

**“Societal Tsunamis”**  
**A Conference Presented by the**  
**Project on Forward Engagement**  
The George Washington University  
April 7, 2006  
8:00 am – 3:00 pm  
**Conference Notes**  
**\*Draft\***

**Contents**

<b>Opening Remarks</b>	
Professor Leon Fuerth	2
<b>Geopolitical Inversion</b>	
Clyde Prestowitz	3
<b>Environmental Dislocation</b>	
Dr. David Jhirad	9
<b>Evolutionary Secession</b>	
Dr. William Bainbridge	15
<b>Conclusion</b>	
Professor Leon Fuerth	19

Student Rapporteurs: Neil Padukone  
Justin Zorn

## **Opening Remarks**

### **Professor Leon Fuerth**

#### **Forward Engagement Project at the George Washington University**

- There is a dangerous tendency to push away decisions regarding long-term issues.
  - Policymakers have created an ideology of discounting the future, encouraging the belief that unseen factors will provide long-term security.
- It is possible to learn useful information about the future through the evaluation of alternative futures.
  - While we cannot know the future, we cannot escape influencing it.
- There are ways to incorporate foresight into governance.
  - Right now, however, our great national power serves as a justification to cut ourselves a lot of slack.
  - Government must come to terms with complexity: Systems are constantly interactive in countless areas and ways.
  - We no longer have the luxury of placing one national challenge above all others.
  - We must keep all in our field of vision.
  - The longer we wait, the more we have sacrificed the advantage of early action.
- Democracy was deliberately “detuned” by the founding fathers. Because fast operation made operators more error-prone.
  - Analogous to development of the standard “QWERTY” keyboard to slow down expert typists, who were likely to jam early typewriters.
- The question of Forward Engagement: How do we systematically stay ahead of the curve?

## Session I – Geopolitical Inversion

### Clyde Prestowitz, Founder and President Economic Strategy Institute

- We can safely assume the sun will come up each morning, although one day, millions of years from now, the sun will nova and cease to rise.
  - There are many such “suns” in our lives. However, they may cease to rise sooner than we think. Examples include:
    - Inexpensive energy and water
    - Heavy reliance on the American dollar ; America as dominant capitalist economy
    - American dominance over internet and IT
- In the year 1450—China & India accounted for 75% of the global economy.
  - When Portugal’s King John I launched his the first major European raid on the North African coast, his knights were astounded by the immense wealth.
  - Understanding these cities were on the periphery of the Baghdad Caliphate, Europeans sought means to travel east in search of great riches.
    - Henry the Navigator, son of King John I, developed the caravel for this purpose.
      - A light and fast ship, its primary cargo was information.
    - Vasco da Gama eventually sailed past the Cape of Good Hope and reached India
- The next 600 years were characterized by Europe’s rise, which culminates in modern American hegemony.
- By 1950, China & India account for 7% of the global economy; Europe and the US account for 75%.
- Today, China & India have rebounded to 15%, and each currently grows at 8% GDP annually.
  - This indicates Asia will soon occupy a larger, if not dominant position, in the global economic system in the years to come.
  - Chinese government official: “We Chinese have had a couple hundred bad years, but now we’re back.”
- Globalization was once “internationalization” but now revealed to be bigger phenomenon characterized by expansion across boundaries
  - Outsourcing reveals this:
    - Prestowitz’s son encouraged him to invest in snow removal around Lake Tahoe: “you can’t move the snow to India, but you can move technology, IT, software around the world.”
- Transformation of China is remarkable: In 1981, there was scarce infrastructure, few signs of wealth
  - Modern transformation reveals a common flawed assumption:
    - Notion that poor countries develop through cheap, labor-intensive, low-skill industry and then, over time, move up the scale of value added as Industrialized countries move to “higher ground.”
      - China and India are moving immediately to occupy American’s modern economic ground

- Richard Chang- Taiwanese born, NYU-educated, started his semiconductor firm in Texas, but moved it to Taiwan because of the labor advantage.
- India's advantage is growing rapidly.
  - Intel's manufacturing facilities in Bangalore employ 2,000 PhDs who work in tandem with employees at a similar site in Oregon.
  - Medical tourism is an emerging industry: a first class ticket, side trip to the Taj Mahal, and full surgical procedure costs, on average, 30% less than a comparable American procedure.
  - Brain scans in conducted in Bethesda now analyzed in Bangalore.
    - Radiology has become an internationally tradable service.
  - Tech-support outsourcing: AOL Retention center defies neoclassical economics by placing an Indian service professional "inside the living room" of an American consumer.
  - Nashat, under the business pseudonym Megan, has an 80% success rate in AOL troubleshooting for American customers. She relies on "accent neutralization" power phrases like "trust me" and "believe in me" to bridge the culture gap.
- In the Industrialized World, trend is often the opposite.
  - As Indians seem to work "40 hours a day"
    - Der Spiegel recently posed the question: "Can Germans work 40 hours a week?"
    - Recent events beg the question: "Can French kids work at all?"
- Two Simultaneous revolutions are occurring :
  - 1) Movement of 3 billion people into a previously exclusive global economic system.
    - Think of the Asian Tigers (tiny countries made a huge impact).
  - 2) Erasure of Time and Distance:
    - Almost any task can be performed in one place and delivered anywhere else instantly.
    - Even many physical tasks—FedEx can get any item anywhere in 33 Hours, more cheaply than ever.
- This has big implications not only for business, but also for geopolitics.
- Hundreds of millions of people stand to emerge from poverty
  - America's enlightened self interest is to seek their success.
- Yet, all players face challenges internally and externally:
  - Can these countries keep growing indefinitely?
    - The answer is yes—but a qualified yes
      - Energy shortages, pollution, an unprecedented pace of urbanization, and political stability problems
    - Neither China nor India can develop along the path of the United States (the 3 car, 3,000 sq ft. home per family model).
      - This would be catastrophic for the environment and quickly deplete resources.
    - A new economic development paradigm is needed
    - Current dynamics can be dangerous
- Contrary to Friedman, the world is not exactly flat: It's tilted.

- US is the world's net consumer; others are net producers and sellers
- Last year, American households consumed \$500bn more than American industry produced.
- We are therefore borrowing \$3bn per day on a “buy and borrow” strategy
- Dominant strategy elsewhere has been: save, produce, export and lend.
- Asian savings rates are astronomical: as high as 55% in Singapore.
- Asian strategy is export-based and built on overvaluing the dollar
  - Hence, Asia manage the dollar
  - It's not just China that overvalues American currency—all Asian countries are doing a “dirty float”
- A Strong dollar, as Larry Summers often preached:
  - keeps consumer prices low, inflation down, but:
  - It puts a magnetic hub on the supply side of the US economy
- We think of China and India as poor and unskilled (and for the most part they are).
  - However, a small percentage of a very large population is still large
  - Many new startups are now moving their R & D operations to India
    - A “Tilted World” is unsustainable
- Prestowitz came to this conclusion after interviews with central bank directors from several countries.
  - Numerous central banks hold excessive dollar reserves
    - Japan and China reserves each in the trillion dollar range
    - South Korea, Singapore, and others also sizable
  - If you owe a bank a \$100, you have a problem. If you owe a bank, \$1bn, the bank has a problem (and so do you).
- We should also fear the unknown :
  - No one at Davos in 1997 expected the Baht to plummet within months.
  - No one in 1998 expected Long-Term Capital Management would go bankrupt.
    - When the firm went bankrupt, the Federal Reserve in NY swiftly bailed them out.
- Prestowitz predicts a dollar devaluation of 50-75%
  - Mainstream predictions of a 23-30% fall are based only on econometric models
  - Trade surplus in services is now small and declining
  - Overall Trade deficit is likely to get bigger
- To change this situation, we should rely on increased manufacturing, yet:
  - Manufacturing in US has dwindled to 12% of GDP (\$1.6 trillion of which only 50% is tradable)
    - Tradable manufacturing now stands at 88% of capacity, and there is little room for growth
- Therefore, we can only rely on decreased imports:
  - This is also difficult because we cannot substitute most goods here at home

- Policymakers have failed to deal with this issue, so a nasty crisis could lie ahead
  - Paul Volker has predicted large crisis within 4-5 years
  - Alan Greenspan agrees the status quo is unsustainable
- These transformations have even bigger implications for climate change and resource depletion
- What we should do:
  - Launch a major initiative to address global imbalances, using the G8 or some similar channel.
    - US would commit to balance budget deficit (and perhaps raise taxes by the end of 2008)
    - All players would agree to price oil in a basket of currencies
    - Equalize the playing field: No player would borrow in its own currency.
    - Manage water—the next war may be over water, rather than oil.
- Is there hope?
  - There is certainly opportunity:
  - Imagine a bridge game with many players: Whose hand would you like to play?
    - The US still has the best cards:
      - Most stable political system, transparent rule of law, best workforce, cutting-edge technology, strong universities.
    - It's quite possible to lose, however, even if you have the best hand.
    - Right now, nearly all are playing as badly as possible.

### Q & A Session I

- **Participant:** Africa has hardly been mentioned in this discussion. If manufacturing moves where labor is cheapest, can jobs move from Asia to Africa for manufacturing? Could nanotechnology lead to cheaper manufacturing without human beings?
  - **Prestowitz:** Manufacturing doesn't necessarily move where labor is cheapest. It moves to find the lowest overall costs of production.
    - This means combination of: cheap labor, good infrastructure, low corruption.
      - Other factors: Intel is opening a new production center in Israel. There, the firm receives a tax holiday and a capital grant—
      - Israel makes offers that cannot be refused to hi-tech firms (like Singapore, France, Maryland, Virginia, and countless others). This is essentially a market distortion.
- **Participant:** What are the prospects for Latin America?
  - **Prestowitz:**
    - NAFTA, we assumed, would expand Mexico's manufacturing base. Factories of Mexico are now moving to China, however. It is not a major growth economy.

- Central American economies are facing serious, chronic economic problems. Attracting manufacturing takes more than cheap labor. In this regard, these economies cannot compete with Asia
  - Venezuela can depend on oil, but Chávez is not building a real economy.
  - Andean states are losing their prospects of positions in the global economy. They not integrated and now moving away from what Friedman calls “golden straitjacket” of neo-liberal economic policy.
  - Chile, Argentina, and Brazil are doing well largely by supplying China.
  - Brazil deserves praise for its ethanol program.
- **Participant:** What is future of backlash against Globalization?
  - **Prestowitz:** Remember Norman Angel’s idea in the 1890’s that the world system was too interconnected permit war in the future.
  - Examples of resistance abound: Think of the Dubai ports deal, our reaction to China’s takeover of Unocal, or France’s constant aversion to multinational corporations.
  - We have lost our credibility in the world
    - A major financial crisis could trigger unprecedented backlash, which could be further complicated by developments in the War on Terror.
- **Participant:** What are the macro-level measures that could be taken to avert catastrophe? Moreover, what about the psychological component. What could governments do to stop the acceleration of trends that lead to crisis?
  - July’s G8 summit is the best place to address these issues. Thus far, they have ignored the forthcoming global economic crises
    - Partners should address the question of how to re-price the dollar in order to soothe worries throughout the world
  - This is a global issue, although it’s primarily between the US and Asia. Europe (and the Euro) has a major part to play.
- **Participant:** The major players of the last era wrote the current rules of International System. As new powers emerge, how will global governance systems be affected?
  - **Prestowitz:** Hard to see. We should “grab bull by the horns” because the power is ours at this time. There is still ample opportunity to shape future events.
    - At a conference in Mumbai, a top Chinese minister discussed democracy: “It’s only a means to an ends—Democracy isn’t the issue when you’re surrounded by slums and beggars.”
  - The US and China are betting against each other:
    - Chinese leaders are betting globalization will make them rich and seal their leadership
    - US officials assume capital flows will break the communist state.
    - Does China know something America doesn’t?
- **Participant:** What implications do outcomes in Iraq have for our policies related the globalization? Further, if China causes shocks to the global economy and we mishandle our responses, how extreme are the dangers?

- **Prestowitz:** They are very extreme.
  - We live in a critical moment in which the world is changing rapidly and dangerously. There is a certain inertia, however:
    - US democracy only functions in a crisis.
    - Today's crisis is quiet, so it's hard to arouse interest. So many believe so strongly in American exceptionalism and the notion that the 21<sup>st</sup> Century is destined to be ours.
  - There is a will in the US to want to believe that our best days are ahead of us.
- **Fuerth:** "We are the greatest power on the face of the Earth" is the denial lullaby politicians repeat frequently.

## Session II – Environmental Dislocation

**Dr. David Jhirad, Vice President of Science and Research**

### **World Resources Institute**

- How do we pay attention to changes of great scope and magnitude that are happening extremely rapidly?
- In particular, how do we deal with changes to the complex, non-linear systems that comprise the world?
  - Global energy and climate systems are among these non-linear systems, and they will and must be transformed over decades
- We have reached a scientific tipping point: climate change is occurring; it is no longer a theoretical construct, we can see and measure the changes
  - There are no dissenting voices in the peer-reviewed scientific community
  - There has been a rise in Carbon Dioxide (CO<sub>2</sub>) concentration to a level that the earth has not seen in 600,000 years. The most likely warming for a doubling of pre-industrial concentrations to 550ppm is predicted to be 3.5 degrees Celsius, and there is a 90 percent probability that the warming will lie between 2.4 degrees C and 5.4 degrees C.
  - However the uncertainties that remain are uncertainties about
    - The exact impacts of these changes on the world's ecosystems and people
    - The rate of these changes
    - The nature and magnitude of change
- These uncertainties are used by naysayers to try to deny 'global warming'
  - Despite these uncertainties, there is no doubt about the causes of climate change: human-induced greenhouse gas emissions coming from energy, industrial and transport systems
- The difficulty of predicting the impacts of climate change flows from the fact that complex nonlinear systems, when stressed to a certain point, exhibit instability and can evolve unpredictably
  - We must consider the finite possibilities of threshold effects
  - When stressed, these effects reach a tipping point that enters into phase change
    - Mathematics of these changes themselves are highly complex
    - Additionally, the effects of external elements are profound and complicate the changes further
    - This complexity places a caution on decision-making
- Many possible options exist, but the scale and pace of concrete solutions remain uncertain
- The only global ecological threat that is comparable to climate change is nuclear war
  - During the Cold War, there was a small, but finite risk of major catastrophe of nuclear war. Policy-makers tried to decrease this already small risk to a level of non-existence.
  - With climate change, there is also a small but unquantifiable risk
    - Mathematical models could be enhanced to accommodate abrupt discontinuities in the Earth's past and future climate

- We'll be lulled into insignificance if we believe we are facing something that is too far-off

#### Begin power point presentation

- The Green-house effect, is a natural process resulting from the sun's interaction with the atmosphere, is being exacerbated by the emission of CO<sub>2</sub> and other greenhouse gases into the air
  - Atmospheric CO<sub>2</sub> concentrations are over 380 ppm today
  - The effect is mainly a result of CO<sub>2</sub> and Methane
- British Hadley Centre has elucidated three major environmental catastrophes
  - Slowing down and eventual stopping of the gulf stream arising from a fresh water flux from the melting of the polar ice cap.
  - De-glaciation of Greenland, which is occurring two times faster than we thought, resulting in rises of sea levels in many coastal cities
  - Probability of heat-waves increases (such as those in Europe in the summer of 2003, which resulted in 15,000 deaths)
- According to the International Energy Agency, primary energy demand will increase manifold
  - China & India, in aggregate, may exceed US & EU energy consumption within 30 years
  - To add to this, current projections use very conservative growth rate figures
- These environmental challenges can not be seen in a vacuum
  - Investment challenge: investments of \$16 trillion investment in an oil, gas, coal, and electricity infrastructure
  - Poverty issue: electricity consumption is correlated with economic growth; there are still 2 billion people in South Asia, China, sub-Saharan Africa, and elsewhere without electricity
- What will it take to stabilize the atmosphere?
  - Energy independence in a globalized world is a fiction
  - A tripling of current global energy consumption could occur by 2050
  - Need to reduce greenhouse gases by 60-80 percent over the century
  - But there is no single technology fix other than a diverse portfolio
  - Different technologies can bring us to various levels of 'cleanliness'

Explore the implementation rate of technology wedges: i.e. a billion cars getting 40 mpg, replace 1000 coal plants, hundreds of nuclear plants, etc.
- As we are dealing with a non-linear system, we don't know how to predict quantitatively when climate change will fully lead to a major physical tipping point
  - But there is a very high possibility for catastrophic consequences
- Though there is a powerful consensus of a scientific tipping point, we are getting close to a business tipping point
  - An incorporation of climate risk into portfolios is very much on the minds of large corporations, banks, and insurance companies
  - GE has a clean energy R&D budget that is comparable with the US DOE, and incorporates 17 different technologies, with major applications to Indian and Chinese energy markets.

- Companies such as GE are not doing this for moral reasons, but rather, they recognize that they can become more globally competitive the next century if they have the ability to lead the “new energy revolution”
- However, without clear, mandatory federal policy and guidance, we will be stalled in the water, and solutions will not be widespread and lasting
  - Need mandatory government limits on carbon, analogous to sulfur dioxide
- The world must also look to different paths to industrialization
  - India and China need to explore, for their own prosperity and security, energy paths that are low carbon and empower 3 billion people
  - Honda and Toyota have best to responded to these challenges
    - Clean diesel, hybrid diesel, hybrid gas
- China has stricter automobile standards than US (closer to US)
  - For security reasons and public health reasons (pollution in cities)
  - China doesn't want to have the same level of oil consumption and dependence as the United States
  - Impact on public opinion: Indian supreme court fed up with expanding pollution; looking for public subway and metro systems; forcing buses/taxis to convert to natural gas
- There is a huge potential for minimizing climate instability
  - To realize this, scientific and business tipping points must be matched by a political tipping point, because this is a critical time, and costs of delay are immense.
  - However, there are risks to democratic governance: the closer we come to the precipice, the more draconian the measures that must be employed

## Q&A Session II

• **Leon Fuerth:** In the past, general systems collapse has entirely removed various civilizations; a profound system collapse can change entire paradigm of Industrial civilization. Might this and other tipping points lead to the collapse of the world system?

• **Participant:** Please elaborate on the Gulf Stream scenario.

**Jhirad:** As a result of climate change, the salinity of the Gulf Stream diminishes, resulting in a change in Gulf Stream density. This density can lead to a collapse, and the change in temperature, i.e. a 6% climate change in Europe.

A mini ice age is possible, and the effects on the global food supply, water resources, and other areas would be immense. Fortune Magazine has referred to the Gulf Stream as the mother of all security issues.

• **Participant:** In mainstream politics, the denialists are winning because they are in a strategically advantaged position. How did they get there and how do we reverse this trend?

- **Participant:** Would Al Gore have painted the picture differently? What would he have? Or is the political system so engineered here that even leadership wouldn't have made a profound enough impact?
  - **Leon Fuerth:** Public figures don't speak about these issues because they would rather avoid the hubris of explaining others' faults when they're out of position of power. But leadership changes the odds on all things. Change the leadership and all things may very likely respond.
  - **Jhirad:** There is a thin majority & bi-partisan consensus. Senators Dominici & Bingaman have been leading an emerging bi-partisan consensus on serious mandatory emission cuts. But they found a brick wall at the White House. But the science is real and compelling, thus we need political leadership and mandatory measures on this.
  - **Fuerth:** "The circumstances are fatal but not hopeless" - a Viennese Adage
- **Participant:** Enacting potential situations would have a most profound effect; take some of these drivers and play them out 20-30 years into the future. Get militaries involved and add a security tipping point to get more attention. Are there any wild cards that could wake us up without all-out destroying us?
  - **Jhirad:** Sea-surface temperatures along the Atlantic Seaboard are higher than normal, and the resulting frequency of category 4 and 5 hurricanes may prove to be the needed shock. The media doesn't do justice to the staggering damage and dislocation of Katrina.
  
- **Participant:** Are these trends projected forward such that any immediate event could impact change? Or is the trend locked in?
  - **Jhirad:** We are due for a set of adaptive responses: every time you say 'long-range,' people phase out. We are looking at a higher quality of mass-transit and a new generation of efficient vehicles, not going back to bicycles. Science shows that our children are likely to live in a climate-altered world.

We need to rely on the capitalist, market system to make technological responses, supplemented by visionary political leadership, in order that the scale and pace of the response be sufficient and adequate for the threat that is faced.
- **Participant:** The money that is being invested in these kinds of technologies is increasing, particularly in Europe. What kinds of policy measures would make markets respond to the challenges faced?
  - **Jhirad:** As long as governments are unwilling to entertain conversations about what will be occurring, it will be harder for markets to respond. But the political system should introduce quotas, caps, and other such measures. WRI analyses show that Honda and Toyota are the best positioned to respond to carbon constraints, and are also doing the best financially in the industry.
  
- **Fuerth:** Only in Presidential Politics do you find people that are thinking about where they are going to be in 12 years, though for different reasons. People do think

in terms of the future when properly motivated. What should political systems do to make more profound changes?

o **Jhirad:** The political system should treat carbon as valuable commodity; and view carbon constraints as an opportunity for regeneration. The idea of “caps” induces fear, i.e. a government takeover of economy, but that kind of move might be most profound, efficient and effective.

• **Participant:** What are the implications of climate change for weather patterns throughout the world? How do we make the connection between specific events and general global climate processes?

o **Jhirad:** The connection between climate change and specific events is difficult to make. None are simple cause-and-effect solutions; although it has been shown that climate change in this century has doubled the risk of the European heat wave of 2003. We can certainly make the argument that climate change is leading to the increased frequency of these rare events

• **Participant:** What if we looked at the security & political ramifications. Given the implications for societal resilience, and the intersection between foreign and domestic security threats, what is the role of the military in societal resilience, and in responding to various natural disaster issues?

o **Jhirad: Assistance agencies** are helping developing countries deal with issues of climate change (i.e water, heat, drought, etc), but we also need o do this with our own societies. What will it take to bring the focus to our own systems?

o **Fuerth:** How can democratic systems of governance adapt to put issues at the top of a list of priorities? Politicians have incentives if they have persistent questioning; a large movement is not necessary, but persistent questioning about an issue tends to have greater effects.

• **Participant:** Can this be seen as a national security threat the way terrorism and other issues are? US dependence on oil impedes the ability to address these issues seriously. How can we change this extreme dependence on oil?

o **Jhirad:** There are important measures that could be taken, but no one wants to talk about a carbon tax or trading system, among other measures. Such measures are the third rail in American politics, from which everyone is staying away.

• **Participant:** Would we have to change some substantive aspect of society to make full use of changes, i.e. getting away from manufacturing? Could we prioritize away from certain wasteful elements (real estate in some places, factories elsewhere) in favor of others? Are there a set of socially disruptive technologies that would transform the way we run our daily business lives?

o **Jhirad:** There are certainly technologies that might facilitate these societal changes. These might include room temperature super-conductors, which could store and transmit electricity without losses, cheap semiconductor solar cells and battery systems, and conversions of ethanol, such as the process in Brazil that saved 100 billion dollars in oil imports. Other breakthroughs would include widespread coal gasification, carbon capture and storage, and nuclear fission.

- But ethanol wouldn't be as helpful in the United States, as ethanol from corn would require more than half our land under corn cultivation.
  - Moreover, conversion from gas to liquid natural gas would be a huge revolution in technology.
  - **Fuerth:** Psychologically, we can be ready to change our habits, but what about political change?
- **Participant:** What is the desirability of talking about possibilities instead of predictions? If methods and observations aren't testable over time, how would they be effective politically?
- **Fuerth:** At present one of the most favored ways policy-makers choose not to do anything is to say that there is inconclusive evidence, that we must wait for data before we change policy. The current practice is to wait until something gets so bad that someone's political future is risked by negative outcomes.

## Session III- Evolutionary Seccession

### Dr. William Bainbridge

#### National Science Foundation

- Convergence refers to an intense activity, merging shared technological goals and concepts across fields such as nanotechnology, biotechnology, information technology, genetics, and cognitive science.
- Adding cognitive science—which itself is linked to psychology, linguistics, philosophy, etc—to this merger is the most controversial element of convergence, but a necessary addition.
- Managing the convergence Nano-Bio-info-cogno technological innovations leads to a clear convergence in society
  - Personality Enhancement: increasing cognitive abilities
  - Personality Capture: storing of memories and human experience
  - Personality Emulation: ‘creation’ of personality based on Artificial Intelligence
  - Ultimate Convergence of these three faculties
- The distant future is connected to today because today’s developments are preparing the way for greater enhancements with unforeseen implications
  - Many of these technologies are not explicitly intended by the researchers to accomplish convergence or personality capture, but seem to be incidentally creating some of the science and technology needed for these advances.

Emerging technological developments based on converging technologies include:

- Assisted Cognition
  - Project ACCESS (Assisted Cognition in Community, Employment, and Support Settings, by Henry Kautz) will create new technology that enhances the quality of life for those with cognitive disabilities (assisted Cognition)
    - Where software is AI Agent w/ GPS, etc., that learns habits of person, knows person’s location, ‘communicates’ with person w/ cognitive disability and assists him based on acquired information
  - Social Networks from sensor data
    - Employ similar techniques as Project ACCESS, but interact with the persons social environment to a greater degree, inferring structures of social interaction, to assist scientific inquiry
  - Cognitive Orthotics
    - Integrate temporal constraint reasoning with reinforcement learning, giving people with cognitive disabilities reminders of necessary actions (i.e. lunch) based on acquired data
- Social networking assistance, creating dynamic social network models from sensor data. “If technology has broken society apart, maybe it can put society back together”
  - Socio-Cognitive Orthotics
    - Machine models the activities of the person and assists based on environmental information
    - assists social networking
  - Quentin Jones – Social Matching

- “Using geotemporal social matching to support community”
    - Reads information from other, geographically proximate peoples’ machines to compare personalities and preferences, and assist active social networking
  - Rosalind Picard – Affective Computing, MIT media Lab
    - “Social-Emotional Intelligence Prosthetic”
    - Assists those with social problems (uncomfortable in social networks)
    - Intimate connection between person and machine; personality of the individual is moving into the machine, to assist those with autism and other such social disabilities
  - EyeTap
    - Wearable computer with a small device over the right eye that records all that is seen. The device simulates ‘augmented realities’ and conducts ‘research’ on the stimuli acquired, i.e. you can Google someone when you meet them with a computer attached to the eye-piece.
  - Gordon Bell – MyLifeBits
    - Downloading his life onto a computer, via video, picture, PDF, Tiff, Audio, and other uploads
    - Preserving memories so that the death of a neuron won’t eradicate them
  - Carpe Vitam
    - Capture of various elements of ones’ life onto computer
  - Personality Capture (by Bainbridge)
    - Affective emotional mapping of episodes
    - Using Gordon Bell’s MyLifeBits archiving
    - Recording questionnaires that give information
    - Ability to formulate an individual’s computer-modeled utopia
  - The Latest: Self II
    - Record, Analyze, and Preserve Yourself
    - ID person’s values and self-image
    - Record and analyze important attitudes, i.e. how you judge yourself and other people, values, character traits, etc.
  - Immersidata Game Behavior Capture
    - Computer game meant to simulate how one would react in certain situations, in which players ‘enter’ the simulated body
  - Videogame play recording
    - Figure out players’ motivations in various social situations
  - Emotional Ratings of Life Episodes (Analogies in Natural Emotion)
    - Advisor system based on ratings of thousands of actual and hypothetical and actual experiences in terms of 20 emotions
  - Robot Cars
    - Computer-guided robotic cars that are able to sense the road
- Controversial Impacts of AI

- AI Demonstrates mind without soul; converging technology erodes our assumptions of what human beings are
- Notion of something in the human brain adapting/evolving to see something greater in the human being in order to cooperate and form social institutions
- Good from the Machine: Artificial intelligence, William Bainbridge
  - Artificial intelligence models religious cognition, demonstrates souls are not necessary for religion
- The Future of Religion, Rodney Stark & William Bainbridge
  - “Religious faith is a kind of wishful thinking, resulting from the human desire for unavailable rewards, the cognitive ability to imagine seeking those rewards from supernatural sources, and the social exchange of information and speculations with other humans”
- AI & Religion, is cybernetic immortality possible?
  - The Age of Spiritual Machines, Ray Kurzweil
  - Are we spiritual machines?, Ray Kurzweil
  - How the Mind Works, Steven Pinker
    - “Evolution has given humans a natural propensity to interpret complex and obscure events as the result of conscious agencies—other minds.”
  - In Gods we trust, Scott Atran
    - “Supernatural agents by cultural manipulation of stimuli in the natural domain of folk psychology, which evolved trip-wired to detect animate agents.”
  - Whereas the 20<sup>th</sup> century debate between religion and science was over evolutionary biology, in this century the controversy will be over our psychology and the cognitive area (Paul Bloom, “The duel between body and soul,” NY times, 9/10/2004)
- **Fuerth:** Are we taking over our own evolution as a species? We use separate sciences, interactions between sciences, and take over the ability to modify ourselves – evolution becomes part of a feedback loop, and its not nature that creates our evolution, but our own desires.
- **Bainbridge:** We’ve been making ourselves ever since Agriculture (versus other species, who don’t actively or consciously determine their own fates)
  - Synthesis of individuals and machines at individual and societal level (Panopticon, Bentham)
- The Secular Abyss, William Bainbridge, on interaction between and effects of religion, secularism, and cognitive science
  - The causes of secularization lie only partially in science and technology
    - Weakening of religion has been a major catalyst; i.e. ability of religion to deter suicide is weakening over time
    - Does religion (versus secularism) support well being?
  - Secularization has reduced fertility and propensity to procreate
  - Other subjects of analysis:
    - Crime and deviance, the new age, scientific religions,

- Atheism (atheists are weak in social obligations, have fewer and weaker profound social responsibilities)
- Cognitive science, technological transcendence, an age of transition
- The same study of biotechnology and nanotechnology should be done

### Q&A Session III

- **Participant:** Does convergence technology hold implications that rise to the level of environmental issues, economic issues?
  - **Bainbridge:** It could have very large consequences, but there is no major action necessary to stop it. With environmental challenges, universal action is needed to stop the trend, but with convergence tech, there's potential societal conflict. At the end of the progression of convergence technology, we are not human anymore.
  
- **Participant:** Technology affects our lives so profoundly, especially this one that could make us live forever. What kind of social tsunami would this induce?
  - **Bainbridge:** "This technology will be the way we live forever, how we go to the stars," but this is not the biological root of man. When we can't really help someone, we comfort them through supernatural hopes. A fertility collapse in industrial populations and the atheism in these societies demonstrate that religion is a factor that keeps the fertility rate up. Though we may have already passed a tipping point in demography, convergence of technology may lead to tipping points in secularization
  
- **Participant:** What about contemporary religion today and its role in politics and policy?
  - **Bainbridge:** In order to bring this issue to a tipping point of its own, we must consider if there is something else on other side of the abyss that is also viable that would require a very radical change in everything.
  
- **Participant:** The rise of religion and militancy in America—including the abortion debates, women's rights—is in large part reaction to change, but there might be a social reason. Perhaps an economic, balance-of-power reason might explain these changes.
- **Participant:** There's almost a religious assumption that lies at the foundation of science. Will religion take a role of supporting altruism or of restricting thought and critical thinking?
  - **Bainbridge:** Monotheistic religion was good starting point for science, as one of the original aims of science was to discover more about God than scripture revealed. But we are currently hard-pressed to find a hard science that fundamentalist religions would actually promote.
  
- **Participant:** What do you include for means of rendering individual and public choices more useful for public terms? If religion makes us more fertile, and if faith is

more needed to meet our social obligations, is this not a reason that religion will rise in areas of high poverty?

- o **Bainbridge:** In terms of social analysis, there is much that is problematic in a context of large powerful organizations, both government actors and others. Thus, there must be multiple approaches to understanding these phenomena. Marxism was such a disaster; the Third Reich was an anthropological version of pseudo-science of the worst kind; and currently, is the only alternative to US capitalism radical Islam?

- **Participant:** Science is driving the future, and at such a speed that we're not prepared to deal with its consequences. Is increasing religiosity coming as a reaction growing out of unpreparedness for the rapidity that follows scientific growth?

- o **Bainbridge:** There must be an array of viewpoints included in this debate, as much of science still remains unscathed by religious doctrines. But the rate of change may not really be that much faster.

- Many of our scientific and technological accomplishments are not occurring quite as quickly as we had presumed. For example, nuclear fusion power may not be possible. In 1960 they said it would be a reality in 10 years, today they say it may be over 50 years till it is realized. Furthermore, not very much has come out of space exploration.

## Conclusion

**Professor Leon Fuerth**

**Forward Engagement Project at the George Washington University**

- Where we are going with this project:
  - o The Forward Engagement project, which is expected to run through Spring 2007, is two-pronged:
    - Initiative designed to reach experts and policy-makers and improve governance
    - We must strengthen the ability of government to know what is being done to them, or not being done to them, in order to affect what is done by them.
  - o Unfortunately, the long-term must be the result of many short-term decisions.