms and virtually create new organisms – it is not outside of reason to believe that extinct species will soon be resurrected from the dead. Advances in computing, especially in the area of

[6] Consumer Electronics Manufacturers Association, as reported in R. Kurzweil, *op. cit.*

quantum computing, suggest that we are on the verge of creating a cognitive technological intelligence and capabilities that exceed our capacity to express in human language. These advances will almost certainly lead the way towards some type of artificial intelligence, where machines may reach parity with or even supersede their human creators. Other advances in the sciences suggest that human life may no longer be limited to planetary boundaries. Human settlement of other parts of the solar system is a distinct possibility in the next century. It would not be easy to exaggerate the effects that any of these developments would have on interpersonal relationships, governance, ethics, or any other sphere of American society. Any one of these developments would without a doubt represent a major discontinuity in the course of human history and would be a clear indicator of an accelerating rate of change.

## Report Map

This report will first cover complexity as it relates to FCIs, and Congress' ability to deal with complexity. We will also address the institutional limitations that inhibit Congress when dealing with FCIs. Next, we will detail the objectives, structure, responsibilities, and budgeting concerns for the proposed institutions: the House Annual Commission on Forward Engagement (HACFE) and the Senate Annual Commission on Forward Engagement (SACFE). In charting these Commissions, we will discuss some of the methodologies HACFE and SACFE should utilize in their approaches and techniques. Finally, we will offer some concluding thoughts about these Commissions and Forward Engagement. The appendices include examples of the FCIs developed in our study, as well as information about an important aspect of Forward Engagement that has until now not been discussed at length: The Human Dimension.

## Univalence vs. Multivalence

In discussing policies aimed at addressing FCIs, the panel uses the term "multivalent" to describe policy that incorporates the inherent complexity of FCIs, and the term "univalent" to describe policy that exists within an individual policy sector. The terms can be applied to not only policy, but to the attitude, culture and structure of an organization. Forward Engagement aims to employ and spread multivalent policies.

## Complexity and the US Congress

FCIs are designated as such because they are marked by complexity. Complexity characterizes a system whose parts mutually interact to form a whole that cannot be understood merely by understanding its component parts. The interactions between these components create dynamics, such as feedback and nodes that amplify or dampen effects, with significant consequences to the whole.

> ***Feedback***: *A process by which a system is controlled or changed by the response it produces. A system created to address FCIs would thus be subject to feedback. Feedback could take the form of social movements, economic trends, etc.*
> ***See Appendix VII***

Complexity has various noteworthy characteristics. It can be very sensitive to minimal disturbances, is difficult by definition to understand and verify, has multiple interactions between different components, and is marked by constant evolution and unfolding over time. The relationships between constituents of a complex system are critical. Relationships are marked by both short and long-range interactions, and are rarely linear. They contain negative or positive feedback loops that dampen or amplify effects. The history of the system is critical to understanding the system, since small disturbances in the past can lead to tremendous changes in the future. Another key feature of complexity is that the whole is comprised of complex parts. The system cannot be controlled by one subcomponent of the system.[7]

Certain limitations—institutional, organizational, and procedural—have hampered the U.S. Congress from effectively addressing FCIs. First, Congress lacks the framework to assess priorities. The legislature does not at present have a mechanism to rank the many threats, vulnerabilities and opportunities for advances it must consider during every legislative session. This is a particular problem because of the tendency for the institution to tend towards the status quo. Without a mechanism to attempt to rank the most vital threats and issues currently facing the United States, the Congress continues to view outdated threats as the most vital, leaving newer threats that are more pressing, not to mention impending threats, often unaddressed. Congress is an institution bogged down with short-term fixes, and diverted by special interests. These problems are certain to remain unchanged so long as pressure groups, narrow interests, and the 24-hour media cycle force Members into a reactive mode and constrict them into short-term thinking. While nothing can change the pervasiveness of the global media or the outbreak of crises that can dominate the political agenda, action can be taken to set aside time on the legislative calendar that is specifically designated for Forward Engagement.

A further problem is that members of Congress are accountable to their constituents. To remain in office, they feel compelled to demonstrate the positive developments they have helped achieve for those constituents. Thus, prevention appears a less desirable option, because when prevention succeeds, nothing usually happens. This contributes to the tendency of Congress to be reactive rather than forward-thinking.

Procedural changes over the last decade have made the consideration of FCIs even more difficult in the Congressional arena. The shift in power from authorization to appropriations committees has largely degraded the deliberative process of legislation. Hearings are often too formal, protocol-laden, and politically charged to be useful channels of information and communication. Rules changes in the House of Representatives, mainly as a result of Newt Gingrich's 1995 Contract with America, have had the negative side-effect of cutting back congressionally supported ways for Members to become informed or cooperate on issues.[8]

Most problematic are the inflexibilities and time limitations characterizing the legislative branch. These pressures, particularly the time issue, significantly reduce the ability of members to understand issues in a complicated context. In sum, Congress lacks time and

[7] Special Issue on Complex Systems, *Science*, 2 April 1999: pp. 79-109.
[8] Lorelei Kelly and Elizabeth Turpen. "Policy Matters: Educating Congress on Peace and Security." *Henry L. Stimson Center*, 2004: p. 26.

sufficient expertise to properly process all the information on pertinent issues, much less ascertain the complexity and ramifications of FCIs.

The limitations delineated above would seem to indicate that Congress as an institution is largely an impediment to change. Drawing this conclusion overlooks the advantages that Congress possesses and the potential the institution has to act as an agent of change. In particular, Congress has the unique ability to appreciate and incorporate the human dimension because of its close ties to its constituents, who will be affected by the FCIs, or who will benefit from preventing negative FCIs, or channeling positive FCIs. Because members of Congress already deal with a wide set of issues, they have a broader awareness of issues that will make it easier for them to grasp interrelations and multivalence. It is also in their interest to identify cross-cutting issues that may hamper or aid their legislative priorities. Finally, in contrast to the Executive, Congress holds tremendous amounts of institutional memory.

Therefore, the Blue Ribbon Panel has worked to identify ways to overcome some of the difficulties inherent in considering FCIs in legislation while also maximizing the unique advantages of the legislative branch of government.

## Energy Policy as a Case Study in Complexity

Continued global economic expansion depends on the availability of sufficient supplies of inexpensive, reliable energy. Therefore, any contingency that could greatly curtail or expand access to energy should be of interest to economists and economic policymakers. It is easy to see, however, that energy is far from a purely economic issue—the discovery, production, sale, and transport of energy affect and are affected by questions of governance, security, technology, and society. A comprehensive and proactive energy policy needs to account for these interrelationships, as they exist in the present and as they can be expected to exist in the medium and long-term future.

The security implications of energy are well-known. Geographically concentrated energy sources such as crude oil are vulnerable to political disruption, as during the 1970s oil shocks, or direct military interdiction. Countries and groups that control these supplies wield great power and invite potentially destabilizing challenges to their position, as when Saddam Hussein invaded Kuwait in 1990. The oil and gas-rich Spratly Islands in the South China Sea, claimed and occupied in part or in whole by five governments, are a more contemporary potential flashpoint. International security in strategically crucial regions such as the Middle East and Southeast Asia will be enhanced or threatened, possibly in unexpected ways, as the importance of oil and gas increases or decreases. A sophisticated American energy policy will recognize not only that international security can affect access to supplies, but also that energy demand can affect security. There can be no clearer example than the spread of nuclear energy, a trend kick-started by the United States in the early years of the Cold War. While nuclear energy provides an alternative to vulnerable oil and gas supplies, and operates far more cleanly than coal, the resultant radioactive waste provides the raw materials for nuclear and radiological weaponry, and its environmentally safe storage remains a significant challenge. The kind of energy the world chooses, the quantity demanded, and the location and abundance of supplies are closely interrelated with international security and governance.

Meanwhile, science and technology partly determine what energy sources are available and how economically they can be utilized. Further, and as discussed above, as a determinant of supply and demand, energy technology has security implications as well. A cogent energy policy will therefore consciously take advantage of the linkages between technology and security, asking how technological development can have not only economic but also security benefits. The potential impact of energy technology on society and governance should not be overlooked, either. While climate change and air pollution can have clear effects on, for example, social organization in climactically-vulnerable agricultural countries and on governance in the urbanizing developing world, new energy sources would not only alleviate these issues but also enable new forms of social, economic, and political organization. Portable solar panels and fuel cells are already empowering farmers in remote areas of countries such as Mongolia and Nepal. Conceivably, such technologies could also be adopted by insurgent groups operating in similar environments.

The proportional significance of the United States in global energy production and consumption is rapidly diminishing with the rise of the Asian economies. Therefore, the possibility of international cooperation on energy issues should be explored. Further, the United States should consider how it might shape energy development in industrializing countries through investment, technology sharing, or other means. The international dimension of energy issues adds a new layer of complexity to the policy environment.

Crafting a comprehensive, maximally effective energy policy will require attention to economics, science, geopolitics, and area studies, because energy policy interacts with all of these areas. The Joint Forward Engagement Committee can assemble knowledge from across the disciplines to assist Congress in understanding the complexity of energy issues and how the United States can exploit this complexity in pursuit of American and global interests.

## Missed Opportunities

Recent history is replete with examples where policymakers have ignored warnings of dangers just over the horizon, preferring to defer these challenges to the future and focus on contemporary short-term problems. One of the most compelling examples of this tendency was the April 2000 report of the U.S. Commission on National Security in the 21st Century, commonly known as the "Hart-Rudman" Commission. Established in 1998 by Secretary of Defense William Cohen, and supported by President Clinton and the House Republican leadership, the commission was tasked with highlighting new threats the United States would face in the 21st Century. The Commission foreshadowed the future by predicting a major terrorist attack in the near future, and calling for the creation of a Homeland Security Agency to guard against a terrorist attack and other threats.

Many of Hart-Rudman's recommendation were subsequently incorporated by the 9/11 Commission Report and the creation of a Department of Homeland Security, the greatest reform of the American national security apparatus since the 1947 National Security Act. However, it would seem that both the 9/11 and Hart-Rudman Commissions' recommendations regarding Congressional reform have yet to be instituted. Hart-Rudman specifically advocated for the merger of homeland security authorization and appropriation functions into one committee. Meanwhile, the 9/11 Commission supported a combined intelligence authorization and appropriations committee, as only one of

several important reforms to enhance Congressional oversight. In addition, the 9/11 Commission argued for a number of measures to strengthen bipartisanship and professionalism in intelligence oversight. These changes include reducing its member size, increasing subpoena powers, eliminating term limits, and including members serving on other national security committees. The purpose of all of these changes would be to streamline and improve Congress's intelligence oversight capabilities and give them funding precedence, while also marginalizing committee partisanship and enhancing the knowledge-base and competence of members.

In addition to addressing future threats and the need for institutional reform, the Hart-Rudman Commission also focused on future opportunities. "Second only to a weapon of mass destruction detonating in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology, and education for the common good over the next quarter century." This recommendation goes to the very heart of Forward Engagement and the concept of FCI's. In recent history, science and technology have contributed greatly to human progress by increasing life expectancy and the quality of life, and even putting men in space and on the moon, to cite a few examples. However, the same technology that saves and improves life can also destroy it - chemical and biological weapons are two particularly potent examples. The U.S. government, and especially the Congress, should strive to study and prepare for an uncertain future, where advances in nanotechnology and the proliferation of WMD technologies, as well as other FCI's, will challenge the personal security of American citizens and the survival of liberal democracy. Moreover, America's traditional strength in the areas of education and science and technology must be preserved in order to sustain American superpower and our way of life.

## Congressional Organizations

Congress has several agencies at its disposal, including the Congressional Budget Office (CBO), the Congressional Research Service (CRS), and the General Accounting Office (GAO). The Office of Technology Assessment (OTA) also produced reports and assessments for Congress for nearly 23 years, until it was abolished in 1995. Members of Congress rely primarily on their staffers, and its in-house agencies – the GAO and to a lesser extent CRS and CBO – to gain understanding of complex technological and scientific components of issues. CBO performs economic analysis, but is ill suited for crosscutting into other areas, especially the areas of science and technology. CRS covers a gamut of areas, making it appear well suited to the task of identifying FCIs. However, CRS's emphasis—fact gathering and reporting—is too superficial, and its pace, too fast to produce the in-depth analysis required for assessing the complexity and multivalence of issues. GAO may offer the most potential for identifying FCIs, and in fact appears to have taken up such an endeavor in the recently published GAO report entitled "21st Century Challenges," referenced in the next section. GAO conducts audits, surveys, investigations, and evaluations of federal programs, which are published as reports to members of Congress or delivered as testimony to Congressional committees. Yet the focus of GAO reports is on the past, not on looking forward and highlighting issues, or making policy recommendations.

To a lesser extent, members of Congress also rely on agencies such as the National Science Foundation, National Institutes of Health, and the Environmental Protection

Agency. The National Academies – the National Academy of Sciences (NAS), National Academy of Engineering (NAE), Institute of Medicine (IOM) and National Research Council (NRC) – have been used to try to fill part of the void left by the elimination of the OTA by advising the federal government on science and technology matters. These agencies are obliged under their 1863 charter to "investigate, examine, experiment, and report upon any subject of science or art." Yet the National Academies are not merely at the service of the Congress, they are obliged to both the legislative and executive branch. In addition, the National Academies are private institutions, and are thus not subject to Congressional oversight.

The Blue Ribbon Panel found that while the existing institutions offer significant potential in various subcomponents of forward engagement, Congress still lacks a mechanism to direct the search for and identification of FCIs. Such a mechanism ought to focus not only on generally identifying FCIs, but also on facilitating Congressional recognition and consideration of those issues.

## The Role of Regulatory Bodies

Regulatory bodies and agencies are chartered by the Congress and organized under the executive branch of the government. The Congress delegates these bodies with broad powers to execute, enforce, and oversee policy in a variety of areas. For example, the Environmental Protection Agency (EPA) is charged with protecting the nation's environment, while the Federal Aviation Administration (FAA) is responsible for regulating all civilian air transport.

The most significant characteristic of regulatory bodies is their wide-ranging ability to issue rules or regulations in order to carry out their agency's mission. Rules generally seek to streamline or clarify a regulatory issue and are subject to public comment and Congressional oversight. For example, the FEC is responsible for administering and enforcing the Federal Election Campaign Act, an important piece of legislation that governs the financing of federal elections. Thus, the FEC uses its broad rule-making authority to carry out the Federal Election Campaign Act as it sees proper and necessary. Through the course of its history, the FEC has issued rules governing contributors and contributions, as well as the content, timing, and quantity of political advertisements. However, every time the FEC issues a new rule, this rule must be published in the Federal Register, and the public is encouraged to comment on the proposed rule. After the period of comment closes, the FEC finalizes the rule, and must consider the record of all public comments in its final decision. The Congress exercises oversight of the FEC to ensure that its rules and actions are consistent with its legislated mandate.

While regulatory bodies dedicate most of their attention to dealing with present problems, they also have the power to deal with possible future developments, or FCIs. Currently, the FEC is considering how it should deal with online campaigning, including the use of blogs.[9] Although, they are a relatively new phenomenon, blogs played a major role in the 2004 presidential campaign, and there should be little doubt that they will have an even greater role in the elections ahead. Regardless of what the FEC decides, it is significant that it has kept up with recent FCIs - societal trends and technological innovations - in

[9] Brian Faler, "FEC Considers Restricting Online Political Activities," *The Washington Post*, March 21, 2005.

considering the regulation of online electioneering. The Environmental Impact Statement (EIS) is another way in which FCIs are considered by regulatory bodies. An EIS is a study that seeks to determine the environmental repercussions of any significant federal action. EISs consider the effects that a federal project will have on the air, water, economy, local ecosystem, and a variety of other conditions. EISs are overseen by the EPA, and federal agencies are required to incorporate the findings of the EISs into their plans so as to protect the affected environments and communities. By evaluating the effects of scientific, economic, social, and other FCIs on local environments, EISs force federal agencies to consider long-term forecasting and long-range planning every time they undertake a major project. Regulatory bodies routinely consider future developments and they should continue to be encouraged to do so. This measure would result in the executive branch becoming more future engaged, but would only indirectly increase the level of future engagement in the Congress.

## Issues vs. Policy Recommendations[10]

In looking at Future Contingencies of Interest, the Blue Ribbon Panel took particular note of the importance of bringing FCIs to the attention of the Congress without politicizing them. As a result, the Panel highlighted the difference between issues and policy recommendations. By keeping analysis and discussion of FCIs within the realm of "issues," we hope to avoid inevitable politicization of the subject that is likely to disenfranchise, alienate or misdirect the concerns of Members of Congress.

Policy recommendations almost inevitably incorporate value judgments and ideological bias that automatically politicize the issue being legislated. The purpose of forward engagement is not necessarily to legislate, but to increase Congressional awareness and consideration of FCIs in all of their policymaking. It is therefore essential to refrain from politicization of these issues as long as possible.

Framing FCIs as issues for consideration rather than imposing policy recommendations has a number of benefits. For one, it buys time for assessing the topic and its ramifications. At the same time, it avoids premature consensus. It also prevents or delays the issue from being framed in a way that contains underlying assumptions which may not be accurate or helpful.

An excellent example of the use of issues rather than policy recommendations is the GAO Report on "21st Century Challenges: Reexamining the Base of the Federal Government." The report presents 12 areas of note that may have serious ramifications for other policy areas in the future. By putting forth these issues in the form of questions, the report draws attention to the issues. At the same time, by keeping the issues in question form rather than putting forth policy recommendations, the report avoids inserting assumptions and biases that may alienate or immediately politicize the issues.

[10] The distinction between issues and policy recommendations has been best explored by Mark Notturno of the Interactivity Foundation. According to the Interactivity Foundation: "Ideally, public policy choices will be based on a careful consideration by democratic citizens of reasonable alternatives and their likely consequences for the future. Often policy choices must be made in response to crisis situations or in highly-charged political contexts in which well-developed policy alternatives are lacking. Public policy development in such circumstances rarely produces satisfactory results."
http://www.interactivityfoundation.org/

# Institutional Recommendations

Engaging issues in an increasingly complex and accelerating future will require greater expertise, flexibility, and creativity than the institutional boundaries of Congress presently encourage. Therefore, this panel provides the following strategy for instituting Forward Engagement as a means to invigorate the legislative process and help the U.S. Congress, the engine of American democracy, to better serve the people.

## Obstacles

The United States Congress was created to serve as a check and balance to the Executive and Judicial branches. The institutional structure is purposefully designed to encourage Members of Congress to address issues in a manner that ensures major changes to domestic or international policy are pursued only with careful consideration, media attention, public support, and appropriate research. The result is an often slow-moving congressional structure that tends to react to issues rather than anticipate.

Furthermore, many Members of Congress are policy veterans of the Cold War. During this period of time the institutional structure of Congress was well suited to respond to a central force of power in the Soviet Union. Threats originated from a known source and Congress likewise filtered those threats through the bureaucratic and often burdensome committee structure of Congress.

The challenge of today's Congress is not only to prevent, protect and deter against the wide range of threats originating from foreign state-actors and terrorist groups, but also to anticipate future vulnerabilities to U.S. national security as a result of emerging future contingencies of interest. The Blue Ribbon Panel encountered several challenges in attempting to encourage a forward-thinking attitude within Congress while addressing the concerns of the panel from the Fall 2004 Panel.

The Joint Forward Engagement Committee suggested by the Fall 2004 Panel was flawed for several reasons, each of which the Blue Ribbon Panel of Spring 2005 attempted to address. First and foremost, the Panel expressed concern that a joint committee would create a commitment that would be difficult to achieve for each House of Congress because of the structural and practical differences between the two chambers. Convenience problems such as the location and time of meetings would prove a hindrance to regular meetings between Members of the Senate and the House of Representatives.

In addressing this concern, the Blue Ribbon Panel initially explored creating a separate committee in both the House and the Senate. Although creating a separate committee in each body would serve as a surface-level solution to the problems of a joint committee, the Blue Ribbon Panel found that such an organizational solution would create even further problems. Primarily, the establishment of a new committee to deal with "forward-thinking" issues would create jurisdictional problems with the current standing committees. Because the range of issues that deserve a forward-thinking mentality span almost every committee, committee Chairmen would constantly be fighting a battle to bring legislation to their committee.

The Blue Ribbon Panel then considered creating similar committee structures to address FCI's, but to leave them without legislative authority. These committees would be filled with Members from all the different standing committees in order to encourage a wide range of expertise, and also to ensure that each standing committee would be successfully informed and educated of pending FCI's through their representative Member.

Before proceeding any further, the Blue Ribbon Panel agreed that current Congressional staffers ought to be interviewed regarding the proposed structure, with a significant amount of emphasis being placed on their feedback. The Panel took one week and spoke with several current and past Congressional staffers, including Chiefs of Staff, Legislative Directors, and other legislative staff from both sides of the aisle. Their feedback proved exceedingly useful, although the current proposal of the Panel was almost entirely dismissed as unfeasible and unattractive to Members of Congress.

Both Republican and Democratic staffers agreed that a committee with no legislating authority would not be attractive to Members of Congress. Such a committee would not have the prestige of committees such as Intelligence, Ways & Means or Rules. Simply discussing FCI's will not be enough for Members. Without the ability to act, the committee will serve as a lame duck and Members will be hard-pressed to take time out of their busy schedules to attend hearings.

Time proved to be one of the most difficult obstacles to overcome. The Spring 2005 class initially proposed assigning one or two Members from each standing committee, and suggested it should be the Chair and the Ranking Member in order to ensure bipartisanship and committee expertise. Upon discussions with staffers, we found that it would be unreasonable to expect Members with a substantial number of existing commitments and responsibility to serve on yet another committee.

Addressing these issues, the Blue Ribbon Panel attempted to create a structure that achieved a number of things. First, the proposal must be feasible. There is no use in creating yet another bureaucratic mechanism that will frustrate Members and consume their already precious time. Second, the solution must be something that the Members desire to engage in. This can be achieved by ensuring that any created committee possesses a certain level of prestige and power, and by creating constituent pressure for Member participation. Also, if the proposed strategy is placed on the agenda by the leadership, both in the Executive Branch and in the House and the Senate, this will help create the impetus necessary to propel forward engagement.

Given these obstacles and aims, the Blue Ribbon Panel realizes that there are flaws in its proposed strategy but that any solution will encounter resistance and require adaptive participants. Below is the Blue Ribbon Panel's recommendation for enhancing the forward-thinking capabilities of the U.S. Congress.

### Special Commissions

Commissions on Forward Engagement shall be established in each chamber of Congress to encourage Members of Congress to consider Future Contingencies of Interest (FCIs) while formulating and voting on policy options. These commissions will be called the House Annual Commission on Forward Engagement (HACFE), and the Senate Annual Commission on Forward Engagement (SACFE).

**Tasks of the Special Commissions**

The Special Commissions will each be tasked with planning and running the "Congressional Forward Engagement Sessions" (CFES), which will take place in January, at the start of each Congressional Session. Upon the conclusion of the CFES, the Commissions shall be tasked with fleshing out the findings of the hearings, considering the inputs of Members of Congress, and using the outcomes of the CFES to compile a Forward Agenda for Congress. The HACFE and SACFE will spend February-September conducting follow-up research and hearings in order to prepare the Annual Report/Agenda for Forward Engagement in the Congress.

**The Agenda**

The agenda will be determined by conducting a risk assessment among the FCI's considered by the Commission and prioritizing as appropriate. While there are a high number of plausible FCIs that could have dramatic impact on the way Americans live their life and/or the security of the nation, it is imperative that they be prioritized in order to ensure that those of greatest risk are addressed first. The assessment will consider three factors while prioritizing future contingencies of interest.

1. Criticality – If this FCI comes to fruition, what aspect of US security will be affected and how critical is it to maintaining national security as well as a sense of normalcy in both domestic and international relations.
2. Threat – Each FCI will be evaluated to determine how likely it is that the FCI will materialize.
3. Vulnerability – Level of security and vulnerability will be evaluated for critical infrastructure and/or aspects of national security that will be affected should a given FCI come to realization.

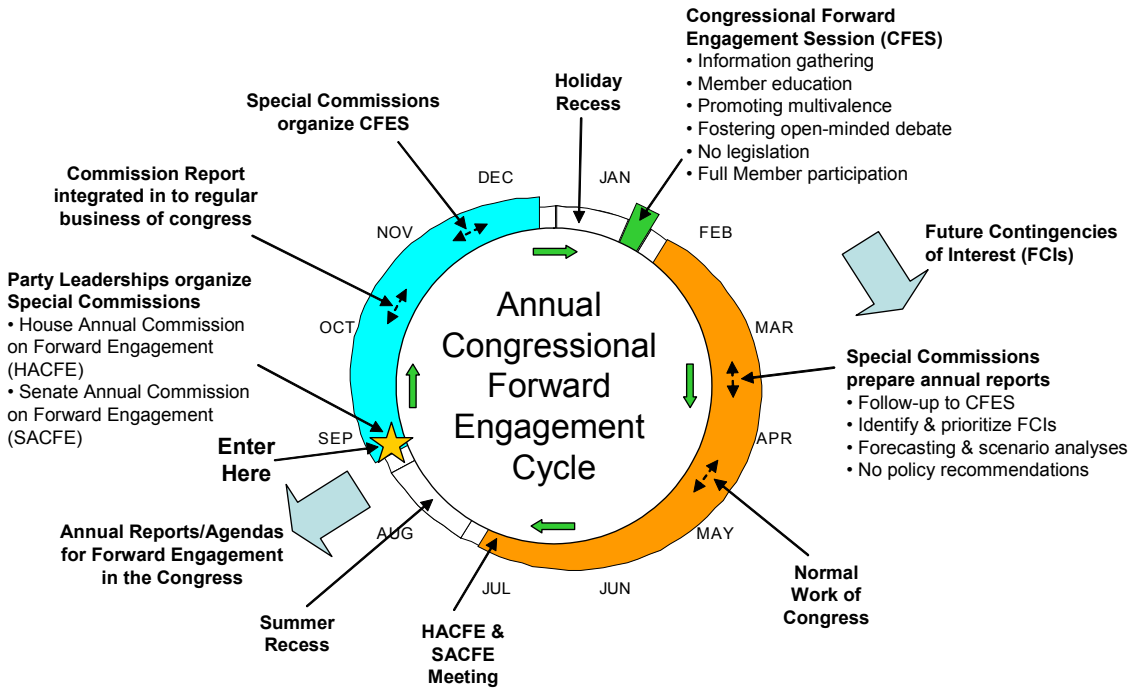
***September – January:*** The HACFE and the SACFE will dedicate time to self-organization and planning the FE Sessions. Specifically, the Commissions will be pro-active in working with the standing committees to prepare for hearings during the FE Sessions that will deal with forward-thinking issues. The Commissions will engage the standing committees in dialogue aimed at identifying issues the committees will deal with during the FE Session. The Commissions will then provide support and counsel to the committees in their combined mission to organize the most thought-provoking and productive hearings possible to best identify the issues that Congress should address. It is expected that the members will play a supervisory role during this period, with Congressional staff carrying the majority of the workload.

***January:*** The HACFE and the SACFE will run the Forward Engagement Session. This will last approximately one week and will be the only period in the cycle where each member will be involved in forward engagement activities. (see below for further detail).

***February-June:*** Drawing from the lessons learned during the FE Session, the HACFE and the SACFE will spend February-June preparing separate reports outlining priority FCIs. The report will identify high priority FCIs and explain – in simple terms – why the FCIs chosen ought to be priorities. The reports will draw on techniques of forward engagement, such as scenarios and forecasting to illustrate the different futures that could arise, depending on how the FCI plays out.

***July:*** In the month of July, the HACFE and the SACFE will meet to discuss their reports. This period of information sharing will serve to educate each house of the other's findings, in order to uncover areas of shared concern as well as provide new ideas to consider for the next report. There will be no requirement that the two commissions come to a final agreement on the prioritization of FCIs. Instead, this meeting will provide a moment to reflect on the findings of both houses. A final report will be prepared, with separate sections for each house's findings. This report will not make policy recommendations; it will summarize the findings of the Forward Engagement Session and incorporate follow-up findings. The unveiling of the report adds a second media opportunity to bring to light issues of long-term importance.

**Figure 4. Annual Congressional Forward Engagement Cycle.**




## The Forward Engagement Session

The Forward Engagement Session will be a period of one week, during which Congress will direct all of its attention toward current policy-decisions, scientific innovations, domestic or international trends, and any other matter that will effectively change the current status-quo either domestically and internationally. The purposes of the FES are four-fold; (1) information gathering; (2) Member education; (3) the promotion of multi-valence among Committees; and (4) fostering open-minded debate on FCIs. Though each annual commission may accomplish these tasks in their own creative ways, suggestions are as follows:

### Information Gathering

Information gathering will be conducted largely through the existing committee structure in order to sustain the current institutional structure. Members of the Special Commissions will be responsible for working proactively with standing committees to develop a comprehensive schedule of hearings to take place during the FE Session. The

purpose of the hearings will be to gather the information necessary to prioritize FCIs and later to serve as an impetus to write the report. The parallel and primary purpose of these special hearings is to engage the entirety of Congress in a forward-thinking dialogue on FCIs. The Commission will be tasked with making the hearings as interesting as possible in order to attract wide participation from Members of Congress.

**Member Education**

The education portion of the FE Session will be accomplished through participatory events, such as war game exercises, and by inviting dynamic speakers to address Members of Congress in a "conference" type setting. Participation will be optional for Members of Congress, however, the Commission's challenge will be to make the process as attractive to Members as possible.

**Promoting Multivalence**

The Commission will make a great effort to promote multivalence by encouraging and coordinating with standing committees to plan joint-hearings. Multivalence will also be encouraged through the "Fostering of Open-Minded Debate." (below).

**Fostering Open-Minded Debate:**

This addresses the goal of bringing FCIs to the attention of the Congress without politicizing them. The Commission will arrange a series of off-the record discussions between interested Members of Congress. The Commission's task will be to organize closed-door, off the record forums where Members will discuss findings from both hearings and "Member-education sessions" without media pressure. Through these private discussions, Members will comfortably express concerns and ideas without fear of political reprisal. Commissioners will be invited to participate, however staff will be discouraged from attending in order to promote a high level of candidness between Members of both parties.

## Membership on the Special Commissions

The House Annual Commission on Forward Engagement (HACFE) will consist of eight Representatives, and the Senate Annual Commission on Forward Engagement (SACFE) will consist of eight Senators. Both Commissions will be bipartisan. The leaders of the Republican and Democratic parties in the Senate will each appoint four Senators to the SACFE. The leaders of the Republican and Democratic parties in the House of Representatives will each appoint four Representatives to the HACFE. The party leaders are advised to select Commissioners that will not roil partisan suspicion and objection to the findings and recommendations of the Commission. With the goal of multivalence, the party leaders will be encouraged to include Members of Congress from diverse standing-committees.

Members of the Commission will be selected prior to the August Congressional recess so that they have four months to meet and prepare for the upcoming January "Forward Engagement Session." Commission Members may serve for longer than one year if re-appointed by party leaders.

Each Commission will endure one year, from September to September. New Members will be appointed into the Commission before the start of the Summer Recess.

## Staffing of the Special Commission

Each Commission shall have a permanent staff of a predetermined number of people to be established by each Commission. Staff will consist of individuals with diverse backgrounds, particularly in the fields of science, technology, economics, security, and governance. Each of the two Commissions will have a staff director who will provide continuity between different Commissions by serving a three-year term. The Speaker of the House will nominate a staff director for the HACFE who must be confirmed by two-thirds of the House. Likewise, the Senate Majority Leader will nominate a staff director for the SACFE who must be confirmed by two-thirds of the Senate. In addition to permanent staff, the Commission will accept Congressional Fellows from various independent organizations and from executive branch agencies. This will serve the goal of networking with experts from both inside and outside the government. The Special Commissions will also have an office for media relations.

# METHODOLOGICAL RECOMMENDATIONS

## Establishment of an Efficient External Relations Office

## Introduction

The External Relations Office will seriously consider the human dimension of Forward Engagement subcommittee legislation in order to make it relevant to the lives of individual Americans. This will guarantee that potential human repercussions of FCIs will not be overlooked or neglected. This office is intended to actively engage and pique the public's interest and involvement, and to keep affected parties abreast of Capitol Hill developments.

Additionally, this effort aspires to garner maximum involvement to underscore the importance of preparing accordingly for the potential impact of FCIs, with the intention of informing Congress. The involvement and advice of the groups listed below will emphasize to Congress the importance and gravity of anticipating future incidents with the potential to impact America's security. Their role will manifest in an advisory nature in which they will serve at Congress' pleasure. The elected officials then will be closely connected to the concerns of their constituents and will be kept abreast of developments.

Furthermore, the office will seek to establish a base constituency within the American public that will serve as the driver for forward-thinking legislation to create a positive, self-perpetuating cycle that maintains an environment that encourages and facilitates forward thinking functionality. As part of an effort to maximize interest and attention, this office will be able to extract relevant findings and recommendations, then alert the agency most capable of effectively responding.

This office will be broken down into several divisions that are tasked with the dissemination of pertinent information to the suitable recipient. The divisions will be in line with the four FCI categories, which are science and technology, economics, governance, and security.

## Outreach to Public

The purpose of this office is to gain public support and involvement by increasing awareness and familiarity, and creating a network that facilitates the exchange of FCI-related information amongst and between the American public and government officials. To increase the American public's awareness of FCIs, this office also must make a conscious effort to reach out to and involve academia, an important untapped knowledge base that can better educate the public.

This is a top-down strategy for public education. The federal government's grappling with FCIs prompts state, county and local governments to assume the lead role to inform, educate and advise the public about FCIs and their potential impact on individual livelihood and well-being.

## Outreach to the Private Sector and Nonprofit Organizations

This office will engage the private sector to enhance its experts' willingness to participate in and lend credence to Forward Engagement subcommittee legislation on a non-partisan basis that encourages pursuit of the best course of action. It will promote competition to explore different ways and methods to enhance interconnectivity between Congress and the private sector. Competition serves to balance partisan ideas that otherwise might compromise the objectivity and apolitical discussion of this legislation's human dimension.

Also, this office will engage nonprofit organizations to increase their experts' enthusiasm to participate in the Forward Engagement dialogue. The office will encourage nonprofit organizations to use their resources more efficiently and effectively in pursuit of long-term objectives and solutions. The office will combine efforts with government and private sector leaders who are able to avert potentially dangerous consequences of FCIs while encouraging their potentially positive benefits.

The private sector's relationship with Congress will be strictly advisory in nature. Congress therefore is free to employ or disregard the private sector's suggestions as it sees fit, though ideally, Congress will seriously consider their recommendations.

## Outreach to Leaders in Health Care and Academia

Medical doctors and academics, as some of society's most respected professionals, serve as an essential bridge for engaging the American public about the dangers and opportunities presented by FCIs. The stature of this community in American society enables and facilitates their ability to inspire action by the average American citizen. Their influential opinions and inspirational abilities will be underscored and strengthened by the circulation of a publication that imparts unbiased and unfiltered information that the average American can comprehend. The ultimate goal is bettering the public's knowledge of FCIs.

Doctors and academics would fulfill a role akin to that of the private sector in which these esteemed experts would serve Congress solely in an advisory role.

## Involvement of Additional Government Agencies

Existing government agencies are able to help streamline and enhance information exchange and sharing, widen the scope of an informed government, and encourage collaboration between Congress and additional government agencies whose efforts will aid and assist Congress' efforts to ensure the safety and security of America. The drafting and enactment of Forward Engagement legislation is too large of a task, and it will be better served by involving more than one branch of government.

Furthermore, these government agencies eventually may develop an efficient, safe network to monitor various activities, prevent redundancies and enhance collaboration. Their efforts to outsource research to federally-funded institutes and organizations that study and develop prevention techniques not only would help ensure the defense of public safety but also draw additional attention to this important venture they have undertaken.

## Congressional Fellows

This office will encourage private, nonprofit and academic sponsorship of select scholars to increase their expertise in particular FCIs. Congressional Fellows may serve as bridges between sponsors, Congress, and the Forward Engagement task force, thereby uniting many components capable of addressing FCIs.

## Media Management

The Forward Engagement office will be tasked with contacting media outlets to entice interest in pursuing news stories, serving as yet another method to inform the American public of the dangers and benefits of FCIs. This effort to increase attention and widespread awareness will emphasize public interest and safety. The themes will be information, preparation, prevention and intervention. These news stories, which directly impact the public's effort and willingness to better prepare itself, will spur Congress to actively tend to these issues.

## Public Outreach Summation

In sum, the success of this effort will hinge on public interest and involvement, requiring an External Relations Office that informs and educates. Congress also must rely on well-informed outside bodies whose expertise will help strengthen America's security. The nature of these broad, complex issues requires Congress to seek assistance from experts whose knowledge and capabilities will complement government's efforts to minimize the negative, harmful consequences of FCIs. Therefore their participation is a critical lynchpin. These participatory recommendations and this involvement should be embraced by Congress to ensure the drafting of effective legislation that will benefit all Americans.

# CONCLUSIONS

As part of its mission, the panel defines interests of the United States from the perspective of a world in motion—one in which events are changing at an accelerating rate. In this world, issues of governance, economics, science and technology, and security defy strict categorization, exposing artificial boundaries in our thinking and reshaping our basic assumptions about reality. Such a dynamic and fluctuating environment ineluctably challenges policymakers to invest their attention in making long-term decisions and attempting to understand the complex relationships between policies and events. Unfortunately, we found little evidence that the Congress is up to this vital task, especially where boundary-spanning or multivalent policies that are concerned. Our analysis suggested there were several sources for this deficiency, some of them stemming from the organizational structure and constitutional role of Congress, and some of them from a culture that fails to look beyond the short-term or reflect on the consequences outside a particular realm of policy expertise. This cultural problem appeared to be true of the congressional workforce at all levels.

The issues pertaining to congressional structure and constitutional role we believe can be most effectively addressed by our recommendation for the formation of both HACFE and SACFE. We also presume that by their formation, we will begin to address the cultural problem by raising awareness and taking the first steps within Congress to correct it. Thus, our recommendations include plans for building consciousness and procedural change, as well as offering a number of methodologies that can be used by the HACFE, SACFE, and any other interested members, committees or staff. The task force recognizes that the day-to-day duties of a Congressman, Senators, and their staffs make the ability to think beyond the near-term extraordinarily difficult. This, of course, means it will also require extraordinary effort to change these habits. However, the task force firmly believes that in this fast-paced and more dangerous world a more far-sighted approach is imperative for American security and prosperity.

In the process of formulating an approach to solve the organizational problems, we considered many alternatives. Starting with the recommendations from the interim report of the Blue Ribbon Panel, the final report rejected the proposal for the creation of a Joint Forward Engagement Committee due to the difficulties in coordinating between the schedules and practices of the two houses of Congress. The first alternative was to create new committees and subcommittees in the House and Senate assigned to address Forward Engagement issues. However, this proposal was rejected for the jurisdictional problems it might cause. A second suggestion involved creating a special committee composed of chairmen and ranking members of germane committees, with the objective of deliberating over Forward Engagement, but without legislative powers to avoid jurisdictional fights or over-politicization of the issues. This option was also rejected due to the perceived burden on Members with existing committee obligations and for the lack of prestige that would inevitably follow from the lack of legislative powers. Finally, the alternative we settled upon showed the most promise for improving Forward Engagement and being institutionally sustainable.

First and foremost, the separate Annual Commissions and Congressional Forward Engagement Session give each chamber the required time to deliberate long-term issues before daily business crowds out the calendar. The Commissions will also provide the

expertise and diverse experience that the body currently lacks. Furthermore, the annual process of producing a Forward Engagement agenda will provide the necessary sanctuary to debate these issues and the hard questions they pose before the politics of legislating begins.

In addition, the Commissions will benefit from its close connection with individual Members of Congress, an attribute that other Congressional offices like OTA did not enjoy. This relationship should lead to a sense of trust in the Commissions' analysis by providing them with some control over the output that ultimately enters the political arena. Although involving Members in the Forward Engagement process opens the risk for premature politicization of FCIs or the political manipulation of the Forward Engagement agenda, the countering weight from opposition parties and outside experts should help mitigate this danger.

Finally, it should be remembered that the benefits of these Commissions and Sessions might not just help avoid a national calamity. Once in place, these instruments of Forward Engagement can help the United States anticipate opportunities and realize the potential of future developments. Instituting these changes, in our judgment, will restore a sense of creative energy and intellectual power in the legislative branch that will make the United States Congress more relevant in the 21st century and a better servant of the people.

Therefore, with this final report, the Blue Ribbon Panel on Forward Engagement respectfully submits these recommendations for consideration and urges their adoption.

# APPENDIX I: ECONOMICS FCIs

## The Future Contingency of the Loss of Dollar Dominance
## Kristen Mann

Through the spring of 2002, I had lived nearly 72 years without purchasing a foreign currency. Since then Berkshire has made significant investments in – and today holds – several currencies. I won't give you particulars; in fact, it is largely irrelevant which currencies they are. What does matter is the underlying point: To hold other currencies is to believe that the dollar will decline. - Warren Buffet[11]

In general, people spend very little time thinking about the "little" changes that could dramatically alter life in the future. Therefore, most people do not imagine a future that is drastically different from the present. For Americans, a future in which the dollar loses its dominance could deeply affect the daily life of private citizens, as well as severely diminish the U.S. role in international relations. With his confession/warning, Warren Buffet is signaling a Future Contingency of Interest (FCI). This paper will explore why a shift away from the dominance of the dollar marks a Future Contingency of Interest. It will also examine the importance of identifying FCIs in general and fleshing out their possible consequences.

Today's world economy is largely based on the dollar. Seventy percent of foreign currency reserves are held in dollars and most international commodities are priced in dollars[12]. Most Americans do not understand the concept of buying foreign currencies, nor do exchange rates factor into their daily purchasing and saving decisions. On the other hand, buying and selling dollars constitutes the basis of the fiscal and monetary systems of other nations, and dollars are bought and sold to maintain the stability of foreign currencies. Foreign private citizens sometimes buy dollars as safe investments when their own currencies are unreliable. The dollar is so entrenched in the world economy that other nations are effectively forced to continue to buy and sell dollars and to do so at times simply to stabilize the dollar. The dollar is central to the functioning of the world economy and the power of the dollar (backed in recent history by strong economic growth) has allowed the U.S. to set many of the terms of the global financial system. The willingness of other nations to invest in the dollar has also allowed the U.S. to spend beyond its means.

It is precisely the latitude to spend beyond means that may return to haunt the U.S. With the U.S. trade and current account deficits burgeoning, and the dollar declining vis-à-vis other currencies, foreigners are starting to lose money on their dollar investments, thereby losing confidence in the dollar. What would happen though if foreign nations and foreign citizens decided that it was no longer worth the risk to hold dollars and slowly started increasing their holdings of other currencies instead? This contingency is not far-fetched.

Buffet is not the only person beginning to shift holdings into non-dollar currencies. Foreign investors hold about half of the $3.95 trillion in marketable U.S. Treasury securities and Asian banks alone hold about $1 trillion of these bonds.

[11] Buffet, Warren. "America's Growing Trade Deficit is Selling the Nation Out From Under Us. Here's a Way to Fix the Problem – And We Need to Do It Now," *Fortune*, November 10, 2003.
[12] Presentation to the Treasury and the Treasury Borrowing Advisory Committee. www.treasury.gov February 1, 2005.

However, Stephen Green, CEO of HSBC Holdings, recently predicted that Asian central banks would significantly reduce their dollar holdings in next few years.[13] The Organization of the Petroleum Exporting Countries (OPEC) likewise revealed that they were diversifying their investment portfolios away from dollars. In Russia, where seventy percent of foreign currency reserves are held in dollars, the government is debating pricing Russian oil in Euros with the goal of decreasing their own dollar holdings.[14] While dumping dollars would be detrimental to all, the movements by Asian banks, OPEC, and Russia could be the start of an even larger trend toward slowly weaning the world economy off dollar dependency.

Developing FCIs in an important exercise in identifying key issues that could have the power to change the trajectory of history as it unfolds. An FCI is a future situation that appears to have a solid chance of occurring based on the course of current events. It is useful to recognize these contingencies and consider scenarios that may transpire as a result. The contingency that the U.S. dollar might not remain an unchallenged currency hegemon is a real one and the consequences could be significant.

The historical strength of the dollar has allowed the U.S. economy to grow at an impressive and steady rate. The stability of the dollar has lent credibility to the U.S. in international financial matters. As a result, the U.S. has been able to unofficially dictate much of the international finance regime. The World Bank is always led by an American, and the U.S. has the largest number of votes on the IMF Executive Board. Both institutions are located in the United States as a visible reminder of this power. As a result, the U.S. maintains significant influence over world economic governance. For example, in the wake of the Asian financial crises, several Asian nations explored establishing an Asian Monetary Fund (AMF). That this project did not come to fruition was largely due to U.S. objection. Some believe this sheds light on the U.S.'s current dominance in international finance regimes;

> Given Asian desires to enhance regional surveillance and coordinating capacity, it might be worth considering the nature of U.S. objections to the AMF…U.S. policy towards an incipient AMF reflects a…political/bureaucratic institutional desire not to cede the power of the international financial institutions – in which the United States is dominant – to regional institutions over which they would certainly have less ideological/philosophical and practical control.[15]

The priceless advantage of the U.S.'s current position as economic powerhouse and holder of the rights of seigniorage over the world's dominant currency has placed U.S. in a position of being able to write the rules of international finance in a manner that benefits and maintains U.S. authority. A grave consequence of losing economic clout would be the loss of authority over the future of the world financial and economic system.

The loss of this position could herald other changes even more visible to the average U.S. citizen. For one, the U.S. would no longer be able to live so far beyond its means as fewer countries and investors would be willing to finance

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[13] *Bloomberg*, "Asian Central Banks May Cut Dollar Holdings," February 11, 2005.
[14] *International Petroleum Finance,* "Dropping Dollar Prompts Russian Reserves Rethink," January 11, 2005.
[15] Richard Higgott, "Regionalism in the Asia-Pacific: Two Steps Forward, One Step Back?" in *Political Economy and the Changing Global Order*, ed. Richard Stubbs and Geoffrey Underhill, 258 (Oxford: Oxford University Press, 2000).

U.S. consumption. Consequences further down the road are even more daunting. English is currently the international language of business and commerce. If the Chinese renminbi were eventually to overtake the dollar as the currency of choice, there would be no compelling reason for China's 1.3 billion citizens to learn English. This would further disadvantage American business people who are accustomed to enjoying access to a wealth of financial and commercial information provided in their own language.

Thus, the implications of a discarded dollar could be immense. Not only could the U.S. lose its power on the world stage, but the lives of average U.S. citizens could be greatly impacted. This future contingency of interest should be considered by the Administration as they continue to apparently dismiss concerns about a falling dollar. Instead of simply assuming the dollar will always maintain its position in international financial markets, it is wise to consider that it might not.

## Obesity: A Weighty Future Contingency of Interest
## Gabrielle Kohlmeier

Every time period is shaped by a number of certain forces or major events. The effects of these influencers may remain confined to one field, have ripple effects that lead to changes in other areas, or be forces of such substantial mass and importance that they affect society as a whole almost immediately through their impact on economics, security, governance, or science and technology as a whole. The most significant of these eventualities, those that appear poised to attain sufficient mass to affect the future, can be termed future contingencies of interest (FCIs).

One of the major contingencies of interest in the realm of economics, both for the United States and the rest of the world, will be the rising cost of health care in the next 15-20 years. Health care costs will balloon as various expectations become realities, including increased average life span of individuals, availability of new, expensive medical procedures and drugs, and possible epidemics of communicable diseases, such as HIV/AIDS, SARS or other similar diseases. All of these factors could, and likely will, have serious economic effects, particularly in terms of health care costs.

Obesity will also have significant health care costs, but it differs from the previously mentioned diseases. With obesity, the question is not whether or not it will have serious economic repercussions—it indubitably will. The question is rather in terms of the magnitude of the economic ramifications of this health problem in the next 20 years and beyond. This paper presents the current and projected prevalence of obesity, the array of health problems that spring from this disease, and its economic costs. Finally, the paper explains why obesity is virtually certain to have major economic effects in the future. Based on the wide number of people who will be affected and the tremendous costs associated with the disease, obesity is an important future contingency of interest for the United States.

### Obesity Trends and Projections

Obesity rates began rising dangerously in the United States in the 1980s, and continue to grow precipitously both in the United States and around the globe.

Approximately one third of Americans are now considered obese[16], the number having more than doubled between 1980 and 2000.[17] The upsurge in childhood obesity is perhaps even more worrisome: since 1988, obesity of children between the ages of 6 and 19 has increased by more than 40 percent (See table 2). The United States is the most obese country in the world (the country with the highest rates of obesity among its population), but it is by no means the only country affected. Contrary to many expectations, the problem is not even limited to highly developed countries. According to the World Health Organization, obesity now threatens more people in the developing world than undernourishment.[18] Countries such as Mexico, Togo, and emerging economic heavyweights such as China and Brazil, already suffer from higher rates of obesity than malnourishment, and obesity rates are still rising. According to obesity experts, while obesity in the past was mainly a disease of poor people in rich countries, the burden of obesity in the 21st century is shifting to include poor countries. Projections into the future estimate that obesity will continue to rise, reaching record proportions by 2025. In the United States, more than 50 percent of the population is projected to be obese twenty years from now (See graph 2).

The importance of these obesity prevalence trends and projections is made clear by looking at the effects of the disease. What makes obesity important enough to be deemed a future contingency of interest is not only its prevalence, especially in the United States, but that it also causes more than 30 other costly diseases, from cardiovascular disease and an array of cancers, to clinical disorders and exceptional complications of injuries and infections following trauma.[19] In fact, obesity has been shown to cause more health problems than smoking or drinking, with obese individuals 30-50 percent more likely to have chronic medical problems than those who smoke or drink heavily. The effects of obesity are similar to twenty years of aging in terms of every day functioning and chronic illness, and obesity has been shown to cut up to 13 years off a person's expected lifespan.[20] As for childhood obesity, more American children are now killed by obesity than gun violence.[21] Altogether, obesity now kills approximately 400,000 Americans of all ages each year.[22]

**Economic Costs of Obesity**

Economic factors actually seem to be among the strongest—though by no mean the only—factors contributing to the tremendous rise in obesity over the last 25 years. Thus economic factors are of particular relevance, not only for this paper, but also to understand the factors that aided the rise in obesity rates. Such examination can provide indications of whether the surges are likely to continue in the future, or if the economic

[16] Obesity is defined as a Body Mass Index greater than 30, or approximately more than 30 pounds overweight for a person 5'4" tall. See figure 1 and table 1 on the rising rate of obesity in the United States.
[17] National Health and Nutrition Examination Survey, National Center for Health Statistics, Centers for Disease Control and Prevention, 1999
[18] "Waist Not, Want Not," *Foreign Policy*, September/October 2003, p. 14-15.
[19] Richard Thatcher, "Political Economy of the 'War On Fat'," *Canadian Dimension*, May/June 2004, p. 30. Other diseases obesity engenders include musculoskeletal conditions, heart disorders, impaired immune response, cancer of the esophagus, gastric cardia cancer, endometrial cancer, colorectal cancer, renal cell cancer, breast cancer, prostate cancer, poor female reproductive health, gall-bladder disease, gout, impaired respiratory function, liver disease, urinary stress incontinence, pancreatitis, sleep apnea, lower back pain, foot problems, and arthritis.
[20] Natasha McDowell, "Obesity's Effect on Lifespan Calculated," *New Scientist*, Jan 8, 2003.
[21] Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity, 2001.
[22] Centers for Disease Control and Prevention, 2004.

factors were temporary forces that will disappear, making it less likely that obesity will rise to the projected levels in the future. There have been two major economically-related forces that researchers have attributed with the rising obesity rates. First is the increased economic efficiency resulting from technological advances. Yet increased obesity is not merely a result of less activity required of humans as machines have continually replaced what used to require human physical exertion. Even more important, technological advances have made food production, particularly of high calorie, processed foods, dramatically less expensive. Economies of scale actually promote greater production in order to further decrease costs. Technological advances have also led to higher incomes, even of relatively poorer segments of the population, which have enabled individuals to consume greater amounts of food.[23] The second major force driving rises in obesity has been the decrease in the cost of high-calorie (high fat, sugar, processed) foods relative to the cost of other foods, and the increased popularity of margin cost pricing, more commonly known as super-sizing.

Obesity rates may have shot up due to economic factors, but the US economy has not received an equivalent benefit in return. While a few, select industries—for example, the diet/weight-loss industry, plus-size clothing manufacturers, and of course providers of high-calorie foods and beverages—will likely benefit as obesity rises, the economic implications for the United States on balance will become quite dire. According to the US Surgeon General, the direct and indirect costs of obesity in 2000 already totaled a whopping $117 billion.[24] Direct medical costs may include preventive, diagnostic, and treatment services related to obesity. Indirect costs relate to morbidity and mortality costs. Morbidity costs are defined as the value of income lost from decreased productivity, restricted activity, absenteeism, and bed days. Mortality costs are the value of future income lost by premature death.[25]

The direct costs of obesity are partly incurred by obese individuals themselves. A recent Mayo Clinic study found that obese men spend roughly $80 per month on prescription drugs, 3.5 times the amount spent by their normal weight counterparts.[26] Two other recent national studies both found that medical costs incurred by obese adults between the ages of 18-65 are 36 percent higher than their normal-weight counterparts.

The largest portion of economic costs stemming from obesity, however, is borne by the general public, through taxes and higher health insurance costs. Two economic papers utilizing econometric approaches to assess costs of obesity found that the government pays for roughly half the total annual medical costs attributable to obesity.[27] Medicare covers many obese individuals, and Medicaid recipients have a 50 percent higher prevalence of obesity. The average cost tax payers pay to cover obesity-related medical expenditure under these two programs was calculated at $175 per year.[28] Individuals also pay for obesity-related medical expenses in other ways, such as higher health-insurance premiums. In addition, the general public pays the cost of retooling or equipping facilities to accommodate larger-sized people, who require special beds,

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[23] Christopher Ruhm, Eric A. Finkelstein, and Katherine M. Kosa."Economic Causes and Consequences of Obesity," *Annual Review of Public Health*, forthcoming Vol. 26, 2005 (Available as Review in Advance as of Nov 1, 2004), pp. 14.6-14.8.

[24] US Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity, <http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_glance.htm>

[25] As defined by the Centers for Disease Control. <http://www.cdc.gov/nccdphp/dnpa/obesity/economic_consequences.htm>

[26] "Obesity Carries Extra Health-Care Costs," *National Health Information Center, US Department of Health & Human Services*, Nov 7, 2004. <http://www.healthfinder.gov/news/newsstory.asp?docid=522142>

[27] Ruhm, Finkelstein, and Kosa. "Economic Causes and Consequences of Obesity," pp. 14.9-14.10.

[28] Ibid

special equipment for healthcare such as larger MRI machines, as well as non-medical facilities, such as larger seats on airplanes, larger cars, and more disabled access.

Businesses also bear costs due to increased health insurance premiums and reconfiguring their products to fit obese individuals, though that is not their only obesity-related cost. A number of different studies show that obese individuals are between 1.61-1.74 times more likely to have a moderate or high number of absences from work due to illness than their normal weight coworkers.[29] The cost of absenteeism was estimated at approximately $2.4 billion in 1998. In addition, obese individuals, particularly women are most likely to work in low-paying occupations and are largely excluded from managerial or professional positions.[30] Women who were obese also earn lower wages than their counterparts, though the same has not been found for men. Another study of baby boomers found that the net worth of obese individuals was roughly half that of normal weight counterparts.[31] The loss of productivity and earning potential affects not only individual people and business, but also the economy as a whole. As obesity rates rise, there will be a greater loss of potential, both in terms of net worth and lost worker productivity.

**Future Economic Implications of Obesity for the US**

The implications of obese individuals making up fifty percent or more of the US population in the next 15-20 years will have staggering implications for the US economy. It is particularly important to note that the number of extremely or morbidly obese Americans is increasing at an even greater rate than obesity in general. Morbid obesity carries even greater medical and morbidity costs. Health expenditure, which already accounted 14.9 percent of GDP in 2002[32], will rise even more as newer, more costly drugs and procedures are developed to help those who can afford them. Yet poor Americans, who are most likely to become obese and then as obese individuals more likely to earn less than their non-obese counterparts, will be hard pressed to afford many of the obesity drugs and medical procedures. Thus it seems likely that obesity will further fuel further economic and quality of life inequalities between economic classes in the US.

Even though many poor people will not receive adequate treatment for their obesity-related illnesses, health care costs will sky rocket. The very poor may be able to receive government aid to treat their diabetes or other obesity-induced diseases, which will put increasing pressure on government health spending. According to experts, the medical costs alone will "strain the health care system and economy in the years to come."[33] This may make these types of health care programs unsustainable, or could require reduced spending for other government programs.

To prevent obese individuals from becoming ostracized from the rest of society, facilities will need to be continually adjusted to accommodate larger individuals. This could further add costs, as seats must be made larger and able to hold more weight. Energy costs are also likely to rise, as Americans fit less comfortably in smaller cars, and continue buying larger vehicles that require more fuel. In addition, many extremely obese Americans have impaired mobility and use motorized scooters for distances they

[29] Ibid
[30] Ruhm, Finkelstein, and Kosa."Economic Causes and Consequences of Obesity," p. 14.11.
[31] Jay L. Zagorsky. "Is Obesity as Dangerous to Your Wealth as to Your Health?" *Research on Aging*, January 2004, pp.130-152.
[32] Centers for Medicare and Medicaid Services, National Health Care Expenditures, <http://www.cms.hhs.gov/publications/overview-medicare-medicaid/default2.asp>
[33] Nanci Hellmilch, "Obesity Rate Could Reach Nearly 40% in Five Years," *USAToday*, Feb 7, 2003.

otherwise would have walked. Individually, these costs may be minimal, but long before half the US population becomes obese the costs will compile to significant amounts.

The loss of productivity associated with obesity will also detract from the economy, particularly in manual labor or other low income sectors which employ those workers most likely to become obese. Immigrants, who provide much of the low-wage labor that the United States thrives on, will also be affected, as recent studies have shown that the longer immigrants remain in the US, the closer they come to matching US rates of obesity.[34] Obviously, morbidity costs will rise as obesity increases. Mortality costs may not end up being quite as costly, as the lifespan of obese individuals may be extended to equal that of their normal weight counterparts. As a result, however, the drugs and other medical costs allowing obese individuals to avoid premature death will further add to increasing health care costs.

While the US is not the only country suffering rising obesity rates, it will continue to have higher obesity rates than any other country according to projections. Thus, the high obesity rates in the US will also affect US competitiveness relative to other, less obese countries. This may have further negative effects for US trade and budget deficits.

**Obesity as an FCI**

Clearly, obesity on a large scale requires significant spending, public, corporate or private, to deal with the tremendous medical costs associated with obesity. In addition, the morbidity costs and loss of potential wealth and productivity that are lost as obese individuals are relegated to non-managerial and professional jobs may come to rival those onerous health care costs. It may not be as clear that the US actually will come to be saddled with the burdens of obesity costs. A number of developments may seem likely to mitigate, if not prevent obesity from actually developing into a massive effect on the economy. Technological developments may develop cures for a number of the diseases caused by obesity, or they may increase productivity and make up for the loss of productivity resulting from obesity increases. Scientific advances—nanotechnology, genetic developments, or pharmaceutical discoveries— may be able to prevent obesity itself or help obese individuals lose excess weight. Even without scientific or technological developments, the US may recognize the costs it will face if obesity rates continue to rise, and move decisively to prevent obesity from becoming an overwhelming economic burden.

Though these or other developments could stem future obesity rates, the possibility of such developments making the requisite impact to prevent obesity from having significant economic effects is quite slim. First, in terms of scientific advances, it is unlikely that these advances, even if they are successfully developed will be inexpensive enough to be readily available to the segment of the US population that will need them the most—the poor, who are most likely to become obese, and least likely to have adequate health care to cover costly drugs or medical procedures. As for technology replacing workers and increasing productivity, precisely such technology has actually contributed to the recent increases in obesity, and thus may further exacerbate the problem even as it makes up for some of the productivity losses. Second, the likelihood of the US acting to prevent obesity through any compulsory measures, such as taxing high calorie foods or mandating certain programs for obese individuals, also seems slim in the near term. Obesity is largely viewed as a personal responsibility, not a public issue.

[34] "Fat Chance for US Immigrants," *New Scientist*, December 18, 2004.

Third, there are strong economic forces that are pushing Americans to continue to consume, if not increase consumption, of high calorie (highly-sugary, fatty, and/or processed) foods. In light of recent legislative moves that seem to exonerate these companies from any culpability or future litigation, it seems that the political will does not exist to intervene in the market to try to bridle those forces. In addition, the economic causes examined earlier that contributed to the rise in obesity were not merely temporary flukes that can be dismissed in the future. Production of energy-dense foods continues to be cheap, and the technology that allows inexpensive production will likely only continue to improve.

Finally, and most importantly, obesity is a future contingency of interest even if projections regarding American obesity do not become reality. In fact, even if the obesity rate does not rise at all or drops, current obesity rates will have long term economic effects. The tremendous rise in childhood obesity virtually seals the certainty of future economic effects as a result of the disease. Many obese children are already suffering from obesity-induced diseases such as type-2 diabetes. But the majority of obese children will not suffer severe effects until they become older and their immune systems become less resilient and resistant to obesity-caused diseases. Adults who are becoming increasingly obese are suffering greater health problems that costs a great deal in terms of long-term health care costs persisting into the future, and in terms of the lost potential previously discussed. In 2025, many obese individuals, or even those who were formerly obese, may only have begun fully suffering the effects of being obese in 2005.

The rising obesity rates over the past 25 years have created a problem that will not disappear over the next 20 or 25 years. In fact, the economic consequences have only begun to come to light. In the near to medium term, the economic implications of obesity will reach a critical mass. According to projections, the rate of obesity will increase more quickly than the growth of the US population as a whole, resulting in half of all Americans being classified as obese by 2025. The economic effects will be pervasive, affecting individual spending, government expenditure, business productivity, and the competitiveness of the US economy as a whole. Based on both the size of the problem and the many resulting economic ramifications, obesity itself must be seen as a future contingency of interest.

# APPENDIX II: SCIENCE AND TECHNOLOGY FCIs

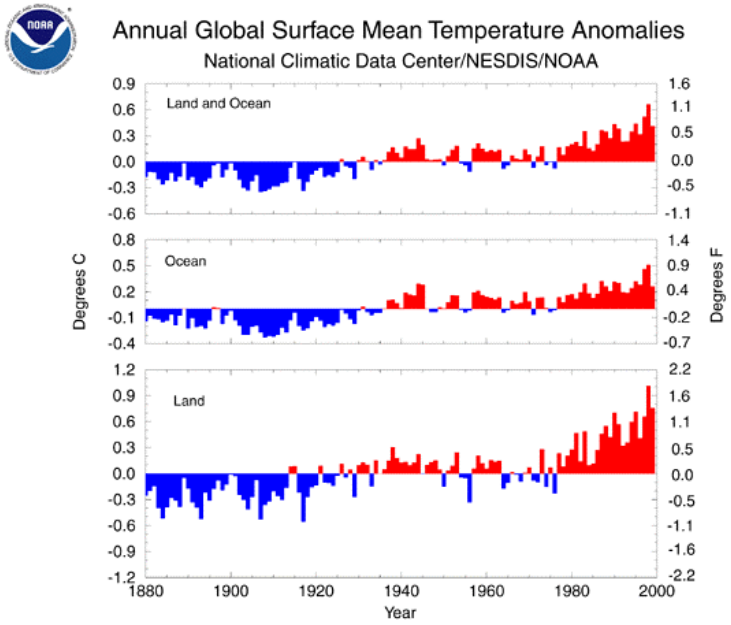
## Climate Change
## Jim Carr

Global climate change has been the rule rather than the exception over the 4.5 billion-year lifespan of planet Earth. The Earth's climate has changed as it has cooled from its early formation, experienced periods of volcanism, had its atmosphere transformed by plant life from one rich in $CO_2$ to one rich in $O_2$, and experienced periodic ice ages. That the Earth's climate is changing today is not news; rather, it is the fact that the Earth's climate is changing as a result of human activity and at an incredibly rapid rate in comparison to the natural climatic changes of the past.

Several pieces of evidence point to a rapidly warming Earth. Analysis of historical surface thermometric data (Figure 1) shows a warming trend that appears to have accelerated about 1980. Systematic errors can play considerable mischief with an analysis such as this one. Weather stations do not uniformly uniform sample the Earth's surface, stations come into and go out of existence, and are not consistently calibrated.

Satellite infrared observations also point to an Earth warming at a rate of about 0.6°C/century. This is slower than the rate inferred from the last 20 years of ground-based data. Satellite observations also potentially suffer from systematic errors associated with their calibration.

**Figure 1. Deviation of the Annual Mean Temperature from its Nominal Value.**

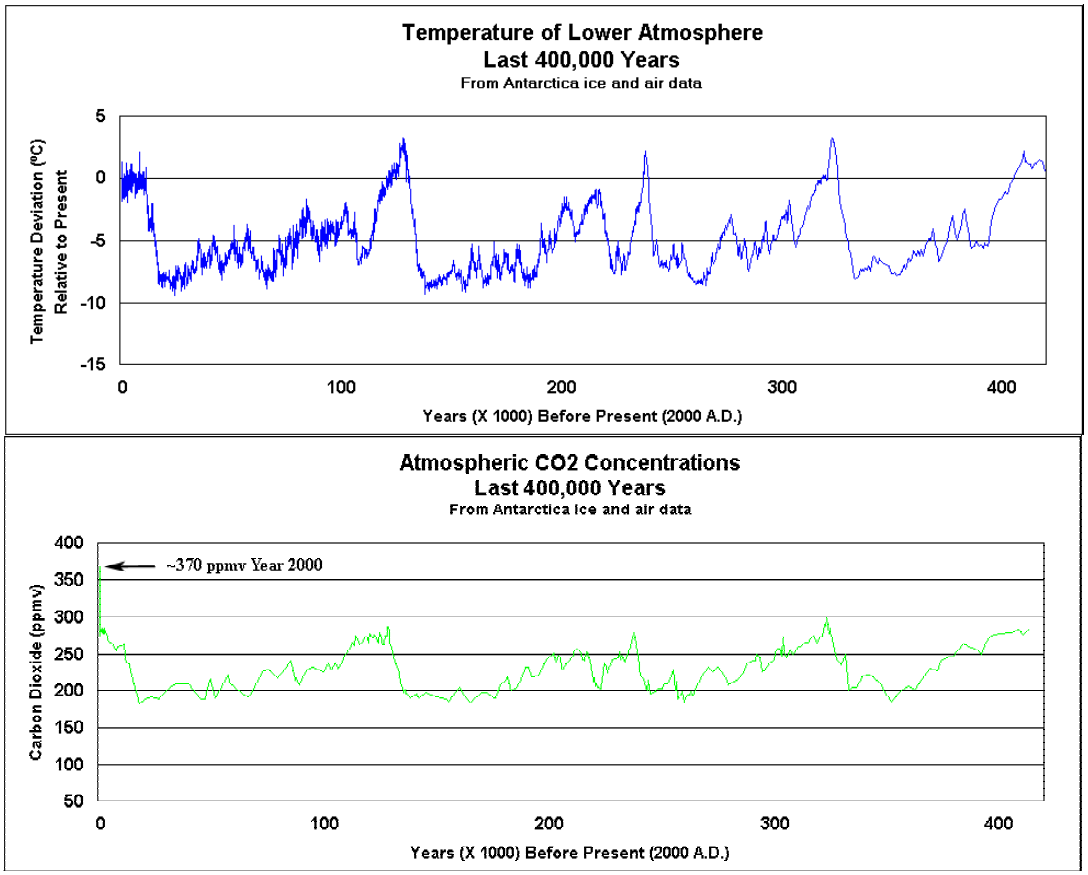



Source of ground and satellite analyses: http://www.ncdc.noaa.gov/oa/climate/research/anomalies/anomalies.html (current 1/30/05).

The ground-based and space-based thermometric analyses serve as projections that point toward a future warming Earth. However, both projections are subject to systematic errors. Moreover, neither of these analyses directly explains the reason why the Earth might be warming. They neither inform us, with a high degree of confidence, that the Earth is warming, nor do they clearly inform us as to why this might be the case.

A story of the Earth's climate and its atmospheric composition is recorded in glaciers as they are built up layer-by-layer. An analysis of ice cores drilled in Antarctica is shown in Figure 2. The ice-core data shows that there is a correlation between temperature and atmospheric $CO_2$. It seems to indicate that the Earth is warmer when the atmosphere is richer in $CO_2$. This is a reasonable observation since $CO_2$ is a "greenhouse" gas. Greenhouse gases are transparent to the visible radiation from the sun, but partially opaque to infrared radiation that is radiated from the Earth's surface. Sunlight continues to warm the surface, but less energy can be reradiated into space when there is a higher concentration of $CO_2$ in the atmosphere. Consequently, the Earth becomes warmer. A greenhouse operates on a similar principle: the glass in its roof passes visible radiation, but blocks infrared radiation.

**Figure 2. Temperature and $CO_2$ Concentration for the Last 420,000 Years.**




Source: http://www.geocraft.com/WVFossils/last_400k_yrs.html (Current on 1/30/05). Original research reported by Petit, J.R., *et. al.*, in **Nature**, 399: 429-436, 1999.

The greenhouse effect would seem to conveniently explain the paleo-climatic record. This being the case, the present atmospheric concentration of $CO_2$ (shown at the left in Figure 2) is unprecedented and alarming. One is tempted to simply conclude that because humans are consuming fossil fuels and driving $CO_2$ concentrations to unprecedented levels that the climate is being driven to a warmer state. However, the reality is more complicated. A more careful examination of the paleo-climatic record shows that $CO_2$ concentration has been a trailing indicator, rather than a leading indicator, of climate change. Therefore, the greenhouse effect is not the root cause of long-term changes in the paleo-climate. The underlying cause is thought to reside, instead, in the field of astrophysics. The large planets (Jupiter and Saturn) and our neighbor (Venus) exercise a subtle influence upon the orbit of the Earth around the sun. This, in turn, causes changes in the pattern of solar heating. Only a fraction of the inter-glacial temperature increases can be explained by this mechanism. The remainder is explained by the action of the greenhouse effect as a reinforcing mechanism. Exactly how this mechanism works is not completely understood. One hypothesis is that as the Earth becomes warmer, dissolved $CO_2$ is released by the oceans, causing further warming. Whether or not this is the entire story, it is clear that the greenhouse effect is not the root cause of global warming in the paleo-climatic record, but rather a reinforcing agent.

Because of the complicated relationship between $CO_2$ and paleo-climate, it is dangerous to project the impact of measurable $CO_2$ today on the climate of the future. Modeling is a better approach to predicting the climate of the future. Many institutions are actively pursuing climate modeling research. A good climate model should account for the "forcings" acting on our climate and the interchange of heat and between the atmosphere and the ocean[35]. The most important forces for heating the Earth, besides the sun, are the greenhouse gases ($CO_2$ , $CH_4$ , $O_3$ and a few others) and soot deposited over snow-pack. The most important forces for cooling the Earth are aerosols and clouds. There are considerable uncertainties in climate models as well, as the interactions between competing effects are not completely understood or difficult to model. For example, warming leads to more evaporation and cloud formation, and clouds reflect solar radiation, which would tend to moderate global warming. Consequently, the fidelity of cloud modeling can have an impact on predicted climate. In spite of the complexity and uncertainty in climate modeling, there is near consensus in the scientific community that the Earth is warming at an unprecedented rate and that it is due to human consumption of fossil fuels.

The predicted climatic warming lies between +2°C and +5°C over the next 100 years if current trends in fossil fuel consumption continue[36]. This is a mixture of projection and prediction because a key assumption (fossil fuel use) is assumed to continue on the present trend line. Many factors can alter the trends for fossil fuel consumptions, including exhaustion of petroleum reserves, economic growth, and conceivably the effects of policy measures (such as those in the Kyoto agreement) that seek to restrain greenhouse gas production. Rates of warming are, therefore, uncertain and may be influenced by behavior changes in the present or near future.

Predicting climate change is one matter, predicting the impact of climate change is another matter. The most straightforward impact of climate change is a resulting change in sea level. Mean sea level will rise with a warming climate as a result of the thermal expansion of the oceans and also glacial melting (secondary importance). Other impacts range from changes in extreme weather patterns (strengthening El Ninos and hurricanes), changes in agricultural productivity, and rapid upsetting of ecosystems (particularly marine ecosystems such as coral reefs).

Our culture generally presumes that ecological change is an undesirable consequence of human activity, but not all of such changes should necessarily be viewed as unfavorable. The global warming phenomenon, its impact, and its desirability/undesirability are most effectively assessed using models. These models represent the physics, economics, or biology imperfectly. Our understanding of the underlying science may change or new technologies and patterns of life may emerge that will upset our conclusions. Our model predictions are, therefore, subject to uncertainty. However, if we wait until absolute certainty is assured, the consequences of our present behaviors (notably the consumption of fossil fuels) may be irreversible. Policy makers should continue to support research into climatology; however, research should be a constant companion of action and not a substitute for it. Unfortunately, the handling of the global change issue in our political system is problematic because of the long time scale over which climate change and our remedies for it act. Urgency for action is not universally perceived and people are, therefore, unwilling to make sacrifices or are likely to perceive unfairness in the sacrifices that they are being asked to make relative to the

[35] J. Hansen, "Can We Defuse the Global Warming Time Bomb?", NASA Goddard Institute for Space Sciences Report, 2003, http://pubs.giss.nasa.gov/docs/2003/2003_Hansen.pdf (current on 1/30/05).
[36] **New Scientist**, January 2005.

sacrifices asked of others. The inability of our political processes to deal with the climate change issue in a rational manner, in the opinion of the author, is a primary reason why the Kyoto accord is not being implemented by the United States.

## End of the Antibiotic Era
## Jim Carr

The antibiotic era began during World War II (WWII) when the process for the industrial production of penicillin was perfected. Antibiotics interfere with cellular processes in bacteria, generally acting on their cell walls or membranes, or by interfering with their protein or DNA synthesis. There are only several hundred known compounds with antibiotic properties that also have therapeutic value. An antibiotic has therapeutic value when it is selective in its action – acting powerfully on the bacterial cells but not on human cells. Most modern therapeutic antibiotics are semi-synthetic. Semi-synthetic antibiotics are variants of a base compound naturally produced by fungi or other bacteria that have been chemically altered to improve their ability to be clinically administered. While there are many variants of a base compound within an antibiotic family, there are only about a dozen important antibiotic families, most notably: penicillins, streptomycins, cephalosporins, bacitracins, macrolides, quinolones, tetracyclines, and sulfa drugs.

Antibiotics have revolutionized the treatment of bacterial infections. Patients afflicted with formerly dangerous infections suddenly became treatable with nothing more than a regimen of oral antibiotics, earning antibiotics the appellation of "wonder drugs". Antibiotics have also found broad usage in the domain of agriculture, where they are fed to farm animals for prophylaxis against disease, improving agricultural productivity. The use of antibiotics in agriculture now exceeds that in humans. Considering also that antibiotics are often inappropriately prescribed for patients with viral infections (for which they are clinically ineffective), more antibiotics are now applied to subjects – human and animal – uninfected by bacteria than to those infected.

Any population of bacteria will contain genetic variants from the main population. These variants arise from natural mutations and exchanges of genetic material with other bacteria[37]. When an infected patient is treated with an effective antibiotic, virtually all of the susceptible organisms will be eradicated, leaving the few resistant organisms. If the immune system of the host is not capable of killing off the remaining resistant organisms, they will flourish and an antibiotic-resistant strain of the original infection may emerge and propagate. The presence of the antibiotic in the bacterial habitat is an evolutionary force that selects for the antibiotic resistance trait. As antibiotics are naturally occurring substances, the evolutionary force to develop a resistance to them is always present; however, in a health-care setting, the presence of antibiotics in the habitat becomes a dominant evolutionary force.

The prevalent use of antibiotics, both appropriate and inappropriate, in health care has been clearly implicated as a cause for the development of antibiotic resistant bacteria. The case against the agricultural use of antibiotics is less clear. Agricultural doses are smaller and are not necessarily targeted against bacteria that are pathogenic in humans. However, traits for resistance may be transferred from harmless to harmful bacteria. Genetic engineering of crops is also an area of concern. Genes expressing resistance to

[37] Bacteria can exchange genetic material. One mechanism is the propagation of rings of DNA, called plasmids, from one organism to another, allowing traits to be passed between different organisms and even between different types of bacteria. This mechanism increases genetic diversity in bacteria, which reproduce asexually, and is evolutionarily advantageous.

an antibiotic have been isolated for study and they are readily available to be sequenced into plant DNA to serve as unique genetic markers for a Genetically Modified Organism (GMO). While there is no evidence that such a practice can enable the passing of the trait from the GMO to a bacterium, critics of genetically engineered crops point to this practice as a potential hazard. Another more sinister contingency is the creation of super-bugs for biological warfare by genetically modifying pathogenic bacteria, such as tuberculosis, to be resistant to all known antibiotics.

We are creating, in our hospitals (and perhaps our farms), pathological strains of bacteria that are resistant to formerly effective treatments. Moreover, when resistance develops in the presence of one antibiotic, this resistance generally applies across the entire spectrum of semi-synthetic variants comprising that antibiotic family. Strains of bacteria (notably staphylococcus) are emerging in hospitals that present resistance to almost all of the clinically preferred antibiotics. When standard antibiotic treatments lose their efficacy, new drugs must be found or antibiotics of last resort must be used. In the later case, patients may suffer serious side effects. In the case of drug-resistant staphylococcus infections, vancomycin, a drug that had been previously abandoned because of its renal toxicity, is now the last line of defense. Ironically, in the face of such apparent need, investment and success in the development of new antibiotics by the pharmaceutical industry has been lacking. The number of new antibiotics approved by the FDA has steadily fallen to the point now that only a couple of new antibiotic drugs are approved each year.

The emergence of resistant strains as dominant strains in the world at large is a future contingency with important consequences for the quality of human life. To first order, the treatment of infectious diseases without effective antibiotics would resemble that before WWII. All Americans would once again be at risk of being killed or crippled by a serious bacterial infection. The immuno-incomptent – the very old and very young, cancer and HIV patients – those suffering from trauma, or recovering from surgery would be placed at the most risk. Life expectancy would likely decrease, reversing a trend that has persisted for over a century, but not catastrophically. Life expectancy at birth now tops 80 years for white females. With increased mortality from infectious diseases, this figure could fall back towards the 72 years expected in 1950[38].

The impact of the end of the era of antibiotics and declining life expectancy on other aspects of life could be both important and subtle. The economy would be affected by more worker absenteeism. Health expenditures would increase, as relatively inexpensive antibiotic treatments are replaced by long-term convalescent care (including a return of sanitaria for those infected with tuberculosis). Disability expenditures would increase for those crippled as a result of bacterial infections such as rheumatic fever (heart damage) and staphylococcus (joint damage and amputations). On the other hand, shorter life spans would reduce the burden on the young for caring for the old and possibly improve the solvency of the Social Security System (if it survives the next four years).

Beyond economic and health matters, the end of the antibiotic era would likely bring cultural changes to America. One of the most important trends in American life since WWII has been the advancing status of women in society. Women have become better educated, more economically independent, and integrated into the workforce and professions. Because reproduction and child care are central concerns in the lives of most women, the female condition can be profoundly affected by technological innovations impacting reproduction and family life. The advent of birth control was

[38] **Third Chartbook on Trends in the Health of Americans**, Centers for Disease Control, 2004.

arguably the most important and revolutionary event in feminist history. More recently, child care outside the home has enabled many women to pursue professional careers that might have been impossible for their mothers. With the effectiveness of antibiotics on the decline, day care centers will come to be viewed as risky incubators for serious illness. Working mothers will feel justifiable pressure to quit the workforce and become stay-at-home moms. In this way, a return to the medicine of the pre-WWII era may also mean a return to a family culture of that era as well.

Finally, how would the public at large feel about the failure of science to produce a never ending series of medical miracles? Disillusionment with science could set in. Believing that science is not the answer to the problems of modern life, or their cause, the public might turn more and more to superstition. Support for medical and other research would be adversely affected and human progress would be slowed.

The end of the antibiotic era may be inevitable. There may only be a limited number of biochemical mechanisms that can be employed to do battle against bacteria without killing the host; but, prudent measures can postpone the end of the antibiotic era. First, in the area of medical practice, we can be more circumspect about how we use our wonder drugs. The prescription of antibiotics in inappropriate contexts must be avoided and the type of antibiotics prescribed needs to be appropriate for the disease being treated. When a narrow-spectrum antibiotic is appropriate, it should be used instead of a broad spectrum one that might cause resistance to collaterally arise in another type of bacteria. Patients also need to be more carefully monitored for compliance with their treatment regimens. Incomplete treatment can leave behind latent bacterial populations with enhanced resistance that can propagate to infect others. Second, in the area of agricultural policy, the indiscriminant use of antibiotics in industrial farming should be carefully and urgently reviewed for safety and regulated if necessary. A few cents extra for a hamburger today is a small price to pay for twenty more years of effectiveness for tetracycline, the most commonly used agricultural antibiotic. Finally, from one who has not yet lost his faith in science to come up with yet another miracle, the government needs to take a proactive role to encourage the discovery and deployment of new therapeutic families of antibiotics. Each new biochemical modality for disrupting bacterial metabolism or reproduction is a potential new family of antibiotics. The government has several important roles to play. One is sponsorship of basic research and the other is creating a regulatory environment that will encourage the private sector to search for new antibiotics and bring them to market. The stakes are too high to leave the arms race between medicine and pestilence to a regulated marketplace that is seemingly more responsive to erectile dysfunction.

## Emergent Applications of Quantum Physics
### Breeann Songer

The concepts involved in quantum physics, which used to be little more than abstractions formulated by highly educated minds, are rapidly becoming tomorrow's reality. It is an exciting moment to be in the field of quantum computers and quantum information technology. In the past decade, research has proven man's ability to use the properties of quantum physics to break any conventional encrypted code, communicate written information and voice securely, and teleport a beam a light. The potential uses of quantum physics are endless and future technology could strongly impact the U.S. and the world in many ways – yet America has yet to begin debate addressing the regulation of, support for, or responses to its applications.

The rate at which applications of quantum physics are being proven is accelerating. In 1985, researcher Dennis Deutsch noted in a paper that a quantum computer could model any physical process, which stimulated much debate. In 1994, interest in this subject exploded after Peter Shor of Bell Labs discovered a new quantum algorithm for factorizing large numbers. In 1998, however, researchers at Los Alamos National Laboratory and MIT made a breakthrough in the nascent field of quantum computing: Contemporary security through encryption relies upon the factoring of large numbers; conventional computers (or mathematicians) have to try possible combinations one by one when trying to break an encryption. Using a property called "superposition," a quantum computer would be able to try every combination simultaneously. In 2003, new advancements generated a communication protocol that could allow corporate, banking and military institutions to secretly share sensitive information. In 2004, Dr. Ping Koy Lam and his ANU Quantum Optics Group won global recognition for taking the application of quantum physics to a new level for teleporting a beam of light.

Regarding encryption/de-encryption, protecting individual, corporate, and government information against crimes such as ID fraud and outright robbery is important for America's economic prosperity. If viable models can be produced, quantum computers could facilitate theoretically un-compromised channels of communication and banks of information – or allow quantum computers could allow individuals or groups to crack major encryption algorithms commonly used today.

With respect to secure communication, two mechanisms using the principle of "quantum entanglement" could send data back and forth with a level of security that is currently unmatched, since no means have been discovered of detecting the entangled particles without disturbing them. This has implications for long-distance exchange of written and spoken communication. Information could potentially someday be transferred instantly and wirelessly between distant places. Among the many possibilities, this could facilitate communication between manned space flights and their home bases or even between different planets.

The U.S. Government has a time-honored tradition of pursuing technology that will give it scientific prestige and an edge over malicious elements at home and competitors abroad. Quantum computing is no exception. Government support for quantum technological development has already resulted in several encouraging breakthroughs. However, the support is currently modest and American policymakers have yet to formulate a plan for dealing with the rise of this technology in the private or public sector. Contemporary discussion regarding the uses of quantum physics is additionally limited by the myopic obsession with its uses in the fields of encryption and communications. The teleportation of a beam of light in 2004 was a tentative step into a new world of future breakthroughs. Although researchers are still skeptical about the odds that complex systems such as living creatures could ever be teleported, they do not question the idea that applications of quantum physics have the potential to change human life as we know it – and in ways that we cannot currently envision.

# APPENDIX III: SECURITY FCIs

## Superpowers Old and New
## David Kay

-*China*: It is estimated that by 2050 China will overtake the U.S. in GDP, although it will take substantially longer to catch up in terms of GDP per capita. While

China will continue to be beleaguered by a full slate of problems, including urban and rural cleavages, structural inefficiencies in banking and government-owned industries, and popular political dissatisfaction, China's ascent is hardly in doubt. China's growing economic power will finance its military revitalization, a new-found diplomatic strength, and the ability to remedy the societal ills that plague it. Currently, as the regional engine for economic growth, China has made many new friends among its southeast Asian neighbors. How China uses its growing political, economic, and military power will determine the type of relations it has with the U.S., India, Japan, and its smaller neighbors. Japan, China's historic rival, may become uncomfortable with relying on others for its defense and may remilitarize. Will the U.S. and China use their preponderance of world power to ensure stability and combat transnational threats, or will they become entangled in a new cold (or hot) war? How does Taiwan react?

-*India:* Although, the forecasts for India's economic growth are not as great as China's, like China, its rise is not in doubt. Similar to China, India is also plagued by significant socio-economic inequalities and other societal ills. However, its continued economic and technological advancement will fuel its increased political and military power, while allowing it to address national problems. With the exception of Pakistan and China, India's current and historic relations with its neighbors have been cordial and productive, and will continue to be so. How it deals with its quasi-failed state neighbor Pakistan will have a significant effect on the future of the region. War benefits neither state, as Pakistan will lose no matter what (conventional or nuclear), and India has no desire to be distracted from national progress or risk nuclear war. India will be forced to make political and economic overtures to an increasingly failed and risk-taking (recall Kargil) Pakistan. On another note, India's rise will demonstrate the validity of the democratic paradigm for non-European peoples.

-*United States:* Regardless of internal or external developments, the U.S. will maintain its overwhelming military and technological dominance for the next fifty years. That being said, the future is still highly disturbing. Current economic policies, especially the dual deficit, are gradually eroding international confidence in the dollar and threatening its position as the universal exchange medium. A possible run on the dollar would annihilate a significant chunk of American wealth and force the U.S. to reconsider its economic policies at home and towards the rest of the world. Also, by strongly undermining the tax revenue base and aggravating societal divisions, current policies are threatening the U.S.'s future ability to fund and cope with an overstretched military, demographic stresses, and any unforeseen contingencies.

## Suicide Attacks Become Commonplace
## David Kay

Why there have not been more suicide attacks in the U.S. is a great mystery. According to the U.S. government there are an undisclosed number of Islamic terrorists and sympathizers based in the continental U.S. While the U.S. government has taken important measures to protect federal buildings, national landmarks, large public gatherings, and transportation and infrastructure, little has been done to secure schools, shopping malls, apartment buildings, and other soft targets. Several small and dedicated teams of terrorist amateurs (professionals are capable of significantly more damage) would only need a few weapons, modest funds, and homemade explosives to impose a new and continuous reign of terror upon the American people. The result: the U.S. would come to look more like Israel and Colombia. Every restaurant, school, and

shopping mall would have armed guards and metal detectors, people would live in gated communities, and soldiers and bomb sniffing dogs on the streets would be the norm. American gun ownership would skyrocket, and troops would be stationed at the borders and all ports of entry. Like Israel, due to the terrorist attack, the U.S. would be forced to adopt a one dollar surtax on restaurant meals, movie tickets, etc. There would be great pressure to end all immigration and travel to the U.S. from Arab and Muslim countries. This would be only one measure in a revived Patriot Act, as the requirement for collective security would quickly overwhelm the need for personal privacy and civil liberties. A rather pessimistic outlook was offered by Gen. Tommy Franks: "We're only one terrorist attack away from totalitarianism."

## The Nanotechnology Revolution
## David Kay

The U.S., once the vanguard state in the democratic, industrial, computer, and information revolutions, becomes the leader of the nanotechnology revolution. Nanotechnology brings the U.S. prolonged economic growth, which sustains the U.S.'s status as a military, economic, and political superpower. Various advances in nanotechnology lead to an enhanced standard of living among the American population, and an increase in U.S. power and influence relative to the rest of the world. Nanomedicine leads to people living longer and more vibrant lives. Nanotechnology advances in defense lead to stronger armor, better aerodynamic performance, and improvements in surveillance and reconnaissance, to name a few. Nanotechnological innovations are also applied to arms control and treaty verification, and border security. On the negative side, terrorists, international criminals, and hostile states also exploit nanotechnology for evil purposes. At home, common criminals, use nanotechnology and for identity theft, stalking, and other crimes increase.

## The Proliferation of Failed States
## David Kay

Environmental and demographic stresses as well as internal strife lead to the collapse of weak governments around the world. In Nigeria, low rainfall as a result of global warming, slash-and-burn, and other types of environmental degradation cause a widespread famine. The tenuous ceasefire peace between the Ibo, Yoruba, and Hausa ends, as ethno-religious groups battle each other for control of food and other natural resources. The breakdown of the public health system and the mass of dead bodies from the war and starvation leads to the quick spread of disease. The overwhelmed Nigerian central government finally collapses and a state of anarchy ensues. Nigeria is one example of where this could. Other states, such as Pakistan, Indonesia, Russia, Brazil, the Palestinian territories, Mexico, and North Korea, are strong candidates. This scenario is alarming not only because of its implications for the populations of those countries, and regional dynamics, but also for the possible direct effects on U.S. national security. Countries like Nigeria and Venezuela sit atop large energy reserves - disruption would have a serious impact on international markets. Meanwhile, Russia, Pakistan, and North Korea each possess nuclear weapons, fissile material, and other sensitive items. Indonesia straddles the Strait of Malacca, a strategic chokepoint through which fifty percent of the world's energy supplies and a third of global trade pass. Mexico, Haiti, and Cuba are contiguous with the U.S. and have in the past flooded the U.S. with

immigrants, disease, and crime. The examples of Afghanistan and the semi-failed Colombian state show that when you ignore failed states, you do so at your own risk.

## An Energy Revolution
## David Kay

The reasons for, and the different types of possible energy revolutions are many. First, because of its oil obsession, U.S. foreign policy is compromised by its entanglement with corrupt and quarrelsome Middle Eastern states. Second, American dependence on Middle Eastern oil deprives the U.S. of significant foreign exchange reserves and makes its vulnerable to economic blackmail. Finally, world reliance on hydrocarbon energy has been one of the greatest causes of environmental malaise and is growing threat to the global ecosystem. Some developments, such as the reauthorization and expansion of nuclear power plants, are not revolutionary. However, others, such as the widespread deployment of hybrid technology, or a major breakthrough in hydrogen cell, or hydrogen-fusion power, would be truly revolutionary. As a result, the U.S. would be the leader in the new 'energy revolution' and would reap significant economic benefits that would allow it to sustain its superpower status and address its societal problems. The U.S. balance of payments would gradually reverse itself as American energy exports increased, and oil imports decreased (growth would also kill deficits). American and world demand for Middle Eastern oil would drop, ending U.S. dependence on, and entanglement in, the Middle East. Global hydrocarbon use would gradually decrease, slowing the deterioration of the global ecosystem.

## Revolution in Military Affairs
## David Kay

Technological, doctrinal, and organizational advances lead to a revolution in military affairs. After significant difficulties in Iraq and the War on Terrorism, the U.S. has improved its ability to conduct stabilization operations, special operations, and precision airstrike. Significant improvements in UAV technology increase U.S. precision strike, ISR, and battlefield damage assessment capabilities. Drawing on its vast diversity, the U.S. deploys a new special forces unit which, through its cultural proficiency, is easily able to blend in with targets throughout the world. These cell-based forces are larger and more high-tech than anything ever used before; and they are not constrained by the rules of war. Finally, the U.S. Army develops its Future Combat System (FCS) and deploys it to U.S. battle theaters. The FCS is heavily armored, but fast, and with a minimal logistical footprint. The FCS's are networked to the UAV's, cell-forces, and other military assets, and they control wherever they patrol, with a lower risk.

## The Weaponization of Space
## Cassandra Aulner and Patrick Klotzbach

### Introduction

The Pentagon relies heavily on the use of space in its operations. Satellite-guided bombs, Global Positioning System (GPS), and the surveillance of enemy activities are all

possible through the use of United States space assets. Precision weapons account for approximately ninety percent of all weapons being used in the Iraq war, up from seven percent during the first Gulf War, and over 30 percent of these weapons are guided by satellite, a strong indicator of the importance of space-based weapons guiding systems.[39] While the United States has relied on space for communications, reconnaissance, and weapons delivery capabilities, space has not yet been weaponized. The weaponization of space and its subsequent implications will alter the current security environment, highlighting it as a Future Contingency of Interest (FCI) for all US policymakers.

**What is Space Weaponization?**

The weaponization of space is a part of space militarization. Currently the US military uses space assets to provide many important services – i.e. satellites as vital parts of military operations and weapons systems – and is exploring the possibility of actual space weaponization. If the US government were to fully explore the weaponization of space, it could include space-based ballistic missile defense (BMD), anti-satellite weapons systems (ASATs), and possibly space-to-earth weapons (STEW).[40] Many Pentagon and government officials, including Peter Teets and Secretary of Defense Donald Rumsfeld, approach the weaponization of space as inevitable, and promote that the United States should be the first nation to succeed in placing weapons systems in space. This view, also reflected by the Bush administration, was outlined in its first Quadrennial Defense Review (2001) as a top priority of the Pentagon. It stated, "A key objective … is to not only ensure US ability to exploit space for military purposes, but also as required to deny an adversary's ability to do so."[41]

What this policy of space dominance fails to address are the many possible security implications of space weaponization; not all space weaponization will necessarily make the United States safer. The dangers of implementing such a policy without fully understanding the potential negative implications could be long lasting and quite damaging. Some potential effects include a space-arms race, endangerment of US military ground forces, and damaged political relationships.

**Possible security implications of space weaponization**

The Bush administration advocates the weaponization of space as a way to pre-emptively deter adversaries seeking to attack the United States, as well as our space assets, and avoid what it calls a "Space Pearl Harbor"[42] However, as the primary beneficiary of satellites (both commercially and militarily) the United States stands much to lose if the weaponization of space does not go as smoothly as envisioned.

One potential effect of the weaponization of space is an international space arms race, much like the nuclear arms race between the USSR and the US during the Cold

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[39] Andrews, Mark. "War with Iraq Means Faster, Better Weapons." http://www.globalsecurity.org/org/news/2003/030320-war05.htm (viewed 9 February 2005)

[40] Mueller, Karl. "Totem and Taboo: Depolarizing the Space Weaponization Debate." In *Space Weapons: Are they Needed?* Eds: Logsdon, John and Adams, Gordon. Space Policy Institute, Security Policy Studies Program: Elliott School of International Affairs, Washington, DC. October 2003. page 2.

[41] Hitchens, Theresa. "Weapons in Space: Silver Bullet or Russian Roulette? The Policy Implications of US Pursuit of Space-Based Weapons." In *Space Weapons: Are they Needed?* Eds: Logsdon, John and Adams, Gordon. Space Policy Institute, Security Policy Studies Program: Elliott School of International Affairs, Washington, DC. October 2003. page 89.

[42] "Report of the Commission to Assess United States National Security Space Management and Organization." January 11, 2000. page 100.

War. Should the United States lead the way in ASAT (as well as other space-based weapons) testing and technology, other nations will follow suit; it is much too dangerous for countries to permit the United States to monopolize space warfare.[43] Charles Pena, a senior defense policy analyst at the Cato Institute, stated in an article discussing the potential arguments for and against the weaponization of space:

> Deploying actual weapons in space - whether defensive or offensive – would be perceived by many as very threatening to the status quo and would prompt the development of ways to counter the threat. Weapons in space would be tempting targets for a pre-emptive attack by an adversary.[44]

This potential space arms race is the crux of many of the other problematic effects of space weaponization, as developing, testing and deploying space weapons can be seen as threatening to all space-faring nations. While the United States will have the economic capability to produce discriminating and effective space weapons, many other nations will opt to destroy satellites (and other space assets) in crude and harmful manners. This concept brings to light another potential danger of space weaponization: targeted attacks against US space assets with lower-grade technology.

Once the United States leads the way in the funding and development of expensive space weapons technology, it will not be as difficult for other nations to follow suit. The countries most capable of developing these weapons – including Russia and China – have expressed a distaste for space weaponization, leading one to believe that perhaps those nations who will choose to pursue ASATs or other space weapons technology will not be able to do so with the same sophistication as the United States. Nations such as this, in an effort to counter the perceived threat from the US, may resort to using nuclear weapons (assuredly a very crude, yet effective ASAT) to destroy US satellites and space systems. The deployment of a nuclear weapon in low-Earth orbit would harm US space assets, disabling all military communications and weapons systems controls, leading to troop vulnerability on the ground. These weapons, lacking in the same discriminatory capabilities as their US counterparts, will emit debris that can have an even longer-lasting effect than the original blast. The potential effect for ground-based troops and military officials in the Pentagon is yet another potentially negative effect of space weaponization.

If US adversaries employ ASATs or other space weapons, however crude they may be, the implications for the security environment would be devastating. As already mentioned, the United States uses satellites to provide imaging, communications, and reconnaissance, as well as to control weapons systems. By attacking or weaponizing space, our adversaries would not only be taking counter-measures against US space activities, but also disabling the vital networks of communication necessary to the military. To prevent this type of space attack, the United States would not only need to know where all 'enemy' space weapons were located, but also the locations of ground-based military activities that could perhaps launch debilitating weapons into space. This type of monitoring would not only require lots of effort, but it would also be quite

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[43] Krepon, Michael. "Weapons in the Heavens." *Arms Control Today*. November 2004. http://www.stimson.org/pub.cfm?ID=190 (viewed February 9, 2005).

[44] Pena, Charles. "Should the United States Weaponize Space?" *Space News* June 17, 2002. page 15. (found on Welcome Kit CD).

expensive. Lastly, the United States cannot ignore the potential foreign policy implications that arise from such forward action.

Those countries most capable of developing similar space weapons systems are not necessarily convinced that US interest in space warfare is limited to countries such as North Korea and Iran. Space weapons in low-Earth orbit will be of grave importance to all nations over which these weapons pass.[45] The interest among Air Force officials, the Bush administration, and the Pentagon all seem to supplement the broader policy of pre-emptive strike and preventative wars, making many allies wary of US activities in space. The United States makes the claim that there is the potential for attack against US space assets and that pursuing space-based weapons systems will ensure that no other nation develops the capability to make those assets vulnerable. Yet, in a case of US primacy in space weaponization, many key allies will feel threatened, and diplomatic relationships could be damaged. These damaged relationships should not be overlooked when discussing security threats.

### Conclusion

The weaponization of space is far from an inevitable outcome; there are many actions that could be taken by the United States and key space-capable nations to ensure the continued peaceful employment of space assets. These options should be exercised now, in order to mitigate the effects of this future contingency of interest. The negative security implications of space weaponization are many, and addressing this issue through the lens of the security environment does not even begin to touch upon the commercial, economic, and technological effects of pursuing such weapons programs.

## Regional Balance of Power: Nuclear North Korea or Iran
## Scott Roecker

Shifts in regional balance of power occur with relative frequency. Over the last 30 years, for example, we have witnessed the breakup of the Soviet Union and two nations in South Asia acquire nuclear weapons. While the former was mostly peaceful, the latter is a constant source of tension. A common thread between these shifts is the fact that all three nations possessed nuclear weapons. Since their development in 1945, nuclear weapons have been the currency of power in the world. Therefore, it is important to pay attention to nations that are developing this capability. Unfortunately, the future developments will most likely mirror what we have seen in South Asia, not what occurred in the former Soviet Union.

The world has learned that an effective method for becoming a legitimate regional power (and thus player on the world stage) is the development and acquisition of nuclear weapons. Currently, this driver can be seen in action in two separate situations, one in Northeast Asia and the other in the Middle East. The first, North Korea, might be an immediate future contingency of interest: Just last week, it officially declared itself a nuclear power for the first time. Second, Iran appears to be moving in a similar direction. Below, I will examine each case and outline how a nuclear North Korea or Iran will shift the security and political dynamics both regionally and universally.

[45] Krepon, Michael.

## North Korea

Perhaps already the ninth nuclear state on earth, a nuclear North Korea would alter the dynamics and politics of Northeast Asia as well as the rest of the world. Below are three views of what the future (3-5 years from now) might look like.

**Future View 1**

South Korea and Japan feel the need to protect themselves from the more pronounced security threat in the region. If these two nations decide to pursue a nuclear weapon to assure their security, it would leave the Nonproliferation Treaty in tatters, and the nuclear curtain provided by the United States would lose credibility in the world. Further, North Korea's success could demonstrate the benefits of preemptively pursuing the development of a nuclear weapon before potential advisories do, as these nations would be forced to play catch-up.

**Future View 2**

North Korea is allowed to keep its weapons, and South Korea decides that these weapons provide sufficient incentive to begin reunification discussions with the North. There would be concrete benefits to reunification on both sides. A singular Korea, with nuclear weapons from the North and progressive economic system in the South, would be a strong force on the world stage. Further, if the move was precipitated by the South in response to the North's nuclear program, the North would have considerable leverage in defining what a new Korea would look like politically.

**Future View 3**

The United States attempts to destroy North Korea's nuclear facilities. Such action could provoke strong rebuke from China or Russia. Also, the causalities in both North Korea and South Korea (as the first likely retaliatory move by North Korea would involve Seoul) could be astronomical. Certainly, such a move would send notice to the world that there will be no new nations with nuclear weapons, but could have severe negative impacts on the United States' reputation.

## Iran

Equally as monumental would be a nuclearized Iran, especially given the tenuous situation currently in the Middle East. Below are four views of what the future (3-5 years from now) might look like.

**Future View 1**

Should Iran become a nuclear power during the next 12-18 months, it would have a tremendous impact on the transition underway in Iraq. One potential outcome could be the absorption of Iraq into Iran. The recent election in Iraq has installed a Shiite-led government, which is the same religious party that currently controls Iran. If Iran and Iraq would become one nation, this would dramatically shift the balance of power in the Middle East toward this new nation as well as the Shiites, and could precipitate the development of a caliphate in the Middle East.

**Future View 2**

Such an event could also have a polarizing effect vis-à-vis Iraq. Even though the ruling parties of Iran and Iraq share the same religious belief, there are signs that the new government of Iraq will be quite different than Iran's. The most obvious is the fact that Grand Ayatollah Ali Sistani, who is Iranian born and the most senior cleric in either Iran or Iraq, is strongly supporting the democracy movement in Iraq.[46] This is in direct

[46] Gerecht, Reuel, "Birth of a Democracy," The Weekly Standard, February 14-21, 2005.

conflict with the current political structure in place in Iran. This could be a source of tension for years to come, perhaps forcing Iraq to bolster its military to match Iran's power.

**Future View 3**

Saudi Arabia, Egypt and Turkey would have to make difficult choices should Iran become a nuclear state. The United States would most likely offer its assistance should any of those nations be attacked by Iran, but it is unclear what path these nations would take. It would provide another difficult test for the Nonproliferation Treaty. Further, this would have definite impact on the price of oil, as Iran would be the clear leader of the OPEC nations.

**Future View 4**

Israel or the United States could attempt to destroy Iran's nuclear capabilities. The impact of such an event would be similar to the *Future View 3* presented in the North Korean case, and would certainly shake the pillars on which nonproliferation rests.

**Conclusion**

In sum, a nuclear North Korea or Iran would present the world with a very important future contingency to consider. The power dynamics in each region would require nations to make difficult decisions in response to the new threat. Each presents a potential monumental shift regionally and universally. Therefore, this future contingency of interest needs to be thoroughly considered, as it (as well as the United States' response) will have lasting impacts on the future events of the world.

## Bio-Terrorism
## Rachel Wanner

In 1991 a bipartisan piece of legislation passed through both the House and the Senate virtually unopposed, and was signed in to law by President George H.W. Bush. The "Soviet Nuclear Threat Reduction Act o 1991," otherwise known as Nunn-Lugar after the sponsoring legislators, came about after a very telling visit with then Soviet Leader Mikhail Gorbachev and U.S. Senator Sam Nunn (D-Georgia). Nunn visited Gorbachev shortly after a failed coup attempted to unseat the leader. Although the coup failed, Gorbachev was held hostage for three days during the attempt. Nunn asked a very important question of Gorbachev during his visit: had he retained control and command of Soviet nuclear forces during that time? The President did not answer, and as Nunn puts it, "that answer was enough."[47]

This was the first realization of many by the U.S. that nuclear and biological materials, weapons and delivery systems are unaccounted for and often unprotected within the international community. This, when combined with the post-9/11 realization that a single terrorist cell has the power and capability to inflict harm and evoke fear upon the world's superpower, has policy-makers struggling to control the situation. Although Nun-Lugar was extended past its initial seven-year stint, it will again expire in 2006, and perhaps is not doing enough in its current state to destroy, transport and secure these lethal agents.

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www.weeklystandard.com

[47]Senator Sam Nunn. "The Nunn-Lugar Vision," The Nuclear Threat Initiative.

**How will this impact the lives of Americans?**

Today the U.S. is exposed to six "Bio Threats": anthrax, smallpox, plague, tularemia, botulism toxin and viral hemorrhagic fevers (like the Ebola virus).[48] Shortly after 9/11, envelopes with small amounts of anthrax infiltrated the U.S. Postal Service and threatened not only the U.S. Senate where they were delivered, but the American people through the fear and suspicion it spread. Other diseases, such as the plague, tularemia and botulism, can be aerosolized. Without proper vaccines and treatment protocols, an unsuspecting U.S. will be greatly affected. Potentially hundreds of thousands of deaths will result from the spread of disease, with rotting corpses furthering the proliferation.

**How will this impact the nation?**

Bioterror, if carried out by suicide attackers as done on 9/11, has the potential to simultaneously impact major cities nationwide. Given the ease with which the members of groups such as Al Qaeda accept their own death, the ultimate suicide bomber will emerge. Both small pox and the plague can be spread person-to-person. The plague, tularemia and botulism can be aerosolized and infect the population via airborne transmission. What if a terrorist group tactically placed infected or agent-carrying "suicide bombers" on strategic flights to varying destinations within the U.S.? These types of weapons cannot be detected by walking through metal detectors.

Again using airplanes as the delivery system of choice, suicide attackers will be able to infect all travelers on their flight. Given the method of transmission,[49] those infected may not realize they are sick until days or weeks later, when symptoms begin to emerge. The incubation period of the six "bio-threats" can last between one day and three weeks. The plague and smallpox can both be spread through human contact, thus infecting the families, friends and coworkers of the sick. The potential for the spread of these diseases is very high. One source cited the mortality rate of pneumonic plague above 90 percent. A World Health Organization study conducted in 1970, though, found that if 50 kg of "*y. pestis"* were to be released in the air over a city 5 million, approximately 150,000 would become infected, and 36,000 of those would die.

**Prevention?**

Antibiotics can be used to treat anthrax and tularemia; the small pox vaccine can be used to up to three days after exposure to protect against the disease. These would seem to be promising and optimistic statistics. At least three obstacles, though, will prevent the population from obtaining treatment. First, the infected may not immediately realize it is ill, allowing for a period of time in which the disease may be spread. Second, once detected, hospitals may be unable to identify the ailment. Each of the six Bio Threats are uncommon and most physicians will have never seen it firsthand. Finally, almost certainly the public has not prepared a system of vaccine or antibiotic delivery. Although an antibiotic is available for the serious form of "inhalation" anthrax, it will be extremely difficult for an effected city to obtain it, disperse it among hospitals, train staff to treat patients and finally to direct individuals where to go to get treatment. The amount of time it takes to develop a working and efficient system can cost the lives of thousands.

In addition to the problems of identification and treatment, there simply are not antibiotics available for every form of drug-resistant bacteria. Although scientists are continuing to inform the public, government and pharmaceutical industry of the growing

[48] Randy Dotinga, "Wanted: Drugs to Fight Bioterror." Wired Magazine, June 2004.

[49] If the agent is able to be delivered without passengers knowing, it will have the potential to reach many more in the days and weeks leading to the detection and correct identification of the sickness.

risk of bio-terrorism, there is not enough money in it for drug companies to engage in the research and development process needed to develop antibiotics and vaccines. According to the May 2004 issue of the journal *Clinical Infectious Diseases*, of the 506 drugs currently in development, only six are antibiotics.[50]

The reason is simple. Pharmaceutical companies rely on profit-margins in order to survive. The cost of developing medicines and vaccines is extraordinarily high, and there are risks involved. Treated patients may have a poor reaction to administered drugs; the threat of a lawsuit can bankrupt a drug company. Furthermore, these companies may spend millions of dollars and years of work developing an antibiotic that is never used because the disease does not emerge as a threat. If the potential market is unstable, it is only wise for pharmaceutical companies to look toward viable buyers. Cancer, high cholesterol and heart disease are high paying illnesses; patients that take a pill every day for life will undoubtedly pay more into the drug company than a patient that takes a treatment for two weeks in order to recover from an infection.

**What can be done?**

Nunn-Lugar, described at the beginning of this paper and initially created to control the spread of nuclear materials, has issued a report outlining five steps to protect against catastrophic terrorism.[51] Unfortunately, this future contingency of interest will be proven only once a population has been successfully infected by a terrorist group or rogue state. As Senators Nunn and Lugar have stated, "we can define (the threat) and specify precisely what it would take to meet it – so we should be able to (control) it."[52]

The Nunn-Lugar vision proposes to deter and prepare for this particular sort of terrorist act through an initiative that would:

> "Advance early recognition, warning and protection efforts by strengthening the global public health capacity to detect, investigate, ad respond to infectious disease threat. The initiative would advance treatment efforts by developing new drugs, vaccines, and antidotes and help develop more effective delivery of prophylactic measures or treatment in the even of mass casualties."[53]

Thirteen years after his father passed the Nunn-Lugar legislation, President George W. Bush signed "Project BioShield" in to law.[54] Project BioShield is designed to provide incentives to the pharmaceutical industry to develop the types of antibiotics and vaccines needed to deter and protect against biological attack. It does this by indemnifying manufacturers[55] and funding up to $5.6 billion of development over the next ten years. Although this piece of legislation hits the nail on the head with its purpose, it does not provide adequate funding to entice drug companies that are making $9 billion in revenue annually off of Lipitor (a cholesterol drug) to abandon their work for roughly $6 billion worth of R&D funds.

**Why is this type of threat and the resulting consequences important?**

President George W. Bush ended his first term with a controversial "War on Terror" and has begun his second on the same platform. A majority of Americans, albeit

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[50] Dotinga.
[51] The Nunn-Lugar Vision: 1992-2002. Nuclear Threat Initiative
[52] The Nunn-Lugar Global Coalition.
[53] The Nunn-Lugar Vision: 1992-2002. The Nuclear Threat Initiative. Page 15.
[54] President George W. Bush signed Project BioShield in to law in July 2004.
[55] By indemnifying manufacturers, they cannot be held liable for negative or unanticipated side-effects of their medications.

a narrow majority, believe in the President's vision. If terrorists are able to attain the materials and delivery systems needed to conduct bioterrorism on American cities, both domestic and international morale will weaken significantly. Everybody will be at risk and the stock market will most certainly crash. Trade will slow and perhaps stop altogether as the international community begins to wonder if U.S. agricultural products are contaminated as well.[56]

**Conclusion**

The fact that most of the "big six" Bio Threats can be treated with antibiotics is promising. The continued work of Congress and the executive branch to legislate solutions to the growing demand for these antibiotics and vaccines is also hopeful. The U.S. must quicken the timeline in which these treatments are developed, however. Available and effective medications and vaccines, along with an informed and prepared public, will serve as deterrents to terrorists wishing to evoke fear and chaos upon Americans.

## Governing the Globe's Nuclear Arms Race
## Henry Brier

The public face of the United States government's foreign policy was winding down her first official international trip in the wake of last week's stunning – yet not entirely unexpected – declaration by one of three sovereign nations of what President Bush classified in January 2002 to be the "axis of evil," according to the Feb. 10 NBC Nightly News. North Korea's announcement that it possesses nuclear weapons and was withdrawing from talks designed to ultimately achieve nuclear disarmament prompted Secretary of State Condoleezza Rice to respond while in Luxembourg that the US government would not launch an attack against North Korea but instead was encouraging the hobbled Communist nation to return to the table. The NBC reporter suggested North Korea's continued defiance might draw potential sanctions to further compromise the reeling state's economic standing, a recourse similar to what the US is poised to pursue against another potential nuclear threat, also an axis of evil nation to be identified later.

North Korea thus is the latest of many nations to become nuclear by publicly announcing its nuclear weaponry capacities, raising several questions for the international community. Among them:

• What governing state should assume the lead in pursuing the resumption of North Korea's involvement in talks, and its disarmament and, if necessary, sanctions?

• What role should the US play as the leader of the free world and the globe's sole remaining superpower whose top official employed an as-of-yet unproven and unfulfilled accusation of nuclear weapon possession as justification for invading Iraq?

• What action should follow Iran, the other "axis of evil" country referenced earlier strongly believed to be pursuing nuclear weaponry?

• What state will view North Korea as threatening and follow suit to defend itself, thus escalating the global arms race?

• What country will next stun the world and announce its possession of nuclear weapons? and,

• What country actually will detonate even one of its nuclear weapons?

Secretary Rice, during her confirmation hearings last month to be secretary of state, did cite North Korea as one of several remaining "outposts of tyranny," thus

[56] Botulism lives and breeds in foodstuffs.

declaring it to be on the US' radar, according to NBC. North Korea is thought to have acted in response to US' hostility against North Korea, believed to be in pursuit of security guarantees and funds to help stave off its internal crumble.

**The Lead Pursuers of North Korea**

Secretary Rice's comments seem to position the US at the forefront of an effort to reel in North Korea, particularly when considering the US is the world's only superpower and one of the five nations abandoned by North Korea at disarmament negotiations (South Korea, China, Japan and Russia being the remaining nations).[57] And, as stated, during confirmation hearings after having been nominated to be secretary of state she specifically named North Korea among Cuba, Burma, Iran, Belarus and Zimbabwe as potential problem countries, according to NBC, prompting the US' further emergence as the leader of the cause to rein in North Korea.

China, considered North Korea's main and most powerful ally, also has emerged as a nation tasked with maintaining the new nuclear power's involvement in the six-nation negotiations, according to a Feb. 12 Associated Press story datelined Beijing. An AP story, datelined today from Seoul, states China will move forward in this effort. The Chinese foreign minister spoke with Secretary Rice on Saturday and emphasized his interest in maintaining a nuclear-free peninsula and resumption of all parties in negotiations, according to the AP news story.

**The US' Role**

NBC News said that North Korea declared in a statement its capabilities were a "nuclear deterrent for self-defense," specifically noting the Bush administration's "hostile policy" toward North Korea. Such an expression clearly pinpoints the US and invites its response and action.

Further strengthening and distinguishing the US as the primary candidate to lead restraint of North Korea is its ongoing war effort in Iraq, which President Bush rationalized by declaring that Saddam Hussein possessed nuclear weaponry. Though this assertion has not been proven as soldiers and weapons inspectors have not found Iraq's alleged stockpiles, the US' war against and its presence in Iraq continues unabated.

In another Feb. 12 AP story, this one datelined from the United Nations, Secretary Rice noted that President Bush said the US will not attack or invade North Korea. Rather, she emphasized North Korea's return to negotiations.

**The Remaining 'Axis of Evil'**

President Bush, in his January 2002 State of the Union, said three countries had not deployed any weapons of mass destruction since the September 11 attacks, "But we know their true nature."[58] He first charged that North Korea was arming with missiles and weapons of mass destruction. Secondly, he named Iran for working on the development of weapons of mass destruction and exporting terror. Then he followed with a strong reference to Iraq's support for terror and its efforts to develop anthrax, nerve gas and nuclear weapons.

In the midst of the US-led invasion and occupation of Iraq and the US encouraging North Korea's return to disarmament negotiations, *The Washington Post* on Feb. 12 reported that the US has been deploying drones over Iran to monitor its nuclear

[57] *The Washington Post* (as printed in *The Boston Globe*), Feb. 12, 2005, "US rejects N. Korea demand on talks" by Philip P. Pan

[58] http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html

program, believing Iran is guising its effort to build nuclear weapons beneath one of nuclear energy. Both Secretary Rice and Defense Secretary Donald Rumsfeld said no plans exist to invade Iran, yet neither would rule out that future option.

That espionage marks the US' third effort involving "nuclear" activity of the three states President Bush named as being the "axis of evil." And, two high-ranking Bush administration officials falling short of ruling out an invasion suggests an ominous future, if the case so advances in that direction.

**Neighborly Escalation?**

With the historical precedent of Pakistan moving forward with its desire to develop nuclear weaponry as a direct result of and response to India reaching that distinction in 1998, a question that begs an answer is: What nearby nation will feel threatened or intimidated and pursue development of nuclear weapons so as to protect itself from a potential strike by North Korea?

Such action, if fulfilled, would ignite a nuclear arms race and further the proliferation of nuclear weaponry. Perhaps an additional nation that fears or is intimidated by the nation fearing North Korea then would establish its own nuclear weaponry, and the process would continue expanding outward to other nations that in turn felt threatened.

**Next Nuclear Declaration?**

Though anticipated, North Korea's announcement was not entirely welcome and was alarming as it prompted tremors of fear to ripple through the global community.

Many countries have ongoing nuclear programs in various stages of development, some further along than believed. One country, Israel, never publicly has acknowledged its possession but leaks and other sources of information essentially have revealed advanced development of nuclear weaponry at a dessert research center named Dimona.

Further, the possession of nuclear weaponry need not necessarily be by a recognized government as Non-Governmental Organizations – such as al Qaeda, Hamas or other like-minded groups – are able to pursue the ability to create nuclear weaponry.

**Detonation?**

Two examples in the historical text establish a precedent as to when weapons of mass destruction already have been detonated and deployed by an empowered government. On two days in August 1945, the US dropped atomic bombs on Hiroshima and Nagasaki, two Japanese cities, as efforts to end World War Two.

Despite the destructivity and harm caused by detonation of such weapons of mass destruction, worldwide proliferation of nuclear weaponry since that point suggests there will be another deployment as that option remains viable given that they were created for a reason and are readily available for that purpose.

North Korea's assertion that it possesses nuclear weapons has not yet been independently verified, according to an AP story datelined today out of Seoul that also notes Australia's foreign minister fears the desire to possess nuclear capabilities will spread beyond the peninsula to another of the six nations involved in discussions. He said Japan will view North Korea's assertion as threatening and will embark on developing its own nuclear program, a belief also endorsed by the Democrat's top senator on the Foreign Relations Committee. The story also noted that South Korea's foreign minister believes the US is fully capable of settling the impasse, despite its ongoing involvement in Iraq. The US

appears poised – if not forced and obliged – to assume a lead role in dealing with North Korea's public declaration last week.

# APPENDIX IV: GOVERNANCE FCIs

## AIDS
## Steven Bulthuis

From the sphere of health-related issues of concern, the AIDS epidemic has emerged as the most serious transnational threat to governance and stability. For example, Africa is home to both unstable regimes and the highest rates of infection in the world. The disease causes undue strain on already inadequate healthcare systems in the immediate and untold pressure on demographics and governance in the future. However, the next regions to be devastated by the disease's rapid spread are India, China, and Russia. These countries will be forced to meet the challenges that this disease brings in the coming decades, from the urgent healthcare problems of treating it to the more latent social deficiencies that abet its spread.

In sub-Saharan Africa, the infection rates in some countries pose serious threats to their mere sustainability. For instance, according to AVERT, an international AIDS charity, in some countries the rate for adults is above 20% and some even above 30%:

**Statistics of AIDS Infection for 2003**

| Country | Adult Rate % | Orphans due to AIDS |
|---|---|---|
| Botswana | 37.3 | 120 000 |
| Lesotho | 28.9 | 100 000 |
| South Africa | 21.5 | 1 100 000 |
| Swaziland | 38.8 | 200 000 |
| Zimbabwe | 24.6 | 980 000 |

(AVERT, 2005. http://www.avert.org/subaadults.htm)

In most of these countries, the healthcare system is not adequately equipped for treating the AIDS epidemic, let alone in these mammoth proportions. Even in South Africa, where the healthcare system was once among the best in the world, the health infrastructure has fallen apart and the government still has not launched a large-scale campaign to provide anti-retrovirals to patients. The healthcare systems of the other countries mentioned above have even less capacity to combat the epidemic and are heading toward ruin.

The AIDS problem darkens the future of these countries, already bleak because of poverty and chronic hunger. In the not too distant future, the adult population infected with AIDS will die and demographics in Africa will be devastated, not to mention the effect on the countries with infection rates above 20% of the population. These countries will be in danger of becoming failed states as a result of losing up to a quarter of the population, creating instability in the sub-Saharan region. The most volatile are President Robert Mugabe's Zimbabwe, already under considerable strain because of his dictatorial rule, and South Africa, which plays an important role in regional security and continental politics. The already precarious economies of these countries could collapse due to the drastic drop in population and the costs of caring for vast numbers of AIDS patients.

Making matter worse, the number of orphans due to AIDS will explode and put debilitating strain on domestic policy.

The next front of the AIDS epidemic will be Russia, China, and India. It is estimated that Russia will have between 5.4 million and 14 million AIDS patients by 2020, the high end of that estimate comprising 10% of Russia's current population.[59] Until only recently, Russia has refused to accept that it has an AIDS problem, a refusal which has translated into woefully inadequate state funding for treatment. That country's healthcare system will need to be vastly rehabilitated from its present state in order to meet the growing need for AIDS treatment in the coming decades. A National Intelligence Council report on the nest wave of the AIDS epidemic notes that the high prevalence of drug use will quicken the spread of the disease, further exacerbating Russia's demographic crisis.[60]

India and China will be confronted with the epidemic in the coming decades as well, which will put pressure on their respective governments to curtail its spread. The major problem with China is its unwillingness to admit to the problem of AIDS because of its relationship with the underside of Chinese society. The disease is most prevalent along shipping routes, where truck drivers and prostitutes mingle, and is transported to the far reaches of the country. Attending to this problem will force the Chinese government to become more responsive to domestic issues that may not accord with the official Communist doctrine. India's experience with the AIDS epidemic will be much the same as China's, with the majority of infections coming from heterosexual transmission, but the NIC report estimates that it will possess the highest number of people with HIV/AIDS in the world by 2010.[61]

For both of these countries, the major challenge is the massive scope of the problem. Even if the infection rate is only 0.5% or 1.0%, the numbers are staggering and the treatment of these patients will put a financial strain on the governments, forcing difficult trade-offs in spending. Finally, if the transmission of HIV/AIDS moves into mainstream society or, at the very least, to the young, urban professionals, the economic costs could be astronomical.[62]

## Increased Domestic Surveillance
## Steven Bulthuis

The events of September 11, 2001, triggered a major overhaul of the intelligence and law enforcement infrastructures of the United States, thus transforming the role of government in contemporary American society. The fact that the terrorists had been living in the United States before they hijacked the airplanes that morning prompted lawmakers to grant domestic law enforcement more power to interdict suspicious persons inside the country. The PATRIOT (Provide Appropriate Tools Required to Intercept and Obstruct Terrorism) Act, passed into law within weeks of the terrorist attacks, updated existing law but it also loosened many restrictions on domestic surveillance. James

[59] Peterson, Scott. "Reluctantly, Russia Confronts AIDS" *Christian Science Monitor,* August 16, 2004. http://www.csmonitor.com/2004/0816/p06s01-woeu.html.
[60] National Intelligence Council, *The Next Wave of HIV/AIDS: Ethiopia, Nigeria, Russia, India, and China*, September 2002. http://www.odci.gov/nic/PDF_GIF_otherprod/HIVAIDS/ICA_HIVAIDS20092302.pdf. p. 12.
[61] NIC., p. 13.
[62] NIC., p. 25.

Bovard, in an article critical of the PATRIOT Act in *The American Conservative*, describes the Act's powers as follows:

> It empowers federal agents to cannibalize Americans' e-mail with Carnivore wiretaps, allows federal agents to commandeer library records, and requires banks to surrender personal account information. It also authorizes federal agents to confiscate bulk cash from travelers who fail to fill out Customs Service forms disclosing how much money they are taking out of or into the U.S. and allows the attorney general to order long-term detentions if he has "reasonable grounds to believe that the alien is engaged in any activity that endangers the national security of the United States." Last year alone, Ashcroft personally issued 170 emergency domestic spying warrants, permitting agents to carry out wiretaps and search homes and offices for up to 72 hours before requesting a search warrant from the Foreign Intelligence Surveillance Court.[63]

The Department of Transportation has instituted its no-fly list for passengers suspected of terrorist ties and the Defense Department's Total Information Awareness program aims at compiling information on as many people as possible. Overall, these initiatives have drastically reduced the civil liberties enjoyed by Americans and while they are ostensibly temporary, plans are afoot to make permanent at least some of the PATRIOT Act's provisions.

While the present security situation is vastly different than it was before 9/11, it may tighten even more should a terrorist attack occur in the coming years. In a recent issue of *The Atlantic*, former counter-terrorism chief Richard A. Clarke drew a picture of the years leading up to 2011, outlining a series of terrorist acts committed on American soil. The most serious attacks were those on Las Vegas in 2005, at a huge mall during the Christmas shopping season that same year, and on chemical plants in 2010. According to Clarke's scenario, these attacks prompted further restrictions in homeland security especially since 'Al Qaeda of North America' claimed responsibility. Roundups were conducted of illegal immigrants and members of ethnic groups suspected of having terrorist ties into detainee camps. Squadrons of unmanned aerial vehicles were deployed to conduct reconnaissance in the United States. A national identification card was produced with all pertinent personal information encoded in it. When Canada refused to let the U.S. squads that were searching for nuclear weapons search on the Canadian side of the border, the 'Northern Wall' was built which funneled traffic to a limited number of highly secured crossings.[64]

While Clarke's scenario was intentionally pessimist, its contents and warnings are not completely out of the realm of possibility. Even if one terrorist attack occurs within the United States, it is not inconceivable that some of the surveillance measures described in the scenario may be enacted. The possible institution of a national ID card has been raised in discussions of further security measures and a future terrorist act in the United States could provide sufficient impetus to make it a reality.

Further tightening of security measures and increased domestic surveillance could have a dramatic effect on governance within the United States. Civil liberties would

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[63] Bovard, James. "Surveillance State" in *The American Conservative*, May 19, 2003. http://www.amconmag.com/05_19_03/cover.html.

[64] Clarke, Richard A. "Ten Years Later" in *The Atlantic*, January/February, 2005, pp. 61-77.

continue to be curtailed, making American citizens targets for surveillance by their own government. Immigration and obtaining a student or work visa to the United States would become increasingly difficult, forcing foreigner to look elsewhere for opportunities. The move toward a police state would have wide-ranging costs, the most immediate one being the mounting government spending required to maintain the heightened domestic security. A more serious problem could be the latent popular ambivalence felt toward a government that is ostensibly protecting its citizens but that is most assuredly collecting information about them and increasingly monitoring their every transaction. This ramification of increased domestic surveillance could create a situation where the American people once felt its leaders were protecting them from terrorist attacks but now feels that the government is suspicious of them. This could work to defray the public in government.

## Colonization of Space
## Leigh Anne Collier

As human spurred development creates a limitation on the capacity of the current habitable parts of this planet, the peoples of Earth will look to expand into uninhabited frontiers. Colonization of space will have significant impact on the proceeding of the planet, international relations, and this country. This makes the prospect of colonization a Future Contingency of Interest (FCI). Potentially, this FCI has implications for all four issue areas (governance, science and technology, economics, and security;) however, it falls predominantly under the scope of the governance working group's jurisdiction. This is due to the fact that the process of colonization requires setting up a new society by an existing governing body or nation-state. This paper will determine the impact of this FCI on the lives of Americans and the interests of the United States.

### Space Program

The United States won the space race to the moon, and since the final Apollo mission has taken great steps toward international cooperation in space. The National Aeronautics and Space Administration (NASA) has been involved in the International Space Station project and has collaborated with countries the world over on various shuttle missions. This spirit of cooperation may change when the ability to set up entire colonies in space, whether they are station orbiting the earth or settlements on neighboring planets. It is quite possible that the United States will once again find itself involved in a space race, but this time for extra-terrestrial territory.

In this area, the United States has one of the most advanced space programs of any country in the world. Currently, the goals of NASA are explained in their "Vision for Space Exploration," which was launched in January 2004 by President Bush. NASA explains that "sustained exploration of Mars and beyond is the ultimate goal of the new Vision for Space Exploration."[65] In June, President Bush stated "The Vision for Space Exploration is a sustainable and affordable long-term human and robotic program to explore space. We will explore space to improve our lives and lift our national spirit."[66] NASA's BAA on Human and Robotic Technology is "well-funded" and its "proposed technologies run the full gamut of those that would be valuable in any scenario for a

[65] http://www.nasa.gov/externalflash/Anniversary_VisMar/index_noaccess.html
[66] FDCH Federal Department and Agency Documents: Regulatory Intelligence Data "Year in Review NASA Builds Success Based on the Vision for Space Exploration" 12/27/04

viable extended-term program of collaborative human and robotic space exploration"[67] Therefore, it is likely that the United States will be a leader and pioneer in space colonization. This country was the first to do any type of robotic exploration of Mars, and scientists at NASA have been considering the possibility of having a Mars colony for years. Last year, " NASA took a big first step in fulfilling the Vision for Space Exploration. Sprit and Opportunity, the Mars Exploration Rovers, landed on the red planet in January and are still going strong a year later. They've already confirmed what some scientists had concluded: that open water once existed on Mars' surface. This finding in turn raises the possibility that life may have developed on Mars long ago. In 2005, NASA will launch the Mars Reconnaissance Orbiter, which will look for water below Mars' surface and scout for future landing sites."[68] It is important to note, however, that the United States has never had its own space station orbiting the planet. After the race to the moon, the Russian and American space programs took divergent paths. Russia focused on developing the MIR station while the United States put all of its efforts into the Shuttle program, whose goal was the creation of reusable spacecraft. The United States has been involved in the development of the International Space Station, however, NASA is not the pioneer in space station development.

In looking at the effect that the prospect of space colonization will have on the lives of Americans, the most significant impact will be in the fact that America may no longer be the destination of wealthy immigrants. Since the arrival of the Mayflower, American has been the melting pot of the world. With the potential that space offers, wealthy citizens of other countries looking to escape their current government or situation may turn to a colony in space rather than moving to the United States. This will mean that poverty level of those seeking entrance into the United States will be lower. This will have significant impact of the economy and the burden that the government will bear for providing for these people.

Another major impact that this might have on the lives of Americans is the potential disease fighting powers of space. NASA experts have been conducting research on the effects of zero-gravity on the aging process and certain physical ailments. If a major discovery is made in this area, for example the potential impact of zero gravity on the rate that cancer spreads, then a hospital in space could become the next Mayo Clinic.

**The Interests of the United States**

Due to the cutting edge technology and research of NASA as the leader in travel to outer space, the United States will likely play a major role in any efforts to colonize another planet. Therefore, the impact of space colonization on the interests of the United States is widespread. First, the United States has a significant interest in the development of the technology required to sustain life outside of Earth. President Bush's "Vision for Space Exploration" and revamping of the way NASA works to include more private sector funding will has brought the prospect of making money into the exploration of space. The technology and patents will be quite lucrative as more and more countries travel to outer space. It will also give the United States a level of control over the process of colonizing space and/or another planet if they develop the technology first.

Setting up a governing system for satellites and colonies on other planets will be an area in which the government of the United States will have the most interest. The type of relationship that a U.S. colony or satellite would have with the "motherland" will

[67] Grey, Jerry. "Reflection and Projection" *Aerospace America* 12/04
[68] http://www.nasa.gov/externalflash/Anniversary_VisMar/index_noaccess.html

depend on the motivation for colonization. If the reason's for colonizing are economic, for example mining raw materials on Mars, the relationship will likely be dominated by the United States, with colonies having a moderate level of independence. If the reason for colonization is environmental, for example, the rain forests no longer provide enough oxygen, or the ozone becomes depleted, then it is likely that colonies will have more independence. If the reason for colonization, however, is military, it is likely that colonies will have little independence.

One of the bedrock principles on which this country is based is the spread of democracy, and colonization in space would be the first real foray in the process of outright colonization, i.e. establishing a society where none existed. Therefore, in thinking about governance, the US government will have to make decision and provision when settling colonies in outer space, especially if they intend to remain in keeping with the traditions of this country, the oldest democracy.

Colonization of space will also have a significant impact on international relations. This is in large part due to the nature of space as an un-claimed frontier. The process of colonization will likely create a wider gap between OECD and non-OECD countries. It could also create tensions about the leaders in space exploration, as well as other countries would like to begin a space program. There are also security issues involving weapons in space that could create major problems in international relations and American Foreign Policy, especially regarding US-EU relations.

Summary

As an unconquered frontier, space offers enormous possibilities. Space policy and the prospect of colonization will likely play a major role in the next century, and decisions made in the next 15 years will determine the role that the United States plays in the process. The impact that space exploration and colonization will have on the lives of American citizens will likely be positive, and may even offer a refuge if this planet reaches the maximum capacity of sustainability. It also offers important medical and scientific opportunities. The government of the United States will face major decisions about governance issues when dealing with the process of colonization, which will challenge the core values of this country and its goal of cultivating democracy. As the United States has not been involved extensively in the process of colonization in the past, these will be new issues with which the government has not previously dealt. The process will also have significant implications in the international relations realm, as more countries enter the exploration of space.

## Waging Private War and Winning Public Peace
## Matthew Poundstone

After the collapse of the Soviet Union in 1991, the rapid windfall of events simultaneously left the West without its historical adversary and deprived the world of a stabilizing political force. The resulting proliferation of intrastate conflict was in part made possible by the debris of ambitious sub-state actors and groups who exploited weak central governments and the communications revolution. Today, the world is still grappling with what can be called the privatization of war, as these groups wield powers of deadly force that were once the exclusive property of sovereign states. These groups range from nationalist insurgents, terrorist networks like Al Qaeda, or private military companies (PMC's) that constitute the modern version of mercenaries. In a previous

paper, a brief background was given into the increased use of PMC's in modern warfare, and three scenarios were constructed to forecast the potential effect of privatized security on the role of the nation-state. This essay will attempt to expand on the functions of private military companies and elaborate on their possible power over future US interests.

In the same way that proponents of globalization prognosticated that the integration of world markets was "inevitable," the rise of privately contracted militaries could have been expected in the post-Cold War world. When the Soviet Union fell, US defense spending fell by a third. The trend was similar in Europe, and the result was a fall in the number of big American defense contractors. However, a mere downsizing of the American defense industry would be an understatement for what was experienced in Russia, as the former superpower witnessed the unraveling of the Soviet empire. Meanwhile, a trend of dissolution experienced around the world led to a series of civil conflicts, notably within Africa and the Balkans. Consequently, the "new world order" was one in which former top military commanders were in high demand and large supply.

Despite the notoriously negative connotations of mercenaries, leaders in the modern and underdeveloped world have found benefits in the use of private military firms. Were it not for the South African based (albeit pre-apartheid) firm Executive Outcomes, the Angolan government might have been overrun by the UNITA rebels. Moreover, an argument can be made that outsourcing restless, politically organized and heavily armed groups through a PMC may provide domestic stability for weak states. In South Africa, for example, the years immediately following apartheid were tenuous and by no means assured of success as former officers of the apartheid South African Defense Forces were being pushed out of power. But instead of remaining idle, the new black-majority government allowed Executive Outcomes to recruit them out of Pretoria and ship them off to fight and train in Angola and Sierra Leone.[69]

Modern democracies with developed economies and powerful militaries have also come to rely on PMC's, and not just to wage war. The extent to which the private sector has grown to dominate multiple spheres of foreign policy was discussed at greater length in a previous paper. Nevertheless, the importance of PMC's in US foreign policy should be underscored since their influence will most likely grow. The expense of deploying personnel overseas, the vast support networks needed to maintain modern militaries, high-tech weapons, the political cost of casualties, and the Herculean task of overcoming legal and diplomatic obstacles, make outsourcing military missions more desirable.

Moreover, the pressure of globalization to decentralize decision-making within large bureaucracies is not necessarily undesirable. In fact, the necessity of incorporating new technology into modern combat may integrate the domestic economy back into the defense industry, which had been dilapidated after the fall of Communism.[70] This integration may have to involve more private-sector investment due to the rapid pace of the industry. Speed and innovation may prove to be the most valuable assets to the world's only superpower when history shows that the biggest military revolutions have come about from nations or groups that were not the dominant powers.[71] Indeed, in a

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[69] Bran, Roberto. "An Encouraging Outcome. Why the South African Historical Experience with Executive
Outcomes Suggests That Using Private Afghan Military Forces in Iraq Could Benefit
Global Security and Afghanistan Society." CDAI-CDFAI 7th Annual Graduate Student Symposium, RMC, October 29-30, 2004. http://www.cda-cdai.ca/symposia/2004/Bran,%20Roberto-Paper.pdf.

[70] "An Industry Reinvents Itself." *Economist* July 18th, 2002.

[71] Ibid.

world where the most immediate threats to the United States are from sub-state actors, privatizing and decentralizing defense may be in order.

Hence, the troubling implications for the privatization of war come from the potential threat it poses to how we define ourselves as a sovereign democracy and to the international codes of ethics we claim to uphold. One of the reasons the word mercenary is a pejorative in the modern vernacular (especially in the American context; Jefferson even cited the king's use of mercenaries as a grievance in the Declaration of Independence) is due to Western notions of a citizen military. The French Revolution sealed the concepts of nationalism, democracy, and military service, and the ideal has been present in our self-image ever since. Therefore, the challenges from PMC's have come from their perceived lack of accountability to their government clients and the people they represent.

In the Abu Ghraib scandal, the world watched American soldiers use the training of private contractors to commit war crimes. There were retributive procedures for the military personnel, but did the firms have liability? If not, what if private security personnel, acting with or without authorization from US officials, were committing war crimes? Under whose jurisdiction could they be prosecuted, if any? Furthermore, if no consensus emerged over the proper conduct or liability of contracted military firms, would top military and civilian commanders find a loophole in the Geneva Conventions and other international rules of just war?

All of these questions may beg a new international treaty, and they speak to one underlying problem: In a world of privatized war, there is less room for distinguishing enemy combatants from civilians. It is possible to discipline civilian contractors, ranging from simple punishments like terminating a contract to locking firms out of future bids, but criminal charges would be at the discretion of the host government. In the case of Abu Ghraib, the decision to stop short of criminal inquiries came from the Justice Department.[72]

However, the privatization of war is not without potential for positive gain, nor does it spell certain doom for national sovereignty. Existing international institutions like the UN can be used as a framework for capturing and coordinating excess military personnel and devoting them to stabilizing conflict zones around the world. Some have also argued that NATO could recruit a mercenary force modeled on the French Foreign Legion for quick deployment to hotspots.[73] Such an arrangement could bolster existing alliances formed under the consent of sovereign states, and it might free unstable areas like Africa from domestic instability. In addition, volunteer mercenary forces modeled on post-apartheid South African might provide a safety-valve to relieve pressures on nation-building efforts like in Afghanistan. Regional warlords, if handsomely compensated, could be recruited and trained to fight in other conflict zones such as Iraq.[74]

In other words, a new era in which war can be waged at the individual, group, and state level is hazardous and potentially threatening to the power of nation-states. However, current trends do not guarantee chaos in the future. The same forces that are undermining the centralization of power under sovereign governments can still be channeled creatively to meet the threats of the new century. Provided that leaders begin to recognize the need to adapt rules, laws, and customs to accommodate these new players, there can be room for stability.

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[72] Carter, Phillip. "How to Discipline Private Contractors." Slate May 4, 2004. http://slate.msn.com/id/2099954.

[73] Kelly, Jack. "Safety at a Price: Military Expertise for Sale or Rent." Pittsburgh *Post-Gazette* Feb. 15, 2000.

[74] Bran.

# APPENDIX V: GROUP MATRIX

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|---|---|---|---|---|
| **Science & Technology** | | | | |
| **Quantum Computing** | Potential for further breakthroughs in quantum technology, possibly including teleportation<br><br>**Colonization of space**<br><br>Current computing system increasingly obsolete | Hacking either mal-distributes wealth or protects its security<br><br>Citizens liquidate savings and foreign holdings through fear of bank insecurity – implications for financial sector<br><br>**Loss of dollar dominance** | Quantum encrypted information is secure, non-quantum is not<br><br>Potential for government / private secure communication | Technology advances too rapidly for regulation<br><br>Secure communications and malicious hacking below federal radar decreases government power and increases lawlessness |
| **Antibiotic Resistance** | Higher mortality from infectious diseases shortens life expectancy<br><br>Higher morbidity leads to serious injury and longer post-infection convalescence<br><br>**AIDS** | Worker and student absenteeism decreases output and education<br><br>Increased costs to employer regarding injury and health care, possible cost to government for public health care | Bio-terrorism leads to paranoia and sacrifice of individual liberties<br><br>**Bio-terrorism**<br><br>More severe injuries and increased sickness leads to compromised military might | Increased public spending on medical research, enhanced dependence on faith healing and alternative medicine<br><br>Shortened life expectancy reduces political influence of seniors and improves solvency of social security |
| **Climate Change** | Breakthroughs in development of alternative energy sources<br><br>New methods of irrigation and production, genetic alterations of crops, new early warning systems for natural disasters and methods to decrease industrial emissions and lower CO2 levels | Harsher seasons lessen productivity, increased property insurance demand<br><br>Expensive cooling units and irrigation projects, increased stress on urban economies due to rural migration | Increased concerns about physical security due to natural disasters<br><br>**Use of alternative energy sources eases tensions with Middle East over oil supply** | Internal discontent / panic if government preventative measures and/or response to natural disasters is inadequate<br><br>Migration resulting from increased aridity, temperature change and natural disasters alter constituencies and pose challenge to governance<br><br>**Colonization of space** (search for more hospitable climate) |
| **Economics** | | | | |
| **Loss of dollar dominance** | Scarce government funds and a weakened economy could jeopardize the US' stature as a research and development hub | As US GDP weakens, other economies become bigger relative to the US | In a precarious economic state, US economy is vulnerable to "enemy" attack by means of dumping or attacking the dollar | US loses leadership role in international financial institutions such as International Monetary Fund and World Bank |

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| **Loss of dollar dominance** (continued) | | **Economy is even less equipped to handle crises like obesity and AIDS.** | As other countries become relatively stronger economically, they also become relatively stronger militarily | Other nations begin to set the rules of the international trade and financial regimes<br><br>The US economy loses flexibility in fiscal and monetary policy as investors are less likely to prop up the dollar or to finance a US deficit |
| **Obesity** | Increased research to combat epidemic leads to new developments in medicine<br><br>**Nanotechnology** (to combat obesity) | Decreased productivity in countries with high obesity rates leads to decreased competitiveness in global markets. | Decrease in immune systems and health lead to greater susceptibility<br><br>**Bio-terrorism**<br><br>Decreased pool of healthy military recruits. | Increased healthcare costs strain the Federal government and other social programs suffer.<br><br>Increased instability in developing countries suffering obesity-related ailments without adequate healthcare<br><br>Increasing quality of life gap between economic classes |
| **Security** | | | | |
| **Nanotechnology** | Breakthrough in nanotechnology has multiplier effect for many scientific disciplines | Trillion dollar nanotech economy by 2015, creating 2+ million jobs<br><br>Private/public holding<br><br>Disappearing MNCs<br><br>US becomes leader in nanotechnology; world driver of economic growth | Revolution in military technology<br><br>Widen military tech gap for advanced nations<br><br>Nanotechnology boosts US military technology and economic power thereby enhancing superpower status | Short-term widening of gap between First and Third World<br><br>Terrorism applications<br><br>Nanotechnology improves standard of living through cheaper goods and makes life easier; increased threats to privacy and new crime wave |

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| **Weaponization of Space** | Increased monitoring and protection of systems<br><br>Higher growth rates for R&D for military tech over civilian, with increased costs<br><br>Divide between commercial and military becomes blurred | Destabilizes commercial satellite industry<br><br>Decreased costs from additional firms increase availability of space systems<br><br>Potential for attacks on commercial satellites<br><br>Increased dependence on space systems | Space Arms Race ensues between the U.S. and several other nations with potential space capabilities: Russia, China, N. Korea<br><br>Increased dependence on space-based weapon systems<br><br>Space systems become high-value targets<br><br>Potential war | Lack of international space policy agreements exposed<br><br>Use of space weapons would violate current treaties<br><br>**Space Colonization**<br>(leads to necessitation of weapons in space) |
| **Rogue State Nuclear Proliferation** | Nuclear technology and knowledge could fall into the hands of other states or non-state actors | Iran would wield more power in OPEC oil decision, potentially driving up the cost of this resource, which will have negative economic impact on the US and other western economies<br><br>North Korean nukes could destabilize Asian economy, with a notable impact on neighbors Japan and South Korea | Regional balance of power shifts dramatically towards Iran, endangering operations in Iraq and US military bases and allies in the Middle East<br><br>West coast of US and allies in N.E. Asia face a new nuclear threat<br><br>Regional balance of power shifts toward N.K., potential forcing S.K. & Japan to develop their own nuclear deterrent<br><br>Could extend to terrorist groups | Nonproliferation Treaty becomes ineffective<br><br>Could spur Korean unification |

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| **Bioterrorism** | Scientists rush to create vaccines and antibiotics to deter and respond to bio-terror attacks<br><br>Vaccines are created for every type of illness, people never get sick<br><br>Populations enjoy increased life-span<br>-Scientific revolution ensues as scientists are funded to begin new projects | Pharmaceutical industry funded by government, stocks soar<br><br>Creation of new vaccines spur scientific revolution, vaccines created for formerly lethal diseases and specialty physicians (i.e.: cancer specialists) become obsolete and are forced to find another trade | Worst-case scenario of successful biological attack will result in the death of an entire generation through the rapid spread of disease<br><br>States begin to implement security measures at the local level as bio-terrorism threatens every airport nationwide | Government forced to create and implement vaccine and antibiotic delivery systems<br><br>**Antibiotic Resistance**<br><br>Vaccines result in longer life-spans, placing a heightened stress on government to provide welfare services<br><br>Creation of a nation-wide system that tracks real-time trends in healthcare treatment and diagnosis – public health care systems will merge with the Department of Defense |
| **Governance** | | | | |
| **Privatization of War** | **Private entities organize like military units**<br><br>Profit-driven rapid development of weapons systems<br><br>Weaponization of Space **(States or corporations with weapons in space)** | Military investment enclaves self-establish in small countries<br><br>More specialization, outsourcing roles other than fighting | Challenges to rules of war<br><br>Decentralization of combat<br><br>**Nuclear Proliferation –** (Rogue states and corporations equipped with nuclear weapons) | **Increased Domestic Surveillance**<br>(Privatization trend could reach domestic surveillance field) |
| **Colonization of Space** | **Health benefits and breakthroughs in space; facilities development**<br><br>Continued advances in space technology; civilian and military uses<br><br>**Quantum Computing –**<br>(for inter-world communication and data transfer)<br><br>**Climate Change**<br>(As driver for the move to space) | Corporations become more involved in space development, technology<br><br>Gap widens between rich and poor countries | Space arms race increases precision of war<br><br>Space weapons systems are redesigned to accommodate space targets<br><br>Inter-colonial struggles<br><br>**Nanotechnology**<br><br>**Weaponization of Space** | **Privatization of War**<br>(privatized space war elements, privatized military space outposts, privatized colonies?) |

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| **Increased Domestic Surveillance** | Increased rate of development of new technologies<br><br>Groups could renounce easily trackable means of communication / doing business and still be a threat; anti-tech movement<br><br>**Nanotechnology**<br><br>New forms of surveillance | New economic interest groups with power in government<br><br>Mounting government spending<br><br>**Loss of Dollar Dominance** (more spending, more budget deficits, more borrowing, dollar decline) | Could forestall or prevent another attack<br><br>If not, will it be ramped up or scrapped? | |

# APPENDIX VI: HUMAN DIMENSION

## Report of the *Ad Hoc* Working Group on the Human Dimension to FCI Analysis

Future Contingencies of Interest are critical considerations for policy formulation. These contingencies will shape the future in the areas of Economics, Security, Governance, and Science and Technology. More importantly, they will have significant human impacts, playing a role in the lives of individuals either directly or indirectly. They may also have macro-level consequences, changing societal relationships, institutions, and values. During the past week, our *ad hoc* working group has considered how the analysis of a Future Contingency of Interest (FCI) can better account for and elucidate these human impacts. We offer, in this report, several of our observations for discussion.

## Criticism of the Current FCI Drivers-Effects/Impacts Matrix

It is the consensus of the group that the matrix relating drivers to effects/impacts has limitations as it is currently formulated. Our first observation is that human impacts are not clearly exhibited, as they are listed with the totality of all effects/impacts in the same column. To address this point, an augmented matrix that more clearly shows the human impacts was proposed. This augmented matrix formalism is discussed in the next section. Our second observation relates more fundamentally to the matrix formalism, which does not represent causal chains with more than one link (driver-effect-driver-effect and the like) in an intuitive manner. A network diagram with human impact end-effects was also proposed as an additional alternative. The network diagram formalism is discussed in a later section.

The group considered how human impacts could be included in both of the proposed formalisms (augmented matrix and network diagram). We elected to restrict our attention to the analysis of the impact <u>of</u> an FCI <u>on</u> humans with an eye towards being able to evaluate the desirability/undesirability of the consequences of an FCI.

Human impacts on the FCI (policy choices, individual or collective behaviors) were deemed by the group simply as drivers.

## Augmented Matrix

Human impacts are, in essence, effects either upon individuals or groups of individuals, or effects upon social institutions or culture. The former are micro-level impacts; whereas, the latter are macro-level impacts. A human-centric approach could treat these human impacts as ends, and base the overall evaluation of the FCI upon them. The matrix lends itself to an extra column to describe the ultimate human impact. Table 1 is an example of the augmented matrix based on the obesity FCI matrix submitted for the previous class. A symbolic key has also been added to identify the scope of each impact.

**Table 1. Augmented Matrix.**

🌎= global affect
🏛= mainly national effect/issue
🧍 =individual/micro-level human impact
👥=societal/macro-level human impact

| | Drivers | Effects | Potential Human Impact |
|---|---|---|---|
| **Economics** | Increased incidence of obesity-caused diseases | 🌎 Increased healthcare costs strain global health care systems | 🧍 Individuals have to pay more for health care directly (premiums) or indirectly (taxes), 👥 Greater number of people with no health care coverage |
| | Increased private and corporate spending on health care cost | 🏛Less capital available for non-health care costs | 🧍 Individuals' discretionary spending drops; 👥 More lay-offs/ fewer new jobs created as companies cannot/do not pay health care for more employees |
| | Decreased productivity due to morbidity costs | 🌎Decreased competitiveness in global markets of countries with higher obesity rates | 👥 Unemployment in uncompetitive sectors |
| **Governance** | Obesity-related costs take up greater portions of GNP | 🏛Increased fiscal pressure on government limits options for new programs/initiatives | 🧍 Individuals affected by program cuts (Cuts for example in education, welfare, military will affect many people); 👥 Which programs chosen/eliminated affects societal structures (division of public/private/charitable sectors) |
| | Obesity prevalence, morbidity and mortality is greater in lower classes | 🏛Increasing gap between economic classes | 🧍 Poor people get relatively poorer, 👥 Increasing discontent, increased demands for economic justice, change in societal values |
| | Public pressure for accountability of companies producing, marketing high calorie (sugar, fat) foods | 🏛Increased government regulation of food companies; Warnings on foods; 🌎MNCs move to other markets outside of US | 🧍 Individual law suits increase 👥 Change in societal values; Society sees new role for government |

| | Drivers | Effects | Potential Human Impact |
|---|---|---|---|
| **Security** | Increased instability in developing countries suffering obesity and lack of means to deal with epidemic | Increased risk of internal uprisings or retaliation against countries viewed as responsible (such as the US) | Individuals less likely to travel to countries seen as Anti-American |
| | Decreased pool of healthy military recruits | Less option to send soldiers for nation-building, intervention or peacekeeping;<br>increased need to reinstitute the draft | Healthy individuals may face draft;<br>Society overall feels less secure |
| **Science & Technology** | Increased research on cures for obesity-related diseases | Prescription drugs, medical procedures discovered to increase life span of obese and non-obese individuals | Individuals live longer;<br>Societal structures change as result of increased life spans |
| | Cloning research is pursued in response to growing need for organ transplants due to obesity-causing diseases leading to organ failure | Cloning becomes acceptable medical device for various organ transplant needs, also for needs not linked to obesity | Societal values change |
| | Development of technologies, including nanotechnology, to remove fat from fat cells | Wider uses of nanotechnology for prevention and treatment leads to further development of the technology for wider medical purposes | Availability of effective cures increases for individuals with variety of ailments who can afford them |

The augmented matrix does not show an evaluation (positive/negative) of each human impact. This requires an additional step. Some group members felt that this step should be an integral part of the matrix. We do not have a specific recommendation as to how to perform the evaluation; however, the work of Petersen[75] was suggested as a starting point.

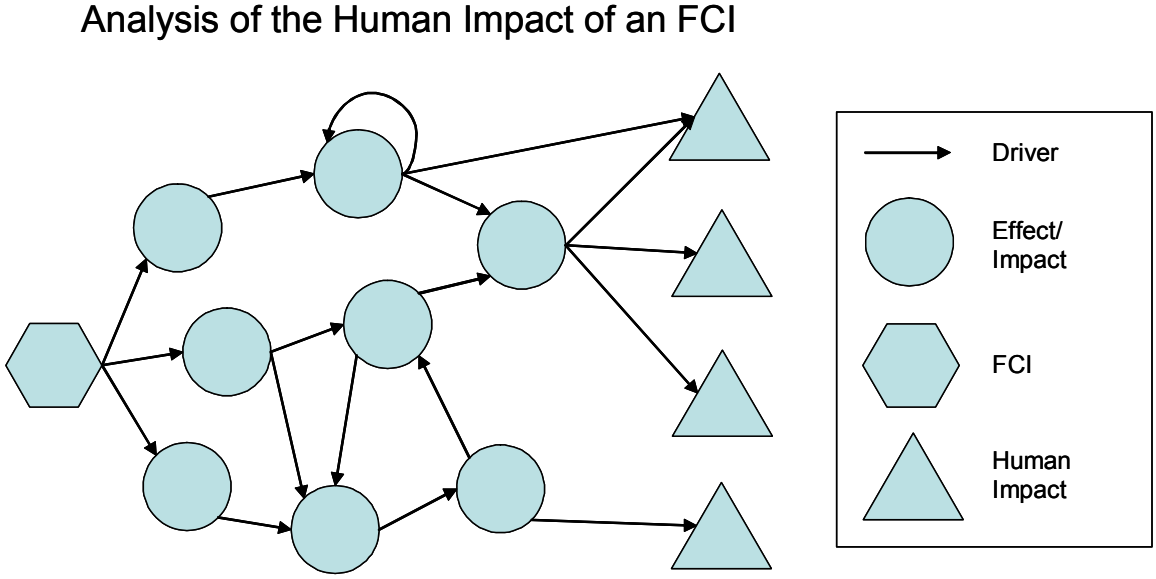
## Network Diagram

The concept of a network diagram is shown in Figure 1. The network diagram has the advantage that the cascading of driver-effect-driver-effect-*etc*. can be represented, as well as feedback (loops). It is also unambiguous as to whether or not the impact <u>of</u> or the impact <u>on</u> the FCI is being considered. On the other hand, the network diagram is effect-centric and busy.

The network diagram approach lends itself to the creation of end-nodes for ultimate human impacts. These could be categorized by the existing labels (Economic, Governance, Security, Science and Technology (S&T)). A fifth category for "human impact" is inappropriate. Since humans will be impacted by all four categories, the concept transcends each group and needs to be taken into account in each situation.

[75] J. L. Petersen, **Out of the Blue**, Madison Books, 1999.

**Figure 1. Network Diagram (Bubbles would be captioned to describe the effects/impacts and arrows would be captioned to describe the nature of the drivers). Network diagrams could be linked to show relationships to other FCIs.**

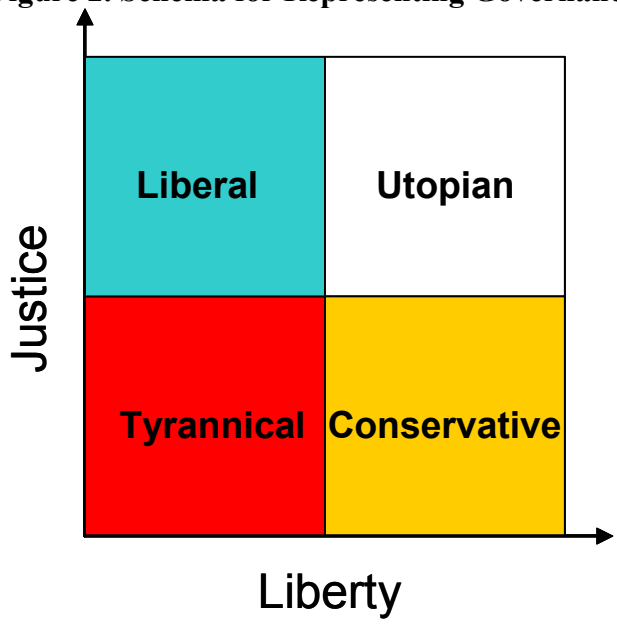



## Meaning of Human Impact

The notion of "human impact" is ill-defined and can be construed as meaning many different things. A more precise definition of this term would facilitate the construction of a framework for structured thinking about FCIs. One should define for whom or for what social construction the impact is being considered. One should also define criteria for impact assessment. Petersen creates such a system in his assessment of wild cards[76]. He considers four human factors: tools, actions, sustenance, and being. They are weighted in importance from least (tools) to most (being). Other systems could be imagined that are tailored to the Economic, Governance, Security, S&T categories. Economic and S&T assessments can be straightforward. For example, *per capita* income or life expectancy are quantifiable and well defined metrics that can be used to state an assessment. Assessments in the other categories may be more abstract and subjective. For example, Governance impacts could be evaluated across orthogonal axes of liberty versus justice (Figure 2). The term "justice" should be understood in this context as "social justice". A society in which individuals are accorded complete liberty leads to social injustice (*e.g.*, the liberty to dump of toxic wastes injures others). Conversely, attempting to achieve complete social justices can stifle liberty. This sort of representation is an oversimplification, but it provides us with a model for thinking, and it illustrates how the evaluation of some attributes of human impact are bound to be controversial and linked to the evaluator's values. Politics enter the process at this point. Returning to Governance as an example, a conservative may weigh liberty more than justice and a liberal would weigh justice more than liberty.

[76] J. L. Petersen, *op. cit.*, 1999.

**Figure 2. Schema for Representing Governance Impacts.**




## Conclusion

Though different perspectives and values may steer the assessment of FCIs in different directions, human impact is an important consideration in evaluating future contingencies. Both the augmented-matrix and network approaches offer useful starting points for consideration of FCIs. The augmented matrix provides a compact, straight forward representation, while the network view incorporates added complexities, such as feedback and interactions between effects. Both can be readily expanded by adding cells or bubbles, allowing the user to take the ideas further. Most importantly, both highlight the effect of the FCI on humans more clearly than the models previously employed.

# APPENDIX VII: FEEDBACK MECHANISMS

"Feedback" is a process by which a system is controlled or changed by the response it produces. A system created to address future contingencies of interest (FCIs) would be subject to feedback. Therefore, the system by which FCIs are addressed will produce responses likely to control or change the system. Policymakers have the difficult task of anticipating the impacts of FCIs across multiple fields (security, governance, science and technology and economics). As previously stated, FCIs are multivalent: they have implications within several different disciplines.

This conceptualization of feedback regarding FCIs goes beyond the traditional conceptualization of feedback in the categories of "negative feedback" or "positive feedback" as information that is useful in changing a system. For example, the possibility that the human lifespan will continue to increase is an FCI. A government policy formulated in response to this FCI could breed new FCIs with a new set of multivalent implications (i.e. with implications in some of or all the fields of security, governance, science and technology and economics).

Moreover, governments are in the unique position of being able to regulate activity in all of these fields, shaping impacts while simultaneously generating side effects that work to diminish or to intensify other regulation. Feedback in and of itself thus creates pressure on governments. It is a process that takes on a life of its own but can be used to manage and modify handling of FCIs.

## Feedback Regarding the Blue Ribbon Panel Recommendations

The Blue Ribbon Panel recommends that Commissions on Forward Engagement be established in each chamber of Congress to encourage Members of Congress to consider Future Contingencies of Interest (FCIs) when formulating and voting on policy options. These Commissions, the House Annual Commission on Forward Engagement (HACFE) and the Senate Annual Commission on Forward Engagement (SACFE), will be most prescient if they visualize feedback, taking the interconnected impact of decisions and reactions to FCIs into account.

The HACFE and SACFE can take the interconnected impact of decisions and reactions to FCIs into account as they run the Forward Engagement Session by encouraging and coordinating with standing committees to plan joint-hearings. Multivalence will also be encouraged through the "Fostering of Open-Minded Debate" as described in the Panel recommendations. In their reports (February-July), the HACFE and the SACFE can additionally attempt to anticipate feedback to bring awareness of and exposure to the process by which the system is controlled or changed by the response it produces.

It is probable that some of the responses to Congressional legislation regarding FCIs will be unforeseeable. However, unintended consequences are part of the nature of feedback. These could take the form of social movements, economic trends, etc. Understanding the nature of feedback engenders more thoughtful planning and flexibility. By considering the complex relationships taking place across fields, policy makers strengthen their ability to formulate effective multivalent policies.