



**STRATEGY
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**THE COMPLEXITY CHALLENGE AND THE NEED FOR A THIRD
AMERICAN REVOLUTION**

BY

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The Complexity Challenge and the Need for a Third American Revolution

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ABSTRACT

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Escalating world complexity, resulting primarily from advancing technological synergy and an unprecedented rise in globalization, dictates that the United States provide visionary and committed leadership to address worldwide equity and equality issues in pursuit of international security and stability. This document examines the impact of emerging technologies and the factors of globalization and technological synergy shaping the modern international security dilemma. In the coming decades communications technology, nanotechnology and biotechnology pose the potential to influence international relations and world development. While offering the ability to raise man to new heights, they may open the door to greater forms of destruction. These technologies will emerge in a world experiencing an unprecedented level of interconnectedness. Worldwide cultural and political systems must adapt and react. This paper seeks to provide a set of specific directions and recommendations, based on long held American principles, for taking the international leadership role.

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THE COMPLEXITY CHALLENGE AND THE NEED FOR A THIRD AMERICAN REVOLUTION

Escalating world complexity, resulting primarily from advancing technological synergy and an unprecedented rise in globalization, dictates that the United States provide visionary and committed leadership to address worldwide equity and equality issues in pursuit of international security and stability. Technological advances are driving cultural and social changes directly impacting world economics and international relations. These forces require the United States take an active leadership role to address systemic security issues in an increasingly complex, tightly interrelated world. Due to its unique history, coupled with its world military and economic roles, only the United States has the ability to build the international cohesion and stability required to address these issues. Little in history has prepared the world for the new emerging reordering factors of economic and cultural interdependence, the ever-increasing speed of technological advancement and worldwide interconnectedness.

Technological progress is leading mankind in directions producing profound opportunities while complicating international issues. There is little doubt among the developed world that the next 20 years will see an expansion in technological innovation. These innovations, coupled with an unprecedented level of connectedness, presents new threats and potential solutions. Technology, since its inception, has produced work saving tools whose use was essentially optional. Today, the use and rapid adoption of technology is a requirement. Those that fail to adapt or adopt pay a heavy economic and cultural price. Addressed in this study are the factors and forces pushing change to unprecedented levels along with the emerging technologies that pose the greatest benefits and the greatest threats.

A simple review of current technologies fails to reveal the substance and supporting issues that are moving the world forward at a faster rate than ever before. Other shaping forces require in-depth analysis to reveal the complex interactions impacting international security requirements across globe. The links between international security, technology and globalism are clearer today than ever before, but much more complicated.

America faces fundamental choices. One choice will allow technology and the market economy to drive national policy decisions. These policies will directly influence global actions and national decisions regarding the proliferation of technological advancements to the developing world. Another choice is to foster the national critical review process. This requires public discussions, critical reviews of new technological advances and conscientiously planning the implementation of new technologies while addressing the international security issues.

The United States' strategy must include a high degree of flexibility and commitment to address the long-term international security implications of a future in a complex, tightly integrated, interdependent, technologically driven world civilization. A future framed by intense periods of resource shortages and reoccurring struggles for economic and cultural dominance among regional powers will test American principles, strategies and leadership.

Certainly technological advances will directly impact the relationship between nation-states struggling to provide security and stability. Today globalization appears to be winning the struggle among developing states seeking the path to a self realized destiny. However, the dynamics of an era characterized by rapid technological advancement, coupled with the quickening pace of social and cultural change, provides little reaction time. The United States must exercise great care in developing policies and relationships in an era where time is compressing.

INTERNATIONAL SECURITY AND UNITED STATES INTERESTS

International security and the strategic interests of the United States are subject to political and environmental fluctuations that cut across all boundaries. The ever-increasing interconnectedness that defines the global village has fundamentally ended the notion of isolation. Modern technologies can empower weak nations or individuals with superpower status. If the international community fails to pay attention, or these threats are unrecognized or unaddressed, individual and national security is placed at risk.

Foreign events can and will have an impact on American interests. The United States cannot afford to ignore international events without great peril to American safety and freedom of action. Failure to address basic human rights, environmental issues or the equitable distribution of world resources places American strategic interests in jeopardy. The United States has little to fear militarily, with the best-trained and best-equipped armed forces in history. However, military dominance alone will not ensure security. Security requires constant vigilance and attention to changes in the international environment. The global environment makes this a difficult, demanding and continuous process. It requires a vision of technologies' ability to transform and transfer capabilities and capacity. Regimes of terror will possess the power to exploit worldwide communications to recruit, coordinate and propagandize. Science may provide nations and terrorists with the ability to produce new forms of bio-engineered weapons of mass destruction. Sophisticated devices of terror, operating at levels of miniaturization that render them virtually undetectable, will require a shift in our security focus.

The United States must actively seek new methods to achieve security and stability in a globalized context.

Technological synergy and its ability to transform whole segments of society are at the center of these issues. In real terms, biotechnology is delivering on its promise today while operating at only a fraction of its potential. Estimates for widespread advances resulting in improvements to the quality of health and the longevity of man will occur in the next decade. Nanotechnology breakthroughs, providing raw computer power capable of modeling nearly any complex system, will leave the research labs in less than two years. Nanofabrication manufacturing tools, able to produce devices at the atomic level, using molecular assembly techniques, are in the design phase. While high-end multi-million dollar systems will not saturate the market soon, breakthroughs in chip technology and manufacturing processes will rapidly come to market. In planning and reaction terms, the future is here. The requirement is to design the political, economic and social systems to maximize the vast potential while minimizing the risks.

EVOLUTION AND THE SPEED OF TECHNOLOGICAL CHANGE

Without question the last quarter of a century saw dramatic increases in the speed of technological advancement. According to some studies, technological capabilities now appear to be doubling every decade reaching a near exponential rate of growth in terms of pure technological advancement.¹ Each new stage of technology builds on the successes of the previous stage.²

Man's initial technological advances resulted from extremely simple tools. But evidence suggests that these simple tools took tens of thousands of years to become ingrained, spreading through the emerging civilization very slowly. At the end of the first millennium mankind progressed faster with paradigm shifts, characterized by the introduction of advanced tools and rudimentary production capabilities, occurring nearly every century or so. However, the use and distribution of new tools including paper, gunpowder, water and wind power still spread slowly and unevenly across the globe.³

In modern times the pace accelerated dramatically as the nineteenth century produced more technological change than the previous nine centuries. The first twenty years of the twentieth century produced more technological advancement than in all of the nineteenth century. World paradigms now shift in very compressed timeframes. The Internet didn't exist a decade ago but now forms an indispensable part of everyday business and personal life around the globe. Technological progress in the twenty-first century, in a linear view, would require on

the order of two hundred centuries as defined by the previous rate. By comparison, at today's rate, the twentieth century saw only twenty-five years of progress. According to Ray Kurzweil, world renowned scientist and inventor, "... the twenty-first century will see almost a thousand times greater rate of technological change than its predecessor."⁴

Whether or not we meet Kurzweil's prediction is not the issue. What is certain is that technological advancement is substantively changing the world at an accelerating rate. To make the most of it requires understanding, planning and preparation.

Technological advance is a natural product of man's evolutionary quest to improve the tools used to manage his world. Selection of the emerging technologies with the most potential to fundamentally impact the world requires the analysis of multiple factors. These factors include:

- New technologies, once fully developed, must possess the ability to change the human condition. Many evolving technologies will simply extend existing capabilities by providing solutions for narrowly defined niche requirements. A fundamental change is one with the potential to set mankind on a new path such as fire, electricity and nuclear power.
- The ultimate impact of the emerging technology must be unpredictable. The potential and vision for the technology must support a broad range of capabilities and future opportunities. In fact, the new technology may open the door for as many negative implications as positive ones.
- Substantial financial commitment must exist to see the project to breakthrough and market. A significant number of research sites must be doing work in this area to ensure there is a dispersion of risk and an increase in innovative approaches raising the likelihood of success.
- Finally, the research must possess the potential for enormous profit. The need to recoup research investments provides a high level of drive and commitment resulting in the active decision-making and management needed to ensure completion. The lack of potential for profitability results in the abandonment of many promising technologies.

EMERGING WORLD ENVIRONMENT

To fully understand the emerging world environment, globalization and technological synergy require further consideration. These factors and forces will influence the dynamics of the world stage raising basic equality and equity questions. The curve of acceleration and the

cycles of new technology fuel the creation and destruction process. The resulting economic forces ultimately impact international social, economic and political systems. These factors, placed into a hyper-globalized world context, produce serious implications for the international economic and security systems.

Today we can clearly see the emergence of four world shaping dynamics. First is the compression of the time available for planning and policy development due to the tightening cycles of economic creation and destruction caused by technological innovation. The speed of technological development can outpace legislative and political systems' ability to guide these changes. The rapid worldwide adoption of the Internet and the extended process to deliver individual security and privacy legislation highlights this point. Biotechnology and nanotechnology, while working to provide solutions to long-standing issues, pose risks that currently have no envisioned solutions. The advent of these technologies, and the large number of unknown implications, closely resembles the birth of nuclear technology.

Second, advances in one developing area fuel advances in other technologies creating new synergies of acceleration. The resulting increase in the speed of development impacts governments' ability to effectively manage the economic and cultural changes. Patent and profit issues may keep needed solutions out of the reach of much of the developing world. This separation between capabilities and distribution may prove to be world polarizing, reference the African AIDS/HIV epidemic and western pharmaceutical companies debate.

Third, globalization will continue to build based on the advances in communications and manufacturing economies. This may result in more wealth moving to the developed countries and away from the developing world. An extension of the current economic gap may restrict entry to the developed world economic status. Without assistance, developing countries that lack the basic infrastructure may not ever be able to reach sustainable modern standards of living creating an environment that threatens international stability. The poverty of Afghanistan and Somalia are blueprints for this scenario.

Finally, for a variety of economic, geographic and cultural reasons, the United States is the best candidate to provide the direct leadership required to assemble the international coalitions necessary to meet the basic developing world infrastructure needs. For the United States it is a matter of self-interest and a logical extension of democratic principles. Failure to provide this high level of committed leadership means turning away from the American tenets of freedom, justice and equality.

Paradoxically, this is both the safest alternative and potentially the most dangerous. It is in the United States' interest to actively pursue a world moving in the direction towards

international security and stability. However, this will take a national resolve that seeks to ensure representative governments in all nations, open markets, free trade, stable infrastructures that provide for the basic needs for all people, and an intolerance of regimes that oppress their people by restricting basic freedoms. This is a dangerous path. Leaders, even powerful nation-states, are often targets of opportunity for a wide variety of critics and threats. Forced globalization is already known in many developing worlds as Americanization. Supporters and detractors, risks and opportunities, exist on both sides, but the challenge is one that must be met.

TECHNOLOGY IN THE 21ST CENTURY

High-speed technological advancement will shape the next century. Breakthroughs occurring in one area will be used to spur further advances in other technologies. As synergistic advances occur at greater speeds, technology will reach new levels of pervasiveness.

Three emerging technologies hold the promise to make possible major changes in a wide variety of basic human endeavors including medicine, health, personal and business relationships, manufacturing and worldwide delivery systems. Nanotechnology seeks to manipulate the physical world at increasingly smaller levels eventually assembling materials at the atomic level. Biotechnology aims at solving the complex systems that create and sustain life. Communications technology's goal is the collapse of time and distance. These far-reaching technologies will not reach their potential for several decades. Nonetheless they present the promise of a vastly different future. No one can predict all of the factors that will impact their evolution. However, they hold unlimited potential and unheralded capability to raise new strategic issues.

The three overlapping breakthrough technologies identified have the power to cause massive shifts in the cultural, social and political landscape of the new global environment. Handled with intelligence, foresight and deft, these advances can lead to periods of increased cooperation and mutual benefit for all mankind. Handled incorrectly the worst tenets of globalization will take hold straining international relationships.

From a national security standpoint these technological advances raise serious issues. Issues including privacy, individual rights and the need to provide for the common security will produce debate on all fronts, but particularly in the Departments of Justice and Defense. Protection of the rights of the individual and need for the protection of the nation will reach a new level of complexity.

COMMUNICATIONS TECHNOLOGY

A relatively simple terrestrial and satellite communications technology infrastructure served as one of the primary catalysts of the globalization movement in the last decade. Major advances in nearly all phases of communications technology will produce a higher degree of connectedness.

Communications technologies will expand the use of the new international standard language of digital communications using the Internet Protocol. Human and systems communications will become pervasive and ubiquitous. These advances will result in cheap and efficient communications systems capable of providing content in multiple formats anywhere in the world. The information required to make better-informed decisions will be available to everyone with a connection, a computer and the knowledge of how to use them.

Personal communications and computer devices will merge and serve as the primary personal gateway for conducting business, education and social interactions. They will lose their status as a luxury becoming a necessity. Security and privacy concerns will remain critical issues until public policy mandates the implementation of existing security technologies to protect individual privacy rights. Instantaneous communications will make secrecy without encryption nearly impossible. Bandwidth and throughput limitations will be issues of the past. Cultures struggling with globalization will be further frustrated because they will lose their ability to stop the flow of information into and out of any country.

America's continued world cultural lead, based on content market dominance, may be diminished. Other cultures will possess the ability to establish niche dominance resulting from shrinking uplink and production costs. It will be virtually impossible for regimes to segregate their people. Predicting the ultimate impact of this technology is difficult, the only certainty is that the ability to communicate more fluidly with greater degrees of understanding will expand and extend affecting human interactions in unpredictable ways. These new communications technologies will introduce a whole range of applications at speeds and costs cheaper than today's home connection. Distance will no longer be an issue.⁵

NANOTECHNOLOGY

Nanotechnology embraces the potential for new capabilities in a variety of fields, working at increasingly smaller levels of miniaturization and achieving new efficiencies of scale. The term, nanotechnology, refers to a variety of manufacturing and assembly technologies working at the far end of the size spectrum (a nanometer is one billionth of meter). In 2001 President Clinton announced the National Nanotechnology Initiative to produce focused research on the

social, economic, ethical, legal and workforce implications of nanotechnology. Initially funded with \$500 million in federal funds, a large number of universities and labs have begun the basic research.⁶

One branch of Nanotechnology research seeks the manipulation of physical properties at sub-atomic levels targeting solutions for all types of resource and material issues. Other research is focusing on building collections of self-assembling molecular devices to carry out work at the atomic or cellular level and the development of nanotechnology manufacturing techniques. The fields of biology and computer technology may benefit first from these breakthroughs. Eventually, a wide range of sciences and industries will benefit from molecular manufacturing capabilities perhaps solving long held and difficult environmental, energy and medical issues. Precision computing aims for manipulation at the atomic level by using nanotechnology to achieve quantum-computing techniques.⁷

The potential of this technology is to allow man to think and act in new dimensions solving problems on levels and at speeds that have yet to be calculated. The very forces of the natural world will become observable and potentially controllable. Changes in computing capabilities will occur over three generations that seek the same result, instantaneous computing against millions of variables.

Ethical use limits, technology extensions and application policy issues surround the development and implementation of nanotechnology. After development and commercial adoption, it will be difficult to stop this technology. Nanotechnology fabrication will support a wide variety of new materials science resulting in new manufacturing and production models that could revolutionize the production and distribution economies. Applied to biological systems, nanotechnology may revolutionize our approach to medicine and warfare. Working models are few, however research is progressing quickly with high levels of government and private funding.

BIOTECHNOLOGY

Biotechnology holds the promise of unraveling the essential characteristics that define life while providing the ability to make changes in structure and function at the cellular level. Tremendous funds flow into biotechnology for research and development because the payback is enormous. Biotech industry fund raising jumped from \$5.23 billion in 1996 to \$14.44 billion in 2002.⁸

In support of biotechnology, computer chip manufacturers have developed new computer architectures with enormous capacity and virtually no cycle time.⁹ The capabilities of these new

systems will pave the way to model and manipulate the invisible natural forces in near real time. Problems with clearly mapped relationships like atmospheric circulation, fluid dynamics, gravitational attractions and nuclear reactions are likely initial candidates. Future uses of this technology include full body part modeling, body image scanning and predictive outcome modeling based on complex systems theory.¹⁰

Even if these new computer systems do not completely provide the solutions for which they were designed, they may spawn a whole new set of technologies and capabilities. One predictable result is the production of an affordable teraflop machine that is smaller and cheaper than today's large supercomputer systems. It is possible that inexpensive commercial microcomputers will reap an improvement in price to performance of almost two magnitudes.¹¹

Biotechnology has created a new form of economics with enormous financial incentives built on mapping the molecular structure of amino acids. The goal is to produce more sophisticated drugs and drug therapies capable of directly targeting the source of illnesses. The genomics industry has more than quadrupled over the last three years becoming a \$50 billion market based on two new industries, Bioinformatics and Proteomics. Bioinformatics merges biology and information economics using data from the mining and analysis of genomic databases. Proteomics focuses on the study and understanding of protein chemical properties and their structures. The evolution of these fields has spawned a scientific culture enmeshed with robots, super computers and advanced X-ray systems.¹² The financial incentives for biotechnology research are clear, pharmaceutical companies pay tens of millions of dollars in royalties for access to a specific gene map.

Biotechnology raises questions of ethics, equality and equity. Affordability, distribution and the international legal and business issues are central arguments. The licensing of commercial research in conjunction with the issue of development costs and corporate profitability may stress the free market stance of the developed world. Biological production of weapons of mass destruction, DNA keyed diseases, and genetically altered agricultural products pose complex risks.

GLOBALIZATION AND THE INTERCONNECTED WORLD

Globalization is viewed as a web of interconnectedness driven by free-market capitalism, where the market is king. The more open economies are to free trade and competition, the more efficient and flourishing national economies become.¹³ However, escalating tensions and unpredictable forces spell peril for unmanaged globalization. The sheer speed of globalization can bypass a country's ability to change and adapt existing models to see, comprehend and

react. "Today, more than ever, the traditional boundaries between politics, culture, technology, finance, national security and ecology are disappearing."¹⁴

The roots of the modern period of globalization lay in the changes made to the international economy at the end of World War II to forestall another era of depression.¹⁵ The drive for open markets and what Thomas Friedman defines in his book, the *Lexus and the Olive Tree*, as the democratization of finance, technology and information, created a natural environment pushing globalization to new levels. When the Berlin Wall fell in 1989, globalization took on new life as technological capabilities replaced the barriers and protectionism of the Cold War.¹⁶

The bi-polar relationship between the United States and the Soviet Union defined the international system of the second half of the last century. In today's environment the division is between those with access to technology and a place in global market and those without. The very nature of trade and its relationship to international economics is in transition. In 1970, foreign trade made up only 13 percent of the U.S. GDP; today that rate has more than doubled.¹⁷

Proponents view globalization as inevitable, stressing the need for increased free trade, unrestricted electronic commerce and worldwide network communications. Detractors see no advantage to globalization but plenty of disadvantages. Stressing the rips in the social and cultural fabric caused by unmanaged globalization, they point out the expanding gap between the rich and the poor while highlighting the loss of jobs and inadequate social systems for those left out. Some believe that unrestricted globalization erodes the ability of the individual and local communities to impact their future. Others support a reversal of the perceived negative trends through trade restrictions and added protective barriers. At the heart of many of these debates is globalization's role in spreading the tenets of democracy while sustaining American economic strength through the development of new markets. Others see this as a misuse of American power.¹⁸

As globalization rolls through countries it can appear as an anonymous force that homogenizes local cultures, breaks down communities and crowds out traditions. Many cultures fear that their diversity, the thing that makes them unique, will cease to exist as they become part of a business model that requires huge economies of scale generated by doing the same business or selling the same product in all markets.¹⁹ However, Richard Robbins reports that more than two percent of the world's population already live and work in countries in which they are not citizens. This transnationalism links together societies of origin and settlement forging entirely new cultures based on social fields that cross multiple borders.²⁰ The reality is

that many people are caught in between seeing the way to prosperity and not being able to get there in their own country.

Support for free market capitalism is not universal. Economist Lester Thurow contends that, "capitalism is myopic and cannot make the long-term social investments in education, infrastructure, and research and development that it needs for its own future survival."²¹ Friedman acknowledges these issues, but counters with his contention that the spread of capitalism has raised living standards higher, faster and for more people than at any time in history. Relative poverty, the difference between the wealthy and poor may be growing in many countries, but absolute poverty is actually falling around the world. According to a 1997 United Nations Human Development report, poverty has fallen more in the past fifty years than in the previous five hundred. The speed of advancement in the developing countries has progressed as fast in the past thirty years as the industrialized world did in the previous century.²²

The proponents of globalization point to the past with its high rates of poverty and decades of war and see the globalized future as a cooperative environment to avoid those pitfalls. New organizations like the World Trade Organization (WTO) and the International Monetary Fund (IMF) have done a great deal to stabilize the world. The WTO's Director General Mike Moore, points out that, "since the General Agreement on Tariffs and Trade (GATT) was set up in 1948, world trade has soared 15-fold, to more than \$7,000 billion a year. This has helped to multiply world output by seven. This huge rise in living standards has allowed nearly everyone to enjoy the luxuries that were previously enjoyed only by the few."²³

Even in the poorest countries, people live longer, eat better, and have more access to clean water than they did 50 years ago. Life expectancy has risen by over 20 years, adult literacy rates have increased by over 30 percentage points and GDP per head in less developed countries has tripled since 1950.²⁴

Benefits from globalization, according to neoliberal ideals, center on three broad themes. The first addresses the flow of capital in the form of loans from the developed world into capital-poor countries where interest rates are high. This moves investment funds into the developing countries, but also increases third world debt. The second benefit is to the consumers who pay less for goods produced more economically and efficiently. The low cost of labor and reduced tariffs lowers the item cost in the developed world because the manufacturer has the ability to sell to a world market. Finally, globalization results in a very quick transfer of knowledge, technology and production techniques in turn raising domestic capabilities worldwide.²⁵

However, to some, these advances are incomplete equalizers. Unmanaged globalization can leave many segments of society, the poorly educated and the untrained, with no hope for a

productive future. Globalization shifts jobs, changes cultures and forces change when change is often unwanted. But globalization remains the best hope of the developing world to raise their overall standard of living quickly.

The creation of new levels of market efficiency is forcing competitors to adapt to doing business using new models or face financial ruin. Globalization has lowered the barriers to the global marketplace lower than anytime in history. On the other hand, competition is no longer regional; it is global leaving only the best solutions in the long run.

An Organization for Economic Cooperation and Development (OECD) study reported that foreign firms pay their workers more than the national average and that gap is widening. Foreign firms spend heavily on research and development in countries where they invest and tend to export more. In Turkey, foreign firms' wages are 124 percent above average; their workforce has risen by 11.5 percent a year compared with 0.6 percent in domestic businesses. Foreign firms spend twice as much on local research and development as the country's domestic firms. The globalized marketplace is raising the standard of living faster in developing countries than the domestic economy.²⁶

The shifts in power today are steadily moving away from the nation-states with their bureaucracy to the private sector and entrepreneurs.²⁷ Because of international bodies like the WTO and agreements between nation-states to open borders to free trade, the world is rapidly moving towards free-market capitalism. "In 1975, at the height of the Cold War, only 8 percent of the countries worldwide had liberal, free-market capital regimes and foreign direct investment at the time totaled only twenty-three billion dollars. By 1997, the number of countries with liberal economic regimes constituted twenty-eight percent and foreign investment totaled \$644 billion," according to the World Bank.²⁸

In today's global environment international investing generally takes one of two forms. Huge multinationals, including companies like GE, GM, IBM, Intel and a host of Asian and European companies have the capacity to make or break an economy with their direct investments. At the other end of the spectrum are the global investment markets. These investment centers, located in New York, Hong Kong, London and Frankfurt, serve as the central hubs where fund and investment managers buy and sell stocks, bonds and currencies around the world. Using the Internet and working around the international clock, they have the ability to prop up or tear down nations and economies at lightening speed. By the end of the 20th century the international investment markets, made up of private and public investors, became the overwhelming source of capital for growth replacing public sector funding.²⁹

The emergence of the international investment markets made a direct impact on the economies of China, Indonesia, Korea, Thailand, Malaysia, Brazil and Argentina raising the standard of living at a rate faster than at anytime before in their history. According Treasury Secretary Larry Summers, "more than one quarter of humanity has seen their living standards quadruple in one generation, thanks in part to globalization. In America, globalization has led to unemployment levels in the last decade that set a fifty year low."³⁰

On the other hand, the international investment markets had a direct negative impact on the leaders of several countries in the last quarter century. Foreign leaders like Zedillo, Mahathir, Suharto, and Yeltsin suffered the ultimate political fallout for not meeting the market requirements for continued investment. Investment markets vote daily on the quality of government and a no-confidence vote closes the door to international funding.³¹ Funds move into and out of countries everyday based on the markets perception of stability, predictability and transparency.³² Political or government instability and the resulting market reaction can literally result in overnight devaluation of a country's bond rating.³³

More than any other factors, technology and cheap communications enable globalization to spread rapidly. Jobs, markets and communities are globalizing at speeds never seen before resulting in the destruction of old markets and skills replacing them with new markets requiring new skills. It is possible that even some very robust cultures may not be able to survive in this new era of hyper-globalization. "The pace of change is now so fast, and the requirements for success so constantly evolving, that no one ever feels they are on solid ground in the way their parents at least seemed to feel in the world of walls, when a union card or a lifetime career with the same company seemed to guarantee stability."³⁴ As Alan Greenspan pointed out in mid-1999, roughly 300,000 jobs were destroyed by new technologies in America every week and 300,000 new jobs were created by new technologies.³⁵ As a result of these changes, new patterns of shifting demographics have emerged that cause stress and conflict that can destabilize economies.

GLOBAL THREATS

There are significant cultural and sociological issues associated with globalization and the wealth it can produce. The speed of change and its challenges to society, traditional business practices and in some cases the very identity of the people, often creates a backlash against globalization. "Markets generate both capital and chaos; the more powerful markets become as a result of globalization, the more widespread and diverse their disruptions."³⁶

The potential is great for regional conflicts to worsen under globalization until all countries meet the minimum requirements to sustain economic growth. Spurring on conflicts are regimes or groups resisting the impact of globalization on their perception of home and world order. When one culture moves forward quickly, jealousy and rivalry are the natural responses. In many cases like Bosnia, Rwanda, Liberia, Algeria or Kosovo, developed nation states would just as soon separate the combatants from the rest of the globalized world leaving them to come to terms on their own. However these conflicts are very disruptive to the global environment. The current concern is that regional conflicts will become regional economic crises. This essentially produces a new twist on the old domino theory extending it to the world of finance.³⁷

Critical issues for a developing country to function in the global economy include energizing the private sector, managing inflation, stabilizing prices and eliminating tariffs, quotas and restrictions on foreign investment. Privatization of state owned industries and utilities and the elimination of corruption, subsidies and kickbacks within the government is critical.³⁸

There are a variety of violent threats to continued globalization. Groups of individuals with real or imagined reasons for attacking the developed world abound. Members of failed states, the dispossessed whose country can't enter the global marketplace and others seeking revenge for perceived inequalities may seek to destabilize other countries or to divert attention in one direction or another. Other areas of particular vulnerability may emerge over time as new technologies impact the global environment.

Crime often becomes the solution for those people that don't make it into the globalization system. People will create their own economy if the system doesn't provide an entry point for them. When a backlash of this type reaches a sufficiently high level, it will influence a country's politics through corruption and violence. A country trying to make the leap into the global marketplace cannot ignore this peril and succeed.³⁹

Today, individuals with great amounts of money or influence have an increased potential to pose a global threat more than at any other time in history. Modern technology provides these individuals with the tools needed to wage various forms of limited war using new networks and capabilities. The wired world extends to them the ability to strike terror and unnerve many more people at once. And, unfortunately, it will take smaller and smaller amounts of toxic/bio-chemical weapons or enriched uranium to impact the lives of millions.⁴⁰

Three countries pose significant threats to sustaining globalization. Japan's failure to fully embrace unimpeded free markets, coupled with its continued support for selected economies and corporations, has positioned it for an economic and social breakdown. China's economic improvement in the last decade is historic. However, China's corrupt political system limits its

growth and may result in a major social, political and economic crisis if it fails in its transition to a full free flowing economy. State-owned industries and banks make up forty percent of the Chinese economy and in January 2000 many of them were bankrupt or unproductive. Russia's promise as an ally in stabilizing regional economic and political issues is offset by its nuclear arsenal and inadequately controlled large surplus of weapons. Sales or the loss of nuclear warheads or material could spell disaster on global terms.⁴¹

Environmental threats pose a serious issue for sustained globalization. If the rest of the world mimics the American pursuit of materialism and production at the expense of the environment, serious risks will exist placing already strained environmental systems in jeopardy. "The latest annual estimates of global carbon dioxide emissions reached an unprecedented high of 6518 million metric tons of carbon dioxide released into the atmosphere. That same year, carbon dioxide emissions from U.S. cars and light trucks alone were higher than total carbon dioxide emissions (from all sources) from every country in the world but three: China, Russia, and Japan."⁴² In the long run, global climate change may be the most critical and far reaching world threat. Atmospheric concentrations of carbon dioxide, a significant greenhouse gas, have risen nearly 30% in the last century.⁴³ The world may see the loss of critical ecosystems faster than imagined.⁴⁴ A 1998 report claimed that fifty percent of the world's known primate species are now threatened with extinction. Fifty-two acres of the world's forest are lost every minute.⁴⁵

Countering these threats is an emerging increase in global activism, spurred by the use of networks and the media to share information and strategies. Businesses in developed countries realize that the environmentally friendly label can be worth more than the long-term costs of ignoring environmental laws. However, in the developing world, struggling with corruption and inadequate enforcement capabilities, this is not the case. Environmental and cultural solutions are required to sustain globalization.⁴⁶ Thurow points out that:

A market driven future, one devoid of major and deliberate interventions to shape the course of human destiny, includes a number of risks. More specifically, it includes environmental risks – that the price of prosperity could be a degraded and permanently altered Earth for future generations; equity risks – that the benefits of growth could continue to accrue unequally, leading, some would say, to "a one-sided dictatorship by the rich and the powerful, or unbridled and unfair competition between the rich and the poor; social risks – that growth could come too slowly in poor countries largely outside the global market, leading to greater poverty and perhaps social disintegration or massive migrations; security risks – that those denied a share of the new wealth and a chance at a better life could

eventually seek redress violently where political channels are ineffective or closed to them.⁴⁷

In his history of the Peloponnesian War, Thucydides states that nations will wage war for one of three reasons – “Honor, fear and interest”.⁴⁸ Globalization will raise the cost of going to war for these reasons, but will not eliminate them. However, for those states that make the conscious decision to enter into warfare to solve their problems, they will find that the price is heavy. In addition to blood, economies, coalitions and connectedness will all be prices on the block.

COMPLEXITY AND THE FUTURE

Technological advances are coming in waves that are closer and closer together. The depth and breadth of these cycles can transform existing systems and relationships. In greater and greater ways, these advances are moving into the primary avenues of human life. On one hand these advances hold the promise of addressing many long-standing goals. Biotechnology may essentially end world hunger through the production of bio-engineered agriculture and livestock with disease and drought resistance characteristics. Gene manipulation may end widespread suffering through the elimination of disease or illness. A new era of computational power may serve to increase man’s overall knowledge producing abilities to map and manipulate the basic forces of nature. Linking the world more tightly while providing unlimited access to all forms of information and education may produce a world population that is better educated and well informed. As these technologies emerge and are adopted into the mainstream, various cultural, economic and governmental systems must adapt and evolve. But without active leadership to shape and form the decisions that must be made, the world may simply become more chaotic and dangerous.

In the next quarter century, transnational corporations will wield more economic power than many countries currently do. At the end of the last century, out of the top one hundred financial entities worldwide, the top five included the US, Japan, Germany, France and Italy, all generating over one trillion dollars. Within the top twenty-five, five were transnational corporations and fifteen transnational corporations made it into the top fifty. There were thirty-five in the top one hundred.⁴⁹ These corporations, with their financial reserves and management expertise, can provide a better path to improving the standard of life for a developing world population than many governments.

In the coming decades, workforce changes will greatly reduce, if not eliminate, the need for manual labor around the world. Jobs will not just be going south, they will be going away.

Robots and computer controlled manufacturing will raise the stakes for populations without technological or service skills. Developed countries' populations will live longer and healthier lives increasing population density to all time highs, even though birth rates are falling in many developed countries. Cities will continue to increase in size and complexity as people migrate from rural areas. By 2015, Tokyo, Bombay, Lagos, Dhaka and Sao Paulo will be megacities with over 20 million residents. Approaching megacity status will be Karachi, Mexico City and Shanghai, all of which will be larger than New York City.⁵⁰

Unchecked environmental issues pose global threats as the continued use of fossil fuels, high-density pesticides and fertilizers contaminate the air and the water to poisonous levels. These byproducts of globalization are responsible for worldwide changes in the earth's ecosystems. Projections indicate by 2025 routine water shortages and desertification will impact over one and a half billion people, a large portion in India and China.⁵¹

Without doubt great challenges lay ahead. Given the accelerating pace of change, and the economic impact of emerging technologies that produce large cultural and economic shifts, the time to analyze and react to domestic and international security and stability issues is greatly reduced.

SOLUTIONS AND DIRECTIONS

Solutions to these problems require new ideas and new approaches to health care, education, ecology, economic market management and equity issues. The overarching American goal should be to maximize the potential of globalization to achieve its national goals while minimizing the disruptive impacts. The United States needs a broad national strategy to provide strong international leadership aligned with national ideals.

Rightly or wrongly, the United States is perceived by many around the world as pursuing a somewhat ambiguous agenda that supports emerging democracies while failing to actively address international equality and equity issues. The internal debate concerning America's super-power status and its inherent responsibilities has been fueled by neoisolationist and neoliberal arguments and the lack of a mobilizing vision. The nation remains uncommitted to any long-term international solution. Failure to solve the root causes of the problems associated with globalization will ensure high levels of international instability and low levels of security.

The debate on how to achieve the required changes is most often leveled between financial aid, foreign grants or market driven assistance. According to some members of the World Trade Organization, "there's no creation of wealth without the necessary infrastructure and that infrastructure demands outside aid." However, Treasury Secretary Paul H. O'Neill

endorses the benefits of the market approach. He emphasizes that all the aid provided last year didn't match what China received in private foreign investment. O'Neill's position is, "if we are going to have real economic development in the world, most of that will come from capital coming into those countries to create jobs. We are not going to do it with welfare."⁵²

To achieve a world with real international security, built on respect, equality and equity, dedicated and directed American leadership is required. Once the United States clearly defines its direction, it must make its intentions well known. The direction must be clearly articulated resulting from a mobilizing strategic vision fired in public debate and backed by legislative consensus. The support of the American people is critical to the type of mobilization and commitment required to create and sustain a global revolution based on American principles. This will require educating the American public on the changing global economic network and America's position relative to the rest of the world. To succeed, America and its institutions must be informed and committed to a changed view of the world.

Maintaining America's overwhelming military superiority by continuing its pursuit of a technologically dominant, highly mobile, highly trained, lethal force is critical to long-term success. Peace is maintained by strength.

The United States should continue to invest in new technologies and pursue advanced research to maintain its economic and technological leadership. Leadership in this area cannot be trusted to any other government. However, it is inherent on America to share the use of technologies that can improve the worldwide human condition. The United States should take aggressive measures to underwrite emerging technology markets, providing an economic foothold if needed. It should implement programs designed to ensure the entire population benefits from educational opportunities that support lifelong training and retraining.

America must take the global lead in forming alliances and coalitions whose primary goal is to assist, with aid and direct grants, developing countries in achieving basic infrastructure requirements including clean water and energy solutions. These programs should set the international example using state of the art environmentally supportable technologies. The management of funds and support for these projects should be placed into organizations that develop employment programs for domestic and foreign labor to offset the loss of jobs negatively impacted by globalization. These programs should formally include new skill development and education opportunities for adult populations in transition and focus on implementing environmental reforms including reclamation, energy production or peacekeeping infrastructure requirements. Adults without self-fulfilling work are foundations for conflict and unrest.

The United States, in conjunction with the United Nations, should lead the world in establishing education as a global solution to end ignorance and illiteracy. This effort should include establishing wholly underwritten secular education programs, providing the schools, teachers, and books for emerging countries that pursue democratic principles. Studies suggest that every additional year of schooling can increase the wages of workers in poor nations by 10 to 20 percent.⁵³ Gene Sperling reports, "education boosts family income, and female education in particular leads to smaller, healthier families by lowering infant and maternal mortality and improving child nutrition. In Brazil, illiterate women have, on average, six children each; literate mothers average between two and three."⁵⁴ Influential congressmen have gone on record supporting the need for expanded education programs, "we will need to increase funding for development assistance to strengthen and expand education in developing countries."⁵⁵ The principle is to educate the world one child at a time.

It must become very difficult for nations to assume a position of troubled isolation while employing intimidation and terror to rule. This requires the implementation and active enforcement of policies that limit or restrict the ability of non-representative forms of government to fund their existence by living on the edges of the free-markets (specifically focused on eliminating the slave and drug trade and ending international crime). It is a matter of exercising unique American capabilities. "Power confers responsibility. The power enjoyed by the United States bestows on it obligations to address conditions it may not have itself brought into being."⁵⁶

Finally, patience is required. This will not be a revolution of a few years, but one of decades requiring constant attention and long-term commitment.

THE FINAL DEBATE

The most difficult question facing America in this endeavor, based on its national history, is the choice between the dynamic polarity of human equality and human rights versus the national right of self-determination. Some neo-isolationists will argue that the right of self-determination of the developing countries is the preeminent principle. They would sublimate the needs of the individual to the needs of whole. Those that see the basic inequality in the world will emphasize the factors of ignorance and poverty, starvation and desperation as the motivating standard.

The opponents to American intervention believe that, "individual freedom means freedom to trade and freedom from government impositions, whether of the domestic or foreign variety."⁵⁷ They rally against what the globalization proponents have coined as the "inexorable

logic of globalization". Those that see no role in globalization for America often cite 19th century free trade advocates "...as opposed to trade barriers and military-political intervention. They realized that trade barriers were a form of intervention."⁵⁸ According to Richman, "for them, government intervention of any kind was the enemy. Lumbering into other people's ethnic and political conflicts is dangerous and foolhardy. It puts American (and other) civilians, as well as soldiers, at risk."⁵⁹

Without doubt, the United States benefits the most from the forces of globalization. It reaps the profit from world markets for American products and creates new levels of wealth and prosperity. Because of this, it is up to the United States to choose the course that produces the greatest potential for long-term stability and security. According to President Bush, in recently announcing additional foreign aid to Latin America, "to make progress, we must encourage nations and leaders to walk the hard road of political, legal and economic reform so all their people can benefit."⁶⁰ The balance between other governments' right to self-determination and worldwide individual equality is the choice. The equality of men becomes the defining issue. America must wrestle with the issues of responsibility and capability when foreign governments hold their citizens hostage, forcing them to live lives of ignorance, desperation and poverty. The right of the governed to self determination is based on the principle of freedom of choice made by a well-educated populace. Without action, a large portion of the developing world will fall far short of this ideal.

America singularly possesses the economic might, military prowess, and political stability required to achieve sustainable globalization. While no country can afford to act alone, given the high level of market, enterprise and cultural interconnectedness that characterizes today's world, one country must lead the effort. In the words of Congressman Jim McGovern, "Our own prosperity is clearly linked to the economic well-being of the nations of Asia, Africa, Latin America and Eastern Europe. As their economies grow stronger, so do markets for U.S.-made products. The generation of children we help save today from hunger and who go to school will become the leaders - and the consumers - of their countries tomorrow."⁶¹ It is America, operating in its own best interest and the best interest of the world, which holds the most promise for assembling the international coalitions and providing the required leadership. Never before has a single nation held the level of global dominance in so many areas that America possesses today.

However, just as it has taken the United States almost two centuries to work out the intricacies of free markets and the delicate interplay between production and demand, America must provide support as other nations learn their way. America has the power and ability to

directly address what appears to the rest of the world as the politics of fear. As Benjamin Barber states, "The politics of fear is not the only stance possible. The world is out of control because the instruments of control—democratic governing institutions and their civil society supports—simply do not exist in the international setting where markets in currency, labor, and goods run like engines without governors." ⁶² The United States, in conjunction with the other developed countries that embrace democratic ideals, must be able to lead others as they make this jump into modernity. It is not a jump without peril, for some it will be a lengthy endeavor as they struggle to deploy the infrastructure required to make the transition.

For those that refuse to recognize the impact of globalization, nor recognize the positive and negative impact of truly revolutionizing technologies on all of mankind, this century will be one of wonderment, questioning and frustration, of cycles of boom and bust, fear and failure. It is vital to America and the whole free world that these powerful forces are actively and collectively managed. Until someone proposes a better system to bring about the changes needed to free all men and raise the poor, it is in the United States' self-interest to lead others to the democratic principles clearly articulated in the Declaration of Independence.

It may well be time for the third American Revolution, a worldwide adoption of self-evident truths. Until all men are set free from fear, tyranny, ignorance, poverty and injustice, there will be no true international security and stability, only brief periods of tranquility between strife. Active United States leadership must buffer the complexity and rapidity of worldwide changes driven by technology and globalization. This third revolution need not be as violent as the events in 1776 or 1863. This revolution can be won with education, vision and commitment, backed by economic, military and technological might.

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ENDNOTES

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⁵ Alex Markels, "The Next Wave," Wired, April 2001, 174-181.

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⁸ David Ewing Duncan, "The Protein Hunters," Wired, April 2001, 164-171.

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²⁰ Richard H. Robbins, Global Problems and the Culture of Capitalism (Boston, Massachusetts: Allyn and Bacon, 1999), 132.

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²⁸ Ibid, 9.

²⁹ Ibid, 114-115.

³⁰ Ibid, 442.

³¹ Ibid, 137.

³² Ibid, 171.

³³ Ibid, 131.

³⁴ Ibid, 417.

³⁵ Ibid, 373.

³⁶ Ibid, 329.

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⁴¹ Ibid, 413-414.

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⁴⁶ Ibid, 301.

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