Crumbling Futures
and Faint Hopes

Results of an environmental scan
January 2000-March 29, 2002

For
The Judiciary of
The Commonwealth of Virginia

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INTRODUCTION AND SUMMARY

In the years since we first began doing environmental scans for the Virginia Judiciary, we have seen many things that were viewed as quite marginal when we identified them zoom into immediate relevance and then burst forth as major challenges and opportunities for the courts. We hope that the advance information we have provided in our past scans has proven useful to the Virginia Judiciary so that it has been able to anticipate these aspects of the futures appropriately and manage them effectively.

Among the items we identified in early warnings that have by now become pressing realities with multiple implications for the futures are:

1. Biotechnology
   - Completion of Human Genome Project
   - Problems caused by gene testing
   - Problems with genetically-modified food
   - Controversies over cloning
   - Controversies over stem-cell research

2. Nanotechnology.
   Although this is still in its early stages, nanotechnology has moved quickly from being decidedly on the fringe to becoming a major target for public and private research funding. Indeed, nanotechnology was dubbed "The Breakthrough of the Year" by Science magazine in 2000, indicating it has moved well up the emerging issues curve towards becoming a powerful problem/opportunity.
   A related development is DNA computing that was a faint possibility we identified in earlier scans and is rapidly becoming useful reality.

3. The emergence of "E-everything"
   The Internet has moved from being a play toy of a few to a vital, growing, and all-encompassing environment for all aspects of life, with even more impact over the near future. Of special importance in this present scan is the movement of the Internet away from a dependence on surface lines (telephone or cable) to various forms of wireless interconnection. A mobile, global net using hand-held (or smaller) devices is replacing the fixed web with large, expensive equipment, enabling "E-everything" to emerge where land-based telephones may not even—or ever—exist.

4. Artificial intelligence, artificial life, and autonomous robots
   seem fully on track of achieving what might have seemed to be exuberantly optimistic claims in previous scans. Every day brings new stories of artificially-intelligent robots doing things and making judgements in areas once thought to be the sole purview of humans. Concern for the "rights of robots" is rapidly becoming a matter of fact and not speculation.

5. Global Climate Change
   Virtual consensus exists among the world’s scientific community that significant global warming and climate change is happening. There is overwhelming scientific agreement that while some of this might be due to "natural" events, enough of it is a consequence of recent human action to require immediate and substantial global human ameliorative response. Unfortunately, the official US position is still to ignore or trivialize the matter, thus irresponsibly foisting the growing problem off on future generations.
6. The triumph of artificiality over nature,
largely as a consequence of all of the items listed above, continues unabated, and indeed
accelerated. A slight ray of hope is found in the recent emergence of "Sustainability Science".
Unlike traditional science which pretends passively and objectively to study a vast, given, and
orderly "nature", proponents of Sustainability Science understand that even if such a "nature" did
at one time exist, there no longer is such a subject "out there" patiently awaiting our
understanding. Science now must study and manage a world very much under human influence,
and do so for the survivability of human and other life on the planet--and not out of idle curiosity
or intellectual novelty.

7. More potential good news for the future
is the hope that global population growth may be slowing down so that the worst-case
scenarios for the 21st Century may be avoided. Nonetheless overall population of the globe by the
end of this century will still tax the carrying capacity of Earth on the one hand and the
organizational abilities of humanity, on the other. And global population may still exceed current
optimistic projections--policies are being formulated in some depopulating parts of the world to
encourage women to have more children. In part, this results from the growing recognition
(especially in Europe and Japan, and to some extent in North America and eventually throughout
East Asia) that the problems of substantial population decline are almost as challenging as rapid
population growth, since much past "economic development" has been in large measure a by-
product of population increase. Maintaining economic growth--if that remains the goal--while
population declines will be a new challenge for more and more communities worldwide.

8. Indeed, the economy remains a matter of enormous anxiety.
Unlike our most recent scan, the current views we encountered vary only concerning how
bad it might get, not how good it might become. The euphoria over the "New Economy" that had
forever banished the business cycle so that we could look forward to twenty or more years of
expanding prosperity is totally absent in our current scans. While many aspects of the New
Economy have been incorporated into the modified Old Economy--E-commerce being the most
obvious part--serious problems remain, highlighted not only by the collapse of the "dot.com"
stockmarket boom, but also by the profound doubts about the fundamental fairness of the
economic system caused by the Enron/Arthur Andersen collapse and other scandals.

9. Moreover, the poverty gap
between north and south continues to widen with powerfully damaging consequences.
Indeed, one of the most important lessons that could have been learned from previous scans is
that the gap between the superrich nations of the north, especially the US, and the superpoor
nations of the South will sooner or later very directly impact all of us comfortably living with the
wealth of the north. That certainly must be one of the most important of the many lessons from
9/11: rich America cannot hide from the negative effects of globalization and only reap the
advantages.

Similarly, the gap between rich and poor within the US is growing, along with crumbling
public infrastructure and the colossal increase in personal indebtedness. The Faustian nature of
consumer debt as a major engine of our economy is only faintly beginning to filter past the
mystification of the "free market" in some of our economic thinking and theory--but in little of our
economic behavior.
10. **Globalization**

itself is now in doubt, if not as an irresistible trend, at least as an obvious good. We identified major pockets of opposition to globalization in the US (as well as elsewhere) in previous scans. It now seems possible that policies favoring globalization of the neoliberal variety will be reversed during the current presidential administration. Both the anti-foreign fears of many Americans on the one hand and the anti-free trade actions of the present US administration on the other suggest that US insistence on and leadership of globalization will be diminished, even if the overall globalization pressures (non-economic as well as economic) continue.

11. **Artilects and Cybercourts.**

Probably the biggest developments of direct impact on the judiciary involve discussions about "the jurisprudence of artilects" and the creation of functioning (instead of merely hypothetical) cybercourts, along with the rapid automation and online availability of many legal and judicial services. More and better opportunities for do-it-yourself justice—and the increased use of non-adversarial, informal, and mutually-agreeable (rather than officially-required) dispute resolution processes—abound. But at the same time, the immediate and perhaps long-ranged consequence of legal and psychological changes in the aftermath of 9/11 suggest that the great period of American personal freedom and self-confidence is over. An era of indefinite length and depth—featuring love of governmental control and support for very sophisticated and omnipresent governmental surveillance over almost aspects of life—has emerged. This was absolutely not anticipated in its current form in any previous scan, and reminds us again of the severe limits to social anticipation.
9/11: From “Land of the Free” to a “Gated Community”?

Scan Cluster 1
9/11: From “Land of the Free” to a “Gated Community”?

Overview

Without a doubt, the biggest event that happened between our previous scan and this one was that of September 11, 2001. For most Americans it was the end of a world and the birth of a new and much more frightening one.

Among the changes, the scans below suggest the following:

- Americans are extremely fearful of their future, expecting escalating violence.
- They thus are quite willing—if not eager—to give up rights once considered to be "sacred" in exchange for security. Major changes in civil rights and procedures have already been made, and accepted, while others are planned.
- Whereas government was hated and considered the enemy by increasing numbers of Americans before 9/11, with more and more services removed from governmental operations and turned over to the private sector, now many Americans seem to believe that governments may do things better and more reliably, if not always more cheaply, than the private sector.
- Activities requiring Americans to travel or to receive physical things from strangers (eg, mail) have suffered while online services (email, eshopping, even egovernment) seem to have increased.
- Younger Americans who have lived relatively prosperous and carefree lives now are confused and fearful about their future. As described in a later scanning cluster on "age-cohort analysis," the profile of the comparatively more numerous "Millennial Generation" just beginning to emerge from high school suggests a rising generation of Americans quite willing to accept authoritarian control in exchange for security and prosperity.

Are these changes permanent, or only temporary? This is not clear. But every indication is that they may well be long lasting indeed, and the seeds of social conflict in the future..

"Sept. 11 nudges Doomsday Clock closer to nuclear strike,"

"The hands of the Doomsday Clock, a symbolic gauge of the threat of nuclear annihilation, were moved for the first time in nearly four years yesterday because of the Sept. 11 attacks, increasing tension between India and Pakistan, and other threats. The Bulletin of the Atomic Scientists, which keeps the clock, set the hands at 11:53, two minutes ahead of the time it has had since 1998. Stephen Schwartz, publisher of the bulletin, said the board originally defined "midnight" as nuclear war." "It was the 17th time the clock has been reset since it debuted in 1947 at the same position it was set to yesterday."


How Sept. 11 Changed Goals of Justice Dept.

Prior to Sept. 11, counterterrorism programs did not lead Attorney General John Ashcroft’s list of priorities.

1.1 Surveillance

1.1.1 An Intelligence Giant in the Making. Anti-terrorism law likely to bring domestic apparatus of unprecedented scope

Molded by wartime politics and passed a week and a half ago in furious haste, the new anti-terrorism bill lays the foundation for a domestic intelligence-gathering system of unprecedented scale and technological prowess, according to both supporters and critics of the legislation. Overshadowed by the public focus on new Internet surveillance and "roving wiretaps" were numerous obscure features in the bill that will enable the Bush administration to make fundamental changes at the Federal Bureau of Investigation, the Central Intelligence Agency and several Treasury Department law enforcement agencies.

Known as the U.S.A. Patriot Act, the law empowers the government to shift the primary mission of the FBI from solving crimes to gathering domestic intelligence. In addition, the Treasury Department has been charged with building a financial intelligence-gathering system whose data can be accessed by the CIA. Most significantly, the CIA will have the authority for the first time to influence FBI surveillance operations inside the United States and to obtain evidence gathered by federal grand juries and criminal wiretaps.

"We are going to have to get used to a new way of thinking," Assistant Attorney General Michael Chertoff, who is overseeing the investigation of the Sept. 11 attacks, said in an interview. "What we are going to have is a Federal Bureau of Investigation that combines intelligence with effective law enforcement."

The new law reflects how profoundly the attacks changed the nation's thinking about the balance between domestic security and civil liberties. The bill effectively tears down legal fire walls erected 25 years ago during the Watergate era, when the nation was stunned by disclosures about presidential abuses of domestic intelligence-gathering against political activists. The overwhelming support in Congress shows that the nation's political leadership was persuaded that intelligence-gathering can no longer be restricted by the reforms that emerged out of a landmark 1975 Senate investigation. After wading through voluminous evidence of intelligence abuses, a committee led by Sen. Frank Church warned that domestic intelligence-gathering was a "new form of governmental power" that was unconstrained by law, often abused by presidents and always inclined to grow.


1.1.2 U.S. Extremists, Terror Groups Eyed

U.S. authorities are monitoring a growing number of contacts between American extremists and foreign terrorist groups to make sure the two don't begin collaborating on attacks, government officials say. The officials caution there is no evidence to date that American extremists have been collaborating on any specific operations with European, Mideast or Asian terrorists. But they said they have evidence that neo-Nazis, white supremacists and Black Muslim factions have reached out to foreign terrorists whose similar hatred for Israel and the U.S. government might make them natural allies. "On the international terrorism front, we see people here and overseas communicating mainly via the Internet and talking back and forth and communicating that way," Dale Watson, the FBI's assistant director for counterterrorism, said recently. Homeland Security Director Tom Ridge is aware there are contacts between American extremists and foreigners and backs the FBI's stepped up efforts, a spokesman said Wednesday.

In the aftermath of Sept. 11, some American white supremacists have written pieces aimed at Middle Eastern or Muslim audiences that blame the attacks on the World Trade Center and Pentagon on U.S. politicians and Israel. "The real reason we have suffered the terrorism of the WTC attack is shockingly simple," former Ku Klux Klan leader David Duke wrote in one such piece. "Too many American politicians have treasonously betrayed the American people by blindly supporting the leading terrorist nation on earth: Israel." Duke's articles on his Web site are now translated into Arabic and have appeared in Mideast and Muslim publications since Sept. 11.
One of the groups being watched in the United States is al-Fuqra, a splinter sect of black Muslims that authorities have linked to several crimes over the past decade from Colorado to New York.


**1.1.3 "Environmental activists described as largest terrorist group in the US."**

Refers specifically to the Earth Liberation Front and the Animal Liberation Front, but may well be used to label any environmental activists.


**1.1.4 The Disappeared**

Since 11 September last year, up to 2,000 people in the United States have been detained without trial, or charge, or even legal rights. The fate of most is unknown. Andrew Gumbel investigates a scandal that shames the land of the free


**1.1.5 "Risks Prompt U.S. to Limit Access to Data; Security, Rights Advocates Clash Over Need to Know"**

The federal government has made a concerted and wide-ranging effort to limit access to sensitive government information that could be used by terrorists. Currently, about 30 pieces of legislation are waiting for debate in Congress over a narrowing of the rights guaranteed under the Freedom of Information Act. Because electronic records are so readily available and easy to disseminate, the government has taken special efforts to remove sensitive information from electronic sources. Some organizations are cooperating fully, such as the Federation of American Scientists, which used to make satellite photos of nuclear sites available online. Even consumer search engine site Google has agreed to erase records of certain federal sites that showed sensitive material. Public disclosure groups and some libraries, however, are voicing concern about the growing trend to limit available information. Although George Mason University librarian Joy Suh immediately complied with a government request to destroy a CD-ROM on the U.S.’s water supply, for example, she is concerned about limiting the public’s access to data.


**1.1.6 State Pulls Data From Internet in Attempt to Thwart Terrorists**

The Pataki administration has quietly ordered state agencies to restrict information available on the Internet, including bridge plans and power-plant maps.


**1.1.7 Security Fears Put Scientists Under Scrutiny**

Michael Goldberg expected to hear from the FBI because he knew the agency wanted "The List." So the phone call from federal investigators to the American Society of Microbiology in Washington, DC, requesting the names and addresses of 43,000 members came as no surprise. Goldberg, the society's executive director, received a letter citing the names of two agents who would come to the ASM office. The letter says it "reaffirms ... that all membership information disclosed by ASM will be used for official purposes and is not subject to [public] disclosure." The organization happily complied with the FBI. But the official scrutiny fuels a growing uneasiness among some US life scientists. Once touted as the leaders of the country’s next economic miracle—a burgeoning biotechnology sector—they increasingly feel themselves the targets of paranoia and misunderstanding.


*The Scientist* - January 21, 2002

**1.1.8 "U.S. to Curb Computer Access by Foreigners"**
Proposed restrictions will limit work by foreigners currently subcontracted by the U.S. Department of Defense. Officials said the restrictions are needed to get a handle on the proliferation of foreign nationals who work on government computer systems, but the plan has raised concerns that the government is being xenophobic and shortsighted. Experts said barring foreign nationals from certain computer projects opens the prospect that key jobs will go unfilled because of a shortage of qualified citizens—a situation exacerbated by the relatively small number of U.S. students who pursue advanced technology degrees. Costs may also rise sharply as higher-paid U.S. citizens replace foreign workers. And small contractors may be forced to withdraw from some bidding.


1.1.9 The Pentagon is developing plans to create the Office of Strategic Influence which will provide news items, possibly even false ones, to foreign media organizations as part of a new effort to influence public sentiment and policy makers in both friendly and unfriendly countries, military officials said.


1.1.10 "Stupidity taken to a new level"

"The Pentagon's idea of lying to media was cut short, but that it was formed at all is breathtaking."


1.1.11 "Spending triples on terrorism R&D,"

The Wartime Opportunists

Make way for the wartime opportunists. Corporate interests and their proxies are looking to exploit the September 11 tragedy to advance a self-serving agenda that has nothing to do with national security and everything to do with corporate profits and dangerous ideologies. Fast track and the Free Trade Area of the Americas. A corporate tax cut. Oil drilling in Alaska. Star Wars. These are some of the preposterous "solutions" and responses to the terror attack offered by corporate mouthpieces. No one has been more shameless in linking their agenda to the terror attack than U.S. Trade Representative Robert Zoellick. Writing in the Washington Post last week, Zoellick proclaimed that granting fast-track trade negotiating authority to the president -- to assist with the ramming through Congress of a Free Trade Area of the Americas, designed to expand NAFTA to all of the Americas, among other nefarious ends -- was the best way to respond to the September 11 tragedy.

The Wartime Opportunists. Russell Mokhiber and Robert Weissman

1.1.13 ABC Signs Deal to Promote West Point

ABC has signed a $25 million deal to promote the U.S. Military Academy at West Point through television specials and commercials. Announced Tuesday, it shows how the lines between advertising and entertainment on television are blurring as clients seek something different from traditional commercials. ABC, which is owned by the Walt Disney Co., promised to run a prime-time special next June, "Young America Celebrates West Point." The deal also includes other properties wholly or partly owned by Disney - ESPN, The History Channel, Lifetime, A&E, ABC Radio and even ESPN magazine.

The deal between ABC and the West Point Project LLC, a group of West Point alumni, was in the works before the Sept. 11 attacks. But Joseph Franklin, a retired general who's the chief adviser for the West Point Project, said it was a "wonderful coincidence" that ABC was featuring the military at a time of war. Keyed to the U.S. Military Academy's 200th anniversary, the purpose of the ad campaign is to help West Point's recruiting, he said.
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Besides the prime-time special, a vignette series called "West Point Minute" will air on ABC News programs "Good Morning America" and "Nightline." They will be clearly marked advertising, the network said. Noted sports filmmaker Bud Greenspan is making a two-hour documentary on West Point's sports history to air on ESPN. ESPN Classic will air an Army football special titled "Field of Honor" and rebroadcast old Army football games.


1.1.14 Washington Police Expand Use of Surveillance Technology

Noting that people in the United Kingdom have "easily adapted" to pervasive public surveillance and that "there has not been an outcry about privacy there," Washington, D.C. police officials are busy expanding the public use of surveillance cameras. A police department spokesman says, "In the context of September 11, we have no choice but to accept the greater use of this technology." MIT emeritus sociology professor Gary T. Marx concedes that "almost all of the surveillance innovations are easily justifiable" but worries that "the major concern is: where is it leading?"


1.1.15 Bank Robber Nabbed by Eye in the Sky

A Vancouver bank robber is probably wondering about his decision to leave the scene of the crime in a taxi equipped with satellite tracking technology. A 26-year-old man held up the VanCity Credit Union on the city's east side and, after grabbing the money, he fled the building and jumped into a waiting taxi, according to Vancouver police. Police called the taxi company, which tracked the vehicle via a global positioning system to an intersection several blocks from the bank. The man was quickly arrested in what police believe was their first use of a satellite to find a bank robber.


1.1.16 Eye Spy direct-to-retina images


1.1.17 FBI May Use Keystroke Loggers Without Wiretap

On December 26th, a U.S. District judge ruled in Newark N.J. that the Federal Bureau of Investigation did not have to secure a wiretap order to attach a keystroke-recording device to an alleged mobster's computer in order to discover the password to an encrypted file. The judge also allowed prosecutors to keep secret the specifics of the technology, saying disclosure "would cause identifiable damage to the national security of the United States."

Lawyers for Nicodemo Scarfo Jr., who had been indicted on gambling and loan-sharking charges in June of 2000, had asked the court not to allow the gambling file obtained from his computer to be used as evidence, saying that the FBI violated the Fourth Amendment, collecting more information than was needed by picking up modem transmissions without a wiretap order under the provisions of 18 U.S.C. 2510. The government did, however, have a search warrant.

After prosecutors invoked the 1980 Classified Information Procedures Act, the judge held an in camera hearing to review classified information about how the logger operates, after which he issued a protective order under CIPS but ordered the government to provide Scarfo's attorneys with an unclassified explanation of how the logger works. The ruling was based in part on the FBI's evidence that it configured the logger to record keystrokes only when the modem was not transmitting. The opinion in the case may be found at:

http://lawlibrary.rutgers.edu/fed/html/scarfo2.html-1.html

1.1.18 Aviation Security

Federal aviation authorities and technology companies will soon begin testing a vast air security screening system designed to instantly pull together every passenger's travel history and living arrangements, plus a wealth of other personal and demographic information. The
government’s plan is to establish a computer network linking every reservation system in the
United States to private and government databases. The network would use data-mining and
predictive software to profile passenger activity and intuit obscure clues about potential threats,
even before the scheduled day of flight. It might find, for instance, that one man used a debit card
to buy tickets for four other men who sit in separate parts of the same plane—four men who have
shared addresses in the past. Or it might discern an array of unusual links and travel habits among
passengers on different flights. Those sorts of details—along with many other far more subtle
patterns identified by computer programs—would contribute to a threat index or score for every
passenger. Passengers with higher scores would be singled out for additional screening by
authorities. As described by developers, the system would be an unobtrusive network enabling
authorities to target potential threats far more effectively while reducing lines at security
checkpoints for most passengers.

Critics say it would be one of the largest monitoring systems ever created by the
government and a huge intrusion on privacy. Although such a system would rely on existing
software and technology, it could be years before it is fully in place, given that enormous amounts
of data would need to be integrated and a structure would need to be established for monitoring
passenger profiles. At least one carrier, Delta Air Lines, has been working with several companies
on a prototype. Northwest Airlines has acknowledged that it is talking with other airlines about a
similar screening system. Federal authorities hope to test at least two prototypes in coming
months or possibly sooner, according to government and industry sources familiar with the effort.

1.1.19 Most Americans Support Government Surveillance, Poll Says

Efforts by the ACLU and other civil liberties groups to turn public opinion against the
president’s anti-terrorism initiatives are falling on deaf ears, according to a poll conducted by
Zogby International. “Despite the best efforts by the ACLU and other rights groups...the various
anti-terrorist efforts by the president and the attorney general have strong public support,” said
pollster John Zogby, president and CEO of Zogby International. The Zogby poll indicates that 54
percent of Americans favor allowing telephone conversations to be monitored; 80 percent favor
allowing video surveillance of public places such as street corners; 67 percent favor roadblock
searches of vehicles, and 67 percent favor having their mail monitored.

John Zogby says he finds it “shocking” that Americans are willing to allow the government to
have greater access to their personal lives in exchange for security. “We are in a moment where
fear trumps other considerations,” Zogby said. “Frankly, I guess I never thought [that] I would live
to see the day when Americans would want their cars stopped and checked, or their mail
monitored, but we certainly had that day.”

1.1.20 Support for ID Cards Waning

National support for ubiquitous ID cards is beginning to taper off after initial demand
following the Sept. 11 attacks. In a recent survey, Gartner found that just 26 percent of
Americans now support the idea and 41 percent oppose it. The week after Sept. 11, the Pew
Research Center found 70 percent backed a national ID to help identify terrorists, a sentiment
bolstered by the fact that 11 of the hijackers used false IDs. The Gartner poll found subtle
differences in the way people perceived national IDs, depending on what they would be used for.
For airport security, the IDs are largely supported, but not for use in conjunction with health care
or financial services. Most respondents said that private industry should administer the system if it
is implemented. Critics of a national ID scheme say the knee-jerk reaction to the terrorist attacks
is giving way to a more reasonable, calculated mentality that recognizes the inherent flaws in any
system. Privacy advocates had said a national ID was one step closer to a police state where
government would be able to monitor citizens’ movements and activities.

Wired News. 13 March 2002
1.1.21 Everything Recorded
Imagine a system which recorded everything its participants saw or heard, and continually monitored their precise locations. Assume that, because of various benefits the system provided, and the availability of mechanisms to ensure privacy, that virtually everyone participated. Sounds fantastic? Sounds awful? Well a system like this was proposed in one of the Turing lectures (the Computer Science equivalent of the Pulitzer prize). I'm interested in collecting ideas about the benefits that such a system could provide. For instance, what studies of interest would become available that made use of this gigantic database?

- Date: Fri, 26 Jan 2001 12:07:28 -1000
  From: David Pager <pagerd001@hawaii.rr.com>
  Subject: A Global Memory

1.1.22 The Intensification of Global Instability
With the outbreak of civil war in Colombia, another country has fallen deeper into the ranks of the unstable. This has been a week of destabilizations. Iran appears to be moving toward internal crisis, Venezuela's political problems are deepening and conflict between Israelis and Palestinians is entering a new era. This troubling spread of instability is rooted in the current structure of the international system. As the world's only superpower, the United States' inevitable obsession with al Qaeda has contributed to this process of destabilization.

- The Global Intelligence Report. 21 February 2002
  http://www.stratfor.com

1.1.23 Anonymous response from a list
The US war on terrorism has encouraged/emboldened other governments to be quick to use violence to solve their problems--in the name of fighting terrorism. In Colombia, President Pastrana began referring to the FARC and ELN only recently as "terrorists"--war there began yesterday. President Bush is now trying to give Colombia extra money to protect the Occidental Petroleum's pipeline through that country--because "terrorists" are attacking our energy sources. Uzbek president Islam Karimov is now justifying his repressive regime's actions against Islamic organizations that are not sanctioned by the state by labeling them "terrorists"--the US no longer even pretends to be opposed to his regime's horrible human right's record. Even Slobodan Milosevic is defending himself in the tribunal he faces by claiming he was fighting "terrorism."

Project this trend elsewhere. Now, environmental organizations in the US are now branded as "the largest terrorist organizations in the U.S." When will they be targeted, and what will the response be? When John Ashcroft told Congress than anyone who dissented was "aiding the terrorists," was that tantamount to saying "aiding and abetting," which is a crime punishable by death? When will dissenters be targeted as those who give aid and comfort and abet terrorists? The question these questions lead to is will the "fighting terrorism"-induced instability eventually lead to instability in the U.S.?

When the US justifies its military actions against something as ill-defined as "terrorists worldwide," and then casts the terrorist net very, very widely, others will follow suit, esp. those governments that we recently befriended in order to conduct these military operations. This uptick in violence and repression should have been expected after Bush gave his speech to the joint session of Congress after the Sept 11th attacks--it essentially gave the green light to anyone doing nearly anything in the name of "fighting terrorism."

- 22 Feb 2002

1.1.24 Group Considers GovNet and Other Security Measures
Bush administration officials expect to make a final decision on the proposed GovNet government intranet within 90 days. They are currently reviewing the technical feasibility and usefulness of the system. Approximately 170 comments about GovNet have been submitted to the General Services Administration, with comments ranging from extremely supportive of the proposed network to extremely opposed to it. The Critical Infrastructure Protection Board, which is reviewing the comments, is also tasked with devising a national strategy to protect the nation's
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digital infrastructure from attack. The Board is working on a strategy to protect the cellular phone network; tools to predict how breakdowns in one computer system may affect others; and a plan to protect networks from computer viruses and worms. The group also supports funding an NSF scholarship program for computer sciences, including network security.

❖ *Newsbytes*, 12 March 2002

1.1.25 CEOs Plans Network to Respond to Terrorist Attack

A task force formed by the Business Roundtable, an organization of corporate chief executives, is planning a nationwide system called CEO Link, designed to allow corporations to communicate with each other in the event of a terrorist attack. The president of Business Roundtable said that the more than 40 top executives who worked on the project "are really looking to make a difference for the country. They aren't coming to the table with business agendas. They're looking at how to make the country more secure." The group is chaired by C. Michael Armstrong of AT&T, which is preparing the design of CEO Link at its own expense. The system will include a wireless phone network as well as a secure Web site.

❖ *Washington Post* 13 Mar 2002


1.2 Government is Good

1.2.1 Is Government the Good Guy?

After 50 years of market ascendancy, government may be poised to reclaim its role as an integral and admirable part of American life.

By John D. Donahue


1.2.2 Private Concerns

For the past three years, New Orleans has been lurching toward hiring private contractors to upgrade and operate its municipal water and sewer system. The plan was to open bids after Christmas and award a 20-year, $1 billion contract by February.

Until Sept. 11.

Since then, one mayoral candidate has persuaded the City Council to call for delaying privatization because it "may pose a serious threat to the security" of the city water supply. Another is pushing a referendum that would allow voters to veto this and other big outsourcing contracts. "Sept. 11," says Councilman James Singleton, the referendum backer, "caused people to pause and ask themselves, `Wait! Is this something we want to do now? Turn our water over to private concerns?'

Over the past 25 years, the pendulum in economies all over the world has swung away from government and toward the market, competition and private operation of what once were deemed "public services." By the end of the 1990s, world governments had sold more than $1 trillion in assets to private investors. And a growing number of state and local governments had turned to private operators to run prisons, parking lots, ambulance services, public schools and social-services operations.

Even before the terrorists struck, the beginnings of a backlash were stirring. Since Sept. 11, the forward march of the market is stalling and, in some places, shifting into reverse. If the shift endures, that Tuesday may prove to be a turning point in the relationship between business and government, comparable to the elections of Margaret Thatcher and Ronald Reagan that began a wave of privatizations and an ear of market ascendancy. This in turn raises questions about whether the prosperity of the 1990s -- so intertwined with the unleashing of market forces nearly everywhere -- will resume when the global economy recovers. The price of security, in short, may
be tolerating more of the inefficiency of government and settling for slightly slower economic growth.

The clearest sign of change came last week when President Bush acquiesced to those in Congress, many of them Republicans, who argued that air travel would be safer if passengers were screened by 28,000 government employees, instead of private contractors. This wasn’t an isolated event. Talk of turning the U.S. Postal Service and Amtrak into shareholder-owned private corporations appears dead for now. So does the political appeal of expanding New York Mayor Rudolph Giuliani’s move to let private ambulance companies respond to more 911 calls.

The Pentagon has temporarily shelved plans to farm out the back-office operations of its high-tech mapping unit. An antiterrorism commission headed by the chairman of the Republican National Committee, Virginia Gov. James Gilmore, says the federal government should build and own a plant to make vaccines for anthrax, smallpox and other diseases. "There’s no market for it normally," he says. "Why would a private manufacturer want to go through the expense?"

In the wake of Sept. 11, the very definition of national security is being expanded. Now, it includes getting to work safely and even shopping at the mall without fear of a terrorist attack. What’s more, government workers, once caricatured for inefficiency, are being praised as heroes for their sacrifices on Sept. 11 and during the anthrax mail scare. "People noticed who was going up the stairs when others were going down," says John Donahue, who tracks privatization trends at Harvard’s Kennedy School of Government. When President Bush threw the opening pitch at a recent World Series game in New York, he wore a blue New York Fire Department windbreaker.


1.3 Other Consequences

1.3.1 Videoconferencing May Get Much-Needed Critical Mass

Will the current reluctance to travel stimulate widespread use of videoconferencing? The stock market seems to think so.


1.3.2 Video Conferencing Replaces Travel

One consequence of last week's events is a strong upturn in the use of videoconferencing to replace travel. This upturn also occurred in the Gulf War, but then leveled off.


1.3.3 Anticorporate Author Klein Sees Lesson in Anthrax

Shortcomings in U.S. public health services in fighting anthrax underscore risks of privatizations, deregulation, and globalization, a best-selling Canadian anticorporate author said Tuesday. Naomi Klein, the author of the 1999 book No Logo: Taking Aim at Corporate Bullies, said questions about globalization "have never been more relevant" than now in the United States. "The front line in the war on terrorism domestically in the U.S. is precisely the public infrastructure [and] social services that have been deregulated, privatized, run down, and vilified for the past 15 years," Klein said.


1.3.4 The End of Snail Mail?

Losing mail delivery in 2001 is nowhere near the problem it would have been just a few years ago. Electronic communications, particularly e-mail, fax and the Web, have already supplanted the postal service—commonly known in the high-tech community as snail mail. It’s just another example of the relentless calculus of the digital revolution, where bits trump atoms. The threat that a deadly disease might be a consequence of opening an envelope could be a tipping point that leads to changes in the way we look at snail mail—and heads us down a road where daily mail delivery goes the way of the milkman.
9/11: From “Land of the Free” to a “Gated Community”?

- Steven Levy. *Newsweek Web Exclusive*. 01/10/13
SCAN CLUSTER 2: AFTER 9/11 – SOME ALTERNATIVE FUTURES

Overview

Not Israel but Singapore

After September 11, 2001, it became very difficult to construct a responsibly-optimistic vision of the future, even though it is absolutely essential to do so. Any good futurists knows that images of the future matter. They are a significant contributor to the creation of the future itself. Expect and work for evil, and evil is a likely outcome. Expect and work for good, and good might happen too. Thus, the good men and women of the peace and futures communities are bravely trying to come up with ennobling, equitable, compelling, and peaceful visions of the futures, as they should. But so far, nothing that is responsible is also convincing. It is easy to say what SHOULD happen. It is so far impossible to find a way to suggest that it will happen.

The events of September 11, however truly horrifying for those who suffered from them, are of special significance mainly in that they finally called to the attention of all Americans a way of life that is commonplace in many other parts of the world, but which Americans have chosen to ignore. Many around the world think it disingenuous that we now insist that they are either "with us or against us" in our war against terrorism in the US while we have been utterly indifferent to longstanding terrorism in their communities.

So if in fact American has just finally joined the worldwide dangerous community and can no longer pretend to be isolated from it, how might the American future best be envisioned? Many American commentators say they see the future of America in the present of Israel: a highly militarized and security-obsessed society, surrounded by hostile people who wish to eliminate them; a society constantly under bloody attack, that must be ready, able, and willing to attack back—if not indeed to attack preemptively; a society that has none of the easy freedoms Americans have for so long professed to hold and to defend until death. "Give me liberty, or give me death" no more. Instead, "Give me shelter." No longer "that government is best that governs least" but "that government is best which protects me best."

There is, however, another example of the future of America, and that is Singapore. Singapore also is located in a dangerous part of the world surrounded by contentious communities. It restricts the activities of its citizens in the interest of their security. It has, so far, not been the target of deadly force from its enemies even though it too occupies disputed land and practices customs not always widely respected elsewhere. However, Singapore has adopted policies and practices that have kept the income and opportunity gap between the rich and the poor among the smallest in the world. Educational and leadership opportunities are widely and equitably available, and the government itself, though strict, is also basically free of corruption and cronyism.

If America is no longer to be the land of the free and the home of the brave, then it might be good to pay special attention to Singapore as a guide for its future.

In either event, for most observers, it is very difficult to see the America of September 9, 2001 in any future America.

The futures community turned out in full force to discuss what the futures looked like after 9/11 The October 2001 issue of Future Survey, Vol. 23,
No. 10, was devoted entirely to this matter, and for the first time included short scenarios written specifically for Future Survey as well as items the editor culled from other publications.

The American Council for the United Nations University (ACUNU) also asked its vast global futures network to offer their visions of the United States. The titles of the resulting scenarios are:

Scenario 1: ESCALATION
Scenario 2: COUNTER MINDSET
Scenario 3: ROOT CAUSES
Scenario 4: SOCRATIC JUSTICE.
Scenario 5: THE WILD WEST
Scenario 6: THE PEACEFUL COWBOY
Scenario 7: THE NEXT YEAR
Scenario 8: FORTRESS USA/OECD
Scenario 9: ESTABLISHING A GLOBAL CIVIC ETHIC

ESCALATION: A long war involving attack and counter attack through biological and nuclear saber rattling. The poppy fields of Afghanistan are attacked with Agent Orange to dry up a principal source of terrorist income. But it is a long war. (Gordon)

COUNTER MINDSET: Political Islamists saw secular Western capitalism as reducing everything to a commodity, reinforcing individualism and greed, and arrogantly running financial and political rules of the world to American's benefit. They believed that Islam's mission was now to set the world right. The strategies followed by the international community addressed this mindset. Television, radio, software, magazine, music materials were designed to reinforce the idea that this was a war against terrorism and promoted the restoration of the right and proper image of Islam. A "Global Partnership for Development" gave reason for people not to be sympathetic with terrorists. In short, this was an "intellectual arms race" (Glenn)

ROOT CAUSES: The US-led military war against terrorism failed to end terrorism. The US proposed a different global strategy involving the provision of minimal standards of health, education, services and housing, worldwide. After a short period of expansion and association with other social radical movements, terrorism started to lose ground. A strong emphasis was placed on education by nations of the world to reduce inequality in access to work opportunities and to attain an acceptable standard of living on a global basis. (Gutierrez)

SOCRATIC JUSTICE: The US used all of the powers that the UN could offer. The US ratified the International Criminal Court and encouraged other nations to do so. The US brought captured terrorists and criminals to the Court and then focused on new modes of international cooperation. (Gordon)

THE WILD WEST: US and Allied military strikes led to endless escalation in a war that apparently was won, but over time sped up the process of decline, with terror meeting terror. The CIA got back into business on a big scale. Nations already poor became poorer. (Inayatullah)

THE PEACEFUL COWBOY: The US sought means to cooperate with other nations to deal with terrorism in a more contained, targeted way, although a great deal of wild west posturing continued. There were three parts to its strategy: improved internal security; enhanced intelligence; and economic action. Eventually, protection against terrorism has become almost a habit. (Barton)
THE NEXT YEAR: An invasion of the Taliban areas results in the execution of the Taliban-held UN aid workers. This provides additional moral support for more military strikes. The US considered withdrawing support for Israel unless they reduced their military severity. Casualties mounted. Bin Laden was apparently assassinated by one of his men but more likely by Alliance special forces. (Rogers)

FORTRESS USA/OECD: Borders were closed, locked down. This led to general impoverishment and the loss of innovation that accompanies immigration. In the short run. It provided the appearance of security, but in the longer run, poverty resulted. (Inayatullah)

ESTABLISHING A GLOBAL CIVIC ETHIC: Key international NGO’s formed a global council that believed that the major impediment to lasting peace and global security was the lack of a global civic ethic. A World Public Service was formed in which volunteers took on global ethical management tasks in international conflict resolution. Their strategy: potential combatants have to agree to mediation and to implement the outcomes thereof. Failing this, sustained ongoing sanctions would follow. Comprehensive military action overseen by a global peace force would be a last resort. (Wildman)

COLONIALISM REBORN: After the US destroys the Taliban regime, internal conflicts in Afghanistan cause local rioting and escalating conflicts. Bin Laden’s death (or capture) creates enthusiasm in the US and unrest in the Muslim countries. Massive deliveries of assistance for Afghanistan are provided to the country in the form of food, quick rebuilding of hospitals, others services, and infrastructure. In the Middle East, the US is forced either to put pressure on both parties to find a compromise, or to accept complete failure of the peace process and thus the West becomes further involved in the unstable region from Pakistan to the Middle East. An unexpected terrorist event dramatically changes the situation which then becomes similar to the colonial wars of the 19th and 20th centuries. A long period of reshuffling of the political and security system follow.

CALL ON THE UN: The investigation that "followed the money" to map the criminal network and catch the criminals proved to be extremely complex and the speed of international financial markets made this task more difficult than anticipated. It became clear that the US experience in Afghanistan would become similar to the USSR’s, but complicated by continued terrorism at home. This situation lasted for more than one year and induced some serious political changes both in different Islamic countries where extremists obtained greater influence and in the US too, where the war (and Bush) became unpopular. The "anti-global" movement gained influence, and new leaders with new policies appeared. The UN was seen as potentially more useful in settling international disputes than direct interventionism had proven to be. The Bin Laden case, still unsolved, was taken over by the International Criminal Court. http://www.acunu.org/millennium/antiterrorism.html

Another group affiliated with the ACNU offered the following thoughts:

A. Two scenarios based on positive feedback:
1. No action except condemnation: terrorism will become more and more unbridled; civilization will be threatened; world security and peace will disappear, and terrorism will control the whole world in the end.
2. Hate to hate or tooth to tooth with immediate response and direct military strikes, the military base of terrorism will be destroyed, injured families will be consoled, the power of justice and the confidence of striking on terrorism will be shown to the whole world, but more innocent citizens will suffer from the strikes while the terrorists hide among them. At the same time, they initiate new attacks (at least psychological attacks) resulting in long term mental chaos in the civilized society.
The two scenarios above will produce a positive feedback and cause the whole world to be unstable.

**B. Two Scenarios based on negative feedback**

3. Love to hate with cultural, economic, spiritual and legislative action including speeding up the process of reducing conflicts in hot areas of the world, reducing the gap between rich and poor, enhancing justice, equity and faith in those poor areas, and encouraging attitude change from hate to love. This transition will lead to long term sustainability, but temporarily some people who can not be tolerant may act out, and some domestic political instability in US may occur by acts of people who criticize the government as being too soft and weak.

4. Love to hate as a long term strategy from outside as mentioned above, while helping local people against terrorism in those countries where the terrorism is based while encouraging internal force to take justice on the terrorism. Measures include financial, institutional, spiritual, ethical and political. In this scenario, terrorism will not be overestimated and soon will become isolated and extinguished. The local people in terrorism-based countries will have time and resources against the terrorism. The world will keep peace, people will keep confidence, and terrorism will gradually disappear or be reduced to its minimum. The future is optimistic. The global order is expected to be set up in a rather new pattern rather than the current mono-pole pyramid pattern.

**A View From Pakistan**

Pervez Hoodbhoy, Professor of physics at the Quaid-e-Azam University in Pakistan wrote in the February 2002 issue of *Journal of Futures Studies* (Vol. 6, No. 3, pp. 169-176):

"Terrorism does not have a military solution." "If the world is to be spared what future historians may call the 'Century of Terror,' we will have to chart the perilous course between the Scylla of American imperial arrogance and the Charybdis of Islamic religious fanaticism." "For Muslims, it is time to stop wallowing in self-pity. Muslims are not helpless victims of conspiracies hatched by an all-powerful, malicious West. The fact is that the decline of Islamic greatness took place long before the age of mercantile imperialism. The causes were essentially internal. Therefore, Muslims must introspect, and ask what went wrong."

"The US too must confront bitter truths. It is a fact that the messages of George W. Bush and Tony Blair fall flat while those of Osama bin Laden, whether he lives or dies, resonate strongly across the Muslim world. Bin Laden’s religious extremism turns off many Muslims, but the find his political message easy to relate to—stop propping up corrupt and despotic regimes across the world just because they serve US interests. Americans will also have to accept that the US is past the peak of its imperial power; the 50s and 60s are gone for good. Its triumphalism and disdain for international law is creating enemies everywhere, not just among Muslim. Therefore they must become less arrogant, and more like other peoples of this world. While the US will remain a superpower for some time to come, it is inevitably going to become less and less super." "Our collective survival lies in recognizing that religion is not the solution; neither is nationalism. Both are divisive, embedding within us false notions of superiority and arrogant pride that are difficult to erase. We have but one choice: the path of secular humanism, based upon the principles of logic and reason. This alone offers the hope of providing everyone on this globe with the right to life, liberty and the pursuit of happiness."

**A Final Possibility**
After 9/11 – Some Alternative Futures

September 11, 2001 can be seen as one of those hinges of history where everything changes. There is no doubt it had that potential. But the real hinges (of which 9/11 was just a more recent turning) were the first and second "Arab Oil Crises" of the early and mid 1970s, and the profound impact of America's defeat in Vietnam earlier. The defeat of the wimpish, peace- and sustainability-oriented president, Jimmie Carter, and the ascendancy of debt-driven excessive wealth amid massive growing poverty nationally and globally--aka Reaganomics--during the 80s and 90s, leading to excesses of the dot.com era, were merely steps in a long path of denial of the end of the American Empire, and of the dominance of Western culture in general (one indicator of which is the negative population growth of Europe and Japan, and of Anglos in North America, while population continues to grow rapidly in the rest of the world).

This suggests three possible alternative futures:

1. Continued spiraled decline into tragedy as the US kills more and more innocent people in order to save them, leading to its own destruction:
   From within: The end of civil liberties; rise internal shootings and killings; refusal/inability of Americans to continue to shop-till-you-drop; continued firings; the end of welfare payments while the economy at lowest ebb. Money goes to cronies for profits rather than equitably for income maintenance or social infrastructure. Thus the end of the consumer-based American economy.
   Manichean beliefs that God blesses America while all terrorists are and personify "Evil" so that our God can beat your god.
   As well as attacks from without, biological perhaps but more likely nuclear.
   Spiraling down into a new, global, dark ages with no one able to get out of it because of the arrival of long-deferred global population, energy, and pollution problems--and especially of global warming and climate change.

2. Leading to the collapse of the US into civil war, and the slow rise over the 21st Century of China, India and Islam, with their conflicts, and a regionalization/globalization on their cultural and technological bases.

3. Or leading to a spiritual awakening, a sustainable and equitable economy, deglobalization and re-localization.
Overview

The last several years have seen some major developments in faith and religious sentiments in the US. Even before 9/11, President Bush had introduced religious symbols and institutions into the public sphere in ways not even Ronald Reagan had done before him. 9/11 itself unleashed a greater outpouring of public expressions of religiosity than America has ever witnessed before. President Bush characterized the American military response to the attacks as a "crusade" and affirmed that God was backing our policies while our enemies personified Evil. However, Bush took pains to say this was not a crusade against American Muslims, and there has been a great increase in interest in Islam in America, suggesting that that faith, already one of the fastest growing in the US as well as in the world, might become a significant presence in American life by the second quarter of the 21st Century.

3.1 "Bush's 'faith office' may stir storm"
"White House office of 'faith-based initiatives'" "plan means channeling serious federal taxpayer money and other aid to church charity programs and religion-based social efforts."


3.2 "Faith-Based Initiative altered, renamed"
The new name is to be "Armies of Compassion"


3.3 "Still one nation under God, but survey finds shifting beliefs"
"Protestants and Catholics still dominate, but their share of souls is slipping." "16% of adults say they changed their religion at least once in their lives, or turned away altogether." "Unbelief is rocketing, up from 8% in 1990 to 14% saying they have no religion." "Believing does not mean belonging. While 81% claim a religious identity, only 54% say someone in their household is affiliated with a house of worship." "A 1,575% jump in Wicans, from 8,000 in 1990 to 134,000 self-proclaimed witches in 2001."


3.4 Bush Urges Freedom of Worship in China
Calling the United States "a nation guided by faith" in a speech broadcast across China on Friday, President Bush pressed for religious freedom.


3.5 Silver Bullet-ism: Technology Runs to the Rescue
While attendance at the nation's houses of worship has pretty much dropped to pre-Sept. 11 levels, there is instead a rising, slightly desperate, faith in technology.


3.6 "Oh, Gods!"
"Religion didn’t begin to wither away during the twentieth century as some academic experts had prophesied. Far from it. And the new century will probably see religion explode—in both intensity and variety. New religions are springing up everywhere. Old ones are mutating with Darwinian restlessness. And the big "problem religion " of the twenty-first century may not be the one you think." It will be Christianity modified by Charismatics on the one hand and the fact that Christianity is now increasingly a third world religion that will be influenced by traditional third world spiritual beliefs and practices.


**3.7 New interest in Islam keeps scholars busy.**

  p. D5

**3.8 The Rise of the Muslim Marine**

While hate crimes against Muslims are rising all over the world, surprisingly the US military is one of the safest places to be a Muslim. Indeed, Qasem Ali Uda forecasts that in 20 years, 25% of all US marines will be Muslim. And many religious conversions of inmates in prison is to Islam. Given the incredible influence that former military personnel have on US policies (ie a look at Who’s Who in America shows that military background and law school education are the two common denominators on the resumes of America’s most influential people), inclusion is the wisest policy.


**3.9 Islamic Culture and Globalisation**

Sharif M. Shuja. 7 Aug 2001 12:29:39 -1000

The spread of Islam has had an impact on the globalisation of culture. Islam has spread not only as a religion but has helped also to give birth to languages which are today spoken by many more non-Muslims than Muslims. Kiswahili in Africa is today the most important indigenous language to have emerged out of Africa - but its origins lie in the interaction between Islam and African culture. Islam and the Arabic language have bequeathed the Arabic alphabet for languages like Farsi, Urdu, Old Hausa and others. The Arabs have given the world the so-called Arabic numerals through which the twentieth century has computerised the human experience. Today the Quran is the most widely read book in its original language in human history. Muslims are expected to read the Quran in its original Arabic and not a translation that may change the intended meaning. The Christian Bible is the most widely read book in translation. Almost one out of every five human beings is a Muslim. In the course of the 21st century a quarter of the human race will probably be Muslim. The new demographic presence of Islam within the Western world is indicative that Islamisation is now a major globalising force.

In the second half of the twentieth century both Muslim migration to the West and conversions to Islam within the West are consolidating a new human Islamic presence. In Europe as a whole, there are now 20 million Muslims, eight million of whom are in Western Europe. These figures exclude the Muslims of the Republic of Turkey, who number some 50 million. There are new mosques from Munich to Marseilles.

Also as a manifestation of the demographic Islamisation of the Western world, there are now over a thousand mosques and Islamic centres in the U.S. alone. And the country has professional associations for Muslim engineers, Muslim social scientists and Muslim educators.

There are some six million American Muslims - and the number is rising impressively.

Currently Islam is the fastest growing religion in Central Asia. After the collapse of the U.S.S.R., all five states of Central Asia - Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan - made an official place for Islam as the dominant religion. In France, Islam is becoming the second most important religion numerically after Catholicism. In Britain some Muslims have been experimenting with an Islamic parliament of their own, and others are demanding state subsidies for Muslim denominational schools. In Germany it has been belatedly realized that the importation of Turkish workers in the 1970s was also an invitation to the muezzin and the minaret
Faith

to establish themselves in German cities. Australia has discovered that it is a neighbour to the largest Muslim country in the world in terms of population (Indonesia). There are new mosques, Islamic schools and Quranic centres from Brisbane to Perth.

The rise of Islamic movements in different parts of the world, aimed at resisting Western domination and control over Muslim territories and resources, Muslim cultures and communities, has provoked a new wave of aggressive emotions against the religion and its practitioners. That it is resistance to Western domination and control - and not some threat to the West as such - which is taking place within the Muslim world is a reality that is concealed from the general public.

The depiction of Islam and the Islamic countries as a monolithic entity may reflect the errors of the orientalist mind-set, which refuses to understand the diversity within Islam for the convenience of a simple explanation. The assumed identity, through segregation and confinement of the Islamic civilization, is a product of the Western imagination and sustains a deep phobia because the simple explanation, ironically, renders Islam both 'unknown' and mysterious.

It is orientalist scholarship that has invested Islam both with internal unity and an external political ambition. Orientalists have reconstructed Islam as a political religion despite the fact that there is little in original Islamic sources on how to form states or run governments.

It should also be mentioned that the fundamentalist movement, most active in the Shi'ite countries of Iran, Iraq and Lebanon, is also diverse and a minority movement in most Islamic countries. Even assuming Islamic fundamentalism would spread significantly, it is not inevitable that it will inexorably lead to a clash with the West. After all, the West, and particularly the United States, has maintained a very special relationship with Saudi Arabia, one of the most fundamentalist of Arab States.

One also needs to be clear about the teachings of Islam. Some analysts in the West take the view that the rapidly growing Muslim population in Europe and the United States, and Islamic revivalism generally, are potential threats to Western culture. The study of Islam demonstrates that it is not a violent doctrine. Islam, like other world religions, is a faith of peace and social justice. In fact, Islam is as universalist as Christianity, and offers a generous consolation when it comes to finding purpose and guiding the soul in a confusing world. It does not turn to fundamentalist militancy, because it has always been a tolerant religion and dislikes extremism and killing. Islam does not encourage terrorism and threatening behaviour. These violent concepts do not originate in Islam as a faith. Those groups who practice terror under the flag of Islam are a small minority, rejected by the great majority of Muslims. In relation to aggressive attitudes, the key message to Western scholars is to oppose extremist Muslims but not blame all Islam.

Today’s tensions should lead to tomorrow’s aspirations. What we need now is a culture of peace that would help broaden cross-cultural understanding between Islam and the West. With proper knowledge of the culture of the Arab and Muslim worlds, this understanding would help foster tolerance and resolve conflict. We need to sustain a diversity of cultures, not a diversity of imagined clashes and conflicts.
There were several major recent developments in the practice of law and the work of courts. First of all, courts will soon be impacted by the many changes in rights and procedures enacted after 9/11. It may be that more and more Americans will turn to formal legal procedures as part of their renewed faith in government, and they may favor even harsher penalties for all actual or potential wrong-doers. At the same time, there seems to be a continued contrary interest in and ability to practice "do it yourself" justice. Finally, an issue whose emergence and development we have long tracked is telejustice and artificial intelligence applied to legal and judicial procedures. The creation of a cybercourt in Michigan, and the experiences of the cybercourt in the William and Mary Law School; increased discussion about the rights of robots (or of "the jurisprudence artilects" as it has recently been phrased); rapid progress in artificial speech recognition and production systems and in visual display; and in artificial intelligence per se all suggest that the days of the old physical courthouse and law office are numbered as once what were considered to be mere "fanciful ideas" about the futures of law and the administration of justice have become jurisprudential realities.

4.1 Do-It-Yourself Justice

4.1.1 "Do-it-yourself law wins--in popularity,"
Quoting Kate Sampson, "It's like the do-it-yourself movement--the Home Depot approach." "The sheer volume of these do-it-yourselfers puts pressure on the courts. Clerk have to answer basic questions a lawyer would not need to ask." "Assistance programs to help fill out forms for divorce, landlord-tenant disputes and other cases are offered by many states. Many judicial websites provide court forms that can be downloaded." "In Minnesota, officials in the state's largest county have set up a self-help center staffed by attorneys and court personnel. 'We started looking at litigants as customers--that's a totally different concept,' said Edward Tloussaint, Jr., chief judge of the Minnesota Court of Appeals, where approximately 20 percent of cases include someone who is representing himself."


4.1.2 I-CAN! Self-Help Computer Kiosks in California
From Sacramento to Washington, D.C., officials advocating greater access to legal services for low-income residents are keeping a close watch on Range County, Calif. and its technology-based solution. The Interactive Community Assistance Network, better known as I-CAN!, already has helped thousands of local residents obtain legal services, including the tools they need to represent their own interests in court...

http://www.pnnonline.org/law/aid021202.asp

4.1.3 Online Legal Education Begins in U.S. Law Schools
The Internet could throw many law professors out of work, and the law school as a physical entity may vanish with the growth of online legal education. The winners on the Internet will be law schools with well-known brand names, as well as faculty members at those institutions. Celebrity faculty members may find new markets for their courses and reap the benefits,
financially and professionally. Mr. Froomkin called this the Arthur-Miller-on-a-disk model, referring to the Harvard University law professor who has already offered to tape his lectures for Concord Law School, an online program. Perhaps someday, all law students will study from Arthur R. Miller, and basic courses will become a commodity in the new national market for online legal education, said Mr. Froomkin. Nonacademics may find it easy to teach certain subjects, or to hire themselves out as graders, e-mail-discussion leaders, and even directors of the entire first-year curriculum. The losers in the new era of legal education will be second- and third-tier institutions that lack name recognition and its concomitant prestige, and their faculties. They will either have to become discount law schools, or go online themselves. And if a school goes online, what need will there be for a physical structure, especially that expensive law library? Some law professors are already living the distance-learning model. Peter W. Martin, a professor at Cornell Law School, transmits his course, "Copyright and Digital Works," to three other law schools: Chicago-Kent College of Law and the law schools at the Universities of Colorado and Kansas. Mr. Martin is paid by the three institutions as an adjunct, and grades each course separately, on a curve.


### 4.1.4 Virtual Chase: Legal Research on the Internet


### 4.1.5 Legal Work Up For Bid

The same entrepreneur who came up with the concept of brokering "pollution credits" now has found a new marketplace to tackle -- corporate law. He's planning to soon launch what amounts to an eBay for the legal industry called eLawForum. Clients will post information on their legal needs and solicit bids from competing law firms, which will then have an incentive to offer lower prices to get the work. Preliminary trials of eLawForum have generated an enthusiastic response from participants, and several competing companies, such as iBidLaw.com, are getting ready to launch their own lawyer-brokerage ventures. While some large, established law firms insist their clients would never abandon them for some Web upstart, smaller firms see the online brokerages as a means to get clients they could otherwise never hope to snare. "It is very hard to crack the New York market," says C. Boyden Gray, partner in a Washington, DC, law firm. "I think this would actually help us (to compete)."


### 4.1.6 Living Without Law: An Ethnography of Quaker Decision-Making, Dispute Avoidance and Dispute Resolution


### 4.1.7 Restorative Justice: Healing the Foundations of Our Everyday Lives

Retribution is the predominant value in the political landscape of criminal justice policy. Punishing criminals as severely as possible remains a persistently popular position in electoral politics. States build more prisons to house the many offenders who are serving lengthy sentences for possession of small quantities of marijuana and crack cocaine in the much-touted "war on drugs." No politician ever lost an election for supporting the death penalty. This retributive impulse on the part of the public and politicians has only been inflamed in the wake of the terrorist attacks on the World Trade Center and the Pentagon. The public seems willing to embrace military tribunals-and their promise of swift and severe justice for those who might have conspired to plan the attacks. Moreover, these unforgiving policies fall most heavily on the shoulders of the poor and members of racial minorities who constitute the vast majority of those who are "processed" by the criminal justice system.

In this book, Dennis Sullivan and Larry Tifft challenge the retributive nature of the existing criminal justice system. They argue that the criminal justice system simply inflicts violence on the offender through incarceration or even death, but does nothing to renew the victim's well-being or to relieve the structural inequalities that gave rise to the crime in the first place. Instead, they
urge us to reorient our entire system of dealing with social harms. They claim we must move away from seeking vengeance and develop instead a needs-based approach that accounts for the needs of all the parties to a violent act, including not just the victim but also the offender and the community itself. The authors reject the labels of "offender" and "victim." They argue that such labels impose a false identity on individuals. Instead, they refer throughout the book to "the person who was harmed" and "the person who has harmed."

Sullivan and Tifft argue for a program of restorative justice that would be geared towards meeting the needs of everyone in society, including those who did the harm. According to the authors, restorative justice programs have several different elements in common. First, such programs are grounded in a "political economy of relationship" based on needs, rather than desert. This different emphasis makes it important to account for the needs of everyone in society: "Such an approach toward justice puts a great premium on the participation of everyone, and on the expression of the voice of each. In other words, the well-being of everyone involved in a given social situation is taken into account: that is everyone involved is listened to, interacted with, or responded to on the basis of her or his present needs" (p. 113). Second, restorative justice programs reject the violence associated with punishment and focus instead on healing broken relationships. Third, restorative justice requires open communication about the harm caused and public acknowledgment of the victim's pain. But the victim is not the only one doing the talking. The offender must also offer his account of the incident. Finally, the community must take an active role in resolving these problems. They must be present at the restorative process itself, but they must also begin to rebuild their communities.


4.1.8 Therapeutic Jurisprudence

The notion of Therapeutic Jurisprudence (TJ) has been discussed and developed by legal scholars for over a decade. It concentrates attention on the psychological and emotional impact of law, legal procedures, and legal actors. Recently it has increasingly informed state court practices. Therapeutic Jurisprudence, is “the use of social science to study the extent to which a legal rule or practice promotes the psychological and physical well-being of the people it affects.” It is the study of the role of law as a healing agent. As such it is an interdisciplinary science, offering fresh insights into the role of law in society to those who practice law. TJ can be thought of as a “lens” through which we view regulations and laws as well as the roles and behavior of legislators, lawyers, judges, administrators, and educators. It may be used to identify the potential effects of proposed legal arrangements. It is useful to inform and shape policies and procedures in the law. It posits that, when appropriate, the law apply an “ethic of care” to those it affects. Courts are moving toward a problem solving orientation to their responsibilities and forming problem solving partnerships to address complex social evils that have come to dominate their dockets in recent years.

- William Schma
  [http://www.ncsc.dni.us/KMO/Projects/Trends/9900/Articles/Therapeutic_Jurisprudence.htm#TJ](http://www.ncsc.dni.us/KMO/Projects/Trends/9900/Articles/Therapeutic_Jurisprudence.htm#TJ)

4.1.9 Pain, Death, and the Law

In the celebrated essay, "Violence and the Word," Robert Cover (1986) developed a novel perspective on law captured in the haunting and often quoted opening sentence: "Legal interpretation," he wrote, "plays on a field of pain and death." Cover's suggestion that law, pain and death are intimately related inspired the essays collected in the volume under review, edited by Austin Sarat. Drawing on works in history, philosophy, and literature, and reading and interpreting a range of judicial opinions, these essays explore such relations by focusing on several important areas--how pain and death are constructed in and by law, how specific constructions of pain evolved over time, the consequences of differing conceptions of pain for legal interpretation, and how both pain and death may give meaning to law. Throughout the book, authors' highlight
the ways in which judicial decisions portray the human body in pain and the ways in which death and pain are transformed into jurisprudential "facts."


4.1.10 Varieties of State Crime and its Control

The inherent coercive power that every government must lawfully have at its disposal to maintain state functioning, combined with government's inertial legitimacy, has produced the historic truism that greater crimes against humanity have been perpetrated by governments and states than by individuals or private criminal enterprises. The control of criminal behavior by government actors must therefore be a core function of any state that aspires to be called civilized and wishes to be included within the community of nations that measure up to the legal/political criteria of the rule of law. Even states whose adherence to the rule of law is evidenced in may ways (e.g., judicial independence, legislative oversight, a vigorous press, review commissions, prosecution of state actors) nevertheless can expect some level of governmental illegality (e.g., Human Rights Watch 1998). When such illegality is systematic or egregious it may be denominated state crime, a species of political crime whose harm, in Hall's (1960: 212-46) sense, includes the undermining of confidence in a government that is lawful, constitutional, and democratic.

**VARIETY OF STATE CRIME AND ITS CONTROL** consists of seven separately authored case studies of state crime in advanced democracies and short introductory and concluding chapters by Jeffrey Ross. This book was preceded by another edited volume (Ross 1995) addressing definitional, conceptual, theoretical and methodological issues about state (or governmental) crime, making the present volume a part of a long range exploration of the issue: Ross, Jeffrey Ian. 1995. **CONTROLLING STATE CRIME: AN INTRODUCTION.** New York: Garland Publishing.

- Jeffrey Ian Ross (Editor). Monsey, N. Y: Criminal Justice Press, 2000. Reviewed by Marvin Zalman, Department of Criminal Justice, Wayne State University

4.1.11 Militarizing The American Criminal Justice System

This is a collection of essays edited by Peter B. Kraska that focus on the "military/criminal justice blur" and the role militarism plays in this development. The ten essays are divided into three categories: Militarized Crime Control in America; The Military Police Blur; and Militarism Comes Home Punishment Feminism and Popular Culture. Topics explored include, inter alia, the growing involvement of military forces in domestic law enforcement, community policing, the patrol of the Mexican-U. S. border, and feminist militarism and popular culture.

The thesis of the work:

I: Traditionally the military handles threats to our nation from outside, while the criminal justice system deals with crime and internal disorder.

II: Historically, a close alliance between the military and domestic law enforcement has been associated with repressive government.

III: The United States is in the middle of a "momentous historical change" that involves blurring this separation and violating a "long standing tenet of democratic governance" (p. 3).

IV: This blurring is aided and abetted by an ideology of militarism defined in one of the essays as "the prevalence of war-like values in society" (p. 123).

- Peter B. Kraska (Editor). Boston: Northeastern University Press, 2001 Reviewed by Peter J. Galie, Department of Political Science, Canisius College.

4.1.12 Legalization and World Politics

The authors of this text examine the phenomenon of "legalization," which they describe as "a particular form of institutionalization" (p. 2). According to the authors, the need for analysis of this concept stems from the fact that "the world is witnessing a move to law" (p. 1). The last decade in world politics has produced two functioning international criminal tribunals, the World Trade Organization, NAFTA, a strengthened European Union, a soon to be functioning permanent International Criminal Court, and numerous other international legal arrangements. Such events
necessitate the type of analysis that this text provides us. Therefore, the major strength of this text is its timeliness. That, along with the quality of international relations and international law scholars that contribute to this dialogue, make this text worth reading.

As these authors describe it, legalization can exist as either hard law, meaning full legalization (high levels of obligation, precision, and delegation) or soft law, meaning anarchy (low levels of all three components). In between these ideal types, we have a mixture of hard and soft law, depending on the levels of the three components. Thus, legalization is not a concept that defines one particular type of institution, but has a range from high to low forms.

Clearly, dispute resolution proceedings of a transnational nature are more "legalized." This is because: 1) adjudicators in a transnational tribunal are more independent in their legal decision-making abilities; 2) a greater number of actors have access to the judicial process; and 3) the implementation of judgments is not dependent on state actors. The implications of this conclusion are that transnational dispute resolution systems tend to increase legalization, while constraining the actions of states. In short, this form of transnational institutions "insulate(s) dispute resolution to some extent from the day-to-day political demands of states" (p. 104). Such a conclusion bodes well for institutions like the newly forming International Criminal Court (ICC).


4.1.13 **Investors Increasingly Take Anger to Court**


4.1.14 **The Search for Lawyers Goes Global**

"The trend to international recruitment raises questions about how to harmonize training in commercial law."


4.1.15 **Public Laws Owned By The Public? Think Again, Copyright Rulings Show**

Who owns the law? Not the public, at least in the latest court battle over copyright infringement on the Internet. Turns out, the text of the public laws in question belongs to a private, but influential, organization. That’s what a federal judge and an appeals court say.

This is one online copyright infringement lawsuit that promises to affect more lives than the record industry’s high-profile dispute with Napster’s music-sharing service. Government at the local, state and federal levels increasingly is enacting laws that have been written and copyrighted by private entities.


4.2 **Cybercourt**

4.2.1 **Order in the Cyber Court**

Michigan is attempting to launch a cutting-edge cyber court to speed business cases through the legal system. Young businesses have died on the vine while waiting for legal disputes to crawl through the courts. "Information technology companies, especially, could be out of business by the time something reaches a jury," said David Zurvalec, an attorney and vice president of industrial relations at the Michigan Manufacturers Association in Lansing, Mich.

Hoping to solve this problem, Michigan lawmakers have proposed a new legal institution that operates at Internet speed -- a "cyber court" that harnesses technology to propel lawsuits to resolution. Michigan’s Gov. John Engler unveiled the idea in his State of the State address.

"Our intent would be to create a 'rocket docket' that can move these cases, depending on their complexity, within 90 to 180 days," said Rep. Marc Shulman of West Bloomfield, who
introduced the cyber court bill in Michigan’s House of Representatives earlier this year. According to the legislation, the cyber court will be available for business disputes involving more than $25,000. The presiding judge will render a decision without a jury. Cases will be argued in the cyber court only if both parties agree to use it rather than the traditional circuit court system.

The bill calls for cyber court cases to be heard via video or audio conferencing, the Internet and possibly other means. When feasible, the court will broadcast its proceedings over the Internet. "The parties would appear from their own remote, camera-equipped computers, or potentially from a public terminal that could be located in a Kinko’s or somewhere else," Shulman said. They would use teleconferencing for the initial hearing, any meetings required during the discovery phase, settlement conferences and, if the case went that far, for the trial and to hear the judge’s decision. Attorneys could distribute pleadings, exhibits and other documents via e-mail, and witnesses could testify over a video link.

Cases would move quickly because judges wouldn't need to set court dates far in advance to accommodate out-of-town participants with busy schedules. Participants wouldn't have to cool their heels while the judge heard other cases scheduled on the same day. Also, Shulman said, since participation would be voluntary, parties would abide by the rules of the cyber court rather than drag out the proceedings to gain some sort of advantage.

Besides making it easier for companies to settle lawsuits in Michigan, supporters hope the cyber court will send an encouraging message to businesses, especially technology firms, shopping for a home. "We see ourselves as a high-tech state and we want others to see us that way as well. The cyber court shows how seriously Michigan takes its technological infrastructure. "Companies that are comfortable using advanced technologies in business transactions might see the cyber court as a good reason to locate in Michigan.

Michigan may become one of the first states to settle real legal disputes in cyberspace, but the model has already been tested in a laboratory setting -- Courtroom 21, operated by the College of William and Mary in Williamsburg, Va.

A mock criminal trial conducted in Courtroom 21 last April employed the same kinds of technologies Michigan hopes to employ. The case involved an international terrorist conspiracy, and one of the attorneys on the prosecution team took part in the trial from the United Kingdom. "He was in a 40-inch plasma screen installed in the courtroom at the counsel table, right next to co-counsel," Lederer said. At one point, the onscreen British barrister questioned the government’s chief witness, who appeared live from Canberra, Australia, in a 50-inch plasma display set up behind the witness stand.

One question Courtroom 21 has yet to resolve is how to share physical evidence, since scientists have not yet learned how to beam up three-dimensional objects through the Internet. The court recently dealt with that issue in a fictional dispute in which a U.K.-based mineral water company claimed a U.S. firm had copied its bottle and label. Disputants on both sides of the Atlantic received samples of both bottles, Lederer said.

Although this is a low-tech solution, the mock trial also took advantage of images transmitted from a graphics program at the University of Leeds in the U.K. "At one point we actually sank one bottle into the other electronically, so you could see one bottle inside the other," making similarities and differences immediately clear, he said.

As more students graduate from law programs like William and Mary’s, the pool of tech-savvy lawyers will gradually increase. Also, attorneys who handle cases in the cyber court will have no choice but to use its equipment.

"Some lawyers are indeed very cautious," Lederer observed. "But many lawyers are surprising pioneers in the area of technology. And others are guided by the duty to the client and the nature of the adversary system. No one likes to lose. If there’s a possibility that technology will be a significant factor on the other side, people tend to look at it."

By Merrill Douglas - October 2001

http://www.govtech.net/magazine/story.phtml?id=3030000000003173

4.2.2 Michigan Governor Establishes Cybertcourt
Michigan Governor John Engler has signed into law a bill to create a virtual state court --
the first to operate in the U.S., according to Matt Resch, an Engler spokesman. A cybercourt exists
at the College of William and Mary in Virginia, but isn't operational, says Resch. The court won't
have a jury and will handle only business disputes involving at least $25,000. District or circuit
court judges will be assigned for three-year terms and will be specially trained to use the system.
"In a world where we can go from idea to IPO at warp speed, we need a connected court that can
keep up," says Engler. (AP 9 Jan 2002)


4.2.3 Forget RoboCop, Here's CyberCourt

In a not-too-distant future, courtrooms could exist only in cyberspace, with crime scenes
re-created as holograms and trial participants seeing each other only through virtual reality
glasses. That's the kind of magic "Courtroom 21" at the College of William and Mary has a taste
of. In a recent demonstration, a judge presided from his home court in Portland, Ore., and a
witness testified from Orlando, Fla. On the bench and in the witness box were huge televisions,
where they could talk via Internet videoconferencing.

Courtroom 21 director Fred Lederer is working with Michigan to develop a cyber court. In
January, Gov. John Engler called for Web-based courtrooms in the state and specially trained
judges to quickly resolve intellectual property rights and other cases for high-tech companies.
"What used to be purely science fiction just isn't anymore," said Lederer, who recently saw
holographic demonstrations at the NASA Langley Research Center in Hampton, Va. "What we can
already do is astounding, and what we may be able to do in the next five years is awe-inspiring."

The federal appellate judges hearing the Microsoft antitrust case this week also used quite
a bit of new technology befitting the case at hand including computers that allowed them to
communicate with their clerks or research legal documents while they listened to arguments. The
laptops came with Microsoft's Windows operating system and Internet Explorer browser as well as
Netscape's Navigator browser. Those browsers are at the heart of the antitrust battle in which a
trial judge ordered the breakup of Microsoft, but court officials would not say which software the
appeals judges prefer.

The U.S. Court of Appeals for the District of Columbia Circuit, for the first time, required
both the government and Microsoft to submit their court filings on CD-ROMs that could be viewed
on the judges' laptops. The CD-ROMs had almost 15,000 links to case law, exhibits, legal motions
and even videotaped testimony, all on a total of four disks. "I think it's going to be better
justice," said Marty Steinberg, president of Denver-based RealLegal.com, the company contracted
by both sides to produce the CD-ROMs. "Everybody has a more precise way to present their
arguments, and the courts have a better way to review this information because it's all relevant."

Six of the seven appellate judges used laptops during the oral arguments on Monday and
Tuesday. The computers had word processors and access to the Lexis and WestLaw legal
databases. The judges could use instant messaging software to "chat" in real-time with their law
clerks, who sat on one side of the courtroom. The seventh judge, David Tatel, is blind and does
not use a laptop on the bench.

Lederer cautioned that all the new gadgets are prompting policy questions. "You really can
come up with a cyber court with no one physically present," he said. "But is it adequate for public
attendance to just dial in? Is that what we mean in the Constitution, or do you have to be able to
walk in? "Not everything that can be done adds to the process."


4.2.4 Imagining the Law of the Future

What will the world of law be like in 1,000 years? That's right. Not five or 10 or 100
years. But 1,000 years from now? At last month's American Bar Association convention
in Chicago, a panel of lawyers, technology experts and one cyberlaw journalist were asked to tackle
that intriguing question.

Moderated by Judge Wendell L. Griffen of the Arkansas Court of Appeals, and sponsored
by the ABA's section of science and technology law, members of the group -- including Raymond
L. Ocampo Jr., former general counsel of Oracle Corporation; Morgan Chu, co-managing partner of Irell & Manella, a Los Angeles-based law firm; Christine Grant, former commissioner of New Jersey’s Department of Health and Senior Services; and Roberta Katz, a lawyer, anthropologist and currently chief executive of Flywheel Communications, a legal computer network – spoke of anticipated breakthroughs in information technology, biogenetic engineering, nanotechnology and neuroscience. They largely warned that lawyers in the third millennium must meet their obligations to make sure that amid the scientific advances the public interest is served.

By Carl S. Kaplan


4.2.5 Electronic Judge and Jury

An artificial-intelligence program called the Electronic Judge is dispensing justice on the mean streets of Brazilian cities. The program is installed on a laptop carried by a roaming human judge and helps to assess swiftly and methodically witness reports and forensic evidence at the scene of an incident. It then issues on-the-spot fines and can even recommend jail sentences.

http://news.bbc.co.uk/hi/english/sci/tech/newsid_726000/726837.stm

4.2.6 Transforming the Law: Essays On Technology, Justice and the Legal Market Place

TRANSFORMING THE LAW is a follow up to Richard Susskind’s important book on the impact of information technology on legal practice, THE FUTURE OF LAW (1996). In the earlier book, Susskind described his vision of the coming impact of information technology on the delivery of legal services and the practice of law. TRANSFORMING THE LAW is a combination of an updating and extension of the earlier argument, a response to some of the critics of that earlier work, a collection of Susskind’s previously published essays on artificial intelligence and the law, and some commentary on recent developments in England (i.e., civil justice reforms developed under the leadership of Lord Woolf). The essays vary in their degree of likely interest to scholars of law and courts, but there is enough here that I would recommend this book to anyone interested in thinking about the changes that are being wrought by information technology in the law and courts arena.

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Reviewed by Herbert M. Kritzer, Department of Political Science, University of Wisconsin

4.3 Jurisprudence of Artilects

4.3.1 Rights of Robots and the Jurisprudence of Artilects:

The advent of artificial intellects (artilects) with knowledge and reasoning capacity surpassing humans will create new legal issues. New rules and standards may be required to govern their use and behavior. In particular it is feared that they may become a super-race that
eclipses humanity, holds the lesser capabilities of humans in disdain, and seeks to marginalize or eliminate humans. In this high level survey of basic legal issues regarding the relationships of humans and artilects, I argue that granting legal recognition to non-human entities should not pose insurmountable problems since it has already been done for corporations. As incorporeal entities, artilects will be highly dependent on our legal and political system to secure their rights, and hence are likely to become model citizens. And, unlike other minority groups seeking recognition, they will have elite professional and corporate sponsors to smooth the way for them.


In the same issue see also Kane Oliver, "A review of 'A jurisprudence of Artilects'"; Frank Wells Sudia, "A brief reply to comments"; Jim Dator, "Artilectual salutations"; Sohail Inayatullah, "The rights of robots? Inclusion, courts and unexpected futures"; and Timothy Dolan, "Perspective templates for post-homo sapiens public policies".

4.4. Crime, Its Causes and Cures

Overview

There has been considerable discussion of the fact that the rate of crime had fallen generally everywhere in the US. Various reasons have been given for this. But many still point out that the rate of crime (and the proportion of Americans--and especially young Americans--in prison) in the US is substantially higher than in any other part of the world, certainly compared to other industrialized countries.

4.4.1 Prison Population in U.S. Is Leveling Off

After growing explosively for three decades, the nation's prison population has begun to stabilize, according to new government figures.

4.4.2 New Report Finds Stronger Link Between Crime and Poverty

"Rosy assessments of the nation's declining crime rate wrong focus on short-term drops from crime peaks early in the decade and ignore the overall rise of violence since the 1960s, according to a new report...by the national Commission on the Causes and Prevention of Violence."
"Violent crime in major cities reported to the FBI has risen by 40 percent since 1969."
"This is the kind of crime rate that we would have said is a disaster when we went to work on that crime report 30 years ago." 
"The report also notes the continued prevalence of crime in the United States relative to other industrial countries. It states, "In 1995, handguns were used to kill 2 people in New Zealand, 15 in Japan, 30 in Great Britain, 106 in Canada, 213 in Germany and 9,390 in the US." 
"Nearly one-quarter of all young children live in poverty and that income, wage and wealth are distributed more inequitably in the US than in any other industrialized country."

4.4.3 Youth in Prison Doubles. Imprisonment of Juveniles Doubles, Research Finds

As states moved steadily to prosecute more young people as adults, the number of prison inmates under 18 more than doubled between 1985 and 1997. In 1985, 3,400 youths 17 or younger were committed to adult prisons on conviction in either juvenile or adult courts. By 1997, the number of such youths had more than doubled to 7,400, the Justice Department reported Sunday. Young inmates by no means are overrunning the prisons' adult population of 2 million, and just 5 percent of all young offenders serve sentences in adult facilities, researchers said. But data suggest that today's violent young offenders are more likely to do prison time than in years past.

That’s partly because of an increasing number of state laws that take away their legal status as minors and make them more accountable, researchers say. The crackdown, fueled in part by high-profile school violence, has placed children as young as 11 on trial in criminal courts.

There’s some justification for public frustration with the juvenile system,” said Vincent Schiraldi, director of the Justice Policy Institute, a think tank opposed to mandatory sentencing. "But sending them to the adult system en masse is no solution. It’s hardly a resounding success for the people it’s got."

By Anjetta McQueen. February 28, 2000

4.4.4 1.86 million prisoners in US

Total sets record despite slowed increase. "With this latest increase of nearly 60,000 prisoners, the US may have matched or even surpassed Russia as the country with the highest rate of incarceration." "The figures indicate that one of every 147 US residents was an inmate in an adult jail or prison in June" 2000. "Among black men in their 20s and early 30s, about 11 percent were in prison or jail. For the same age group 4 percent of Hispanic men and 1.5 percent of white men were prisoners."

http://www.ojp.usdoj.gov/bjs

4.4.5 The Crime Drop in America

The debate over the causes of the crime drop has been especially ideological. Conservatives argue that there is no need to look at the root causes of crime, and that massive policing and imprisonment can cut back on crime. Liberals argue that there is no evidence that police actions reduce crime. The point remains that no matter what the crime rate, the ones who commit such crimes as murder tend to be those who suffer the most from economic and social oppression.

The basic facts are simple. After a long period of a U. S. homicide rate of about 5 per 100,000 people, the rate began to climb in 1965. By 1980, the rate began a slow and steady drop up to the present day for adults, but the rate for juveniles dramatically increased in the late 1980s. By 1992, the rate began to drop even for juveniles, with the total rate now back down near to the 1965 level. Most of these authors are willing to attribute the 1960s increases to the loss of legitimacy of the American state, although how this is tied directly to interpersonal violence between intimates, for example, is not made clear. Certain demographics related to the baby boomers kept the rate high in the 1970s. However, the juvenile rate in the 1980s can only be attributed to crack wars.

During the 1980s, juvenile homicide went up, but adult homicide went down. Gun violence, especially handgun violence, accounted for almost all of the increase in homicides. One reason for the increase in lethality was the change by American gun manufacturers to producing a new generation of Saturday night specials, very cheap machine pistols. Although police sweeps, and stop and frisk actions may have had limited effects, the most effective measure may have been the Brady Bill. Although popular logic is that criminals will just get the guns another way, in fact Wintemute found that they did not. Those who had arrest records but were sold the guns had a much higher rate of later conviction for gun crimes than those who were denied gun purchases.

Another factor conservatives claim has reduced the crime rate is incarceration. Certainly it would be hard to find a factor that has changed more. Incarceration rates doubled in the 1980s, and then doubled again in the 1990s. William Spelman finds that perhaps 25 percent of the crime drop can be attributed to the prison buildup, though he questions whether this decrease is worth the social and financial costs of the imprisonment binge this country has gone through.

Many police departments have argued that it was their policies, ranging from zero tolerance to aggressive patrolling, that were responsible. John Eck and Edward Maguire find it hard to substantiate virtually any of the police claims, mostly because the policies involved were implemented after the crime drops began.
An interesting chapter is on the history of the rise and fall of drug markets in New York City over the past 30 years. The authors believe that crack markets changed the nature of homicide, fundamentally changed the robbery conduct norms, and increased woman and child abuse. Their most important argument is that the main reason why the crack market has decreased dramatically is because the current generation of youth simply does not want to smoke it. The negative role models of crack addicts in their lives has convinced youth even in the worst neighborhoods that marijuana, perhaps with a bit (not a lot) of malt liquor, is a much better way to get high.

Alfred Blumstein and Joel Wallman (Editors). New York: Cambridge University Press, 2000. Reviewed by Martin D. Schwartz, Department of Sociology and Anthropology, Ohio University

4.4.6 The Culture of Control: Crime and Social Order in Contemporary Society

The mid twentieth century world of criminology and crime control was the world of "penal welfarism"--a world increasingly defined by the assumptions that reform and social intervention were plausible responses to crime; that alternatives to prison were healthy; that the death penalty was useless and barbaric; that crime control was a clinical, scientific discourse free of populist sentiments; that personalized victims were not part of the criminologic equation; that the state was to be the only player in crime control; and that things were generally okay--some basic level of deviance was a normal part of mass society and we were making progress in managing it. Scholars and policy makers predicted a continued strengthening of these premises.

But then came the big surprise. Over the course of the last twenty or thirty years, these premises have not only unraveled, but almost INVERTED as we have undergone a fundamental reorganization of the discourse and practice of crime control in the United States and the United Kingdom. The conventional wisdom now places the victim at the center of an ongoing crisis in crime, embraces retribution, applauds the death penalty, fills the prisons, and laughs the idea of reform or rehabilitation off the stage. James Q. Wilson's once jarring assertion that "nothing works" (so let's lock them up as fast as we can and as long as we can) has emerged as the now unsurprising common sense of a new era in crime control. Confounding the expectations of many scholars writing about the almost inevitable unfolding of a patient, caring, rational, tutelary state in which crime control institutions are a sort of boundless treatment center, we seem to have revived an earlier mode of the angry, violent, indiscriminate punisher who seeks revenge and exclusion. How and why did it happen?

Garland argues that the radical transformation in crime control must be understood not (just) as a response to rising crime rates or the fear mongering of the mass media. Nor should it be seen as (just) some internal intellectual adjustment in the world of criminology and crime policy or as a simple outgrowth of the rise of the conservatives in the U. S. and U. K. These events were certainly an important part of the story, but he bases his explanation for the change in crime control policy (as well as the public sentiments and other trends that support it) upon more fundamental causes to be found in the broad historical transformations of economic and social life that marked the latter decades of the twentieth century. The origins of the transformations that created late modernity "can be traced back to the process of capital accumulation and the unceasing drive for new markets, enhanced profits, and competitive advantage" (p. 78). As the rapid economic changes of the era gave rise to such things as the service economy, regressive taxation, stagnant wages, weakening unions, and permanent armies of the un- and underemployed, we see the formation of a cleaved society marked by resentment, conflict, and the deterioration of any sense of shared fate or identity. Other important changes define the era: dramatic reformations in family structure; the rise of the segregated suburb; the revolution called television; the decline of traditional communities and patterns of authority. And, of course, there were the increases in crime that began shortly after mid-century. New patterns of need, alienation, isolation, opportunity and mobility helped fuel a widespread and sustained increase in crime rates and, in turn, the debate over how to respond to those crime rate became increasingly politicized and polarized.
Garland’s analysis reminds us that people still make choices and that it is critically important to understand the rise of the socially conservative, free market, anti-welfare politics that were exemplified by Reagan and Thatcher. With this political shift, came the rise of a "reactionary vision in which the underlying problem of order was viewed not as a Durkheimian problem of solidarity but as a Hobbesian problem of order, to which the solution was to be a focused, disciplinary version of the Leviathan State" (p. 102). As politics made a dramatic shift to the right, conservative ideology increasingly influenced the formation of crime control policy.

Perhaps the most striking facet of late modernity is a widely shared, institutionalized cluster of attitudes and beliefs that Garland calls the "crime"—high crime rates are an ongoing crisis; crime engenders intense fascination, fear and anger; crime policy is an emotional and highly politicized terrain; crime victims are at the center of policy concerns; the state is unable to meet new challenges; private defense and security is widely engaged; the mass media continually feeds our awareness of crime. It is upon the terrain of this new, settled consciousness of crime that the harshly punitive and costly policies of the current era find such widespread public support. A triumphant ethic of market individualism insists that we are all free, rational beings making choices about an array of options. For the middle classes and above, this leaves us free to work, play, purchase and prosper, liberated by the knowledge that we are free, self-made, and not responsible for the fates of others. For the working class and below, people are free to work, scrape, and go without, "liberated" by a culture that sees poverty as yet another choice made by a rational consumer. Within this framework, crime is also positioned as the rational choice of a free, self-made person and, therefore, the neo-conservative strategy of increasing the likelihood of apprehension and the severity of punishment is a sensible adjustment in the market economy of crime. The ethos that "crime is a decision, not a disease" parallels and supports the market economy's necessary fictions that prosperity and poverty are the accomplishments of individuals, not races, classes, or genders and that none of us is responsible for the plight of others or obliged to confront structural deficiencies in the system.

Tragically, the most telling epilogue for this powerful book has been written by the episodes of terror and state reaction that marked the last months of 2001. When each day sees new and more radical measures of control as a desperate state swings blindly at its challenges, it is hard to imagine a more disturbing affirmation of the interconnectedness of crime policy, economics, politics, insecurity, and the seemingly intractable conflicts of our divided global culture. Also, it is also hard to question the prognosis that the "iron cage" built by our new culture of control will expand, fortify, and entrench in the years ahead.


4.4.7 Crime and Markets: Essays in Anti-Criminology

These essays plumb the terrain between crime and markets, and between sociologically oriented criminology and economic public policy analysis. Most of the chapters are drawn from empirical studies Ruggiero has conducted during the 1980s and 1990s on two major forms of market-oriented crime, i.e., drug dealing and political corruption.

The sub-title of Ruggiero’s book describes another organizing axis of these essays, namely criminology as a discipline and research tradition with its convoluted history as both a central form of "official" knowledge and of radical critiques of liberal capitalist societies. Anti-criminology is not so much a theory (like labeling theory) or an ideology (like the anti-psychiatry movement of the 1960s) as it is a rejection of the premise that "crime" can be the subject of a distinct scientific theory with the aim of producing covering laws or even generalizations of an ultimately predictive nature.

The growth of the drug economy and a whole array of semi-legal and semi-illegal markets that Ruggiero describes challenges the very sustainability of the premise of criminology (official and critical) that there is a criminal subject to be interpreted at all. The young worker moving between selling drugs in clubs, fake designer tee-shirts at flea- markets, and at other times using skills as a carpenter to do urban loft improvements without proper permits, does not need to be explained as such.
However, if Ruggiero abandons the sociological tradition of seeking a general theory of deviance, it is not for a priori economic reasoning or moralistic sermons on the character of the poor, he remains committed to empirically exploring the way particular crime choices get made. A good example is the subject of political corruption that Ruggiero addresses in the second half of the book. The business executives offering bribes and the local officials taking them to arrange contracts do not suffer from a deficit of resources or opportunities that criminology has presumed must underlie the deviance of the poor. Indeed Ruggiero suggests that corruption reflects a surplus of both resources and opportunities, a criminality of the affluent.

What makes the whole of high interest is the effort to see criminal activity in the context of intense competition for advantage in highly dynamic fields rather than as an expression of a stultifying marginality. In this regard particularly Ruggiero's anti-criminology offers a potentially influential model of its own for how to retool the study of crime by reintegrating it with the study of law and politics.


4.5 Causes of Violence

Overview

<table>
<thead>
<tr>
<th>Why humans kill and assault one another has long been a matter of intense debate. Is it natural and inevitable, and thus only barely controllable? Is it a moral defect in the individual criminal? Or is what is termed violence in one society (or context) behavior that is rewarded in other environments or situations?</th>
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<td>Science magazine recently devoted an entire issue to the scientific study of violence with conclusions of significance to courts, lawyers and lawmakers.</td>
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4.5.1 Violence: A New Frontier For Scientific Research

"One is the past failure of our funding agencies to adequately support research on violence--its causes and the effects of various means to control it. The second is the failure of our legislators and public officials to apply even the limited knowledge that we do have to policies that address violence." "Understanding the biological underpinnings of individual violent behavior is an important aspect of the problem. Eventually, clarifying the biological basis of violent behavior may even lead to some effective therapies." "One direct response to violent acts is incarceration, and this has been the sledgehammer most often chosen. We also must learn more about individual development (biological factors and parenting styles, for example) and how these interact with community environments (that condone or discourage violence) and situational dynamics (when a gun enters a teenage dispute, events move much more quickly and lethally than only fists are involved)."

From the introduction by Alfred Blumstein (545) to a special section with six articles on violence (Science, 289, 28 July 2000. pp. 545, 569-594)

"A small band of researchers is pursuing provocative theories that implicate dysfunction of serotonin-containing brain circuits in violent behavior; suggest that violence is pathological, in that it is 'normal' aggression gone awry." (569) "Surgeon General David Satcher, meanwhile, is preparing a major report on strategies for treating violence as a disease--an approach he has long advocated." "The view that violent behavior can best be understood and prevented if it is attached as if it were a contagious disease that flourishes in vulnerable individuals and resource-poor neighborhoods." (571)
"Decades' worth of NIMH-funded studies on risk factors that appear to contribute to aggressive behavior, such as neglect and abuse in childhood, harsh and inconsistent discipline, and associating with anti-social peers." (572f)

"Some well-meaning programs designed to control aggressive children may be worse than useless; They may be doing harm. For example, collecting young people in group homes or sending them to boot camps or on wilderness ordeals—popular in many states—may intensify rather than reverse antisocial behavior." (573) "We are sending them to graduate schools for violence and delinquency."

"A bullying-prevention program focuses on elementary schools and attempts to change the social climate so that intimidation is a less acceptable way to solve problems." "Boys in foster care were far less likely to run away than those in group homes. Most important, boys in foster care were less likely to get into trouble." (573) "Therapeutic foster care, costing $1934 per delinquent is a bargain. The economists calculated that standard law enforcement costs an additional $27,000 per delinquent." (574)

"Scientists have long know that damage to certain brain regions can result in violent behavior." "Most violent individuals have no obvious brain damage." Most violent youths do not become murders." (580)

"Imprisonment alone can't explain the recent drop in violent crime because the boom in incarceration started in the 1970s and crime rates started falling almost 20 years later." The cause may be "the legalization of abortion." (583) "Legalized abortion accounts for 50% of the recent drop in crime." (584)

"Although incarceration and abortion are debatable contributors to the decline in violent crime, perhaps the most important factor is a drop in the number of guns on the streets." (584) "The FBI Unified Crime Statistics report for 1999 suggests that the recent crime drop may be slowing in big cities."

"The US is currently undergoing a 'civilizing process' Historians have traced the rise of cultural intolerance for interpersonal violence in Europe and the same phenomenon seems to be happening here." "Violence is increasingly not tolerated in the US." "Fewer people report hitting their adolescent children." "Fewer husbands hit their wives." "Intimate partner homicides has also declined steadily" (585)

But the economic boom is a big contributor to the decline "and we can't institute a robust economy." (585)

Much research focuses on individuals, but "the vast majority of aggression involves familiar individuals, which means that aggressors and victims share a past and can be expected to share a future." (586)
"The conclusion from this growing area of research is that human aggressive conflict is best understood as an integral part of the social network. It operates within a set of constraints as old as the evolution of cooperation. Certain forms of aggression, such as warfare and random shootings, fall outside this framework, but the majority of aggression arises within the face-to-face group or family. It is this context that shaped human social psychology for millions of years, including both discordant and integrative social tendencies. Without denying the human heritage of aggression and violence, this research demonstrates an equally old heritage of countermeasures that protect cooperate arrangements against the undermining effects of competition." (590)

4.5.2 Molecular Basis Of Aggression

Aggression is a primitive, yet highly conserved vertebrate behavior, and it is reasonable to expect that the molecular mechanisms underlying aggression are similar (and possibly ancient) among vertebrates. Species-specific features of aggression might be the result of adaptive cooping of novel molecules as modulators that have been incorporated into ancestral, pre-existing, neural circuits.

Although many other molecules can affect aggressive behavior, most appear to influence aggression by affecting the signaling properties of 5-HT. Understanding the interactions of 5-HT receptor subtypes should lead to novel insights into the molecular mechanisms underlying aggression.

SCAN CLUSTER 5
SCIENCE AND TECHNOLOGY

5.1 Breakthroughs

Overview

Every year, *Science* Magazine, the official organ of the American Association for the Advancement of Science and thus the major general science journal in the US, highlights the major scientific "breakthroughs" of the past year, and speculates on what might be the breakthroughs of the immediate future. Here is what they said for 2000 (Completion of the Human Genome Project—an event that we have long anticipated in our scans) and for 2001 (Rapid developments in nanotechnology. It is important to recall that "nanotechnology" was a far out fantasy when we began our work with the Virginia Judiciary. While its applications still remain limited, the basic science and technology is rapidly maturing).

5.1.1 Breakthrough Of The Year 2000

"2000 was a banner year for scientists deciphering the 'book of life'; this year saw the completion of the genome sequences of complex organisms ranking for the fruit fly to the human (Science 290 22 December 2000, p. 2220f).

And because of the death of 18-year old Jesse Gelsinger in a gene therapy clinical trial in late 1999, *Science* determined that "Biomedical ethics is on the front burner". The US Government established an Office for Human Research Protections within the Department of Health and Human Services (p 2225).

5.1.2 Breakthrough Of The Year 2001

"In 2001, scientists assembled molecules into basic circuits, raising hopes for a new world of nanoelectronics." "a feat *Science* selects as the Breakthrough of 2001. If researchers can wire these circuits into intricate computer chip architectures, this new generation of molecular electronics will undoubtedly provide computing power to launch scientific breakthroughs for decades." *Science* 294, 21 December 2001, p. 2442ff.

For 2002, the editors of *Science* suggested that since "The Bush Administration has limited federal support for human embryonic stem cell research...that leaves the door open for unfettered research in privately funded labs and in countries with less restrictive rules." "But also watch for legal and commercial entanglements as companies race to stake their claims in the wide-open field."

Also "Genes tell cells what proteins to make, so figuring out how proteins interact is vital for leveraging genetic knowledge in medicine and biotech." "Biotech companies and funding agencies are pouring hundreds of millions of dollars into untangling the proteome. Next year could see the first protein-based drug targets from biotech proteomics."

Also, "Chronic diseases generally result from the interplay of multiple genes. Geneticists have made much progress pinning down the genetic basis of single-gene disorders, but the roots of more complex diseases have been elusive. With the human genome sequence in hand, researchers expect to make clear progress in determining the relative contribution of various genes to problems such as heart disease, cancer and diabetes." (2444)

5.2 The Internet Society
5.2.1 Internet Futures

Overview

If there is any one thing that can be called THE major recent scientific and technological development that has changed the world in the past ten years, it must be the development of the Internet and the World Wide Web. Barring massive technological failures (perhaps caused by "terrorism" or economic/environmental collapse) evolving generations of the Web (the first of which is called the "Grid") will be agents of even greater changes in behavior and hence society.

5.2.1.1 The Internet Morphs From 'Novelty To Utility'

U.S. Web users are browsing for entertainment less, but employing the Internet more for activities such as telecommuting, online banking and making travel reservations, according to a study by the Pew Internet & American Life Project. "The Internet has gone from novelty to utility for many Americans," says Lee Rainie, director of the Pew project. "They are beginning to take it for granted, but they can't imagine life without it." Many users said the Internet is changing their offline behavior as well, with 25% reporting less television watching, and nearly a third of online shoppers saying they spending less time at bricks-and-mortar stores. The survey did not find a dramatic increase in telecommuting, but 14% said that having Internet access at home increased the amount of work they brought home, and the amount of time they spent doing it. Top on the list of complaints related to Internet use was the overwhelming amount of spam mail received, with 44% of respondents reporting it's a problem and more than half saying they'd received pornographic spam.

CNet/Reuters 4 Mar 2002.

5.2.1.2 Web's Enormous Potential For Evolution: Web still has enormous potential for evolution, scholars at SLAC conference say

Technologies like mobile computing, peer-to-peer networking, ubiquitous wireless access and intelligent software agents dramatically will change the way we interact with the web -- as long as big business doesn't strangulate innovation for the sake of its own profits. That was the message of a group of futurists, entrepreneurs, academics and computer pioneers that gathered Dec. 3-4, 2001, at the Stanford Linear Accelerator Center (SLAC) to discuss the web's past and future. The conference took place one week before the 10th anniversary of the first U.S. website, a three-line page that went online at SLAC on Dec. 12, 1991.

"The Internet is the most mutable, plastic medium we have had for 400 years, and it has barely begun to start," announced futurist Paul Saffo at the beginning of the conference's second day. The speakers singled out peer-to-peer (P2P) networking as the web's next major paradigm. In P2P networks, individual users' machines connect directly to each other; a personal digital assistant (PDA) can download a phone book directly from a next-generation cell phone instead of connecting through a server. "Peer-to-peer is about the observation that everything is a server now," said Phipps.

Another major change in the Internet will be the shift from today's human-driven applications -- sending e-mail, watching the news on streaming video or collaborating with business partners via videophones -- to applications where humans play little or no role.

The future of communication is not about people talking to people," said Saffo. "The future is machines talking to other machines on people's behalf." Armando Fox, an assistant professor of computer science at Stanford, agreed: "Most of what we think of as 'surfing' will be done by machines.

Internet entrepreneur Jim Fruchterman, web guru Nathaniel Borenstein and Stanford law Professor Lawrence Lessig instead spoke about the web's potential for social change -- and the threats that could undermine that potential. "The web is a bridge across many of the gaps we
have in today's global society between what's possible and what's profitable, between the rich and poor," said Fruchterman, the co-founder of a project to provide reading machines for the disabled.

But exactly whether and how those bridges will get built is not always clear; much depends on who controls the Internet itself, said Borenstein. "We're way behind on understanding how the Internet does and doesn't affect our society," he added.

Lawrence Lessig, whose books Code and The Future of Ideas have made him one of the most well-known voices in cyberlaw, talked about the forces that are shaping the "digital spaces" of the future -- often for the worse. Lessig said that cable giants like AOL Time Warner are using their control over high-speed Internet access to put the brakes on innovation and shut down the "commons" -- a shared community resource -- that made the Internet revolution possible.

New technologies, such as streaming video, cut into the core business of cable companies, said Lessig. Because the cable companies own the infrastructure -- the fundamental physical connections that make the network possible -- they can strangle the newborn technologies that threaten their dominance before they learn to walk. As Lessig put it, "This is giving the dinosaurs the power to veto mammals." Lessig also is concerned about the role of copyright in shaping the net of the future. The ability of creators to use the work of others -- whether the creator is a DJ sampling a piece of digital music or a programmer adapting a piece of computer code for his or her own use -- has been crippled, in Lessig's view, by increasingly restrictive copyright laws. Those laws have been periodically strengthened over the past 100 years under the influence of corporations with strong financial interests in protecting intellectual property, said Lessig. Only if copyright protection is balanced by a healthy respect for innovation, Lessig concluded, will the kind of creativity that gave birth to the Internet revolution continue.


5.2.1.3 The Grid: A New Infrastructure for 21st Century Science

Driven by increasingly complex problems and propelled by increasingly powerful technology, today's science is as much based on computation, data analysis, and collaboration as on the efforts of individual experimentalists and theorists. Built on the Internet and the World Wide Web, the Grid is a new class of infrastructure. By providing scalable, secure, high-performance mechanisms for discovering and negotiating access to remote resources, the Grid promises to make it possible for scientific collaborations to share resources on an unprecedented scale, and for geographically distributed groups to work together in ways that were previously impossible.


5.2.1.4 Grid Computing Planet 2002 Conference & Expo

The only trade show in the world dedicated to Grid technology, coming to San Jose June 17th-18th. Grid Computing Planet 2002 Conference & Expo will bring together Grid technology researchers, developers, vendors and users to learn, exchange ideas and hear Grid computing success stories. The event also will feature an interactive exhibit floor enabling Grid technology vendors to showcase their products and answer questions. The conference emphasizes topics that will help attendees determine how they can utilize Grid technology, what type of Grid application will work best for them, and what tools are available to get started. To view the whole agenda visit:

http://destinationsite.com/c/?c=552494.156693.0.14694.1.

5.2.1.5 Semantic Web

The Web is huge but not every smart. Computer scientists are beginning to build a "Semantic Web" that understands the meanings that underlie the tangle of information. Today's World Wide Web is fundamentally a publishing medium—a place to store and share images and text. Adding semantics will radically change the nature of the Web—from a place where information is merely displayed to one where it is interpreted, exchanged and processed. Semantic-enabled search agents will be able to collect machine-readable data from diverse sources, process it and infer new facts. Programs that weren't made to be compatible with each
other will share previously unmixable data. In other words, the ultimate goal of the Semantic Web is to give users near omniscience over the vast resources of the Internet, turning the millions of existing database islands into a single gigantic database Pangea.

Mark Frauenfelder, A Smarter Web, Technology Review, November 2001

5.2.1.6 Web Is Gaining On TV As Leisure Activity

Two new studies indicate that the Internet is successfully cutting into TV viewing time, with 80% of the multitaskers who watch primetime television while surfing the Net considering the Internet their primary activity, according to a report from Statistical Research. Another study, from Arbitron and Edison Media Research, asked people which medium they would choose -- the television or the Internet -- if they were limited to one. While television won out over all, a full one-third of respondents said they would ditch their TV set before disconnecting from the Net, and that percentage shot up to half among the younger, 12-24-year-old crowd. "The Internet is a young medium," says Arbitron VP Thom Mocarsky. "It's a surprise that so many refuse to give it up. Consider it a warning to the established electronic media."

Hollywood Reporter 2 Feb 2001


5.2.1.7 Fad Or Revolution--Blogging Sweeps Web

Whether it is just a fad or a truly revolutionary movement, Web logging, or blogging, is catching on. Bloggers, estimated between 500,000 and 1 million, publish online journals that cover a wealth of matters, including personal information, current events, opinions, commentary, or anything else that interests them. The advent of free, automated online publishing systems let the genie out of the bottle and caused a surge in the blogging population. "Now everybody can publish their own Poor Richard's Almanac," commented blogger Doc Searls. University of Tennessee law professor Glenn Reynolds, also a blogger, likes the system because feedback is so rapid, practically instantaneous. Pew Internet and American Life Project researcher Amanda Lenhart wonders if blogging is more than just a passing fad. "My sense is these Web pages offer a new functionality that wasn't too available to most people until recently, but the question is whether people will use them much in the future," she said.

Scripps Howard News Service. 6 March 2002.

5.2.1.8 No longer free?

The real force behind the Web, many software developers argue is that it’s free. Last August, the World Wide Web consortium’s Patent Policy Working Group proposed a set of procedure changes that would, for the first time in the consortium’s history, create an official structure for companies to collect licensing fees on technologies incorporated into Web standards. Such fees would typically be paid by companies that sell commercial software or services based on the standards, but could be passed along to the average Web user in the form of higher prices or usage charges.

Wade Roush. Web Tools Ahead? Core software may no longer be free. Technology Review, January-February 2002 v105 i1 p20(2)


5.2.2 Internet Sex
5.2.2.1 30% Of Teenage Girls Suffer Online Harassment

Thirty percent of teenage girls have been sexually harassed in a chat room, according to a poll conducted by the Girl Scout Research Institute. Only 7% had reported the harassment to their parents, however, because they feared being banned from online activities. Most of the girls said they tried to avoid pornographic sites, but that they sometimes ended up there by accident. They also reported receiving a lot of pornographic spam. And while the GSRI said parents should pay more attention to their daughters' online activities, 87% of the girls polled said they could chat online without their parents knowledge and 54% said they could conduct a clandestine cyber relationship. (NUA Internet Surveys 11 Mar 2002)

http://www.nua.com/surveys/?f=VS&art_id=905357736&rel=true

5.2.2.2 Virtual Infidelity.

Yale psychologist Janis Abrahams Spring writes that mental health professionals are seeing an alarming increase in relationships damaged by Internet affairs. J. Lindsey Short, a Houston attorney and president of the American Academy of Matrimonial Lawyers, said he and colleagues across the country are seeing a dramatic increase in divorce cases tangled in Internet affairs. One piece of technology in the works that could increase the number of cyberaffairs is a partial body suit that allows online lovers to stimulate each other electronically, even if they’re thousands of miles apart. You strap on a belt and attach it to the pelvis.

Patrick Kempt. Virtual Infidelity; In causing pain, it's the real thing. Chicago Tribune, February 3, 2002, Section: Health & Family; Pg. 1; Zone: C.

5.2.2.3 Porn Industry A Force In Driving Innovation

The world’s oldest profession has been instrumental for years in driving technological innovation. The porn industry was an early force in popularizing Polaroid cameras, VCRs, and CD-ROMs, and became the first industry to make money on the Web. Now it’s turning its eyes toward DVD technology and has begun making DVD movies that resemble video games, allowing viewers to watch and play along. "The technology fits our product," says one cutting edge DVD producer. Meanwhile, the interactive technology now pioneered by porn purveyors likely will find its way into mainstream Hollywood studios before too long: "It has a great children’s application, says David Crawford, DVD production manager for Wicked Pictures. "You can tell a nice little fairy tale and have this be the frame of it. The idea is great, whether the content is for adults or children."

Los Angeles Times 9 Jan 2001

5.2.2.4 Nanograsms?

"Just as porn accelerated the adoption of video as a mass medium, nanograsms will provide the juice to fund the nascent field of nanotech. Certainly NanOs tickle the fantasies of Gina "Nano Girl" Miller, Extropian president of Nanotechnology industries, a fan club and nonprofit research clearinghouse. The idea, Miller says, is that nanobots could conduct your neurons in a symphony of sexual pleasure. 'Sensations could be upgraded to mathematically multiply--to double, triple the original,' she says. 'Or you might be able to learn the different ways that different individuals experience orgasms on a cellular and molecular level, then pick and choose which of their responses to incorporate into your own.'"


5.2.2.5 Cyberbabes and Orgasmatrons Heat Up the Future
By 2012 the Orgasmatron -- the artificial sexual pleasure device dreamed up for Woody Allen's film "Sleeper" -- will become a reality, according to predictions for the next 30 years by Ian Pearson.

* Within four years, toys will be emotionally interactive, responsive to the feelings of the children playing with them.
* Humanoid robots will fill factory jobs by 2007. By 2015, robots will be able to take on almost any job in hospitals or homes.
* By 2010, up to a quarter of showbiz stars will be computer generated.
* By 2025, there will be more robots than people in developed countries. By 2030, robots will become mentally and physically superior to people and it will be possible to fully link computers to the human brain.

Reuters. February 16, 2002

5.2.2.6 Supreme Court To Hear Case On Computer-Generated Child Porn

The U.S. Supreme Court has agreed to hear a case that challenges the 1996 federal "Child Pornography Prevention Act," which makes engaging in child pornography a crime even when the images depicting minors engaging in sexually explicit acts are generated entirely by computer, without the participation of real children. A lower court overturned the law, ruling that it "criminalizes the use of fictional images that involve no human being" and are "entirely the product of the mind." However, both Congress and the U.S. Justice Department have taken the position that the law protects real children by reining in a pornography industry that desensitizes viewers and thus puts children at risk of exploitation.

New York Times. 23 Jan 2001

5.2.3 Internet Commerce

5.2.3.1 Online Sales Up 20% in 2001

U.S. consumers spent an estimated $32.6 billion online last year, boosting sales figures by 20% over the previous year's numbers. The growth is due, in part, to merchants' efforts to simplify online shopping by storing billing and shipping information and offering one-click checkout features, says E-Tailing Group President Lauren Freedman: "Once you get into it I think people get hooked." To put the numbers in perspective, catalog sales, which have been around for decades, totaled about $72 billion last year, double the amount generated through online shopping. "It's fairly significant in a fairly short time span," said Freedman. The online sales estimates do not include sales from ticket agencies, online travel services and financial brokers.

Los Angeles Times. 21 Feb 2002

5.2.3.2 Companies Boost Productivity Through The Web

Moving traditional business functions to Internet-based technologies is saving U.S. companies tens of billions of dollars a year and boosting the growth rate of U.S. productivity, according to a new survey of 2,000 companies, sponsored by Cisco Systems and authored by Hal Varian, dean of information management at the University of California, Berkeley, and Robert Litan, director of economic studies at the Brookings Institution. The report estimates that using Internet-based technology for things like supply chain functions and customer relationship management saved U.S. businesses $155 billion from 1998 to 2000. That total could rise to $500 billion by 2005, if every company adopted all available technologies, says the head of Cisco's Internet-solutions business unit. Based on those estimated savings, using the Web for business functions could boost the U.S. productivity growth rate by 0.36% a year.

Wall Street Journal 4 Dec 2001
http://interactive.wsj.com/articles/SB1007419980707882280.htm (sub req'd)
5.2.3.3 Online Spending Keeps Rising While Economy Shrinks

Online sales grew last quarter at a time when overall retail sales dropped 2.6 percent, according to Commerce Department figures. Although growth over the second quarter was marginal, e-commerce showed an increase of 8.3 percent over last year, giving evidence that the e-commerce sector is more resistant to downward economic pressure than other retail sectors. Nielsen//NetRatings and Harris Interactive have published another report that shows significantly greater growth than the Commerce Department because they included online travel sales, auctions, and event ticket sales, which are not considered retail by the government. That study showed third quarter e-commerce sales 60 percent higher than the same period last year, up to $16.3 billion from $10.3 billion.

† Investor's Business Daily, 29 November 2001

5.2.3.4 B2B: From Boom To Bewilderment And Back?

Rumors of e-commerce's demise, it seems, have been greatly exaggerated, especially in the B2B arena. In May, Daimler-Chrysler claimed a 3-billion euro auction on auto exchange Covisint; in August, General Motors announced it had procured $98 billion in raw materials through the same exchange. In June, retail marketplace GlobalNetXchange announced its transaction volume had surpassed $1 billion. While 2000 online marketplace sales of $141 billion were less than 1 percent of total B2B transactions, research group GartnerG2 nevertheless describes growth as "spectacular," a 585% increase from 1999. "By 2005, public and private e-marketplaces will become the dominant B2B trade mechanisms for thousands of companies," said the GartnerG2 report. (Line 56 15 Nov 2001)

† http://www.line56.com/articles/default.asp?NewsID=3145

5.2.3.5 E-Commerce: "A Nice Business, Not A Great One"

The Gartner Group, which predicted in January 2000 that by 2004 the value of global transactions flowing through the Internet would be $7.3 trillion a year, has now revised its projection downward by more than $1.3 trillion. One of Gartner's critics, David Simons of the institutional research firm Digital Video Investments, complains that predictions such as the one Gartner made last year "seduced investors and companies to overextend themselves. The subtext of all these projections was that somehow the Internet business models were far superior to what they replaced - that they were the most fantastic thing since Dell and Gateway invented direct selling of PCs. But the business models weren’t revolutionary. And there will always be so much competition that, for most players, at best it'll be a nice business, not a great one."

† New York Times 26 Mar 2001
http://partners.nytimes.com/2001/03/26/technology/26ECOMMERCE.html

5.2.3.6 Slouching Toward The Paperless Society

How far as we from becoming a paperless society? Still pretty far, but financial institutions are certainly heading in that direction. Some companies, such as Datek, now charge a fee for each trade confirmation on paper; others, such as E*Trade, issue only electronic statements unless customers specifically request paper ones. Still, many companies are testing the temperature before getting in the water, and a Wells Fargo executive says, "At this point we are still focused on allowing customers to choose the option they are most comfortable with"; the company, along with companies such as Bank of America and Vanguard Group are encouraging paperless accounts but not making them mandatory. One problem is that some institutions still make the process a hassle, and one mortgage company loan processor says that at least four banks have told her that loan applicants must have original statements going back two months: "Lots of people get really angry, saying, 'Why can’t I just fax you what’s on the Web?'"

† San Jose Mercury News. 12 Mar 2002

5.2.3.7 Wristwatches To Tell Time, Order Hamburgers, Pay For Gas
The Timex watch company has developed some wristwatches with Speedpass technology that uses a radio frequency transponder to communicate credit or debit card information allowing customers to pay instantly in places like Exxon and Mobil gas stations and McDonald’s restaurants. The watch is currently being test-marketed in Illinois. (AP/USA Today 28 Feb 2002)

5.2.3.8 Bellsouth Hangs Up On Pay Phones
Bellsouth has decided to try to sell its 143,000 pay phones, because their usage has "decreased dramatically" due to the rapidly growing phenomenon of wireless communications. It’s unlikely that the company will get much money for them, because they are dispersed over the entire region served by Bellsouth, rather than concentrated in high-volume locations, and because industry analysts such as Jeff Kagan see their future extending for just a few more years: "The future pay phone will have keyboards and touch screens and will let people access their e-mail and voice mail boxes and access other Web-based information. That will give the pay phone business a few more years of viability, but ultimately, devices that make calls and send e-mail will be cheap enough for everyone to carry one."

Atlanta Journal-Constitution. 3 Feb 2001
http://www.accessatlanta.com/partners/ajc/newsatlanta/payphone0203.html

5.2.4 Internet Crime

5.2.4.1 Spam A Growth Industry?
Spam is nothing if not a growth industry. On average, 11 percent of all e-mails now are spam. The average e-mail user got 1,470 unsolicited commercial messages last year.


5.2.4.2 The High Cost Of Spam: Business Week
For corporations and ISPs, all of this will be costly. Ferris says most businesses are woefully unprepared for the onslaught: "Right now, it's still only an irritant," he says. "A year from now, it will materially interfere with business." One study shows that a company with 500 employees, each of whom receives five junk e-mails per day and spends about 10 seconds deleting each one, can expect to lose close to $40,000 per year in wasted salaries and 105 days in lost productivity.

http://www.businessweek.com/technology/content/mar2002/tc2002031_8613.htm

5.2.4.3 Have IPOD, Will Shoplift?
It turns out that Apple’s new iPod device is well-suited to electronic shoplifting, with its roomy 5GB hard drive capable of serving as portable storage for very large files, such as the latest Mac OS. A CompUSA shopper describes watching a young man equipped with an iPod walk over to a nearby display Macintosh, plug his iPod into the machine with a FireWire cable, and copy Microsoft’s new Office for OS X suite, which retails for $500. The whole process took less than a minute. "Watching him, it dawned on me that this was something that was very easy to do," said witness Kevin Webb. "In the Mac world it’s pretty easy to plug in and copy things. It’s a lot easier than stealing the box." And while the iPod has a built-in anti-piracy mechanism that prevents music files from being copied, there are no such protections for software. "This is the first we have heard of this form of piracy," said a Microsoft product manager. "And while this is a possibility, people should be reminded that this is considered theft."

Wired.com 28 Feb 2002
http://www.wired.com/news/mac/0,2125,50688,00.html

5.2.4.4 Internet Gaming Is Increasing
Internet gaming is growing. Internet gambling sites could generate an estimated 5 billion in revenues by 2003. The figure approximates roughly half of last year’s casino earnings in Nevada. In the United States, where many states have banned internet gambling operations, MGM Mirage
and Harrah’s have announced new on-line play-for-free or play for prizes operations that are but a short step away from internet gambling. In addition, Nevada recently became the first state in the nation to enact legislation to open the door to Internet gambling.

- Sue Kelly. Gambling on the Internet. FDCH Congressional Testimony. 7/12/2001;

An Australian company EventsMarket, has developed a stock exchange or future-style wagering system that allows sports fans to buy and trade coupons at fixed prices on events of any kind. They plan on linking gambling activities to interactive TV creating a unique stock exchange style wagering system allowing anybody in the world to bet on any event as long as someone else is prepared to match the bet. As conditions in the event change in the lead-up, or during the match, the price will change and fans can buy or sell. The company sees the services more as brokering than bookmaking. The operators brokers bets and does not take the risk. The product has been launched in Europe and Canada.


5.2.4.5 E-Mail Sharing Banned By Law In Australia

Forwarding e-mail to friends, family or colleagues without permission from the sender is now illegal in Australia, thanks to a new law that took effect yesterday. Penalties for violation could be as much as five years’ jail time or fines of AU$60,000 (US$31,400). The motivation behind the law is copyright protection for the sender of the original e-mail. But in addition to material that already has copyright protection, such as excerpts from books or song lyrics, the new measure also affects personal messages. "It's quite possible that the forwarding of an e-mail could be a technical infringement of copyright," says a legal advisor for Australia's attorney general. "E-mailing something is a 'communication' under the Digital Agenda Act and so is putting something up on a Web site." This new interpretation means a simple e-mail about office gossip or holiday plans also carries personal copyright protection. It is estimated that 5 million or more e-mail messages are forwarded around Australia every day.

- The Sunday Telegraph. 4 Mar 2001

5.2.5 Internet Learning

5.2.5.1 Skipping Class 101

Harvard University is offering a new online service to students that allows them to view videotaped lectures at their convenience. The videos are posted on a private Web site and are usually available within hours of the actual class time. Many professors, however, complain that the new service encourages students to skip class and cram online before tests. Paul Bergen, senior manager of the Instructional Computing Group at Harvard, argued that 70 percent of the page views for the video watch between 5 minutes and 30 minutes, indicating that most of the online reviewers are just reviewing select portions of the lecture that they need to clarify. Some professors have taken precautions against excessive absenteeism by restricting the time recorded lectures are online, making it impossible for students to catch up on an entire semester's worth of work during finals week.

- Wall Street Journal. 22 August 2001

5.2.5.2 Lectures vs. Laptops.

Something alarming happened in my contract law class. I asked that laptop computers be used only for note taking, and my students went ballistic. Solitaire and Minesweeper are everywhere now in university classes. At Yale, where classrooms are wired to the Internet, students can also surf the Web, send e-mail or even trade stock. Soon the wireless Internet will make this possible at all schools. Not all students do this sort of thing. But the abusive use of laptops is getting to be increasingly prevalent. Students toggle between windows during any part of the class they deem to be boring often when their fellow students are asking questions or answering them. Seeing the person in the next seat playing a video game while you are trying to
puzzle out a law question is demoralizing. And students who surf are not fully present to ask or answer questions themselves.

Admittedly, students can mentally check out of class in other ways for instance, by daydreaming or doodling. But not all activities are equally addictive. I should know. I may be the only law professor to have asked for cybersitter filtering software to keep me from surfing the Web too much at my office. Still, I was surprised at how brazenly my own students resisted my laptop restrictions, both in class discussion and in a virtual chat room (which, perversely, they could post to during their other classes). They argued that they were multitasking, staying productive during dead or badly taught portions of class. They said classroom surfing reduces sleepiness, increases their willingness to attend class, allows them to research legal questions being discussed, and so on. They said the professor has an incentive to teach more effectively when he or she must compete against other more interesting claims on students’ attention.

Their arguments could apply equally well to the opera hall, the jury box or the church pew. Will the lure of technological stimulation someday overwhelm current mores about paying attention in those places, too? At least, we should try to stem the tide in the classroom. Few students say on their admissions applications, after all, that they intend classroom solitaire to be a central part of their educational experience.

Ian Ayres. Professor of Law at Yale.

5.2.5.3 Mobile Bubble of Learning

Cell phones, Palm Pilots, wireless Web - they help us check email, trade stocks and stay in touch - but can they help us learn? Can we, should we, try to fill in gaps of daily time with learning opportunities? Last summer, the Stanford Learning Lab (SLL) developed a few rough prototypes for mobile learning. The SLL staff chose foreign language study as the content area, hypothesizing that mobile devices could help provide sorely needed opportunities for review, listening and speaking practice in a safe, authentic, personalized and on-demand environment.

The prototypes developed let users practice new words, take a quiz, access word and phrase translations, work with a live coach, and save vocabulary to a notebook - all in an integrated voice/data environment. The intent this summer was not yet to support an actual Stanford course, but instead to begin exploring recent technologies and fundamental human cognitive challenges involved in learning on-the-go.

The SLL’s vision was to fill in gaps of time -- to create a bubble of learning that you carry with you, but may only access for periods of 30 seconds or 10 minutes at a time. Being mobile correlates with highly fragmented attention, and the challenge was to better understand what kind of learning can happen in those fragmented pieces of time.

Speaking of Computers, Issue 55, January 8, 2001

5.2.5.4 Stanford Students in Palm PDA Wireless Trial

Palm is working with students at Stanford University Law School to determine how well PDAs aid learning. Through the online law database West Group, the Stanford students will have wireless access to a legal research service and several e-book titles. Students and faculty receive a Palm PDA, six months of wireless access, software, and a portable keyboard. Other campuses are also experimenting with such wireless technology, including the University of North Carolina at Chapel Hill, where students can access the high-speed Internet on their laptops through Cisco transmitters. The University of Maryland has established the Hinman CEO program to provide select students with a living environment that contains business tech tools, including high-speed connections, voice-over Internet capacity, and video teleconferencing. Meanwhile, the National University of Singapore says it plans to make lectures and tutorials available over the Web, with students using laptops connected to a campus-wide network to access the lectures.

Newsbytes. 23 May 2001

5.2.5.5 Handhelds To Be Harvard Medical Students' First Assist
This August, 338 Harvard Medical School students will begin using PDAs as their main data tool—the first institution in the United States to make PDAs the standard instead of personal computers, Harvard officials claim. The PDAs will be used for such tasks as taking class and patient notes, scheduling class, hospital rounds updates, and e-mail. Educators will be able to package and send text, graphics, and tables, and PDA users will be able to exchange data with PCs through the Internet. John Halamka, the school's associate dean for educational technology, says PDAs are necessary to keep students on track and on the move, thereby saving time for learning. The PDA network uses AvantGo software and servers for the system's Internet applications, and Halamka believes that implementing the system will cost about $350,000.

5.2.5.6 Researcher Sees Role For Virtual Reality In Distance Education

Jaron Lanier, chief scientist for the National Tele-Immersion Initiative, believes virtual-reality technology that he helped pioneer will play a significant role in distance education. He stressed that it is particularly important for the teacher to perceive that the students are close enough to interact with, a distinction that current online education technologies do not support well. Tele-immersion, Lanier said, would be an excellent platform for academic collaboration and small seminars. Cost will be a key factor in virtual reality's penetration into the education sector, he explained. Lanier predicted that some virtual-reality hardware will become more affordable. Cheap alternative display devices should debut in the next several years, for example. Lanier foresees a time when geographically distant students will be able to attend lectures in which teachers are represented by three-dimensional images. The educators will use similar imagery to represent the class, fostering a healthier level of interaction than current broadcast-based technologies.

5.2.5.7 Learning In 3-D

Universities and companies are using 3-D virtual classrooms, highly interactive e-learning environments that offer participants a sense of belonging that distance learning programs often lack. "We want people to feel as if they have gone somewhere else to participate in a learning experience rather than just reading a page on screen," explained Sitel's senior vice president of human resources, Sheena Wilson. "So we've recreated as best we could the visuals associated with going somewhere." Students can communicate with each other through representative avatars and visit virtual classrooms or even more expansive environments online. Activeworlds.com offers universities free Web connections between a certain number of students and the virtual classrooms, but charges for additional students as well as more sophisticated 3-D worlds. Meanwhile, Sitel University offers corporate training via virtual classrooms to managers worldwide.

5.2.5.8 3-D Software From Adobe

Adobe Systems Inc., which is the leading maker of desktop publishing software, is introducing a new product that will let designers create 3-D Web pages where visitors can interact in real-time, as though they were in a store or showroom. A beta test version of the software, which is called Adobe Atmosphere, is available for free at the company's site, www.adobe.com.

5.2.5.9 Immersive Web Technologies
Researchers studying immersive Web technologies at universities across the country are pioneering the future of the Internet. The hope is that within 10 to 15 years Web users will be able to see 3D images, hear full-channel sound, and even feel the texture of a fur-lined coat they plan to buy online. Jaron Lanier, chief physical scientist at Advanced Network & Services, says the real benefit will come from being able to interact with other people using the entire range of human senses. However, bandwidth and processor speeds remain barriers to refining the super-sensitive subtleties of human interaction. Researchers at the University of Southern California (USC) are exploring the use of haptics, a force-feedback technology that allows people to feel digital objects. Regardless of the advance of immersive Internet capabilities, some experts doubt whether this will be the end of the line using technology to replicate real life. Jaron Lanier says human senses are so refined that, although we may be wowed by new technologies, people will soon be able to quickly distinguish between the digital and corporeal.

- *Los Angeles Times*, 5 February 2001

### 5.2.6 Internet Health Care

#### 5.2.6.1 Doctor On The Net

The Scottish Higher Education Funding Council has announced that it will support a feasibility study for an International Virtual Medical School. The project would use e-learning to provide training software for medical students, access to seminars, and sharing of expertise from around the world. So far, eight British, eight North American, and four Australian medical schools have become involved in the undertaking; China has also indicated that it would like to participate. The project could revolutionize medical training, said Prof. Ronald Harden of Dundee University. Rather than foster rivalry, the organization would support cooperation among schools, he said. In addition, traditional universities should get involved in such an area before commercial training groups do, Harden explained. He envisions "a repository or bank of reusable learning objects." Harden believes that copyright issues would be avoided by labeling videos, lectures, and so on.

- *Guardian* (London), 4 December 2001

#### 5.2.6.2 Bad Advice?

A recent issue of the British Medical Journal published a study of 121 health-related websites. Although there has been some improvement over the past few years, accuracy of information is low in five common health topics. The Database of Adverse Events Related to the Internet (DAERI) is seeking information on patients who may have been harmed psychologically or physically because of information on the Internet or through web prescribing of medicines, misdiagnosis, or delays in seeing a doctor.

- March 8, 2002
- [http://www.medcertain.org/daeri](http://www.medcertain.org/daeri)

#### 5.2.6.3 Health Sites Get Accreditation From Standards Group

The American Accreditation Health Care Commission has put the stamp of its approval on 13 online health-care sites, the first such sites to earn AAHCC accreditation. AAHCC sets quality standards for managed-care and other health-care programs. The move is aimed at helping people sort out good information from bad in the health care field, which has become a popular area of online research among consumers. "There is so much bad information on the Internet, especially about health-care content," said Kevin Noland, COO of A.D.A.M., one of the sites to earn accreditation this week. "Someone needs to set a standard so people feel they are getting information from a trusted source." Standards for approval include full disclosure about funding and advertising, quality of editorial content, linking to other sites, and privacy and security. Other accredited sites include WellMed, WebMD and Health Insurance Association of America.
5.2.6.4 E-Health, Telehealth, And Telemedicine: A Guide To Start-Up And Success.

5.2.7 E-Books

5.2.7.1 E-Books Victorious
Mark Gross, president of Data Conversion Laboratory, thinks that the e-publishing has already won a stealth war: "What people forget is e-books were going strong before they were called e-books and they went on to sweep into many aspects of business and publishing. Most of this has gone unnoticed by the media. Probably because it has been a kind of backdoor revolution. To cite one example: Print law books are just about gone. People don't use them in law firms anymore. It's all electronic books or online. A revolution has occurred, but no one's noticed."

5.2.7.2 Reported Death Of E-Books Was An Exaggeration
Despite recent demise of e-book imprints at Random House and AOL Time Warner, industry e-book sales have actually continued to rise (though the total numbers are still in the tens-of-thousands, not the hundreds-of-thousands). Patricia Schroeder, head of the Association of American Publishers, says: "Publishing houses are still very much watching how this is unfolding. This is a nation that always overhypes technology in the beginning and then overreacts in the other direction."

5.2.8 Telecommuting

5.2.8.1 Telecommuting: Overview Of Challenges Facing Federal Agencies
Robert E. Robertson, director, education, workforce, and income security issues, before the Subcommittee on Technology and Procurement Policy, House Committee on Government Reform. GAO-01-1116T, September 6.

5.2.8.2 Working Via The Net Gains Popularity
A new study commissioned by WorldCom shows that almost half (46%) of the U.S. workforce works remotely over the Internet at least once a week, whether from home or with colleagues at other company sites. More than two-thirds say they'd like to do so more often, and 14% say they use the Net for some type of remote work every day. The study found that 91% of those surveyed said using the Internet for meetings and collaboration saves time and money, and 61% invest that time into more work-related tasks. The remainder said they use it to spend more time with friends and family. Fifty-five percent of workers polled said meetings held online or through phone conferencing tend to be shorter than face-to-face meetings, which is a good thing, says the Gartner Group, because workers with access to instant messaging systems tend to multitask during meetings anyway. When meetings tend to drag on "workers will dive into more productive interactions via wireless [messaging]," says a Gartner research director. One workplace productivity consultant points out that "virtual workers" tend to work longer hours and have a more entrepreneurial mindset than office-bound employees.
5.2.8.3 Rep. Wolf Wants $500 Tax Credit For Telecommuters

Rep. Frank Wolf, R-Va., reintroduces a bill that would provide a $500 tax credit for employees who telecommute, either by working at home or from telecommuting centers.


5.2.8.4 Work From Home, Save The Environment

The U.S. Commerce Department has begun a pilot program that will give economic incentives to companies in five cities with poor air quality -- Los Angeles, Houston, Denver, Philadelphia and Washington -- for allowing their employees to telecommute. Commerce Secretary Norman Mineta assured a group of Los Angeles executives: "E-commuting is a tool that help your employees be more productive workers. It could be the best thing you do for your bottom line this year."

- AP/San Jose Mercury News. 22 Aug 2001

5.2.8.5 The Organizational Context Of Teleworking Implementation

The authors identified ten drivers that facilitated the implementation of teleworking in an organization: 1) active in the knowledge-based sector; 2) located in a congested area; 3) characterized by a high level of electronic communication; 4) driven mainly by output-oriented coordination and control systems; 5) focused on nonroutine decision making; 6) building upon team organization; 7) experienced in the use of flexible work hours; 8) experienced in outsourcing; 9) characterized by a high number of employees; 10) characterized by a high proportion of white collar workers and a high proportion of employees with a high education level.


5.2.9 E-Government

5.2.9.1 Electronic Democracy And Environmental Governance: A Survey Of The States

Information technology is rapidly changing the way we work, shop, and play. Some envision a future where it also has a profound effect on democracy, with governments at all levels using Internet-based technology to engage citizens in the democratic process. A new paper by researchers at Resources for the Future (RFF) says that state-level governments are in an early and experimental phase in applying the principles of electronic democracy to environmental decisionmaking. The paper describes an RFF survey examining how all 50 states use the Internet to engage citizens in environmental issues.

(The survey can be found at http://www.rff.org/disc_papers/PDF_files/0042.pdf)

RFF researchers found that while all 50 states have environmental Web sites that provide at least basic information, relatively few use the Internet for active on-line interaction between citizens and government, or among citizens themselves. Beyond simply providing information, states were evaluated for the degree to which their Web sites invite public involvement in the environmental decisionmaking process. Only 36 percent of states received a high score for allowing the public to submit electronic comments on proposed regulations via e-mail or a Web-based form. Interviews with state agency staff, however, suggest that on-line notice and comment is emerging as a key interactive feature in many states, and on-line input is increasingly being treated the same as that received through more traditional means.

The survey is one part of a larger project at RFF to examine the impact of the Internet on public participation in environmental decisionmaking. For more information on the RFF project on Electronic Environmental Democracy: The Future of Information Technology in Participatory Environmental Management, go to

- October 19, 2000
5.2.9.2 Democratic Divide: The Impact Of The Internet On Parliaments Worldwide

An investigation of 179 parliamentary websites.

- [http://pro.harvard.edu/abstracts/038/038010NorrisPipp.htm](http://pro.harvard.edu/abstracts/038/038010NorrisPipp.htm)

5.2.9.3 Student Government Online.

Students in Washington State University's online education program now have their own student government, making the school one of the first in the country to have this. Student-affairs officer Renee R. Smith said the online government fulfills all the same functions as a traditional student government but with "a distance spin on it." Meetings of the online Senate and online committees are held in chat rooms, and all online students are invited to participate. The president of the online government, Lori A. Schaer, has online office hours once a week and answers questions from online students via e-mail. She said the government is essential for the online student population, many of whom have questions about the very nature of their program. "A lot of our students are a little bit older and just getting into using technology," she said. The online government held a real-world gathering last spring in Seattle so that students could meet with advisers and career professionals. The online student government has a budget this year of $58,800, which includes stipends for the officers and salaries for the Webmaster and other developers.

- [Chronicle of Higher Education. 16 March 2001](http://chronicle.com)<ref>

5.2.9.4 Internet Changed Culture Of S. Korean Vote; Citizens Web Page's Role In Exposing Candidates' Pasts Exemplifies Political Tool Of The Future

The Internet emerged in Thursday's South Korean parliamentary elections as a powerful political tool that will affect how future elections are run here and perhaps elsewhere in Asia, according to politicians and analysts today. If there is any doubt, they say, just ask 58 of the losing candidates. The Internet played an instrumental role in their defeat.

"The Internet has proven itself to be a medium to be reckoned with," said Auh Taik Sup, a professor of mass communications at Korea University and president of the Korean Cyber-Communications Society.


5.2.9.5 republic.com

In REPUBLIC.COM Cass Sunstein convincingly argues that deliberative democracy is challenged by the rapid expansion and diversification of information and communication choices, particularly those facilitated by the Internet and cyberspace. Sunstein also cautions that the tendency for individuals to exhibit consumer sovereignty and practice perfect filtering by consuming only that information which they choose undermines the preconditions for a well functioning system of free speech necessary for deliberative democracy. Deliberative democracy depends on free speech, not just speech that is free of censorship, but also speech as a right of access to venue and audience (e.g. "public forum"). Free speech therefore includes the opportunity to be exposed to multiple viewpoints expressed in common venues as well as in the unplanned and often unwanted situations of daily life.


5.2.9.6 Most Web Sites On The Hill Unimpressive, Survey Finds

A recent survey of congressional Web sites has identified "a digital divide" within Congress, in which a small minority of offices boast sophisticated sites while the majority offer unimpressive ones. The Congress Online Project, a venture funded by the Pew Charitable Trusts, evaluated the Web sites of all 605 House and Senate personal offices, committees and leadership offices. Just 10 percent received grades of A or B, while 90 percent got grades of C or below.
"This is a good news-bad news report," said Rick Shapiro, who headed the survey. "The good news is that we found some wonderful Web sites that have created models for how legislators can effectively use this medium. The bad news is that most offices aren’t aware that these great models exist, and they’re making lots of common mistakes that greatly reduce traffic to their sites." Part of this disparity stems from the fact that the lawmakers have a different agenda from the constituents, lobbyists and journalists who are searching the Web. As the report notes, those accessing the sites "are seeking basic legislative information such as position statements, rationales for key votes, status of pending legislation, and educational material about Congress. However, offices are using Web sites primarily as promotional tools -- posting press releases, descriptions of the members’ accomplishments, and photos of the member at events."

Party affiliation is not a reliable indicator of Internet savvy. Of the top 24 House sites, 79 percent were managed by Republicans and 21 percent by Democrats. But of the 11 award-winning Senate sites, 73 percent were managed by Democrats and 27 percent by Republicans. Among leadership sites, Republicans bested Democrats 75 percent to 25 percent.

The best sites, according to the project, correctly identify their audience; provide up-to-date, targeted content; offer opportunities for interaction; are easily used; and employ creative innovations. The Web site for Sen. Jeff Bingaman (D-N.M.), for example, features a map of New Mexico that provides constituents with easy access to news releases related to where they live, as well as special sections targeted to students, educators, businesses, first-time visitors and frequent visitors. House Republican Conference Chairman J.C. Watts (Okla.) racked up 1.7 million visits last year by "pushing the boundaries of what is possible for Congress on the Web and applying practices in line with some of the best practices for private sector Web sites," according to the report. The site, www.gop.gov, allows visitors to create customized versions of the page, provides links to "hot topics" and posts an online discussion board.

"We have done some pretty innovative things with technology, creating the first congressional Web site to link the entire House Republican Conference together with an organized, central and searchable electronic clearinghouse," Watts said. The site "helps Republicans in the House communicate and get our message out to a whole new audience."

The report also outlined several mistakes other lawmakers were making with their Web pages, though the authors declined to identify any of the offending sites. These errors included engaging in excessive self-promotion, failing to provide fresh content and including so many graphics that visitors have to wait several minutes to download the site.

A quick Washington Post survey of congressional sites last week found quite a few lawmakers who fell into these digital traps. Rep. James A. Traficant Jr. (D-Ohio) posts a campy image of himself waving a placard that declares, "Bangin' Away in D.C." That graphic, however, makes downloading the site more time-consuming. Rep. Todd Akin (R-Mo.), meanwhile, has a feature that has a July 16 news release as its most recent news flash.

Still, Congress as a whole is making progress. The report notes that a similar study in 1999 found only 12 sites worthy of recognition, compared with 35 this time. According to Shapiro, the benefits of having a good site are obvious: California Rep. Mike Honda, a Democrat from Silicon Valley, receives more communications via the Internet than by phone, fax and mail combined. "If you build it, they will come," Shapiro said.

Juliet Eilperin

Vice President Dick Cheney on Wednesday introduced the redesigned FirstGov Web site <www.firstgov.gov>, which the government hopes will be a significant step forward in the way government responds to the public. The new site coordinates 35 million federal, state, and local government Web pages, allowing users to apply for jobs, renew driver’s licenses, research laws, and many other activities. According to Mark Forman, who directs federal "e-government" efforts, the organization of the new site allows users to find what they are looking for within three mouse clicks.
5.2.9.8  2000 Digital State Survey

The Center for Digital Government, in conjunction with the Progress & Freedom Foundation and Government Technology magazine, conducted the 2000 Digital State Survey. This yearlong, four-part study, sponsored by Compaq Computer Corporation, explored eight areas of technology application in the 50 states: electronic commerce, taxation/revenue, social services, law enforcement and the courts, digital democracy, management/administration, higher education and K-12 education.

Each quarter throughout the year, survey results from two of the eight categories were released with the top-10 ranked states in each category featured in Government Technology magazine.

NOTE: Virginia does not appear among the top twenty-five in the "Law enforcement and courts" category.

 July 25, 2001
http://www.centerdigitalgov.com/center/digitalstates.phtml

5.2.9.9  States Receive Grade In E-Government Study

"State Web Portals: Delivering and Financing E-Service" (January 2002), a Price Waterhouse Coopers Endowment study of state Web service portals found the top five states to be California, North Dakota, Maine and North Carolina while the bottom five are New Jersey, South Dakota, West Virginia, Nevada and Tennessee.

Virginia ranked 8th, and was cited positively frequently in the report.

The report examined the functionality of all 50 state web portals by evaluating their features and content across four dimensions: openness, customization, usability, and transparency. Openness is the extent to which a government website provides comprehensive information and services; customization indicates the extent to which users can create uniquely tailored views of the portal content; usability refers to the accessibility of the content for a range of users; and transparency indicates the ease with which users can assess the legitimacy of the content. High-functioning web portals are those incorporating features in each of the dimensions. The more features included on the web portal, the higher the level of functionality of the portal.


5.2.10 China and the Internet

5.2.10.1 China To Become Intel's Biggest Customer In Asia

Seeing Asia as Intel's biggest source of growth as the region catches up with the rest of the world in the use of computers, Intel executives predict that much of that growth will occur in China, which will overtake Japan as a customer for Intel microprocessors. Japan is still struggling with a decade-long economic slump, whereas China has new economic momentum derived from its entry into the World Trade Organization. Intel chief executive Craig Barrett says, "Probably this year or next China will surpass Japan as our largest customer." (Reuters/New York Times 1 Mar 2002)

http://www.siliconvalley.com/mld/siliconvalley/2767753.htm

5.2.10.2 Chinese Will Be Most-Used Language On Web By 2007

Chinese will top English as the most-used language on the Web by 2007, according to forecasts by the World Intellectual Property Organization. Currently, a slim majority of the world's
460 million-plus Internet users are from English-speaking backgrounds, but by next year most Internet users will have a mother tongue other than English, and by 2003 a third of users will be communicating in another language online. The development will bring a proliferation of multilingual domain technical problems and disputes over the use of trademarks as domain names, says WIPO. (Financial Times 7 Dec 2001)

5.2.11 Beyond Reading And Writing?

5.2.11.1 They Don’t Read Newspapers

Newspaper publishers who think the downturn in the Internet financial world takes the pressure off getting a presence online -- and who, in fact, cut back their electronic presence -- should think again, said Brent Baker, dean of Boston University's College of Communication. Today's 40 million Generation Y news consumers will spend their entire lives using the Internet to read their news, he says: "This is the first generation that doesn't need us. They don't read newspapers. ... If you bring people into this new media world as children, do you really think they'll go out and buy the New York Times?" A panel of 18- to 20-year-old college freshmen agreed with Baker, citing inconveniences ranging from newsprint ink stains to the time it takes to navigate a newspaper vs. an indexed Web site as reasons they prefer the Internet. "It's a part of my lifestyle," said one student. "Everything moves so quickly now. I don't have time to sleep, let alone read the newspaper." Baker concluded, "There will come a time when your online unit will be supporting your offline unit. There will be a great erosion in readership -- with one exception: community newspapers." But even the ultra-local paper will eventually wind up online, he added.

5.2.11.2 Language And The Internet

How abbreviations people use in email are changing English.

5.2.11.3 The Arrival of Talking Computers and the End of Literacy--A 20-Year Forecast

Over the next twenty years, VIVOs (voice-in/voice-out talking computers using visual displays but no text) will make reading, writing and text itself obsolete. Text/written language is essentially an ancient technology created 6,000 to 10,000 years ago for storing (by writing) and retrieving (by reading) information. VIVOs will perform this same storage/retrieval function more easily, efficiently, cheaply, and universally without requiring people to learn to read and write. By 2020, electronically-developed countries will be well on their way to becoming oral cultures.

5.2.11.4 What Happens When Machines Can Speak?

In the next 20 years, a machine will pass the Turing Test by speaking fluently in everyday language and appearing as intelligent as a human to all with whom it interacts. The point-and-click
environment of today's PC will disappear. In its stead will be a simple everyday language interface (or "non-interface") based on prototypes being created today.

Machines and humans will work together side-by-side, speaking to one another. Rather than using monitors and keyboards, we'll simply speak to a microphone embedded in the wall, or to our enhanced wristwatches or lapels, receiving immediate, relevant responses in a modulated human voice.

Jack Dunietz, *New York Times*, 1/08/01

**5.2.11.5 Voice Recognition Meets Real-World Challenges**

Despite major challenges to implementation, replacing traditional transcription with voice recognition in radiology brings benefits that make the transition worthwhile, according to Dr. Keith J. Dreyer, vice chair of radiology at Massachusetts General Hospital in Boston. He related Mass General's experience with integrating voice recognition into its radiology workflow and noted a subsequent improvement in report throughput, followed by a decrease in operating dollars. "I predict that by 2010, the majority of all U.S. radiology reporting will be generated using voice recognition," he said.

Merlina Trevino. *Diagnostic Imaging Online*. February 21, 2002

**5.2.11.6 Hello, World: Imagine A Machine That Speaks Your Language And Translates It For Those Who Don't**


**5.2.11.7 Pictures, Not Words**

The Internet is evolving from a text-based medium to an image-rich communications and marketing channel, and pictures are moving toward a more central role in relaying news and information. Currently, the ratio of text to image is about 80 to 20 on the Internet, but in coming years, communications experts predict the percentage of pictures will double. Emerging technologies, such as interactive pages that enable a would-be online shopper to stroll the virtual aisles of a department store, will ratchet up the demand for high-quality images. "The technological platform is there, but the corresponding content is lacking," says Horst Wackerbarth, photographer and founder of the Akademie Bildsprache in Hamburg. Research at the University of Konstanz has found that Web surfers can navigate through a Web site faster and more easily using image-based navigational tools rather than text directions. Not only that, but in today's multilingual environment, pictures are the universal language. In 1999, 1.5 billion pictures were produced for professional use. Image collectors such as Bill Gates and Mark Getty, who own the rights to about 70 million pictures, are among the growing number who recognize the future value of these works.

Die Welt. 14 Feb 2001

**5.2.11.8 Penetrating The Mind By Metaphor**

Why, he wondered, did marketing experts tend to work with words and numbers when companies did most of their marketing through pictures? "I was aware of this mismatch between the way information is delivered and the way in which people had to react to that information," Mr. Zaltman said. "What if we presented data in the form that consumers actually experienced them? Words, but also visual metaphors." He began reading about neuroscience and synthesizing the ideas that became ZMET.

Emily Eakin. *New York Times*. 02/02/23

**5.2.11.9 The Leonardo Loop: Science Returns To Art**

"Our 500 year love affair with the print medium caused by invention of the printing press may be an aberration in our fundamentally visual way of communicating." "In the future, as in the past, it will be the ability to see, not the ability to manipulate symbols, that will matter most."

5.3 Robots and Artificial Intelligence

Overview

Developments in robotics and artificial intelligence (AI) continue to speed forward suggesting that the centrality of human mental and manual labor will decline even more rapidly in the future than it has in the past. Since law and judicial decision making are among the most well-defined artificial systems in the world, they appear particularly ripe for augmentation if not replacement by robots and AI.

5.3.1 Robot Prepares To Operate On Brain

No need to worry any longer about the surgeon’s hand shaking during delicate brain surgery—intelligent robots are set to take over. The nerve-tingling prospect was put forward by UK-based Armstrong Healthcare Ltd., which claims to have developed the world’s first intelligent robot for image-guided surgery. Unveiling its "PathFinder" robot at a news conference in London, the firm said it would provide surgeons with a way of guiding instruments very precisely to the chosen site of the brain with minimal damage to surrounding tissue. Potential uses included the treatment of brain tumours, Parkinson’s disease, epilepsy and even new techniques of stem cell replacement therapy.

 Reuters. Sep 05 2001

5.3.2 FIRA-ISI 2001 Robot Soccer Championship

Robotics competitions have become popular and attract people from all walks of life throughout the world irrespective of their ages. Robot soccer makes heavy demands in all the key areas of robot technology, mechanics, sensors, communication, and intelligence. The hope of course, is that by discovering how to get a robot to move with agility, see with acuity, and think perceptively in the limited context of a soccer game, it will be possible to use the same techniques to build robots to carry out other more useful tasks.

For details on previous tournaments see:

 Reuters. Sep 05 2001

5.3.3 Long-Distance Robots

I was evaluating a new kind of robot that could allow a travel-weary executive to visit any office in the world without ever leaving his or her own desk. The technology is called telepresence, and it takes advantage of the vast information-carrying capacity of the Internet. A telepresence robot is typically equipped with a video camera, a microphone, and a wireless transmitter that enables it to send signals to an Internet connection. If a user at a remote location logs on to the right Web page, he or she can see what the robot sees and hear what the robot hears. What’s more, the user can move the machine from place to place simply by clicking on the mouse. With the help of artificial-intelligence software and various sensors, telepresence robots can roam down hallways without bumping into walls and even climb flights of stairs.

Until now, businesspeople have relied on techniques such as videoconferencing to participate in meetings that they can’t attend. Anyone who’s seen a videoconference, though, knows how frustrating the experience can be. Unless the participants are sitting right in front of the camera, it’s often difficult to understand what they’re saying. Researchers are developing new systems that may make videoconferences more realistic [see "Virtually There," by Jaron Lanier;
But there's another problem with videoconferencing: the equipment isn't very mobile. In contrast, a telepresence robot can travel nearly anywhere and train its camera on whatever the user wishes to see. The robot would allow you to observe the activity in a company’s warehouse, for example, or to inspect deliveries on the loading dock.

The idea for iRobot’s machines originated at the Massachusetts Institute of Technology’s Artificial Intelligence Laboratory. Rodney Brooks, the lab’s director, co-founded the company in 1990 with M.I.T. graduates Colin Angle and Helen Greiner. iRobot’s offices are on the second floor of a nondescript strip mall, just above a store selling children’s clothing. It’s the kind of office that an eight-year-old would adore—machines that look like miniature tanks lurk in every corner, as if awaiting orders to attack. The robots are tested in a large, high-ceilinged room called the High Bay, which is where I encountered a telepresence robot named Cobalt 2. The machine resembles a futuristic wheeled animal with a long neck and a bubblelike head. When the robot raised its head to train its camera on me, it looked kind of cute, like a baby giraffe. Angle, who is iRobot’s chief executive, says the company designed the machine to appear friendly and unthreatening. "We wanted to create a device that would be easy for people to interact with," he says. The robot rides on six wheels and has a pair of "flippers" that it can extend forward for climbing stairs. The antenna is fixed to the back of the machine like a short black tail.

TELEPRESENCE ROBOT called the Packbot is designed to do reconnaissance in dangerous environments. iRobot, a company based in Somerville, Mass., has built other mobile machines that can transmit video over the Internet (above). Will these mechanical avatars soon be knocking on your door? The fundamental challenge of telepresence is not technological but psychological: I, for one, would have a lot of trouble keeping a straight face if a robot sat next to me at one of our magazine’s staff meetings. And can you imagine how most senior citizens would react to the wheeled contraptions? Nevertheless, people may eventually accept the technology if the potential benefits are great enough. For example, an elderly person may decide to tolerate the intrusions of a camera-wielding robot if the only safe alternative is living in a nursing home.

“The technology of telepresence makes the world even smaller.” Mark Alpert, January 04, 2002

5.3.4 Book Foresees Productivity Gains As Machines Are Improved

Researchers at MIT’s Artificial Intelligence and Computer Science Laboratories have joined together to develop new hardware and software that they say could increase productivity by up to 300 percent. The modules are part of the Oxygen Project, so named because of the premise that future computing should be as pervasive as oxygen and as easy to use as breathing. Two products currently in development—the Handy 21 and the Enviro 21—feature hardware that is easily reprogrammed to switch functions so that the devices can serve as TVs, cell phones, radios, or network computers. Michael L. Dertouzos, director at the MIT Computer Science Laboratory, is writing a book about the project. He said advances such as limited natural speech recognition and response are the beginnings of a revolution in how computers and humans work together.

5.3.5 Can Robots Make Good Models Of Biological Behaviour?

A new approach in ‘Biorobotics’ defined as the intersection of biology and robotics- is based on building physical robot models of biological sensorimotor systems. The author notes that no specific position in the space of models thus defined is the only correct one. Seven dimensions on which simulation models -the representation of a hypothesis about a target system- can differ are defined, and distinctions between them discussed. They include Relevance, Level, Generality, Abstraction, Structural accuracy, Performance match, Medium. The author, cites three examples of robot models of rat hippocampus, desert ant navigation and human motor control and suggests these arguments reflect the view that biological behaviour needs to be studied and modeled in context, that is in terms of the real problems faced by real animals in real environments.
5.3.6 Right From Wrong

Weng is breeding a new kind of "intelligent" robot that learns in a novel way: by experience, the way animals and people do. He said this approach to learning will be cheaper, faster and more flexible than traditional robot-training methods, which are limited to what a human programmer tells the machine to do. Instead of stuffing its computer brain with elaborate instructions -- like Big Blue, the IBM chess champion -- Weng teaches his robot a few basic skills and then lets it learn on its own by interacting with its environment.


5.3.7 Computers Learn To Play By Rules.

In the 1983 movie War Games, Matthew Broderick's character teaches a wayward Pentagon computer about no-win situations by training it to play Tic-Tac-Toe. Now an Israeli software-development company called Artificial Intelligence N.V. (Ai) is planning to use games to learn some fundamental lessons in how to teach a computer to think. The company took the occasion of the 17th International Joint Conference on Artificial Intelligence this week to announce a competition to test computer learning algorithms by having them play a series of simple games without knowing any of the rules. The programs will be given a list of the allowable moves, each represented by a meaningless symbol, said the company's chief scientist, Jason Hutchins. By choosing their moves and getting scores back, the programs are supposed to "learn" the most effective strategies to win the game. The contest, which will take place over a month's time, will be a round-robin competition of between six and 12 games such as "Rock/Paper/Scissors." "Each of the games are being created to train specific abilities," Hutchins said. "What's exciting is that we will have the Computer Science Department at MIT competing against a 12-year-old hobbyist from Australia."

Ai is best known for creating a natural-language learning program -- nicknamed Hal after the computer nemesis from 2001, A Space Odyssey -- that is being taught to speak English simply by being talked and read to. Hal's trainer, neurolinguist Anat Triester-Goren, said Hal has made some of the same errors in learning as real children do. Hutchins said that people who have read transcripts of Hal's conversations were unable to tell them from transcriptions of real toddlers talking. Having a language program that people cannot tell from the real thing -- known as the "Turing test" -- is the Holy Grail of one branch of artificial intelligence research, he said. He adds that most people forget that the test's inventor, computer pioneer Alan Turing, also said the best way to accomplish the goal would probably be to build a "baby machine" and train it.

Smart bots: Rodney Brooks, director of the MIT AI Laboratory and chairman of iRobot Corp., told about his company's experiences trying to bring intelligent robots to the mass market over the past several years. One device iRobot is presently working on releasing is what he referred to as a "physical avatar," a remote-sensing bot that can be controlled from any Web browser with a high-speed connection. Because of the inevitable delays, the device needs to have enough on-board intelligence to maneuver itself around in response to commands like "go into the next room." The current version, built with off-the-shelf parts, has remote vision and two-way voice capabilities. One use he suggested was for remote attendance of business conferences. When a member of his staff did that recently, he said, the 'bot was able to follow participants around the room as well as talk and listen. "It's hard to predict what's going to happen" when you put a new technology like this into people's hands, he said. In one particularly galling case, iRobot built a robotic floor cleaner for stores and office buildings that could sweep, mop and polish floors, as well as navigate itself around obstacles and overlap the cleaning areas. The cleaning companies were thrilled to have a machine that could do all three things at once, Brooks said, but having it be self-controlled was too much for them. To sell it, the company had to take out the robotic components and sell it as a machine for human janitors to operate while following behind it.

We're gear, get used to it: Manuela Veloso, a computer science and AI professor at Carnegie-Mellon University, said robots are already making themselves useful in a number of
settings, including hospitals and nursing homes -- where they are taking over some of the drudgery usually associated with practical nursing; and in the operating room -- where remote-controlled robots are performing delicate operations in spaces too small for surgeons to reach directly. "There is much more use of AI incorporated into the real world than people realize," said Sony Corporation's Hiroaki Kitano, whose division developed the Aibo robotic pet. "When it comes to it's maturity, it becomes invisible." At the same time, he questioned whether humanoid robots that could mimic a range of human activities was even a worthwhile goal.


5.3.8 Machines With Minds Of Their Own
*The Economist* - 03/22/01
http://www.economist.com/displayStory.cfm?Story_ID=3D539808

5.3.9 Could You Chat With A Database?
*Techweb*. 03/19/01
http://www.techweb.com/wire/story/TWB20010319S0009

5.3.10 Talking Heads
*The Economist*. 03/22/01
http://www.economist.com/displayStory.cfm?Story_ID=3D539623

5.3.11 Games To Take On A Life Of Their Own Taylor: Copying The Brain's Neural Networks
Video games of the future could have characters with almost human intelligence. Scientists from King's College in London are working on enabling computers to understand, speak, learn and eventually, think. They have created a technology called the Language Acquisition Device (LAD) which emulates the functions of the brain's frontal lobes where humans process language and emotion. The system works by using neural networks to mimic brain function. It then learns language as children do, not through rules and vocabularies, but through association and example.


5.3.12 Robots Beat Human Commodity Traders
In IBM's test, software-based robotic trading agents - known as "bots" - made seven per cent more cash than people. Both bots and people had the same set-up, allowing them to trade through an unbiased software-based auctioneer. The auction was designed to mimic the kind of commodities market where buyers and sellers have a fixed amount of time to trade in a single commodity. Six bots and six people traded against each other. (...) Their goal was to maximize their profit at the end of trading.

Duncan Graham-Rowe. *New Scientist*. 1/08/01

5.3.13 Part Man, Part Computer: Researcher Tests The Limits
(...) will have surgery to connect nerves in his arm with wires leading to a "smart card"- sized collection microprocessors. The wires will pick up signals from his central nervous system and relay them via a radio transmitter to an external computer that will record the patterns. Warwick hopes the device will pick up discrete signals from the nerves depending on his movements, his sense of touch, and even his mood, and then send those signals back to his nerves to see if they can mimic the movement or the sensation.


5.3.14 At Airport Gate, A Cyborg Unplugged
Teve Mann, an engineering professor at the University of Toronto, has lived as a cyborg for more than 20 years, wearing a web of wires, computers and electronic sensors that are designed to augment his memory, enhance his vision, and keep tabs on his vital signs. Although his wearable computer system sometimes elicited stares, he never encountered any problems going through the security gates at airports.

Last month that changed. Before boarding a Toronto-bound plane at St. John’s International Airport in Newfoundland, Dr. Mann says, he went through a three-day ordeal in which he was ultimately strip-searched and injured by security personnel. The difficulties that Dr. Mann faced seem related to the tightening of security in airports since the terrorist attacks of Sept. 11. But he had flown from Toronto to St. John’s two days earlier without a hitch. On that day, Feb. 16, he said, he followed the routine he has used on previous flights. He told the security guards in Toronto that he had already notified the airline about his equipment. He showed them documentation, some of it signed by his doctor, that described the wires and glasses, which he wears every waking minute as part of his internationally renowned research on wearable computers. The security guards continued to require that he turn his machine on and off and put it through the X-ray machine while also tugging on his wires and electrodes, he said. Still not satisfied, the guards took him to a private room for a strip-search in which, he said, the electrodes were torn from his skin, causing bleeding, and several pieces of equipment were strewn about the room.

Without a fully functional system, Mann said, he found it difficult to navigate normally. He said he fell at least twice in the airport, once passing out after hitting his head on what he described as a pile of fire extinguishers in his way. He boarded the plane in a wheelchair. Since losing the use of his vision system and computer memory several weeks ago, he said, he cannot concentrate and is behaving differently. He is now undergoing tests to determine whether his brain has been affected by the sudden detachment from the technology. The experience also raises the question of how a traveler will fare once wearable computing devices are such fixtures on the body that a person will not be able to part with them.

5.3.15 The Bionic Man: Restoring Mobility

Bionics engineers are making increasingly bold and successful use of their tools to restore mobility to persons with missing or nonfunctional limbs. These tools include the latest materials, minielectronics and megacomputers, advanced robotic mechanisms, and algorithms. The residual sensorimotor system can be tapped in order to transmit its intents to replacement or reactivated body parts. Bionics can restore lost mobility to individuals if (i) they can express cognitive control over relevant motor functions somewhere in their residual anatomy and (ii) a device can pick up and decipher that cognition.


5.3.16 Brain Cells Linked To Silicon Chips

Scientists at the Max Planck Institute for Biochemistry in Germany have electronically linked multiple snail neurons onto transistor chips and demonstrated that the cells communicate with each other and with the chips. Biophysicist Peter Fromherz says: "It's very primitive, but it's the first time that a neural network was directly interfaced with a silicon chip. It's a proof-of-principle experiment." The combination of biology and technology eventually may lead to such things as artificial retinas or prosthetic limbs that are extensions of the human nervous system, and the development of robots possessing far more intelligence than the current generation of such machines.

Washington Post .28 Aug 2001

5.3.17 In Breakthrough, Monkey Think, Computer Do

An experimental brain implant the size of an M&M has allowed a monkey to control a computer cursor by thought alone, Brown University researchers announced yesterday. It is the
latest advance by scientists trying to perfect a link between mind and machine in the hope that thousands of patients who are unable to move or speak can resume communication with the world around them.

The technique translates signals from a few motor neurons on the surface of the monkey's brain via cable into movement on a computer screen. There is no need for the extensive training previous experimental techniques have required.


### 5.3.18 Creation: Life And How To Make It

Steve Grand, the author of "Creation: Life and How to Make It," is searching for the Holy Grail of artificial intelligence, a way to build a robot that thinks, feels and learns.


### 5.3.19 Self-Organization In Biological Systems

Scott Camazine et al, Princeton University Press, 2001

A review of the book by John Pepper and Guy Hoelzer observers that "The way humans build things is not typical of nature. Perhaps because we do things so differently, our initial encounters with self-organization in nature are often disorienting. When information and control are distributed among many interacting agents, organization can seem to arise spontaneously from disorder. There is no architect or manager, and the agents neither plan nor perceive the whole of the emerging pattern which may bear no obvious relations to the relatively simple interactions that produce it." "Self-organization can lead to surprisingly complex functional structures." Chapters in the book focus on aggregation in microbes, schooling in fish, and behavior of highly social ants, bees and wasps.


### 5.4 Physics and Electronics

**Overview**

Physics has been the major source of new technology, and hence of social change, over the 20th Century. New theories suggest that there are plenty of surprises in physics to provide still greater change over the 21st Century. Tiny DNA computers are developing rapidly. There are utilities (such as "spin") lurking in well-known physical properties that have not yet been tapped, and there are marginal ideas moving closer to the center, such as greater evidence for parallel universes (whose existence might prove useful in many ways, not least for teleportation and space travel). Fractals await utilization.

**5.4.1 When Branes Collide: Stringing Together A New Theory For The Origin Of The Universe**

Big bang which created our universe was caused 15 billion years ago when "a parallel universe moving along a hidden dimension smacked into ours" setting in motion the processes that lead to the present and beyond.

5.4.2 Spintronics: A Spin-Based Electronics Vision For The Future

"Until recently, the spin of the electron was ignored in mainstream charge-based electronics. A technology has emerged called spintronics where it is not the electron charge but the electron spin that carries information, and this offers opportunities for a new generation of devices combining standard microelectronics with spin-dependent effects that arise from the interaction between spin of the carrier and the magnetic properties of the material."


5.4.3 Molecular Electronics Will Change Everything


5.4.4 When The Chips Are Down—Scientists Seek Alternatives To A Computer Technology Nearing Its Limits

"Experts predict this march toward miniaturization will hit a wall by about 2010. That's when transistors as we know them will have shrunk so close to the atomic scale that quantum physics will take over, and the old rules of chip design won't hold." "Getting nature to cheaply build a transistor as precisely shaped as a cell's receptor might be one way that 21st Century electronics could vault over the miniaturization wall." "The new devices must be on the scale of nanometers and suitable for inexpensive mass production." (350) R. Stanley Williams of Hewlett-Packard Laboratories says, "The laws of physics indicate it may be possible to build computing devices that are 1 billion times for efficient than those we have now." (351)


5.4.5 Scientists Build Tiny Computer From DNA

Following Mother Nature's lead, Israeli scientists have built a DNA computer so tiny that a trillion of them could fit in a test tube and perform a billion operations per second with 99.8 percent accuracy. Instead of using figures and formulas to solve a problem, the microscopic computer's input, output and software are made up of DNA molecules—which store and process encoded information in living organisms. Scientists see such DNA computers as future competitors to their more conventional cousins.

Patricia Reaney. Yahoo News / Reuters. 01/11/21.

5.4.6 Fractals And The Law?

In one of the earliest scans we did for the Hawaii judiciary in the early 1970s was on fractals. At that time, fractals were mainly a mathematical curiosity which could be used to describe the seemingly chaotic way in which trees branched, rocks shattered, and shorelines followed much more irregular paths than appeared on most maps—indeed getting more and more irregular as the scale of observation got smaller and smaller: splintered cracks inside of splintered cracks seemingly to infinity.

What possible use could that be to social sciences, or to the courts?

Sid Perkins, "It's a rough world: Fractals help model vexing problems" *Science News*, February 2, 2002, pp. 75f, writes that "far from being merely mathematical abstractions, fractals pop up throughout the natural and human made world. They appear in the swirling patterns on a flowing liquid's surface and the patch mosaics of urban sprawl. Scientists have used fractals to analyze all sorts of irregular objects or phenomena, from swings in the stock market to the frequency of natural disasters.

Fractals do not appear to have been used to explain legal phenomenon yet but since they are moving into economics and international relations (Myron Frankman, "Fractals and the Common Heritage of Mankind," <www.arts.mcgill.ca/programs/econ/fractal.html>, their use to understand law and the administration of law should not be far behind.

5.5 Teleportation

Teleportation, long the stuff of science fiction from the old (and revived) movie, "The Fly" to the popular series "Star Trek" and its many progeny, is getting closer and closer to reality.

Teleportation can be defined as:
(1) The disembodied instantaneous transport of an object from one place to another such that the object vanishes at Point A and reappears in the same material form at Point B.
(2) The instant molecular creation at Point B of an object from Point A without destroying the original object at Point A.
(3) Scanned information from an object at Point A sent to Point B where a fully functioning replica of the object is constructed.
(4) Any of the above, which also allow the object to appear at more than one other place.

Over the next 20 years, teleportation technologies may develop sufficiently so as to reduce the need to transport goods by trucks, ships, and planes from one place to another, and thus reduce the negative environmental and public health impacts of transportation practices. However, these teleportation technologies will have their own negative impacts on the environment and public health. These impacts have not yet been identified, but they can and should be identified in advance of the diffusion of teleportation technologies. Preventive and ameliorative policies and procedures can and should be formulated to guide the development of the teleportation technologies.

Rapid prototyping, atom holography, and quantum teleportation are three areas of technology and science potentially leading to teleportation. Other developments in quantum physics, nanotechnology, materials science, and genetic engineering will also contribute to the emergence of teleportation over the next twenty years.

Rapid Prototyping (RP). Rapid prototyping machines exist at the present time. They are essentially three-dimensional printers. Instructions are transmitted to an RP which “prints” an object by emitting layer upon layer of material until the desired form and functioning is achieved. RP technology is already making commercial products such as invisible dental braces, parts for the automotive and aero-industries, models, molds, and metal and glass-filled nylon parts for NASA’s space shuttle fleet. Marshall Burns, the founder of Ennex Corporation, a manufacturer of RP technologies, stated more recently, "We're talking about transforming the Internet from a medium of communication to a medium for delivering manufactured goods".


Atom Holography. The technology of atom holography may take the remote construction of a functioning three-dimensional object one step further and many steps faster. "Instead of making an image in light as is done in conventional holography, atom optics would make the hologram of atoms." According to Pierre Meystre of the University of Arizona, "What this means is we could make a real, 3-dimensional replica of some object. We could copy objects. All of the individual steps to do this with nonlinear atom optics have been demonstrated. It's just a matter of making it work all together. I think it will happen in the next two or three years"


Quantum Teleportation. During our environmental scan for the Virginia Judiciary immediately before this one, we reported encountering an item by Andrew Watson, "Teleportation Beams Up a Photon's State," Science, Vol. 278, December 12; 1997, 1881-1882. Shortly after we read A. Furusawa, J. L. Sorensen, S. L. Braunstein, C. A. Fuchs, H. J. Kimble, and E. S. Polzik, "Unconditional Quantum Teleportation," Science Vol. 282, October 23; 1998, 706-709. This was the first time that we were aware that any kind of teleportation might actually become possible. We concluded that teleportation was a candidate "emerging issue", and decided to track it. Our initial assumption was that the leap from the quantum teleportation of a single photon to the teleportation of complex products was too great to be of immediate concern. However, as we continued to research the matter, we soon realized that there were several other scientific and technological developments, such as RP and Atom Holography, that could result in alternative or complementary paths to teleportation. Yet, every month of so, new advances in teleportation proper appear in the scientific literature, as the following chronological record suggests: Dik Bouwmeester, et al., "Experimental quantum teleportation," Nature. Vol. 390, December 11, 1997, 575; Alan Hall, "Beam me up: an experiment confirms that teleportation is possible--at least for photons," Scientific American, December 22, 1997 http://www.sciam.com/explorations/1229teleport/index.html; Robert Tindol, "Caltech physicists achieve first bona fide quantum teleportation," News release, California Institute of Technology Press, October 22, 1998, http://pr.caltech.edu/media/Press_Releases/PRI11935.html; "Quantum Teleportation," IBM Research. http://www.research.ibm.com/quantuminfo/teleportation/; Charles Platt, "Clear the line, I'm sending myself right now," Wired, January 2000, pp. 204-210; "Atom Experiment Brings Teleportation a Step Closer," Yahoo/Reuters, September 26, 2001; and Anil Ananthaswamy,"Teleporting larger objects becomes real possibility," February 6, 2002. http://www.newscientist.com/news/news.jsp?id=ns99991888.

Complementary scientific and technological developments. Advances in nanotechnology, which has already become a major funding priority of the US Federal Government, in material sciences, and especially in genetic engineering--the most promising and powerful technology of the present and immediate future-
will also certainly contribute to the rapid advancement of teleportation over the next twenty years.

5.6 Space

Overview

Three separate recent developments suggest imminent increased activity in space activities. One is the insistence by the current Bush administration that space be militarized in many ways, from the revival of the old "Star Wars" Missile Defense System of Ronald Reagan, to increased funding and movements towards co-ordination of the space wing of the US Air Force, through the fact that the new chief Administrator and all of the top officers of NASA are, for the first time, former Pentagon officials and/or military officers.

A second is the fact that China is continuing to push forward with its plans for a manned space flight soon, and a moon landing thereafter.

A third is that the first "space tourist" flew on the International Space Station while others are waiting for their chance. NASA, which has resisted any hint of space tourism, finally had to produce a set of rules and regulations for tourists on the space station.

Harold Linstone also believes that there will be renewed activity in space in the US and elsewhere, partly as a consequence of the upswing of the 5th K-wave, and partly because 9/11 has enabled Bush to move quickly forward in creating a separate branch of the military that is oriented towards space, and in researching and deploying the Star Wars Missile defense system.


5.6.1 End Of Mir Space Station

March: "Russia's 15 year-old Mir space station plunges into the Pacific ocean, ending the country's sovereign manned space exploration program and shifting Russia's focus in space to the International Space Station project."


5.6.2 American Businessman First Space Tourist

April: "American businessman Dennis Tito becomes the first space tourist when he blasts off in a Russian Soyuz capsule for a visit to the International Space Station


5.6.3 Let's Challenge China To A Space Race

http://www.spacepolicy.org/page_mw0100.html

5.6.4 China Shoots For The Moon

"China announced plans to send a man into space by 2005 and, eventually, head for the moon."

→ Honolulu Advertiser. November 24, 2001, p. 10

5.6.5 China Works Towards Manned Space Flight

According to People's Daily (the official English edition of Renmin ribao newspaper of the Communist Party of China) March 8, 2002, Hu Shixiang, vice director of China's manned spacecraft program, announced during the current session of the National People's Congress that the
People’s Republic of China shortly will launch its third unmanned spacecraft "while the first manned one is to be launched next year at the earliest.


5.6.6 NASA Approves Space Visitor Rules

http://www.washingtonpost.com

5.6.7 ‘N Sync Singer In Talks For Trip Into Space


5.6.8 US Air Force, NASA Exploring Joint RLV Work


5.6.9 NASA Chief Calls For Closer Cooperation With Pentagon


5.6.10 US Defense Department Proposes Modes Increase For Missile Defense

"With the Bush administration signaling its intention to scrap the 1972 Anti-Ballistic Missile treaty, the Missile Defense Agency also would begin examining new technologies that were prohibited by the treaty, officials said."


5.6.11 NASA Picks Another Marine For Top Leadership Post

"NASA chief administrator, Sean O'Keefe himself a former Pentagon comptroller and Secretary of the Navy, has picked two Marine Corps generals and an Army financial manager for top jobs in his administration."


5.7 Genetic Engineering and Biotechnology

Overview

The 21st Century promises to be dominated by advances and controversies involving genetic engineering and biotechnology. The Science, February 16, 2001, issue on "The Human Genome" presented the commercial (Celera) version of the complete human genome. The public version was published in the British journal, Nature the same time. Both are required reading for all applied futurists, going beyond anything available anywhere previously. However, this is such a fast-moving field, that it will be a struggle to keep up, much less to get very far ahead, as futurists need to try to do.

One of the most important discoveries was that, instead of the 100,000 or so genes expected in the human genome, there appear to be only 30,000--only twice as many as a nematode. That makes it clear to most people that any simple "reductionist" theory of genetic engineering is doomed. Rather, we may be in a situation now, vis a vis the gene, that we were in less than one hundred years when physicists, looking for the atom as "the building block of matter", discovered there was something "inside" the atom, and so kept on looking. They have found more and more, but their knowledge of the atom was vital to their further understanding, and manipulation for practical purposes.

There is now recognition that "the gene" is at best only a way station in the process of discovery, and perhaps only a metaphor and not a "reality." Indeed,
one of the best things about this edition of *Science* are the several book reviews that make that point—about the power and severe limitations of the genetic metaphors such as "breaking the code of life" or "discovering the building blocks of life".

One reviewer pointed out that President Clinton, in announcing the successful completion of the human genome project, said that "It is the language by which God created Man." It is highly likely that we will hear new metaphors for biology and life over the coming decades, but "the genetic code" has proven very useful so far.

So now the biologists are dealing with the futurists’ fundamental question, "What’s next?" There are several excellent articles in *Science* on that.

One of the "next" things is "functional genomics" that takes the sequence and tries to understand the functions of what is there. Another is "proteomics" since it seems clear (especially for humans) that genes are just a basis upon which highly complex proteins configure whatever is biologically distinctive about humans.

There is a good article titled "Dissecting human disease in a postgenomic era" and another titled "Toward behavioral genomics". Both give good overviews on what seems to be the understanding now between genes and disease, on the one hand, and genes and behavior, on the other, both showing that while the relationship is not simple and direct, neither does it appear to be impossibly complex.

### 5.7.1 Beyond the Genome

#### 5.7.1.1 From Genome To Function

"After the completion of the genome sequences, the challenge ahead for all biologists is to use the data to interpret the function of the protein, the cell, and the organism." "Traditionally, most biologists have not used, or indeed valued, computational approaches and modeling in their work, because most biological systems are very complex and the interactions among their components were still being discovered." (2095) "Elucidating protein function is the central focus of biology today, and computational approaches can only become more important in this challenge." (2097)


#### 5.7.1.2 Designer Enzymes

*The Economist* - 03/22/01
http://www.economist.com/displayStory.cfm?Story_ID=3D539633

#### 5.7.1.3 In The Map For Human Life, Count The Microbes Too

"[W]e depend on more than the activity of some 30,000 genes encoded in our human genome. Our existence is critically dependent on the presence of upwards of 1000 bacterial species (the exact number is unknown because many are uncultivable) living in and on us." "Thus, if truth be none, human life depends on an additional 2 to 4 million genes, most uncharacterized."

5.7.1.4 Twelve Drivers Shaping Genomics

Recently, the Institute for Alternative Futures issued a report on the "Twelve drivers shaping genomics:"

To help frame the research priorities for a new center for social science research on genomics and society in the United Kingdom, the Institute for Alternative Futures (IAF) and the Center for Research and Innovation on Competition (CRIC), worked with a wide range of experts to identify twelve drivers likely to shape genomics between now and 2015. The UK government’s Economic and Social Research Council (ESRC) commissioned this futures research, including forecasts and scenarios, to explore the genomics revolution in agriculture, health care and other areas and identify where social science research could make its greatest contributions.

The drivers in order of their significance are:

1) Functionality of Genomics (how well do the applications of genomics work),
2) Regulation of Genomics (health, agriculture, other uses, including military),
3) Business Forces and Beyond (industrial structure, operations, innovation);
4) Genomics Itself (the internal or endogenous aspects to the science of genomics and the institutions that will develop it);
5) Politics and Geopolitics (global developments of states, multinational corporations and other players and global implications of national and local politics);
6) Demand (for the range of genomic-related products in food, health, environment, manufacturing, etc.);
7) Social Attitudes (towards or opposed to genomics, including how social learning takes place and attitudes change);
8) Social Mobilization (group and organization structures as they support or oppose genomic developments);
9) Governance of Knowledge (Intellectual Property Rights (IPR), distribution of knowledge);
10) Events (within genomics and beyond that could be more disruptive in accelerating or retarding genomic applications);
11) Risk (the nature of genomic related risks, perception of the risks, liability for them);
12) Environment (the state of the environment and the impact of genomics).

More details on these drivers, including forecasts and qualifications for the ranking, are given in the full workshop report at


5.7.2 Business Opportunities

5.7.2.1 Brush Up Your Biology ... Start Doing It Now

The Internet pioneers are all looking for new challenges now -- and finding them in biotechnology. The list of Information Age celebrities turning their attention (and vast amounts of money) to biology-related fields include Danny Hillis, Jim Clark, Frank Moss, Bill Gates, Paul Allen, Larry Ellison, Nathan Myhrvold, and Edward Jung. Myhrvold calls biotech the next "exponential industry," and Moss predicts: "A tidal wave is about to come."

Moss says that biotech may or may not turn out to be "bigger" than the Internet, but he believes it will be a lot more important: "Over the next years, diseases will be cured. That's a hell of a lot better than finding books, or other uses of the Internet we're even less proud of." During the second quarter of 2001 venture capital funding going to medical, health, or life science companies more than tripled (to a 14% share), while the share of capital going to Internet startups declined from 48% to 28%.

USA Today 13 Aug 2001

5.7.2.2 As The Future Catches You: How Genomics & Other Forces Are Changing Your Life, Work, Health & Wealth

One of the reasons I wrote this book is that science's ability to change the economy is so far ahead of public policy and the public's ability to understand. There's a real danger that we'll have a crash because there's a knowledge vacuum, and it could be filled with folks who are completely illiterate and uneducated. We have to make sure that when we make choices as a society, people understand the choices, agree with them, and are behind them. Otherwise, the system is going to fall apart.

- Juan Enriquez

5.7.2.3 Biotechnology Addresses The Genomic Generation

- Red Herring 1/5/01

5.7.2.4 Biotech Tool Makers Go Begging

- Red Herring 1/16/01

5.7.2.5 With Return To Fundamentals, Biotech Still Shows Promise

- http://www.boston.com/dailyglobe2/014/business/With_return_to_fundamentals_biotech_still_shows_pr omiseP.shtml

5.7.2.6 Gene And Protein Patents Get Ready To Go Head To Head

"Genomics companies thought they had genetic medicine to themselves. Now proteomics firms are staking a claim."

"Humans...may have only 30,000 to 40,000 genes, far fewer than the previous estimate of 100,000. But with proteins, the more they look, the more they find. Researchers now believe that we have as many as 2 million. Not only does this finding demolish the dogma that each gene encodes a single protein, it also throws a wrench in the business strategy of many firms that have spent the past decade furiously locking up patents on key genes involved in disease. Those patents cover what were thought to be the single proteins those genes encode—which means that any other proteins the genes give rise to may be ripe for patent lawyers' pickings."


5.7.2.7 High-Speed Biologists Search For God In Proteins


5.7.2.8 Searching For Recipes For Protein Chips


5.7.2.9 Quests Build To Clone Humans

Panayiotis Zavos and Severino Antinori are looking for a few talented scientists. Next month, the University of Kentucky professor and the Italian fertility clinic doctor plan to hold a meeting in Rome to jump-start one of the most controversial projects researchers have ever proposed: to clone whole human beings as a way to help infertile couples have children.

The two doctors are not the first to publicly declare their intention to clone humans. In the four years since Scottish researchers presented Dolly, a cloned ewe, a US physicist and a UFO sect based in Canada have announced similar plans.

- Peter N. Spotts, Peter Ford
  http://www.csmonitor.com/durable/2001/02/07/fp1s1-csm.shtml

5.7.2.10 First Human Cloned Embryo

5.7.2.11 Cosmetic Genetics Engineering Could Be Near
A leading scientist at the World Economic Forum said that genetic research may soon be used for cosmetic or other non-medical purposes. Speaking at the forum, George Church said people eventually might alter genes to pass on certain characteristics to future generations, but in the near term genetic engineering of those already alive would be possible.

He said the characteristics could be related to intelligence or looks. Children or adults could be genetically engineered for more immediate effects, Church said. "We may think of this as less of a threat because it is not inherited and therefore does not capture emotion in the same way as germ line changes, but it would have an effect far more quickly than genetic engineering that relies on procreation," Church said.

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5.7.2.12 Don’t Die, Stay Pretty


5.7.2.13 Alcor Life Extension Foundation
The Alcor Life Extension Foundation is a nonprofit corporation that provides cryotransport services. Cryotransport is the process of placing a person in cryostasis, freezing/storing a body at the temperature of liquid nitrogen, after a terminal illness or fatal accident, in the hope that medical science can resuscitate that person in the future, when life extension and anti-aging have become a reality. Alcor members and staff argue that the traditional definition of death (the cessation of vital bodily functions – particularly the heart and lungs) needs to change. Through Alcorian eyes, as long as a person’s brain cells and brain structure are properly preserved, the person is still potentially alive no matter how much time has passed without a heartbeat or respiration. Although Alcor is only providing cryotransport services for about 50 people, there is increasing interest in life extension. As the expensive procedure drops (current prices range from $50,000 to 120,000) cryosuspension could become routine. As Dr. Jerry Lemler states in the This Week at Alcor review (January 21 – January 27, 2002): On Monday, we hosted a funeral association delegation from the Chicago area. They asked how funeral directors and mortuaries can one day reach the goal of cryosuspension services as a routine alternative to the third option of conventional burial and cremation.

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5.7.2.14 Pets Of The Future
Scientists recently created a cloned cat named cc, and they’re hard at work on cloning dogs. Around 120 million cats and dogs live in homes across the United States, and surveys suggest that 1 in 10 people would clone a pet. Cloning techniques also make it easier to genetically alter animals. One company already has set out to make allergen-free cats, and one can imagine flea-repellent pets or attack dogs with superaggressive genes.

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5.7.2.15 Nutrigenomics
Nutrigenomics looks at the effect of nutrition on a molecular, genetic level. Currently, the RDA (recommended daily allowance) provides general guidelines designed for the entire population. New genetic research will ultimately provide diets tailored to each person’s unique genetic make-up.
Palm-sized devices which already exist to analyze DNA could be used to detect an individual’s susceptibility to cardiovascular disease. Nutrigenomics will allow this information to be matched up against food, and food components, that have a positive impact on health for that
individual. Nutrition tailored both to an individual's genetic make-up and their occupation can also be envisaged, where the diet for, say, an athlete takes into account his or her genetic disposition to maximize its effectiveness.

Ultimately, nutrigenomics is just one of a series of genetic specializations, like proteomics and pharmacogenomics, that have followed the mapping of the human genome. Will there be implications for your insurance if you are found have a susceptibility to heart disease? Will there be implications if you fail to follow a diet to retard the onset of symptoms?

http://go.hotwired.com/news/medtech/0,1286,50879,00.html/h20020308

5.7.2.16 Probiotics

Discusses the new medical practice of "probiotics" (in contrast to "antibiotics")--the therapeutic introduction of naturally-occurring (though perhaps enhanced) microbes to fight diseases,


5.7.3 Threats and Dangers

Overview

For many years, Americans were unperturbed about the possible negative effects of biotechnology and genetic engineering. This is no longer the case. There is growing concern, in part for health and safety, and in part for moral and ethical, reasons. Of special interest is the insistence of some groups of disabled persons that "one of the primary principles of the disability rights movement is that having a disability must come to be regarded as a normal part of living" that should not be "corrected" as though disabled persons were "flawed" rather than merely different. These concerns have been voiced more loudly as genetic testing has become increasingly cheap and easy, and possibly routine, required, or abused.

5.7.3.1 Pharmacogenomics: Ethical, Legal, And Social Implications Of Genomic Research

Over the past few decades, the study of genetics revolved primarily around the identification of chromosomal abnormalities, such as an additional or a missing chromosome, or a mutation in a single gene. But as our knowledge of the field has increased, we have come to recognize that our genetic code not only influences the development and expression of disease, but also guides our ability to avoid disease and dictates how we respond to therapeutic interventions. Indeed, the study of pharmacogenomics has expanded greatly, and can potentially play a major role in US healthcare delivery.

Nevertheless, many would argue that although the research has progressed steadily, our understanding of the ethical, legal, and social implications (ELSI) raised by the use of genomics in general, and pharmacogenomics in particular, has remained stagnant.
5.7.3.2 Stem Cells Branch Out

Introduction to a series of articles on stem cells.


5.7.3.3 The Human Embryonic Stem Cell Debate: Science, Ethics And Public Policy.

Twenty chapters discuss stem cell technology per se, the historical context, the ethics and politics of hES cell research, feminist, Jewish, Roman Catholic, Protestant and secular ethical perspectives, and public policy suggestions.

From Future Survey, 24:1, January 2002, p. 21


5.7.3.4 Researchers Use Asexual Embryo To Get Stem Cells

The technique, done on a monkey, creates brain and heart tissue without any cloning.


5.7.3.5 Red Cross Shifts, Rejects Pioneering Stem Cell Grant

In an unexpected twist to the stem cell controversy, the American Red Cross has decided to turn down what would have been the first federal grant devoted to research using stem cells from human embryos. The decision suggested that stem cell research, widely touted as the greatest hope for new cures for disease, has become so controversial that some major research institutions might be scared away, research advocates said.

After a bitter debate over the morality of the research, the government has finally cleared the way for scientists to receive federal money for stem cell experiments this year. However, the promise of the research depends on scientists stepping forward to apply for the grants, advocates for the work said. A Red Cross scientist applied for a grant last year, and the National Institutes of Health announced Thursday morning that it was the first award to be approved. But Thursday afternoon, the Red Cross said it had decided not to accept the grant in order to focus on other areas of research.


5.7.3.6 Custom-Designing Our Children

John Derbyshire comments on a debate between Dinesh D'Souza, and Ronald Bailey of *Reason* magazine, about the morality of "genetically enhancing" human beings, most especially by way of custom-designing our children. The exchange follows on from a long piece by Dinesh titled "Staying Human" in the January 22nd issue of *National Review*. "It's a fascinating debate, on a topic we should all be thinking about (says Derbyshire). I'm not going to get into it here; I just want to make one point that didn't get covered in those pieces.

"Here is the point: Fretting about the ethics of these issues is a thing that only Western countries are going to do. Elsewhere, eugenics - including 'genetic enhancement' - will not be fretted about or debated, it will just be done. To see what I mean, check out an article titled 'Popularizing the Knowledge of Eugenics and Advocating Optimal Births Vigorously,' by Sun Dong-sheng of the Jinan Army Institute, People's Republic of China." "An English translation of the article can be found on the web. The translators note, in their preface, that: 'The taboo on this subject is not as strong in East Asia as in the West. One might hypothesize that Asians, and more particularly the populations of the Han cultural zone (Japan, North and South Korea, China, Taiwan, Hong Kong, Singapore, and possibly Vietnam), take a more pragmatic, less structured and ideological, and more far-seeing approach (eugenics, after all, is, by definition, a long-run program) to the development of human capital, than do Westerners.'"
"The significance of the article is that it is perfectly ethics-free. There is no discussion of the morality of eugenics and genetic engineering. It is just assumed that to 'improve the genetic quality of our population' is a thing that everybody should support, and that the methods of doing it can safely be left in the hands of scientists and politicians. The mentality here is basically that of a cost accountant, arguing that a poor country like China simply does not need the extra burden of ‘useless mouths’ - the omniscient party, of course, getting to decide who is 'useless.'"

http://www.nationalreview.com/05mar01/dsouzaprint030501.html
http://www.nationalreview.com/derbyshire/derbyshire022701.shtml

5.7.3.7 Theft And Sale Of Human Body Parts In China.
Although China strictly forbids the sale of human organs, doctors are reported to remove organs from executed prisoners, Organs of executed convicts are usually harvested as soon as the bullets are put in the back of their heads (or hearts, if the corneas are needed). Because China executes more prisoners than the rest of the world combined, estimated at 3,000 a year, it can supply foreigners willing to pay to avoid the long waiting lists for donated organs in their home countries. One result: a thriving Internet trade in organs. "I'm offering to sell one of my kidneys because I really have no other way to raise a sum of money," says An Feng, a 29-year-old from Xi'an who has posted several notices on the popular NetEase auction site. "I need to pay back a loan very urgently." One morbid posting reads, "I have organs--a heart, kidneys, corneas--for sale. I don't plan on living anymore, and I need some money for my parents' old age."

- Bay Fang, China's Bitter Harvest, U.S. News & World Report, 02/05/2001, Vol. 130 Issue 5, p34, 1p, 2c

5.7.3.8 The Ecological Risks And Benefits Of Genetically Engineered Plants
Based on an extensive analysis of plants (only so says may not hold for other organisms), and concludes there is not enough evidence to claim either benefits or risks from GEOs, so any such claims should be evaluated carefully.


5.7.3.9 The Risks On The Table

- Scientific American - April, 2001

5.7.3.10 Allergic Reactions Trigger A Sober Look At Biotech Foods

- IHT - 03/20/01
  http://www.iht.com/articles/13922.html

5.7.3.11 Monitoring And Labeling For Genetically Modified Products
"This significant public opposition to the use of GMOs in many regions of the world clearly indicates that only by addressing environmental concerns and consumer demand with improved risk management (specifically monitoring) and appropriate labeling will it be possible for the industry to introduce GMOs into worldwide markets without significant resistance. It is highly important for the biotechnology industry in the United States to accept the challenge of developing and regulating products that take into account regional diverse needs and concerns of consumers and specificities of the environment."


5.7.3.12 Disabled Peoples International Statement On Human Genetics
The European contingent of Disabled Peoples International (DPI Europe) released a position statement in November on the new human genetics. DPI is an international human rights organization committed to the protection of disabled people’s rights.
The statement addresses the threats to people with disabilities posed by developments in human genetics, including the increasing use of prenatal screening and pre-implantation diagnosis. "Human genetics poses a threat to us because while cures and palliatives are promised, what is actually being offered are genetic tests for characteristics perceived as undesirable," the statement says. "[O]ur perceived value and role as well as our human rights are continually diminished by the questionable medical ideas and discriminatory attitudes spawned by the new genetics....

"We repudiate the utilitarian ideology which informs much of the new human genetics, particularly the assumption that society would be better off without the inconvenience and expense of disabled people. In contrast, we want to see all clinical practice based on strong principles of justice, ethics and non-discrimination with a respect for diversity, autonomy and fully informed choice."

The DPI statement includes a list of 10 demands about the future of the new human genetics. These include strict regulation of human genetic techniques; non-directive, rights-based genetic counseling; support for all children and celebration of human diversity; representation of disabled peoples on all human genetics advisory and regulatory bodies; and protection of disabled people from discrimination and violation through medical intervention. The full text of the DPI statement can be viewed at http://www.dpieurope.org/htm/bioethics/dpsngfullreport.htm

5.7.3.13 The Treaty For A Genetic Commons - Why The Disability Rights Movement Should Support It

One of the primary principles of the disability rights movement is that having a disability must come to be regarded as a normal part of living. We reject the medicalized perspective of disability, through which we are regarded as flawed human beings who will never be completely socially or economically acceptable unless we are cured. Therefore, we are suspicious of new medical technologies that are promoted with the promise to cure long-term disabilities, in part because such assurances have historically been used to generate public sympathies for questionable treatments and procedures. To be clear, we do support the availability of appropriate health care for all, especially for people with disabilities who are often unable to obtain health care coverage because of discrimination by the insurance industry or because of poverty.

We support the Treaty for a Genetic Commons because we are concerned about the social consequences of corporate zeal to maximize profits from genetically-based technologies. Corporate marketing of such new medical technologies could further the economic disparities between rich and poor countries. One of the risks of commercial control of genomics is that we will become a world of genetic "haves" and "have-nots," with genetically-caused disabilities increasingly becoming concentrated in the Third World and among the poor. People with disabilities are already found in the greatest numbers in Third World countries, where there are the fewest resources for support.

Existing tests for genetic conditions are promoted by exploiting public fears of disability. The treaty will thwart the further marketing of medical products through the exploitation of stereotypes of "normalcy". Unless stopped, genetic tests and treatments will be marketed by corporations through strategies that devalue the lives of disabled people and create fear of disability as a motivation for people to use them.

-- DRAFT --

THE TREATY INITIATIVE TO SHARE THE GENETIC COMMONS
We proclaim these truths to be universal and indivisible:

That the intrinsic value of the Earth’s gene pool, in all of its biological forms and manifestations, precedes its utility and commercial value, and therefore must be respected and safeguarded by all political, commercial and social institutions,

That the Earth’s gene pool, in all of its biological forms and manifestations, exists in nature and, therefore, must not be claimed as intellectual property even if purified and synthesized in the laboratory,

That the global gene pool, in all of its biological forms and manifestations, is a shared legacy and, therefore, a collective responsibility,

And,

Whereas, our increasing knowledge of biology confers a special obligation to serve as a steward on behalf of the preservation and well being of our species as well as all of our other fellow creatures,

Therefore, the nations of the world declare the Earth’s gene pool, in all of its biological forms and manifestations, to be a global commons, to be protected and nurtured by all peoples and further declare that genes and the products they code for, in their natural, purified or synthesized form as well as chromosomes, cells, tissue, organs and organisms, including cloned, transgenic and chimeric organisms, will not be allowed to be claimed as commercially negotiable genetic information or intellectual property by governments, commercial enterprises, other institutions or individuals.

The Parties to the treaty - to include signatory nation states and Indigenous Peoples - further agree to administer the gene pool as a trust. The signatories acknowledge the sovereign right and responsibility of every nation and homeland to oversee the biological resources within their borders and determine how they are managed and shared. However, because the gene pool, in all of its biological forms and manifestations, is a global commons, it cannot be sold by any institution or individual as genetic information. Nor can any institution or individual, in turn, lay claim to the genetic information as intellectual property.

7 Aug 2001

5.7.4 Genetic Testing

5.7.4.1 The Debate Over Tell-Tale Genes

New diagnostic tests could take advantage of the nearly 1,000 genes identified to cause disease. But some say such tests are already used by insurance companies and employers to discriminate against those prone to certain diseases.

Kristen Philipkoski.

http://www.wired.com/news/technology/0,1282,41807,00.html?tw=3Dwn20010214

5.7.4.2 Should All Newborns Get The Same Tests?

Great disparities exist among state-run screening programs. Some think it may be time for national standards. California is launching a pilot program to expand its newborn screening program from four medical conditions to 30. Florida, which already screens for five metabolic diseases, is debating becoming the first state to screen for genetic predisposition to type 1 diabetes. And Wisconsin, which currently screens for 21 disorders, is running a pilot program to determine the feasibility of screening for five more.


http://www.ama-assn.org/sci-pubs/amnews/pick_02/hlsb0204.htm

5.7.4.3 Evidence Builds That Employers Hire And Fire Based On Genetic Tests; Meanwhile Protective Legislation Languishes


5.7.4.4 Preventing DNA Based Discrimination
Most advancements in science have the potential to both help and harm, and the successful mapping of the human gene is no exception. While the genome breakthrough holds great promise for improving medical treatment, many privacy advocates fear that DNA will be used to discriminate against individuals based on unchangeable genetic characteristics that in no way limit abilities and that may never develop into a disease. In response to this threat, Rep. Louise Slaughter (D-NY) and Senate Majority Leader Tom Daschle (D-SD) have introduced the “Genetic Nondiscrimination in Health Insurance and Employment Act.” The legislation would prohibit insurers from restricting enrollment or adjusting fees on the basis of genetic information, prohibit genetic discrimination in all areas of employment and forbid insurers and employers from requiring genetic testing.

Genetic discrimination is not something that only sick people need to worry about. Each and every one of us is estimated to carry between 5 and 50 flawed genes!


5.7.4.5 Gene Testing for Birth Defect Goes Mainstream

Gene testing is going mainstream: Starting this month, tens of thousands of white Americans will be offered testing to see if they carry a gene mutation that causes cystic fibrosis even if no one in their family has the disease. Under new guidelines, obstetricians and gynecologists are supposed to offer the gene test to every Caucasian -- or the partner of a Caucasian -- who is pregnant or considering having a baby. It marks the first time gene tests are being offered to the general population. Until now, they have been recommended just for small groups of people who know they’re at high risk for a particular inherited disease, such as an illness runs in the family.

Are we ready for mainstream gene tests? The American College of Obstetrics and Gynecology is betting that with a little education, Americans will be savvy enough medical consumers that the screening will prove a boon.

- http://cnn.com
  Wednesday, October 03, 2001

5.7.4.6 Who Owns Your Genes?

The question is whether any money has been made from tests based on genes -- and in the case of the AIDS-resistance gene, none yet has. Some patients have become wary about providing their tissue for genetic research and a few have demanded money up front.

- Gina Kolata. May 15, 2000

5.7.5 Biology Primer

Overview

Everyone, especially all personnel of the courts, are well advised to bone up on basic biology and genetic engineering. Here are some websites recommended by a genome-watcher.

5.7.5.1 Genomics: Journey To The Center Of Biology

Brief history of biology from heredity to genomics

5.7.5.2 The 12 Best Sites To Learn About Genomics

Bruce Goldfarb[SMTP:bruce@charm.net]
February 13, 2001

1. Blazing a Genetic Trail
An excellent, well-written overview of genes and hereditary disease developed by the Howard Hughes Medical Institute.

- [http://www.hhmi.org/genetictrail/](http://www.hhmi.org/genetictrail/)

2. **Blueprint of the Body**
   An in-depth special report from CNN.com.

3. **DNA From the Beginning**
   An animated primer on DNA, genes and heredity sponsored by Cold Spring Harbor Laboratory and funded by the Josiah Macy, Jr. Foundation.
   - [http://vector.cshl.org/dnaftb/](http://vector.cshl.org/dnaftb/)

4. **The DNA Files**
   A series of reports produced for National Public Radio by the non-profit SoundVision and hosted by John Hockenberry. Topics include gene therapy, DNA and behavior, genetic testing and other related issues.
   - [http://www.dnafiles.org/](http://www.dnafiles.org/)

5. **The Genetics Revolution**
   Special report from Time magazine.

6. **Human Genome Special**
   Special report from New Scientist published June 26, 2000, commemorating the completion of the human genome first draft.

7. **Primer on Molecular Biology**
   An intelligent, no-nonsense text prepared by the US Department of Energy’s Oak Ridge National Laboratory. An advanced degree useful, but not required.
   - [http://www.bis.med.jhmi.edu/Dan/DOE/intro.html](http://www.bis.med.jhmi.edu/Dan/DOE/intro.html)

8. **Nature Genome Gateway**
   A wealth of authoritative information from the journal Nature, which published the public Human Genome Project sequence. Nature also published the landmark 1953 paper of James Watson and Francis Crick describing DNA structure, also included.
   - [http://www.nature.com/genomics/human/](http://www.nature.com/genomics/human/)

9. **The Human Genome**
   Special issue of the journal Science publishing Celera's human genome sequence and a host of supplemental material.

10. **The Human Genome Project: Exploring Our Molecular Selves**
    The National Human Genome Research Institute has created a free multimedia educational kit for high school students and the general public. The kit includes a CD-ROM; an award-winning video documentary, "The Secret of Our Lives"; a commemorative poster; and a booklet, "Genetics: The Future of Medicine."

11. "In My Humble Opinion: Genomics is the most important economic, political, and ethical issues facing mankind."
    An extraordinary precis describing the impact of genomics, written by John Ellis in the November 1999 Fast Company. Required reading for anybody interested in a glimpse of the future.

12. **Genomics News Wire**

5.8 **Nanotechnology**
Overview
Once a decidedly "far out" idea, nanotechnology won the "breakthrough of the year" award from Science magazine in 2001.

5.8.1 Issues In Nanotechnology
"It has been almost a decade since Science devoted a special issue to nanotechnology, and even the title of that issue reflected the scarcity of actual working nanotechnology at the time." "The present special issue can reflect only some of the current trends in this rapidly expanding area."


5.8.2 Nanotech: The Science Of Small Gets Down To Business
Special Issue, Scientific American, September 2001. Features articles on nanofabrication, nanophysics, nanoelectronics, nanorobotics, nanomedicine, as well as nanovisions, nanofallacies, nanoinspirations, and nanofiction. The basic conclusion is "if the nano concept holds together, it could lay the groundwork for anew industrial revolution." Nanovisions is by Eric Drexler, the founder of the field, who "describes the concept of molecular construction systems called assemblers that could build almost anything, including copies of itself." Richard Smalley dismisses the "nanofallacy" of "out-of-control nanorobots" which is a fear many opponents of nanotechnology have expressed.


5.8.3 Nanotechnology Used For Futuristic Combat Uniforms
Supported by a five-year $50-million grant from the U.S. Army, the MIT-affiliated Institute for Soldier Nanotechnologies is developing new combat uniforms with embedded particle-size materials and devices ("nanotechnology") that could detect biological or chemical threats, detect bleeding, and apply pressure. Using nanotechnology, shoes could be designed to give soldiers enough extra energy to allow them to jump over 20-foot walls, and their combat fatigues could contain light-deflecting material that would make combatants blend in with their environments to become almost invisible. (AP/San Jose Mercury News 13 Mar 2002)

http://www.siliconvalley.com/mld/siliconvalley/2854064.htm

5.8.4 The Once And Future Nanomachine: Biology Outmatches Futurists' Most Elaborate Fantasies For Molecular Robots

5.8.5 Angels On A Pinhead: New Research Networks For Nanotechnology
Nanotechnology promises to be the defining science of the 21st century. With its integration of the organic and inorganic works, it represents more than simply a continuation of the principles of microtechnology. Because of this it requires new structures of R&D management, and new communication processes. A number of recent foresight studies identify potential future applications for European industry and point to the strengths and weaknesses of Member States. But only new interdisciplinary research networks will enable Europe to harness the power of nanotechnology--or prepare its citizens for the benefits.
5.9 Other Developments

5.9.1 The Future Of Medicine

"It's been somewhat surprising in this era of triumph for modern medicine to see the rapid growth of alternative/complementary medicine, which is used by as many as one in three Americans." "There is a growing tendency among physicians to acknowledge and even embrace certain forms of alternative/complementary medicine." "Now I think we may be seeing another refinement, one that is taking us from 'complementary' to 'safe and effective.' More and more Americans are demanding greater certainty from alternative or complementary products as an increasingly number of press reports document health problems resulting from certain natural products and complementary practices." "In this new climate of national wariness and concern for personal safety, those interested in selling and buying natural products associated with complementary medicine will be better off in the long run if reliable research is able to certify their safety and efficacy."


5.9.2 Future Of Tobacco Control

Where might tobacco control be in 2015? Those were the questions addressed by a panel of experts during the special session, “Future Scenarios: The World of Tobacco in 2015.” The first scenario includes a continuation of economic and health disparities between developed and developing countries, increasing economic penalties imposed on tobacco companies and more companies raising tobacco taxes leading to only limited reductions in prevalence and use. The second scenario features a strong and binding Framework Convention on Tobacco Control, the development of alternative use for tobacco, massive reductions in the use of tobacco products worldwide and the elimination of all tobacco advertising. In the final scenario, governments conclude that the economic benefits of tobacco outweigh the costs, the tobacco companies develop a successful two-world approach assuaging concern in the developed world while marketing as usual in developing countries and activism for tobacco control recedes.

The Future of Tobacco Control: 11th World Conference on Tobacco OR Health

http://www.wctoh.org/pdf/3_wed080900.pdf

5.9.3 Technology And The Future Of Health Care: Preparing For The Next 30 Years


5.9.4 Neuroscience: Breaking Down Scientific Barriers To The Study Of Brain And Mind

"Despite this remarkable progress, the neuroscience of higher cognitive processes is only beginning. For neuroscience to address the most challenging problems confronting the behavioral and biological sciences, we will need to continue to search for new molecular and cellular approaches and use them in conjunction with system neuroscience and psychological science. In this way, we will best be able to relate molecular events and specific changes within neuronal circuits to mental processes such as perception, memory, thought, and possibly consciousness itself." (1120)


5.9.5 Understanding Intelligence.

"Embodied cognitive science is a growing area of research that attempts to understand intelligence by constructing actual or simulated agents. This work takes as a core assumption that a true understanding of the processes of intelligence requires actually building agents that are
capable or surviving autonomously in the real world." This claim stands in contrast to approach, common in cognitive science, that focus on solving well-specified problems without concern for autonomy. For example, the authors offer Deep Blue—the computer program that beat world chess champion Garry Kasparov a few years ago—as a prototypical case of artificial intelligence methodology.

As they point out, this program was successful because it exploited the fact that chess is a game with specific rules that allow the set of possible moves to be enumerated. Thus, Deep Blue was a technological marvel (it was able to search through a large space of possible moves quickly) but not a generally intelligent one." (From a review in *Science*. 288, 28 April 2000, p. 624.)

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5.9.6 Olfactory Fingerprints For Major Histocompatibility Complex-Determined Body Odors

Recognition of individual body odors is analogous to human face recognition in that it provides information about identity. Individual body odors determined by differences at the major histocompatibility complex (MHC or H-2) have been shown to influence mate choice, pregnancy block, and maternal behavior in mice. Unfortunately, the mechanism and extent of the main olfactory bulb (MOB) and accessory olfactory bulb (AOB) involvement in the discrimination of animals according to H-2-type has remained ambiguous. Here we study the neuronal activation patterns evoked in the MOB in different individuals on exposure to these complex, biologically meaningful sensory stimuli. We demonstrate that body odors from H-2 disparate mice evoke overlapping but distinct maps of neuronal activation in the MOB. The spatial patterns of odor-evoked activity are sufficient to be used like fingerprints to predict H-2 identity using a novel computer algorithm. These results provide functional evidence for discrimination of H-2-determined body odors in the MOB, but do not preclude a role for the AOB. These data further our understanding of the neural strategies used to decode socially relevant odors.

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Michele L. Schaefer, David A. Young, Diego Restrepo, *J. Neurosci*. 2001 April 1; 21(7): P. 2481-2487
Overview
While economic practices based on neoliberal economic theories rule the world, there are greater numbers of people--still a tiny minority--who believe an economic system based on free exchange is possible.

And there are more people--though still too few to change policies--who, looking at the contradictions within the global capitalist system, on the one hand, and the impending "train wreck" looming between continued economic growth globally and environmental limits and collapse, on the other, maintain that a new economic system is necessary.

6.1 Gratis Economy

6.1.1 The Gratis Economy: Privately Provided Public Goods
A work in the relatively new field of economic sociology, this highly unconventional book deals with the logic of toll-free services and generalizes the notion of voluntary work toward encompassing everything that can be obtained free of charge in the world.

  http://come.to/Gratis-Economy/

6.1.2 The Future Of Ideas
In a favorable review of Lawrence Lessig's new book "The Future of Ideas," noted Yale computer scientist and author David Gelernter offers the following discussion of profit vs. nonprofit funding of innovation. "Lessig is a booster of free software. 'The most important space for innovation in our time was built upon a platform that was free,' he writes, and much of the Internet is built out of free software. On the other hand, many of the main ideas were invented by the private, profit-making world; neither free nor for-profit has a monopoly on innovation. Unix and Linux (which is based on Unix) are free, and they are crucial to the Internet. But when Ken Thompson and Dennis Ritchie invented Unix in 1969, AT&T was paying their salaries. This world-changing software emerged from the heart of regulated-monopoly capitalism. The desktop user interface -- the windows, menus, icons and mouse we know and love (or anyway, know) -- was invented by Xerox in the 1970's and developed further by AT&T, Apollo, Sun, Apple and other companies in the 1980's. Xerox invented the Ethernet, too. I.B.M. invented many of the essential technologies of computing. Mr. Lessig doesn't do justice to the delicate, hugely valuable balance between public and private. Both worlds are indispensable."

- http://partners.nytimes.com/2001/12/12/books/12GELE.html

6.1.3 Genuine Progress Indicator To Replace The Gross Domestic Product
Since its introduction during World War II as a measure of wartime production capacity, the Gross National Product (since changed to Gross Domestic Product -- GDP) has become the nation's foremost indicator of economic progress. It is now widely used by policy makers, economists, international agencies and the media as the primary scorecard of a nation's economic health and well-being. However, there is an emerging movement by economists to replace the GDP with the Genuine Progress Indicator (GPI). The GPI broadens the conventional accounting framework to include the economic contributions of the family and community realms, and of the natural habitat, along with conventionally measured economic production. The GPI takes into account more than twenty aspects of our economic lives that the GDP ignores. It includes estimates of the economic contribution of numerous social and environmental factors which the
GDP dismisses with an implicit and arbitrary value of zero. It also differentiates between economic transactions that add to well-being and those which diminish it. The GPI then integrates these factors into a composite measure so that the benefits of economic activity can be weighed against the costs. The GPI is intended to provide citizens and policy-makers with a more accurate barometer of the overall health of the economy, and of how our national condition is changing over time. The GPI is emblematic of a grassroots movement that has been building in this country for over two decades: an acknowledgment that sprawl, growth and congestion are changing neighborhoods, depleting green spaces and affecting our quality of life. Americans might be ahead of their policy makers in measuring what's really important. Redefining Progress’ 'Genuine Progress Indicator' (GPI) Rose Slightly In 2000; Alternative Economic Measure Remains Below GDP.

6.2 Growing Rich / Poor Gap

6.2.1 Americans See Rising Economic Inequality As Boom Bypasses Poor
Americans increasingly see an economic divide between the haves and have-nots, according to a new poll from Pew Research Center for the People & the Press that also finds a majority of people dissatisfied with the country's direction. The report indicated the economic boom of the 1990s had little impact on the financial well-being of those at the lower end of the economic scale.

6.2.2 Economic Boom Skipped Generation Of "Nowhere Kids"
Nearly five million young people between the ages of 16 and 24 were out of school and out of work at the turn of the 21st century, showing little change from figures a decade earlier, according to the results of a new study of U.S. labor market conditions from Alternative Schools Network in Chicago.

6.2.3 Illinois Poverty Watch
Almost one in 10 Illinois residents is "extremely poor," earning less than the federal poverty level of $17,029 a year for a family of four; more than a third of Illinois counties are on "poverty watch" or "poverty area of concern" lists in a new study from the Heartland Alliance for Human Needs & Human Rights.

6.2.4 Pulling Apart: A State-By-State Analysis Of Income Trends
Despite the strong economic growth and tight labor markets of recent years, income disparities in most states are significantly greater in the late 1990s than they were during the 1980s. The average income of the lowest-income families grew by less than one percent from the late 1980s to the late 1990s a statistically insignificant amount. The average real income of middle income families grew by less than two percent, while the average real income of high income families grew by 15 percent.

Ten States where Income Inequality Between the Top and the Bottom Was Greatest, 1996-98: New York, Arizona, New Mexico, Louisiana, California, Rhode Island, Texas, Oregon, Kentucky, and Virginia.

6.2.5 Divergent Paths: Economic Mobility In The New American Labor Market
"The negative impact of economic restructuring is not just happening at the fringes of the work force. It is [also] happening to white men, traditionally the most protected group, at the heart of the work force." "With the kinds of declines in hourly wages that we find here, it is a bit of a puzzle why there has been so little public outcry. One reason may be that people are working more hours and there are more women in the work force now. The net result is that total household income levels have held steady, but it takes more effort to bring in the same income. This kind of new economy may preserve living standards, but it is not family friendly. As it sucks more and more resources out of the home, we are seeing rising stress on families, and declining time for being with children."

"We have choices to make here - and we can choose a system in which prosperity is shared, and the reward for hard work is at least a living wage. It is a question of distribution and equity. Economists will say that is a political question, and they are right. This is a political choice, and it determines where American society will be in the future. For many decades, regulated economic growth was the rising tide that lifted all boats. But that has clearly changed now. Upward mobility has deteriorated to the point where workers face much more limited and unequal wage growth, even when the economy grows at record rates as it did in the 1990s. On the international scene, the recent experiences of Russia and Argentina also make it clear that the social costs of a free market approach can be very high, without producing the promised economic development. If we continue on the trajectory found in our study, it will make the gulf between the rich and the poor nearly unbridgeable. That would truly be the end of the American dream. Is that really the choice we want to make?"

Jared Bernstein, Elizabeth C. McNichol, Lawrence Mishel, and Robert Zahradnik
January 2000     EPI Study

6.2.6 Labor Day Report: Layoff Leaders Cushioned From Downturn And CEO Pay Rises At No-Tax Firms With Corporate Tax Rebates

CEOs of firms that announced layoffs of 1,000 or more workers this year earned about 80% more, on average, than executives at 365 top firms surveyed by Business Week, according to "Executive Excess 2001," a new report by United for a Fair Economy and the Institute for Policy Studies.

The report also found that the wage gap between men and women is widest at the top. Among the 30 highest-paid CEOs, women earned only about eight cents on the dollar as compared to men. Contrast that with 72 cents on the dollar among blue collar workers and 68 cents among white collar workers. In additions, the study revealed that companies that received millions of dollars in outright corporate tax rebates in the late 1990s paid their CEOs more than other firms. The increased wage inequity between CEOs and workers in 2000 continued a decade-long trend. If the minimum wage had grown at the same rate as CEO pay since 1990, 571%, it would now be $25.50 an hour, rather than $5.15 an hour.

6.2.7 Richest Of The Rich Getting Even Richer

"Average American making gains, but falling further behind wealthy." "If you’re this typical American, your job probably provides you with health insurance but not a pension." "You may own a little stock and your net wealth is going up. But your borrowing is going up even faster, to the point that your debt is greater than your annual salary." "The gap between poor and middle class is shrinking, but the gap between the rich and everybody else is wider than ever." (From "The State of Working America, 2000-2001" published every two years by the Economic Policy Institute.

"The poorest one-fifth saw its average after-tax income fall 8.9 percent from 1979 to 1999, to only $8,761. But the after-tax income of the richest 1 percent rose 93.4 percent, to an average of $515,612 per household."
"Between 1989 and 1999, while the median hourly wage for all workers grew by only 2.4 percent, the median income for all CEOs nearly doubled to an average $3.5 million. At the very top, CEOs of the 350 biggest corporations earned an average $12.4 million per year in salary, bonuses and sock options, a figure that grew by more than 500 percent in the 1990s."

"The bottom two-thirds, with one-half of 1 percent of assets, has more than 12 percent of all debt. The debt figure is rising for all Americans except the top 1 percent, and for most people it is going up faster than stock ownership."

Honolulu Advertiser. 9/3/00, p. A3

6.2.8 More Get Rich And Pay Less In Taxes

The number of Americans with million-dollar incomes more than doubled from 1995 through 1999, as their salaries and stock profits soared.


6.2.9 For The Boss, Happy Days Are Still Here

Despite a bad year for business, the pay for top executives like Steve Jobs is still setting records.


6.2.10 Leaving Shareholders In The Dust

In an inversion of the notion that managers interests should align with shareholders', many technology executives unloaded stock and got lavishly rewarded.

http://www.nytimes.com/2001/04/01/business/01FAIL.html

6.2.11 Captains Of Industry Rarely Go Down With Ship


6.2.12 Now A Majority: Families With 2 Parents Who Work

For the first time since the Census Bureau began tracking the numbers, families in which both parents are working have become the majority even among the most traditional families: married couples with children.


6.2.14 '90s Boon Stingy On Public Good

For nearly a century, every time the American economy boomed, it left an enduring legacy of vast new public works and bold private initiatives that were intended to benefit all. Interstate highways and universal phone service changed how we lived. The moonshot and environmental clean up helped define who we are. But as the nation comes off the expansion of the 1990s, the longest in its history, it has few similar accomplishments to show for the good times.

Americans are twice as likely to own a personal computer as they were when the growth began. But they're also more likely to run short of the power needed to operate it. They can purchase the most technologically advanced health care on earth but face a rising risk of being unable to find an emergency room or a variety of basic drugs. They can buy Perrier but can't always get clean tap water.

The chief reason: The prosperity of the last decade has been a peculiarly private affair. While affluent Americans spent generously on themselves, the nation as a whole did not. On the contrary, it devoted a historically small fraction of its new economic bounty to the roads and airports, waterworks and sewer plants that have traditionally made up society's foundation.

While an increasingly deregulated private sector profited handsomely from the decade's growth, it was also given new responsibilities for such shared services as electrical power and..."
health care. It tackled these tasks with the same spare, profit-driven techniques that it applied to car making and computers.

The result has been a broad deterioration that has left even the rich with their alignments wrecked by potholes, their travel trashed by flight delays and their health threatened by emergency care cutbacks. There has also been a crumbling of Americans' once-easy confidence that here at least the power was reliable, the water clean and the telephone service certain. To be sure, government did not altogether abandon bricks and mortar. In fact, it substantially increased its spending on schools, highways, airports and the like starting in the mid-1990s. And free-market advocates argue that without the private sector’s lean and mean approach, there would have been no economic boom, no hiring binge, no productivity gains, no high-tech revolution to benefit the country.

http://www.oaklandtribune.com/

6.2.15 New Economy Now Just Part Of Old Economy
The shake-out of dot-com companies seems to be making the future of the "new economy" clearer. For one thing, the "Internet sector" is being subsumed into the general economy, and "pure play" Internet companies (i.e., companies whose businesses are entirely built on the Internet) are becoming extinct as they are being absorbed or displaced by traditional companies. For another, the Internet is now understood to be more a medium than a separate industry, and the companies that succeed will be ones that develop multiple selling channels. But in spite of the current market volatility most analysts think that a new-old economy will emerge from the downturn stronger than ever. (USA Today 3 Apr 2001)


6.2.16 Trend Toward Shorter Corporate Lifespans
Over the last decade there has been a trend toward shorter corporate life spans, particularly among technology start-ups. In the current economic environment it is easy to think this is about bankruptcy. No, it is increasingly due to the short-term need to innovate faster. In 1991, the average time to IPO or acquisition for venture-backed startups was nearly six years; last year, the average was down to 3.6 years. For example, of the 23 companies Cisco bought in 2000, 15 were less than three years old upon acquisition. This trend lends credence to the "built to flip" syndrome.

This is an important trend for futurists to internalize. It should be factored into scenarios and forecasts so as to not fall victim to business-as-usual assumptions. An impending change of ownership, either partial or total (i.e., alternative future or scenario) should be analyzed by the start-up. On the other side of the equation, the potential acquiring firm should be equipped with sufficient vision to understand how the target firm may strengthen its organization. In other words, "Acquiring (sic) minds want to know."

Futures Research Industry Report - May 2001
Randall L. Scheel, Futurist & Publisher, Futures Research Industry Report, 3112 SE Silver Springs Drive, Vancouver, WA 98683 USA

6.2.17 Changes In World Economy On Raw Materials May Doom Many Towns
Foreign competition from countries that deal in commodities is stifling the economic progress of many rural American towns.


6.2.18 Bono, Gates Take On Treasury Chief Over Aid.
"[Bill] Gates chastised the US government yesterday as 'the laggard' among world aid donors. 'If we took the world and reordered it so that you and me were close to a random neighborhood from some other part of the world, you would see the living conditions, the medical problems, the infant mortality and of course the human spirit would respond to that,' Gates said."

"After announcing yesterday that he is giving an additional $50 million to combat the worldwide
spread of AIDS, Gates challenged [US Treasury Secretary Paul] O'Neill and the Bush administration to increase US spending for health care programs in sub-Saharan Africa and other poor regions. "Gates' personal foundation has given out $2.8 million in grants and pledged $2.1 billion more since its creation two years ago. More than half the grants have gone to global health projects. O'Neill made clear that he remains opposed to appeals for an increase in aid from wealth nations."


6.2.19 Triple Bottom Line Reporting: Public Relations Or Committed Change?
The "three bottom lines" of socially-committed enterprises are: Economic prosperity, environmental quality, and social justice.
Sohail Inayatullah adds there must be a fourth bottom line--concern about the needs of future generations.

6.2.20 The Rich Keep Getting Richer While The Rest Of Us Don't Really Care.
Because most of us still believe in the American Dream, all evidence to the contrary notwithstanding.

6.2.21 Supersonic Flight Is Making A Comeback
Gulfstream, a company best known for making planes that chauffer celebrities and corporate executives across the skies, has been hiring engineers from NASA and Lockheed Martin to start chasing the sonic dream. The major hurdle, overcoming the sonic boom that has been an inescapable consequence of supersonic flight. Due to its deafening sonic boom that can shatter windows in buildings below, the Concorde, the only commercial supersonic airliner has been banned from overland flight. The restricted Concorde can only take trips over the water. Low-boom research suggests it is possible to reduce the boom by redesigning the shape of the plane.

6.2.22 How Will Washington Read The Signs?
Enron’s collapse may well halt the trend of the government allowing companies to operate with declining amounts of regulation.

6.3 Consumer Debt

Overview
To the extent there is any public concern about debt in the US at all, it has focused almost entirely on the national debt. For the last half of the 20th Century, many Americans were engaged in a political controversy about whether a large national debt was good or bad or indifferent.
It used to be that Keynesian Democrats argued that it was OK for the government to engage in deficit spending during the time the economy was sagging, in order to jump-start it again. Republicans used to maintain that deficit spending was always evil.

But then the Republicans elected Ronald Reagan, who, supporting economic concepts that George Bush Senior at one time termed “voodoo economics,” turned the US from being the number one creditor nation—the nation to whom the rest of the world was in debt—to the number one debtor nation—the nation which owes the most to other nations. And Reagan did that within a two year span—from 1980, when he took over, to 1983. And the US still is the world’s leading debtor nation, though Japan is challenging us for that distinction.

Of course, two years ago, Republicans and Democrats alike were trying to get the public to believe that there are huge budget surpluses currently and for the foreseeable future which, if applied properly, can erase the national debt by 2013, or some such date. Clinton even made a big show of paying down one billion dollars—of a 6 TRILLION dollar national debt [Honolulu Advertiser, March 10, 2000, p. A2]—not much when you place what was paid against what is still owed.

However, the Congressional Budget Office later had the courage to admit that the “Ever-growing budget surpluses, which are prompting the major party presidential candidates to boost their tax cut and spending plans, have done little to change a grim long-term financial outlook for the US.” “Even if politicians were to agree to save every penny of the surplus and use it to pay off the national debt, the cost of providing promised health and retirement benefits after the baby boom generation leaves the work force will overwhelm the federal budget, the CBO concluded. ‘If the nation’s leaders do not change current policies to eliminate that imbalance, federal deficits are likely to reappear and eventually drive federal debt to unsustainable levels’ the CBO said.” [“Budget surpluses won’t stop future shortfall, agency says,” Honolulu Advertiser, October 7, 2000, p. A1.]

Now, in the aftermath of 9/11, federal deficits loom again as the US gears up its war economy to fight all possible foes, internal and external, for the foreseeable future.

Nonetheless, discussion of the national debt occupies far more ink and oratory than does the discussion of consumer debt. But it is our contention that it is—and has been for 30 years—to consumer debt that people should turn their attention, because it suggests that most conventional economic beliefs and policies are myths if not outright lies.

No one, not even the richest person in the world, “earns” enough money through their labor to enable them to buy everything they want. Everyone, from the richest to the poorest, has to borrow vast sums of money. The poorest, or at least the middle class, borrow the most, in relation to what they earn or save.

Without this huge and growing bubble of consumer debt, we would have had a major economic depression in 1980, when Reagan took over, as well as during the mid 1990s, when the Asian portion of the global bubble burst. But how much longer can our portion of the bubble continue to expand?

“[N]ew statistics [from a report by the Federal Reserve] offer ample evidence for those who argue that Americans are living dangerously beyond their means, and that the current patterns of economic growth are creating unacceptable divisions in society.” “Growing debt contributed to the plight of the bottom-of-the-ladder groups. The Fed researchers found that about one family in eight spent more than 40 percent of their income toward meeting their debt payments in 1998, up appreciably from 10.5 percent in 1996. The measure rose for most demographic groups, but families with incomes below $50,000 and the
elderly showed the greatest strains.” “Perhaps the most striking revelation of the report concerned rising levels of indebtedness during an economic boom fueled foremost by consumer spending. Families took on higher levels of virtually all forms of debt in the three year period under study: mortages, installment loans, credit-card debt and other obligations. ‘The most amazing figure to me is that the median value of total family indebtedness rose from $23,400 in 1995 to $33,300 in 1998,’ said Edward Wolff, a New York University economist.” ["Fed says family wealth declining dangerously,” Honolulu Advertiser, January 19, 2000, p. Al, A6].

Meanwhile, Americans continue reach the lowest rate of savings ever--month after month after month. Here are some quotes:

“The percentage of income that Americans were able to save [sank] to two-tenths of a percent in June, the lowest level since the Government began keeping monthly statistics in 1959" [New York Times, August 4, 1998, p. c2]. But on June 28, 1999, the government said the savings rate “fell to a record low of minus 1.2 percent” [Honolulu Star Bulletin, July 28, 1999]. “By August [1999], the saving rate was minus 1.5 percent.” [Honolulu Star-Bulletin, October 1, 1999, p. C1].

The headline of an article in the Star Bulletin for January 31, 2000 read, “America's spending tops their income” and the first sentence said “American's personal income rose in December and they spent all of it and more, giving the nation's retailers one of their best holiday seasons in years.” Elsewhere the article noted that “With Americans spending more than they earned in December, the personal savings rate was pulled to a record monthly low.”

Well maybe that was just the Christmas shopping, and the savings rate got better later?

No. The headline in the Star Bulletin for August 28, 2000 once again stated, “American's savings rate hits all-time low” with the text explaining that “spending by consumers increased twice as fast as their incomes.”

And then, the headline in a Star-Bulletin article (September 29, 2000, p. B-4) read, “Free-spending Americans put savings at all-time low.” The third paragraph begins, “With spending outpacing income, the amount of after-tax income left over after spending fell to a negative 0.4%--the lowest rate since the Commerce Department began tracking such data in 1959.”

“Consumers are financing shopping sprees through borrowing, previous savings, or gains from stock market and other investments,” the report concludes once again.

Indeed, as saving plummets to new depths, levels of consumer debt get higher and higher at the same time:

“Americans are carrying more debt than ever--about $1.3 trillion not including mortgages.” “The average household credit card balance jumped 2.5% to $4,722 last year.” [Honolulu Advertiser, October 7, 1999, p. B7]

6.3.1 Credit Spending Tops Forecast

"Consumers borrowed money at a brisk pace in February and shopped up a storm on their credit cards, despite gloomy news about the nation's economy. Total consumer credit increased by a seasonally adjusted $13.5 billion in February or a 10.5 percent annual rate, the Federal Reserve reported yesterday." "In January, consumer borrowing grew by a total of $16 billion, or a breakneck 12.5 percent rate."


6.3.2 Consumer Debt in US Piling Up
"Personal debt is at an all-time high, and the amount of income Americans are devoting to making payments on it is at levels unseen in 15 years. Mortgage delinquencies and write-offs by credit card companies are rising, and personal bankruptcy filings could hit a record this year. "Our average client is carrying more debt than they've ever carried, and they're in trouble. If their overtime is cut back or a husband or wife is laid off, they have virtually no savings, so they go over the edge."

"The national balance on credit cards, auto loans and other consumer loans rose to a record $1.58 trillion in April. Mortgage debt totals about $5.2 trillion. Americans are spending 14.3 of their take-home pay on debt--the highest percentage since 1986."


6.3.3 Consumers Trim Borrowing In June

"Consumers cut their borrowing by $1.5 billion in June, according to the Federal Reserve. That's the first monthly decline in more than 3 years and the steepest drop in consumer credit in more than 9 years. Economists had expected consumer credit to grow by $10 billion but consumers added only slightly to their credit card debt...."

USA Today, August 8, 2000

6.3.4 Credit-Card Rates Again Miss The Cut

"Interest rates have fallen dramatically this year, but the benefits have been slow to accrue to credit-card borrowers. Most still are stuck with double-digit rates. Banks have not dropped their card rates nearly as fast as their own cost of funds has gone down. " The Federal Reserve Board has slashed short-term interest rates four percentage points this year--from 6.5 percent at the start of this year to 2.5 percent. The average prime rate, a key benchmark for bank lending, has gone down in lockstep--from 9.5 percent to 5.5 percent. But credit car rates have taken their own path. Between a fourth and a third of all credit cards have 'fixed' rates that don't adjust automatically. Those rates have fallen from 15.46 percent at the beginning of the year to 14.25 percent. "The decline is due mainly to competition. " The majority of cards have variable rates. The average rate on those cards has dropped from 17.09 percent at the beginning of the year to 14.12 percent. "But the rate of decline has leveled off...."


6.3.5 Economic Slump Across The Board

"You turn to the right, and you've got credit card bills. You turn to the left, and your stocks just plunged. You turn back to the right, and you've lost your job. "Coming so soon after a period of unprecedented prosperity, this downturn caught many unprepared. And credit counselors say many Americans are ill-prepared to weather prolonged unemployment. "In 2000, consumers pushed into credit counseling carried debt that on average accounted for 88 percent of income. "And the debt load is growing."


6.3.6 Keeping Holiday Spending Under Control

"Our saving rate is the lowest its been since 1947, according to the Federal Reserve Board. We have more debt, more gambling and more bankruptcies on a percentage basis than we've had since 1947."


6.3.7 Older Americans' Debt Burden Is Growing

"In the space of a decade, older Americans have become more financially vulnerable. They have more years to provide for themselves and less assets to do it. Older people on average still owe less than their children and grandchildren. But it's harder for them to dig their way out of
debt when medical problems arise or economic circumstances change." "As a new generation of Americans retires, values of thrift are being replaced by the free-spending attitudes of baby boomers. We’re seeing the advanced wave of the baby boomers who are extremely comfortable with debt."


6.3.8 More Graduates Mired In Debt, Survey Finds

Two out of three students must now borrow money to attend college, and four out of ten face unmanageable debts as they finish.


6.3.9 The New Post-Industrial Struggle

The old industrial struggle was between companies and workers. The new struggle is between companies and workers. But the issue isn't exactly the same as it used to be. The new battle is over who's going to keep spending, and thereby keep the American economy going.

You see, since last year, American companies have cut way back on their purchases of everything from new equipment and technology to advertising, legal services and consulting. The only reason the American economy isn't in a recession is because consumers—the vast majority of whom are employees—have not cut back their spending. In every other slowdown, it's been the other way around. First, consumers cut back on their spending and then companies cut back on theirs because sales are down. This time, companies have pulled in their belts because their top executives aren't very optimistic about the economic future. Employees, on the other hand, keep spending because they are optimistic, or at least they have been. And as long as employees stay reasonably confident and continue to buy, the economy keeps moving forward.

But here's where the tension is growing. You see, employees are already deep in debt. We're seeing levels of borrowing we've never seen in this country. Consumer credit debt climbed 5 1/2 percent in 1998 and in 1999, and then surged a whopping 12 percent last year, and it's still rising at that pace. Mortgage debt is way up, too. Employees can't go on spending like this, especially if companies start cutting back on jobs and wages, which are the next big candidates for serious cost-cutting.

High-tech firms and business services such as advertising and consulting have already laid off thousands of people because the companies that used to buy these products and services have all but stopped. And other companies are starting to whack their payrolls as well.

If this goes on, consumer confidence is going to take a dive. And when that happens, American workers will essentially go on a spending strike. That prospect should terrify American business because when employees pull in their belts, not even Alan Greenspan can save us.


http://prospect.org/webfeatures/2001/08/reich-r-08-10.html

6.3.10 Consumers Running Out Of Steam?

People are buying electronics even while acknowledging higher debt and shrunken stock portfolios. They worry about losing their jobs, but not enough not to snap up low interest, or in some cases no interest, deals on homes and automobiles. The results have been striking: The US economy grew by a faster-than-expected 1.4 percent rate in the final quarter of 2001, rebounding sharply for the 1.3 percent third-quarter loss following the September 11 attacks. Consumers ratcheted up spending on costly manufactured goods, such as cars, at a rate of 39.2 percent in the fourth quarter. Total consumer spending rose at a brisk 6 percent. Even so, economists—including Federal Reserve chairman Alan Greenspan—caution that America's buying frenzy can't last. Greenspan predicts a subdued recovery.

6.3.11 Will Korea's Credit Card Boom Lead To Bust?


6.4 Work and Not Work

Overview

We have commented in previous scans about the uncertain futures of work. While Americans are working longer and harder, while barely maintaining earlier standards of living, robots and artificial intelligences are taking over more and more jobs once only humans could perform. Is there any real future for human labor at all? If there is, who will do it, if birthrates continue to decline in the advanced industrial countries?

6.4.1 Future Work: Myths And Realities

Which of these scenarios would you like in your future? All work will be done on a project basis by autonomous teams as free agents or small enterprises, linked by networks (Curtain 1998). Or corporations will be virtual countries, large conglomerates will dominate with smaller supplier enterprises on the periphery (ibid.). Or stable large companies will retain valued knowledge workers with comprehensive incentive packages and a culture of internal networking (Department of Trade and Industry 1999). Or technology will create jobless economic growth and mass unemployment (Batstone 1999). Many projections about the future of work and jobs have been made. Are some of them self-perpetuating myths? Are some more likely than others to come true? These questions are explored here by examining trends in technology and nonstandard work and their implications for work in the 21st century.

Sandra Kerka. ERIC Clearinghouse on Adult, Career, and Vocational Education, 2000.

6.4.2 Racing To Replace Retirees.

A workforce crisis is looming as baby boomers prepare to retire. States are turning to succession planning to avoid major headaches.

"Sidebox: Feds Struggle with Retirement Crisis"

The federal government also faces a looming workforce crisis. Nearly 71 percent of senior civil servants will reach retirement eligibility by the end of 2005, according to a report by the General Accounting Office (GAO). To make matters worse, few federal agencies are doing anything in terms of succession planning. Despite the GAO's belief that "placing appropriate emphasis and attention on succession planning will help agencies ensure that they have a well prepared, qualified and diverse group of people available to fill career [senior executive service] positions," nearly 24 agencies do not have a formal succession planning program.

Tod Newcombe October 2001
http://www.govtech.net/magazine/story.phtml?id=3030000000003166

6.4.3 New Report Says Labor, Skills Shortages Could Threaten Economy

A new report released by the Washington, D.C.-based Employment Policy Foundation (http://www.epf.org/) finds that, despite a rising tide of layoffs, restructurings, and bankruptcies, the U.S. economy remains fundamentally sound. But, the report cautions, the nation's long-term prosperity could be threatened by looming labor and skills shortages. According to the report, "Building America's Workforce for the 21st Century," workers today enjoy higher compensation, better working conditions, more opportunity, and greater productivity than ever before. But failure to close a predicted labor supply gap caused by the imminent retirement of millions of workers could lower gross domestic product by 3 percent over the next ten years and by as much as 17 percent over the next thirty years.

"As America observes Labor Day, a serious worker and skills shortage looms over the next three decades, spurred by the retirement of more than 61 million workers in the next three years,"
The Economy

said EPF president Ed Potter. "Demand for labor will begin exceeding supply within just five years. Unless those shortages are resolved, the United States will be unable to maintain its historic rate of economic growth, with the workforce being short by almost 5 million workers by 2011 and almost 36 million workers by 2031. In addition, the workforce could be short as many as 20 million college-educated workers by 2031."

September 4, 2001

6.4.4 Sleep Deprivation.

Polling conducted for the National Sleep Foundation finds epidemic levels of sleep deprivation. Given all these problems, it's little wonder that 43 percent of Americans say they're so sleepy "that it interferes with their daily activities a few days per month or more." Work is one such activity, with 31 percent of women and 22 percent of men saying they're sleepy on the job two days or more per week. Eight percent of workers sometimes nod off on the job. An employer who hires young adults for their boundless energy may be in for a rude awakening: 40 percent of 18-29-year-olds (versus 23 percent of 30-64-year-olds) confessed they're sleepy at work two days a week or more. The young folks are also twice as likely as their elders (22 percent versus 11 percent) to be late for work due to sleepiness. Happily, 16 percent of respondents said their employers allow them to take naps at work, and nearly half of these lucky souls take up the offer. On the other hand, 7 percent of those polled have changed jobs in order to get more sleep.

In recognition of sleeping needs and circadian rhythms, the Minneapolis School District changed the starting time of its seven comprehensive high schools to 8:40AM and the dismissal time to 3:320PM. Prior to the change, classes began at 7:15AM and dismissed at 1:45PM. Overall, attendance has improved and grades appear to have improved.

Mark Dolliver. Better Take a Quick Nap Before Reading This One. (National Sleep Foundation finds most Americans are sleep deprived), New England Advertising Week, April 2, 2001 v38 i14 p24; also National Sleep Foundation, http://www.sleepfoundation.org, National Sleep in America Poll; and University of Minnesota, College of Education & Human Development, http://education.umn.edu/carei/Programs/start_time/2001exec_sum.html

6.4.5 Livable Hours

Most Americans work longer hours, under more tension, than they did a generation ago. In Europe, especially in France and Germany, unions in several industries have won a thirty-five-hour week. In the United States, however, the desire of workers to make more money in the short run has often drowned out the desire for more rest. But recently there have been some stirrings of interest in the US labor movement in curtailing overtime—often in the hope of opening up more jobs for the disemployed increasingly in order to protect family life. Religious and spiritual leaders have begun meeting with policy experts, economists, and labor leaders to explore what new approaches would make free time possible.

Arthur Waskow, Free Time for a Free People : There's a Growing Movement To Add Livable Hours to Calls for a Living Wage, Nation, Jan 1, 2001 v272 i1 p22; also Shalom Center, http://www.shalomctr.org/html/comm15.html, Free Time/Free People Statement
6.4.6 Mid-Career Retirements Increasing.

There is a growing number of people taking breaks in their careers - they've been called sabbaticals. It's happening in the corporate world right now. People take three months, six months, a year off, and then go back to work. Employees are saying they want that time to be "me time." They'll say, "I'm going to get some more education. I'm going to relax little bit, spend time with the family. Schooling has to change. Kids will have breaks, and will experience variances in their education. Instead of sending their kids straight through public schools, parents may take some time to home school their kids. Schools will start to set up special travel arrangements so families can take learning vacations together. There will be increased demand for a new kind of financial planning service. "How can I save and invest my money so that I can fund my own mid-career retirement?" At this point, there aren't that many employers that are funding this, and even if they are, people don't want to be tied down to go back to that same company. There will also be demand for all kinds of adventure experiences - education tourism. While people want to relax, they also will want to learn something. There will probably be some degree of guilt - "all of my buddies are working and I'm not." So while there will be demand for adult education, there will be pressure to get these things done faster. "If I go back to college, perhaps I'll get a mini Master's degree." There will also be demand for short-term leases on recreational vehicles and vacation home time-shares. There will be more interest in experiences, rather than things.

- Alison Welner, Workplace Trends. American Demographics/ Feb 2001


"The word `retirement' is never going to go away, but the word will have new and varied meanings." The Bureau of Labor Statistics reports that 2 percent of the 37.5 million people 55 and older who were not in the labor force in 1998 wanted a job - that is essentially 750,000 people willing to be put to use. The statistics may not even tell the full story, since many older people who express no interest in working might be enticed back into the labor force if they felt employers were open to hiring them.

Many of today's 40 million 60-plus seniors are no longer content with the backgammon- and bingo-filled retirements of their parents. A growing number of them are starting new careers, enrolling in university courses, learning new skills, and volunteering for social causes. And yet, there is still a dearth of organized programs and policies that cater to a life beyond golf and shuffleboard. That, say experts, is both a serious problem and an incredible marketing opportunity. By 2030, 20 percent of the U.S. population, or 70 million people, will be over 65 - and the need for institutions and businesses that help individuals redefine this life stage and utilize their untapped talents will become substantially more pressing. "We now have the opportunity to recreate what we want late life to be about in this society," says Professor Nancy Morrow-Howell of Washington University in St. Louis, lead author of Productive Aging: Concepts and Challenges, published in 2001. "The older population today has incredible individual capacity - time, health, income, knowledge - but we haven't developed the capacity to channel it."

Are employers and marketers ready for the new generation of retirees? Experts - not to mention future retirees - are doubtful. "There is still a mismatch in society between what people are looking for in later life and what society provides," says Marc Freedman. Forty-one percent of respondents 65 and older today say they are very, or somewhat, worried that at age 75 they will not have enough opportunities to be productive. Younger generations are even more concerned: 58 percent of 18- to 64-year-olds say they too are worried, according to The National Council on the Aging (NCOA). In terms of volunteering, the majority of opportunities currently available to seniors consist mostly of busywork - envelope-stuffing and pushing hospital carts - says Freedman. Yet 60 percent of older adults want more, saying that "feeling valued and needed" is extremely important for personal fulfillment, and 53 percent say the same about "being intellectually challenged," according to the Hart study. Says Freedman: "For a long time people were content just to be busy, but now people are looking beyond activity for activity's sake."
The Economy

Controversies about globalization continue to dominate our news and futures. But globalization per se is not new. It is as old as humanity. Historically, the speed and extent of globalization has increased with each change in modes of transportation and of communication. From the invention and diffusion of the wheel, to sailing ships, to steam ships, to railroads and automobiles, to propeller and then jet airplanes, the speed and ease of transportation has increased, and so the limitations of distance imposed by earlier technologies have decreased.

The invention of speech, then of writing, of the printing press, of the telegraph, telephone, radio, motion picture, television, satellites, computer networks, cell phones, and the world wide web, each also increased the speed and scope of global communication, minimizing limitations of the earlier technologies, and creating new social possibilities and problems.

But the fundamental processes underlying each of these technologies were not new. With each new level of technology, it may have seemed new to those experiencing it because of the transforming qualities of each change in mode of transportation and communication.

So many of the current concerns about "globalization" are in fact very old, when looked at historically, even though the people actually experiencing them now—not having been around 500 or 5000 years ago—can not be blamed for their feelings of fear or of exhilaration.

However, there may be something new about recent aspects of globalization associated primarily with the collapse of communism as a serious alternative to global capitalism, so that there is now only one global economic ideology supported by one set of political superpowers, facilitated by oligopolistically-controlled global media all singing versions of the same global economic song.

This comment reminds us that globalization is much, much more than a set of economic factors alone—more than the global flow of capital and goods—and more even that the transborder flow of labor, though that aspect of globalization is generally under-appreciated.

Globalization is also the flow of genes (of genetic information), the flow of popular culture and of new ideas, and the flow of environmental problems including diseases.

There is very little that is not touched by and part of the globalization process, including most of the anti-globalization forces who could not organize nearly as effectively against globalization were it not for all of the globalization technologies and ideologies they use to fight it. This is the ultimate paradox: anti-globalization is part of globalization.

In the late 80s and early 90s, globalization appears to have been viewed as inevitable and highly desirable by many leaders worldwide. To many, it was mainly a question of how soon it might come, and how they might be among the first to take advantage of it. There were critics of course, but they were a distinct minority. Almost everyone was singing the neoliberal song with full voice and chorus.

But then the Mexican, Russian, and Asian economic crises occurred in the late 1990s, and there was a vast outpouring of criticisms of globalization. While of course many people continued to support globalization without restraint, many
Globalization

more began urging caution and reconsideration; suggesting that local communities might want to find a different way.

The collapse of the fondest dreams of the so-called "dot.com" "New Economy" in 2000 then led many more people--especially in North America--to re-evaluate the desirability and inevitability (or at least the timing) of globalization.

But with the events of 9/11, the concerns of what we originally termed that "strange alliance" of labor unions, environmentalists, and America First! patriots in the US (who first made major headlines at the anti-WTO demonstrations in Seattle) suddenly lurched forward in the consciousness of many more Americans.

It is not clear how deep and widespread that sentiment is, or how long it will last, but many Americans generally now seem to fear anything foreign, and to love everything American--including the US government, which they despised only a few months ago--and thus are quite suspicious of anything global unless it is clearly under American control and for America's plain advantage.

So what is next?

The CIA posted on its Website two reports presenting an intelligence perspective on two globalization issues. The first Global Growing Migration and Its Implications for the US, is a follow-up study to the publication, Global Trends 2015: A Dialogue About the Future With Non-government Experts. This latest study examines "the growing global movement of people and its implications for the United States." The study examines the political, economic, social, and security issues raised by increased migration, including "the extent to which some countries may try to use migration as leverage in bilateral relations." The second report, written by RAND for the National Intelligence Council, examines the implications of the revolutions in biotechnology and information technology and the challenges and questions likely to be raised in these fields between now and 2015.

Global Growing Migration and Its Implications for the US


7.1 Balancing The Costs And Benefits Of Globalization And Urbanization
Rural-urban disparities will persist.
The future is urban (Today, 37% of Asia's population lives in urban areas. By 2025, 51 percent " will).
Economic globalization and the knowledge society will entrench existing disparities and create new ones.
Policy recommendations:
Invest in education.
Plan locally, but think globally.
Decentralize and devolve authority.
Build capacity.
Create safety nets.

7.2 Culture Goes Global
Describes the new "transnational" generations who flow easily between multiple world cultures.
❖ http://www.technologyreview.com/magazine/jul01/jenkins.asp
8.1 Global Warming and Climate Change

Overview

Scientific evidence for anthropogenic global warming and climate change is now overwhelmingly clear and convincing. Yet the US refuses to join the rest of the world in acting quickly and effectively to limit their potentially horrendous impacts on future generations. The US claims the actions proposed by the Kyoto Protocol and the more recent Bonn Agreements would too seriously impact the American economy. Yet, why it would not similarly impact the economies of all of the other industrialized nations who have signed the Protocols and Agreements remains a big mystery!

8.1.1 "The Second Warmest Global Surface Temperature In More Than A Century Of Instrumental Data Was Recorded In The 2001 Meteorological Year."

"The global warmth in 2001 is particularly meaningful because it occurs at a phase of the Southern Oscillation in which the tropical Pacific Ocean is cool. The record warmth of 1998, in contrast, was bolstered by a strong El Nino that raised global temperatures 0.2 C above the trend line. "This warming is considered to be a consequence of anthropogenic greenhouse gases, and thus the high 2001 temperature will likely invigorate discussions about how to slow global warming."


8.1.2 Longer, Warmer Days Ahead?

When the mercury peaks near 100 Fahrenheit on scorching summer days, nightfall can bring much-needed relief from the heat. In the not-too-distant future, however, we may have to wait longer and longer for that relief to come. According to a team of Belgian researchers, long, hot summer days may soon be getting longer and hotter. Earlier this month, Olivier de Viron and colleagues at Belgium's Royal Observatory and Catholic University of Louvain released a report concerning the effects of global warming on Earth's rotation rate.

Science News - February 17, 2002
http://www.astronomy.com/Content/Dynamic/Articles/000/000/000/764ezsxm.asp

8.1.3 The Causes Of 20th Century Warming

"N]atural forcing alone is not a plausible explanation for the observed changes [i.e., warming] in the 20th century and that natural and anthropogenic forcing have both made substantial contributions to the observed change." "The agreement between observed and simulated decadal-scale temperature variations strongly supports the contention that forcing from anthropogenic activities, moderated by variations in solar and volcanic forcing, has been the main driver of climate change during the past century." (2083)


8.1.4 Climate Change In Nontraditional Data Sets

"Nenana Ice Classic is a betting contest held in Alaska in which participants attempt to guess the exact minute in spring that a wooden tripod positioned on the frozen Tenana River will fall through the breaking ice. Started as a diversion for railroad engineers in 1917, the contest... records the exact minute of ice break up date back to 1917." Trend data show the breakup happening earlier each year.

Raphael Sagarin and Fiorenza Micheli, Science. 294, 26 October 2001, p. 811

8.1.5 How Fast Are Sea Levels Rising
"The most important contribution to 20th and 21st century sea level rise is likely to be thermal expansion of the ocean as it warms. Other contributions include the melting of glacier, changes in the mass of the Antarctic and Greenland ice sheets, and (highly uncertain) changes in the terrestrial storage of water".


8.1.6 The Other Global Pollutant: Nitrogen Proves Tough To Curb

Largely from synthetic fertilizer, and from animal manure, but also from fossil fuel combustion. Latter is being controlled somewhat. Not much control of fertilizer and manure. So growing problems loom.


8.1.7 Global Warming Will Persist At Least A Century Even If Emissions Curbed Now

"Though significant uncertainty remains regarding the amount of global warming that will occur over the next century or two, scientists agree that the trend will continue for the next hundred years even if fossil fuel consumption is dramatically reduced. Scientists predict significant increases in global temperature and sea level this century. And related changes in weather patterns are expected to affect agricultural production. Global warming is likely to have the greatest human impact in poor countries unable to adequately respond to the changes." "The only way to stop the increase of carbon dioxide in the atmosphere is to reduce CO2 emissions to 20 to 30 percent of today's levels," Dickinson says. "This may require a similar reduction in the consumption of fossil fuels. I believe we will eventually achieve that goal, but it will probably take 100 years. That means reductions in automobile emissions and carbon dioxide released from coal-powered electric power generation and other industrial activities. "We have to move our energy systems to forms other than fossil fuels. And when I say we, I don't just mean the United States. The U.S. is the biggest user of fossil fuels, but China and India are likely to surpass the U.S. in the next 50 years, and China may surpass the U.S. in the next decade."

Georgia Institute Of Technology. 2/18/2002.

http://gtresearchnews.gatech.edu

8.1.8 Federal Report On Global Warming Predicts Widespread Impact On U.S.

June 12, 2000


8.1.9 *Climate Change 2001: The Scientific Basis* (Cambridge U Press, 2001). By Filippo Giorgi and Bruce Hewitson

Science is moving towards the possibility of making local forecasts so each member of Congress and their constituents, for example, can learn the estimated impacts of climate change on their home district, and hence be more inclined to act on that information.


8.1.10 Integrated Assessment Of The Public Health Effects Of Climate Change For The United States

The objectives of the research project were to assess the potential impact of climate change on important regional public health endpoints, including water-borne diseases (Cryptosporidiosis and Cholera) and vector-borne diseases (Hantavirus, Dengue fever).

March 13, 2001

http://es.epa.gov/ncrest/QA/final/grants/96/ecoass/global/patz.html

8.1.11 Declining Environment Cited As Major Killer

Diseases caused by environmental degradation kill one in five children before age five in the poorest areas of the world, international health experts said. Worldwide, almost one-fourth of
disease was linked to environmental factors of poor water and sanitation, indoor and outdoor air pollution, and vector-borne diseases, according to a report by the United Nations, the World Bank and the World Resources Institute, a Washington-based think tank.


8.1.12 Climate Change Affects Mosquito Genetic Behavior

- New Scientist. January 10, 2002
  [http://www.newscientist.com/hottopics/climate/climate.jsp?id=ns99991525]

8.1.13 Quantifying The Risk Of Extreme Seasonal Precipitation Events In A Changing Climate

Increasing concentrations of atmospheric carbon dioxide will almost certainly lead to changes in global mean climate. But because—by definition—extreme events are rare, it is significantly more difficult to quantify the risk of extremes. We estimate that the probability of total boreal winter precipitation exceeding two standard deviations above normal will increase by a factor of five over parts of the UK over the next 100 years. We find similar increases in probability for the Asian monsoon region in boreal summer, with implications for flooding in Bangladesh.


8.1.14 Climate Science: The Investment Forecast

New studies predict that the risk of extreme rainfall over Europe and Asian monsoon regions is increasing, with more floods likely worldwide. At least part of this change is caused by anthropogenic emissions. Changes in extreme climate, such as hot spells, droughts or floods, potentially have a much greater impact on society than changes in mean climate, such as summertime temperature averaged over several decades. So the ability to assess future risks associated with extreme events is increasingly important to policy-makers.


8.1.15 Increasing Risk Of Great Floods In A Changing Climate

Here we investigate the changes in risk of great floods—that is, floods with discharges exceeding 100-year levels from basins larger than 200,000 km2—using both streamflow measurements and numerical simulations of the anthropogenic climate change. We find that the frequency of great floods increased substantially during the twentieth century. The recent emergence of a statistically significant positive trend in risk of great floods is consistent with results from the climate model, and the model suggests that the trend will continue.


8.1.16 NASA Image Reveals Giant Chip Off The Antarctic Ice Block

[http://www.gsfc.nasa.gov/GSFC/EARTH/environ/antarctic/pineisland.htm]

8.1.17 A Slower Flow

The deep 'overturning' circulation in the North Atlantic, in which northward-flowing surface water sinks at high latitudes and flows back at depth, may not be fully understood, but its existence has long been public knowledge. Only in the 1990s were two shallow overturning circulation cells discovered, lying on either side of the Equator. M. J. McPhaden and D. Zhang have now produced an analysis of historical data to show that both cells have been slowing since the 1970s.


8.1.18 The Role Of The Thermohaline Circulation In Abrupt Climate Change

Some modeling experiments find that during the next few centuries, the THC [Thermohaline Circulation, Ed.] moves to an 'off' state in response to increasing greenhouse gases. A reduction of the meridional heat transport into the circum-Atlantic region would partially
compensate the warming due to increasing greenhouse gases, although such a change could have serious climatic consequences for the climate in the circum-Atlantic region through modifying long-established regional air-sea temperature contrasts, seasonal variations in the direction and strength of wind patterns and the location of convective areas.


8.2 Responding to Climate Change

Overview

The US stands out glaringly as the only major nation unwilling to respond seriously to global climate change. When finally forced to make some sort of a gesture, the US issued some voluntary guidelines which, even if followed, would only eventually decrease the rate of greenhouse gas emission increase, and leave unaddressed the need for rapid and substantial emission decline. Many economists argue that, far from being a liability, it makes good economic sense to cut emissions, and that the longer the US delays the more expensive and wrenching it will be to catch up with the "greener" and hence more efficient economies of the world.

If economic rationales do not convince, lawsuits (already working their way through the national and global legal system) might. Or failing that, widespread environmental terrorism.

8.2.1 17 National Academies Endorse Kyoto

"As the Bush administration dithers over what it might do to address global warming, 17 national academies of science decided to cut to the chase in an editorial in this week’s Science. Affirming the Intergovernmental Panel on Climate Change's conclusions that human activities are warming the planet, the statement urges those with 'doubts'--by implication, the United States--to ratify the Kyoto Protocol, which would impose binding limits on greenhouse gas emissions by industrialized countries." "Notably absent from the list of signers is the US National Academy of Sciences." (1276). "The academy's hesitance on the Kyoto treaty is not shared by some of its members. Sherwood Rowland and several other NAS members signed a letter organized by the Union of Concerned Scientists just before the December 1997 Kyoto meeting urging mandatory limits on greenhouse gas emissions. But another member who often speaks out on policy, Stanford ecologist Paul Ehrlich, says he understands the NAS's position. 'As an academy member, I'm quite happy to say the Bush position is idiotic,' says Ehrlich. But the academy, he notes, was set up 'to give scientific advice to the government' through its deliberate panel process and 'has no mechanism for taking a position' on urgent policy issues." (1277).

The joint statement itself, titled "The science of climate change," states: "There will always be some uncertainty surrounding the prediction of changes in such a complex system as the world’s climate. Nonetheless, we support the IPCC's conclusion that it is at least 90% certain that temperatures will continue to rise, with average global surface temperature projected to increase by between 1.4 to 5.8 degrees C above the 1990 levels by 2100." "We urge everyone--individuals, businesses, and governments--to take prompt action to reduce emissions of greenhouse gases." "The balance of the scientific evidence demands effective steps now to avert damaging changes to Earth's climate." (p. 1261).


8.2.2 Going It Alone

"The agreement on carbon emissions targets miraculously reached in Bonn on 23 July 2001 left the United States right where President Bush apparently thinks it should be: all alone on climate change. The deal agreed to by the other industrial nations has imperfections, to be sure,
such as the dubious credits for regrowing forests. But it commits the world's other big emitters to a serious course of action and leaves the United States on the sidelines. "the Bonn agreement has breathed new life into the hopes for progress on global climate change. Those hopes are tempered, however, by US abstinence and by the lack of a real compliance mechanism to support the commitments of the participating nations. Moreover, even achievement of the modified targets will leave us, in mid-century, with atmospheric carbon dioxide concentrations more than twice preindustrial levels and still growing."


8.2.3 Bush Backs Spending For A “Global Problem”

"A group of distinguished American scientists last week confirmed that the world is warming and humans are probably to blame for most climate change. The quickie, 1-month analysis by an 11-person committee of the U. S. national Research Council also confirmed that essentially identical conclusions from an earlier 3-year international study had not been unduly distorted when summarized for public consumption." "Bush's response, a 5-year U. S. Climate Change Research Initiative, appears to be a repackaged version of the existing U. S. Global Change Research Program begun a decade ago by his father." At the same time, Bush reiterated his rejection of the as-yet-unratified Kyoto Protocol, calling it 'fatally flawed;' It would damage the U. S. economy, he said, and unfairly relieve developing countries of any commitments to reducing their greenhouse gas emissions. Although 'we recognize the responsibility to reduce our emissions,' Bush said, the US won't be doing so thorough the mandatory emission reductions of the Kyoto Protocol."


8.2.4 Bush Plan Expected To Slow, Not Halt, Gas Emission Rise

President Bush announced a plan calling for voluntary measures to slow but not halt the growth in emissions of gases linked to global warming.


8.2.5 Ersatz Climate Policy

The Bush administration is offering the illusion of environmentalism by announcing policies that sound impressive but are nearly content-free.

- Paul Krugman

8.2.6 Realism In Cutting Emissions

The climate policy President Bush announced on Thursday sets out a far more workable approach for measuring progress against global warming than the one in the Kyoto framework.

- R. Glenn Hubbard

8.2.7 Global Warming Economics

The original Kyoto Protocols, and the Kyoto-Bonn Accord signed by 178 of 179 nations on 23 July 2001, are a noble but deeply flawed attempt to use market forces to control greenhouse gases. Since the US is by far the major producer of greenhouse gases, its refusal as the sole nation in the world to be part of the Accords render them futile.
"Given the current emphasis on yet a different 'global public good'--security from transnational terrorism--it seems unlikely that a grand coalition will be assembled in the near term to rewrite the rules on global warming. In this circumstance, the major merit of the new accord is that it is the first experiment with market instruments in a truly global environmental agreement. There is little appreciation of the importance of 'institutional innovations' of this kind, and even less appreciation for the fact that there are no mechanisms for dealing with economic global public goods like global warming. For this reason, the Kyoto-Bonn Accord may be a useful if expensive guinea pig. Operating the Kyoto-Bonn mechanism will provide valuable insights on how complicated international environmental programs will work. It is hard to see why the United States should not join with other countries in paying for this knowledge."  (1284)


**8.2.8 Carbon Emissions: The Economic Benefits Of The Kyoto Protocol**

The third Conference of the Parties in Kyoto set the target of reducing greenhouse-gas emissions. One of the main objections to the protocol's ratification is that compliance would pose an unbearable economic burden on the countries involved. But we show here that this is not the case if costs apart from the direct costs of energy production are also considered. Costs are also incurred in rectifying damage to human health, material goods, agriculture and the environment related to greenhouse-gas emissions.


**8.2.9 Global Warming Fixes Available Now At Low Cost**


**8.2.10 Lawsuits May Be Next Weapon In Climate Change Fight**

Lawsuits may become the next weapon against climate change as impotent, tiny islands, sinking beneath the waves, seek revenge on the rich, polluting nations and multinational concerns they accuse of wiping them out. Law experts and environmentalists say that potential legal action by the Pacific state of Tuvalu against countries like the United States and Australia would be prohibitively expensive, drawn out, and hard to win. But the global attention it could draw to the cause of some of the world's smallest and lowest-lying countries, which fear they could cease to exist if sea levels rise as global temperatures increase, may alone justify the attempt.


**8.2.11 Global Warming May Bring New Variety Of Class Action: Environmental Lawyers Explore The Options**


**8.2.12 The Skeptical Environmentalist: Measuring The Real State Of The World.**

Lomborg insists that there are no real environmental problems. Indeed, generally the environment is getting better. His book is full of data and statistics, but they are separate and unrelated, not only to each other but to the years of environmental policies which have worked in some areas and might work if applied to others (as the Kyoto Protocol desires) (From a review in *Science*, 294, 9 November 2001, p1285f.)


**8.3 Population**

**Overview**

The decennial census of the US was taken in 2000 and so America is learning new things about itself, especially that it is getting older, more diverse, and more populous (though the latter would not be true were it not for
immigration and the higher fertility of the immigrants. Otherwise, the US would be getting older and less populous, as is Europe and especially Japan).

But the population of the rest of the world continues to grow, though at a slower rate, so that a new "gap" has been identified in the world between the declining and aging industrialized world and everyone else. Yet, even some of the growing nations are also aging, China being a prime example, as improved health and nutrition allows more people--especially women--to live longer than ever before.

Recent UN figures suggest lower fertility worldwide actually might cause global population to begin to fall by the last decades of the 21st Century. Fundamentally good news indeed, if true. But pronatal policies and preferences might very well drive birthrates up again as they have so often in the past.

8.3.1 A Demographic Perspective On Our Nation's Future

Demographic trends in the United States foreshadow major economic and social changes. Four major implications emerge: (1) The United States has experienced declining birth rates and a maturing age distribution. As the number of older adults increases and the needs of those adults find political expression, national budgetary priorities will likely focus on such needs, straining education budgets. Furthermore, the number of workers in the prime working years will begin to diminish. (2) An obvious gap has emerged as access to computers has made computer literacy during childhood increasingly prevalent among people born since the mid-1980s. Among earlier cohorts, computer literacy remains less prevalent. This "digital divide" could create a society of information "haves" and "have-nots." (3) Existing economic disparities tied to education levels could widen dramatically. Specifically, the economic prospects for those finishing high school and obtaining a bachelor's degree may begin to diverge sharply from those who do not earn a degree. These disparities may reduce individual opportunity and shortchange the nation's scientific enterprise. (4) A complex ethnic mosaic is materializing across the country. Census Bureau projections show a population in which Hispanics will soon outnumber African Americans; and non-Hispanic white (Anglo) persons will become the "minority" by 2060, comprising less than half of all Americans. In terms of social change, intermarriage is rising, and more Americans identify themselves as multiracial. The challenge regarding this evolving variable (ethnicity) is to balance the interests that unify a local community with those that distinguish or divide its members.

Peter A. Morrison. August 26, 2001
http://www.rand.org/publications/DB/DB320/

8.3.2 US Birth Rate On Rise For First Time Since '90

Both the total number of births and the birth rate are up for the first time since 1990. This was true for all women between the ages of 15 and 44, but the overall trend appeared to be driven by an increase of births among women in their 20s. The report appears to be the first signal that the daughters of baby-boom women are having their own children, and having them at younger ages than their mothers--a pattern more akin to women of earlier generations. "The trend is likely to continue because the teenage population is growing." "Certainly it follows that as the economy does well and family income rises, most families are in a better economic position to have children," said David Landry of the Alan Guttmacher Institute, which performs research on reproductive issues.

Honolulu Advertiser. 3/29, 00, P. A9.

8.3.3 US Birthrate Highest Since 1971, Researchers Say

"American women are having more children than at any other time in the past three decades--2.1 on average in a lifetime, the government said. For the first time since 1971, women are producing enough children to offset deaths in the US, the National Center for Health Statistics said." "Researchers said the roaring economy of the 1980s was probably a major factor, helping potential parents feel more comfortable about supporting a family."

8.3.4 Women Are Having More Children, New Report Shows: Teen Birth Rate Continues To Decline
February 12, 2002

Women in the United States are having more children than at any time in almost 30 years, according to the latest Centers for Disease Control and Prevention (CDC) birth statistics released today by HHS Secretary Tommy G. Thompson. At the same time, Secretary Thompson said that births to teens continue to decline.

In 2000, the average number of children born to women over a lifetime was 2.1, according to a new CDC report, "Births: Final Data for 2000." During most of the 1970s and 1980s women gave birth to fewer than two children on average, a rate insufficient to replace the population (2.1 is considered the population's replacement level).

Increased fertility in 2000 was reported for all age groups except teenagers. Birth rates for teenagers fell to 48.5 births per 1,000 females 15-19 years of age in 2000, a 22 percent decline from the record high of 62.1 in 1991.

"The continued decline in the teen birth rate is very encouraging," said Secretary Thompson. "Reducing teen pregnancy is an important health goal for our nation."

The birth rate for teens 15-17 was down 5 percent, while the rate for 18-19 year olds declined 1 percent for 2000. Overall teen birth rates declined for white, black, Hispanic, and Asian and Pacific Islander teens and were stable for American Indians.

The new report features a number of other significant findings:

- There were 4,058,814 births in the U.S. in 2000, a 3 percent increase from 1999, and the third straight increase following nearly a decade of decline from 1990 thru 1997.
- The average number of children born to women over a lifetime was fairly consistent along racial lines. White, Asian/Pacific Islander and American Indian women all had total fertility rates of 2.1, and black women had a total fertility rate of 2.2.
- Among Hispanic women, the total fertility rate (3.1) was higher than the national rate, with the highest rates for Mexican women (3.3) and Puerto Rican women (2.6) and the lowest for Cuban women (1.9).
- The percent of women who smoked during pregnancy declined again in 2000 to 12.2 percent, and has dropped by more than one-third since 1989.
- The rate of triplet and other higher-order multiple births declined for the second consecutive year, after increasing more than five-fold between 1980 and 1998.
- The rate of cesarean deliveries rose for the fourth consecutive year to nearly 23 percent. The cesarean rate declined steadily between 1989 and 1996 but has risen 11 percent since 1996, and is now the highest reported since 1989. Between 1999 and 2000, the primary cesarean rate was up 4 percent and the rate of vaginal birth after a previous cesarean dropped 12 percent.
- For the first year in nearly a decade, the pre-term birth rate declined, from 11.8 percent to 11.6 percent of all births. The pre-term rate has risen fairly steadily over the past two decades. However, the low birthweight rate (7.6 percent) did not improve in 2000.
- More than one-third (33.2 percent) of all births were to unmarried women, up from 33 percent in 1999. Birth rates increased for unmarried women in all age groups except teenagers, whose rates continued to decline.

The report is available on CDC's National Center for Health Statistics Web site at: http://www.cdc.gov/nchs.

8.3.5 White Population No Longer Majority In California
Whites are no longer the majority in California, after a decade that saw explosive growth in the Latino and Asian population, according to new Census Bureau population estimates. The white population totals 49.9 percent of the state's 33.1 million residents, with Latinos follow at 31.6
percent, Asians at 11.4 percent, blacks, 6.7 percent and American Indians, less than 1 percent. From 1990 to 1999, the Latino population of California grew by 35 percent to 10.5 million, while the Asian and Pacific Islander population increased by 36 percent. The black population rose slightly from 2.1 million to 2.2 million, and the number of non-Hispanic whites decreased, as a percentage of total population and in real numbers. Nationally, Latino and Asian numbers increased substantially during the past decade as well. The nation's Asian and Pacific Islander population grew 43 percent to 10.8 million, and the Latino population grew 38.8 percent to 31.3 million. However, the white population nationally increased between 1990 and 1999, rising 7.3 percent to 224.6 million.

8.3.6 1 Of 10 In US Foreign-Born. Number Is Highest Since 1930s.

Peter Hong and Patrick McDonnell. Honolulu Advertiser. 2/7/02, P. A1

8.3.7 Older Drivers

Demographic changes in the United States have resulted in a growing number of drivers over age 65. It is estimated that by the year 2020, more than 15 percent of drivers will be older than 65. Public safety concerns about the driving performance of older adults have been raised by evidence showing an increased crash rate per mile driven for drivers aged 70 or older compared with other adult age groups. This increased crash rate has been attributed to age-related changes in driving skills in addition to various medical illnesses. Older drivers, however, tend to drive less at night, during adverse weather conditions, during rush hours or in congested thoroughfares. These factors, along with a reduction in overall miles driven per year, make public policy decisions on screening older drivers questionable, considering that the number and severity of crashes by younger drivers outweigh those by older people. Nevertheless, these concerns may be important when dealing with individual patients.

David B. Carr. The Older Adult Driver. American Family Physician. Jan 1, 2000 v61 p141

8.3.8 Obesity Epidemic Worldwide

For the first time in history, the majority of adults in some societies are overweight. In the United States, 61 percent of all adults are overweight. In Russia, the figure is 54 percent; in the United Kingdom, 51 percent; and in Germany, 50 percent. For Europe as a whole, more than half of the adult population between 35 and 65 years of age is overweight adults increased by 61% from 1991 to 2000 alone. The epidemic is international in scope. The number of overweight people is rising in developing countries. In Brazil, for example, 36 percent of the adult population is overweight. The same is true for 15 percent of China's adult population. In a Worldwatch paper titled "Underfed and Overfed," Gary Gardner and Brian Halweil report that the number of overweight people has climbed to 1.1 billion worldwide, rivaling the number of undernourished and underweight. Peter Kopelman of the Royal London School of Medicine summarizes the thinking of the medical community: "Obesity should no longer be regarded simply as a cosmetic problem affecting certain individuals, but [as] an epidemic that threatens global well-being."

Lester Brown, Obesity is Threat to World Health. American Fitness. May 2001 v19 i3 p62

8.3.9 2000 World Population Data Sheet

"Contains the latest population estimates, projections, and other key indicators for all geographic entities with populations of 150,000 or more and all members of the United Nations." The data are broken down by standard variables such as birth and death rates, infant mortality and total fertility rates, life expectancy, percentages of populations with HIV/AIDS, population of rural vs. urban, increases in population rate, "doubling time" at current rate, projected population totals for 2010 and 2025, and more. These variables may also be examined by region.

http://www.prb.org/pubs/wpds2000/

8.3.10 Urban Population Trends
"It is projected that the world's population will rise from 5.7 billion in 1995 to 8.9 billion in 2050." "The world is polarized between the net-immigration in more developed countries and the net-emigration in the developing world." "Since the last decade of the last century, the world witnessed dramatic refugee stocks and flows."

"Asia currently hosts 11 'mega-cities (cities with populations of over 10 million people): Tokyo, Mumbai, Calcutta, Shanghai, Dhaka, Karachi, Delhi, Jakarta, Osaka, Manila and Beijing." (4) World's 15 largest cities, ranked by population size, 2000:

Tokyo, Mexico City, Bombay, Sao Paulo, New York, Lagos, Los Angeles, Calcutta, Shanghai, Buenos Aires, Dhaka, Karachi, Delhi, Jakarta, Osaka (6)

Sixty percent of the world's population is expected to live in urban areas by 2030. "In Europe and North America, the percentage of the population living in urban areas is expected to rise from 75% and 77%, respectively, in 2000 to 83% and 84% in 2030." (5)

8.3.11 World Population Shifts: Boom Or Doom?

The structure of world population growth is changing. Currently, the world's population of roughly 6 billion is growing by an additional billion people every 12 to 13 years. This average growth rate (1.4 percent) masks the fact that some parts of the world are growing much faster than others. Developed countries are growing at less than 0.3 percent per year, while the rest of the world is growing almost six times that fast. These demographic differences, as well as widening economic differences, between the developed and less-developed world are increasing the flow of people toward the developed world. How the developed world responds to these immigration pressures will largely determine whether such pressures become a precursor to boom or doom. This presentation examines population shifts in different parts of the world, their effects on the flow of people across borders, and potential responses by the developed world to growing immigration pressures.


8.3.12 Human Life Overreaching Its Boundaries


"Humans are perhaps the most successful species in the history of life on Earth. But our success is showing signs of overreaching itself, of threatening the key resources on which we depend."

(From a review of the book in Science. 291, 26 January 2001, p. 671)

8.3.13 Beyond Six Billion: Forecasting The World's Population.


8.3.14 The End Of World Population Growth.

Wolfgang Lutz, et al., Nature. 412, 543-545 (2 August 2001)

8.3.15 U.N. Study: Population Boom A Bust

Women around the world are choosing to have fewer children, confounding long-held predictions of a global population of 10 billion by the end of this century, a U.N. study said. Demographers from around the world met at the United Nations on Monday to consider lowering that estimate to between 8 billion and 9 billion. The implications are "momentous," the U.N. Population Division report said. Governments use population projections to plan just about everything, from social security to school budgets, said Joseph Chamie, the agency's director.

For decades, experts assumed the global population, now about 6 billion, would reach a staggering 10 billion by the end of this century. But the past few decades have witnessed dramatic declines in birthrates in the large, developing nations that were driving the growth. There are 74 countries in what the United Nations calls the intermediate-level fertility group, where
women have between 2.1 and 5 children each. This group accounts for about 43 percent of the world's population and includes Bangladesh, Brazil, Egypt, India, Indonesia, Iran, Mexico and the Philippines. The study suggests those nations are heading toward a fertility rate of 1.85 children for each woman by 2050, a significant decrease that in India alone would represent 85 million fewer people. "That's groundbreaking because anything below two children, like we have in Europe, the population starts to decline," Chamie said. If that new scenario is correct, the world population will ultimately begin to shrink, though not in this century.

Since 1965, world fertility has declined from 5 to 2.7 births per woman, the study said. There are many factors for the declining birthrates, not the least of which is the use of contraceptives. Now that women have the means to limit the size of their families, they are choosing to do so, Chamie said. "For centuries people did not have this control, this freedom to choose the timing and the number of children they wanted," he said. Also, many people in developing nations are moving to cities, negating the need for large families to work the farm. Changing attitudes about the role of women, declines in infant mortality and better reproductive health care also play a role.

Suriname is at the low end of the intermediate-level nations with a birthrate of 2.2 children per woman, while Guatemala and Sudan are at the high end with 4.9. By comparison, Europe is at 1.34 children per woman and Japan 1.33. China, the most populous nation, has a birthrate of 1.8 children per woman.

Reuters. 03/12/2002

8.4 Water

Overview

Two natural resources upon which modern life relies--water and petroleum--are in crisis. Obviously, the water crisis is the more serious since water is necessary for life at all, while oil merely fuels a particular life style. Both portend increased future strife, if only because it takes more and more energy to get or convert dwindling water sources.

8.4.1 World Water Crisis Will Threaten One In Three
A looming water crisis could threaten one in three people by 2025, sparking as much conflict this century as oil did in the last, the U.N.-sponsored Third World Water Forum said in a statement Monday. Governments must urgently find new ways to conserve shrinking water supplies amid rising demand, forum participants -- including leading scientists and environmentalists -- were told on the opening day of the week-long conference.


8.4.2 Managing Water For People And Nature
"Growing water scarcity and alarming declines in aquatic biodiversity indicate that water policies in most of the world are failing to protect life's most vital resource." Half of the world's population will live in areas of significantly water stressed river basins by 2025. In addition to absolute shortage, water is becoming scarce because of higher pollution levels and habitat degradation. "Concerns about water scarcity also include groundwater sources" which are shrinking and/or becoming polluted.

"A major reason for growing water scarcity and freshwater ecosystem decline is that water is undervalued the world over." "A first step toward sustainable water management is to improve efficiency by setting prices that reflect the cost of supplying and distributing water."

"A second step is to include the cost of integrated watershed management in the price of water." "[E]very $1 invested in watershed protection could save from $7.5 to nearly $200 for new water treatment facilities." "A third step...is to charge polluters for their effluents."


8.4.3 Irrigation Shortages Fuel Global Threat
"It is a frightening scenario: Millions of refugees streaming across borders in search of water, governments shaken from within by water riots, hostile nations pushed over the edge in open warfare by conflicts over scarce water. It is a picture that appears increasingly possible in the coming decades."

(And this is a growing problem for the US too, especially for many of the big cities, not only in the West and Southwest, but Midwest, Northeast and South.)


8.4.4 The Water Manifesto: Arguments For A World Water Contract.

8.5 Energy

Overview
While gasoline prices have never been lower for many Americans, and while more and more Americans are driving increasingly gas-guzzling (and unsafe) vehicles, many experts are warning about the end of oil, and the urgent necessity of moving to alternate energy sources as soon as possible. But, as with global warming and climate change, America officially denies the urgency or necessity, and refuses to do much to respond in anticipation of what many people believe to be looming crisis.
8.5.1 *World Energy Assessment: Energy And The Challenge Of Sustainability*

"The report is the most comprehensive and far-reaching single volume on energy policy ever published. It is also one of the most readable...." "The data and analyses in this volume demonstrate that changing energy systems offers a powerful instrument to shift current unsustainable development toward a sustainable future. The World Energy Assessment itself proves a powerful tool to persuade the public and policy-makers around the world that the changes are both feasible and desirable."


8.5.2 *Decreasing Reliability Of Energy*


8.5.3 *Hubbert's Peak: The Impending World Oil Shortage*

The worldwide production of oil will peak between 2004 and 2008, and after that, production will no longer keep up with demand.


8.5.4 *Assessing Today's Supplies To Fuel Tomorrow's Growth*

We have enough energy of all sorts through 2020, though it will take a lot of effort, money, and energy to get it.


8.5.5 *USGS Optimistic On World Oil Prospects*

"A new 5-year assessment on the global store of oil bodes well for the world as a whole but ill for the United States." "The timing of the world oil peak may remain contentious, but optimists and pessimists alike agree that the United States will become increasingly dependent on foreign oil.


8.5.6 *Higher Fuel Prices Do Little To Alter Motorists' Habits*

Despite rising fuel prices, few people have sharply cut back on driving or begun shopping for cars based mainly on fuel efficiency, and the nation is on pace to use almost the same amount of gas as it did last year, which was the most ever.


8.5.7 *Bush Administration Allows Oil Drilling Near Utah Parks*

The Bush administration is opening the red rock country near two of Utah's popular national parks to oil and gas drilling.


8.5.8 *A Contest For Energy Dominance Between The World's Two Largest Oil Exporters, Saudi Arabia And Russia.*

- [http://www.foreignaffairs.org/articles/Morse0302.html](http://www.foreignaffairs.org/articles/Morse0302.html)

8.5.9 *Fuel's Paradise: World-Class Contrarian Thomas God Has A Theory About Life On The Planet: It's Pumping Out Of The Earth's Crust--And It Is Swimming In Oil*


8.5.10 *Pebble Bed Technology*

South Africa is getting ready to build new nuclear reactors using a technology that some claim could usher in a new era of safe, inexpensive nuclear power using a long-studied and
promising design: the pebble bed modular reactor. In comparison to current technologies, a pebble bed reactor is relatively simple to build and inexpensive to operate; construction and operating costs are expected to be competitive with those of coal and natural-gas plants. Perhaps more crucially, it is immune to today’s worst-case scenario: a loss of coolant in the reactor core that would lead to a melting of uranium fuel and a catastrophic release of radiation. That’s because the fuel is encased in billiard-ball-sized graphite “pebbles” that can’t get hot enough to melt. What’s more, this encasement may make the spent pebbles more rugged in long-term storage. Though pebble beds have advocates in utility board rooms, their case is not yet approved in the eyes of the U.S. Nuclear Regulatory Commission. Two major hurdles for pebble bed reactors: they create highly reactive fuel waste and are potentially vulnerable as terrorist targets. Nevertheless, Exelon, the largest U.S. nuclear-power plant operator, sees the pebble bed technology as the breeze blowing the nuclear industry out of its doldrums.


### 8.5.11 Tomorrow’s Energy: Hydrogen, Fuel Cells, And The Prospects For A Cleaner Planet

- Peter Hoffmann. Cambridge, MA: MIT Press, 2001
- National Hydrogen Association:
  - http://www.ttcorp.com/nha/
- Hydrogen Future Act Of 1996:
  - http://thomas.loc.gov/cgi-bin/query/D?c104:3:./temp/~c104yJOENk::
- Hydrogen Information Network
  - (from U.S. Department of Energy)
  - http://www.nrel.gov/
- Stuart Energy:
  - http://www.stuarentergy.com

### 8.5.12 Personal Power: Solar Utility In A Backpack

A solar power unit that can be carried in a backpack was created by a Portland, Oregon, inventor and released just three months ago. It is already making its way around the world.


### 8.5.13 Solar Servers Beat Black-Out Blues

A Virginia Web hosting company has turned to solar power to run its servers, using an array of Siemens solar panels to collect energy and converting it into alternating current that can be stored in batteries for a rainy day. SolarHost says the solar collectors, which take about five hours per day of peak sunlight to charge, provide about 140% of the energy needed to run servers and keep the lights on in its building. "More and more companies are using solar power, and the California situation is accelerating that trend," says a spokesman for the Solar Energy Industries Association.

- Interactive Week. 23 Mar 2001

### 8.5.14 Japan Looks For Bright Answers To Energy Needs

Feasibility studies for a massive solar array to beam energy back to Earth being undertaken worldwide.

8.5.15 Energy Breakthroughs: Zero Point Energy, Cold Fusion, And Converting Pollution Into Energy

It turns out that zero point energy is not so speculative -- it has been measured. The Casmir Effect was first measured in 1997 and now, in a recent experiment, a team of scientists at the University of California, Riverside, has made what may be a first step in harnessing this energy of space.

http://www.cosmiverse.com/space01310203.html

Another potential breakthrough area of energy is the oft-maligned cold fusion. A good number of researchers have continued to experiment in the area with mixed results, but now Dr. Brian Clarke of McMaster University in Ontario, Canada, has found something that is not easily explained away.


It might be possible to directly convert pollution into electricity? That's what new "bacterial batteries" may well do. We're working on an energy project here at The Arlington Institute, trying to identify some new technologies that could really make a difference.

http://www.nature.com/nsu/020114/020114-9.html

John Pedersen's Arlington Institute
http://www.arlingtoninstitute.org

8.5.16 Bubble Fusion' Paper Generates A Tempest In A Beaker

A team of scientists at the Oak Ridge National Laboratory, led by senior scientist Rusi Pesi Taleyarkhan, claim to have achieved cold fusion. But their claim is hotly contested by other scientists. The work relies on a phenomenon known as acoustic cavitation, in which sound waves rattling through a fluid create tiny bubbles and then cause them to expand and compress. Under certain conditions, those bubbles give off tiny flashes of light as they collapse, a phenomenon known as sonoluminescence. Many scientists believe that the bubbles, compressed by the acoustic waves, reach great temperatures and pressures. Some speculate that under the right conditions, those bubbles might -- just might -- provide conditions extreme enough to trigger fusion.

The first order of business is to end the bickering, says Lawrence A. Crum, a researcher at the University of Washington's Applied Physics Laboratory in Seattle and a reviewer. "What matters now is to confirm whether there really is fusion going on. If this really is confirmed, there'll be a bunch of companies started," he predicts, to build bubble-fusion power sources. Lahey is cautiously optimistic that his group's design could turn into a big source of future energy. "The first step would be to increase the neutron yield by replacing the deuterium with tritium," an even heavier form of hydrogen with two neutrons. Adds Taleyarkhan: "We've already filed patents on lots of ideas for scaling up." Even small units could find immediate markets. Applications would include sterilizing food, boosting the production of chemicals by raising the temperature of reactions, and producing the streams of neutrons needed for small, inexpensive detectors for sniffing out explosives at airports and remotely peering into cargo containers at seaports.

Actually, the entrepreneurial phase has already begun. Three years ago, engineer Ross Tessien founded Impulse Devices Inc. His Grass Valley (Calif.) startup has hired a leading sonoluminescence researcher -- D. Felipe Gaitan, a protege of Crum's -- and is working on simulations of sonofusion reactors up to 20 feet in diameter that would create giant bubbles. Tessien is now negotiating with Los Alamos National Laboratory to verify his computer models.

Compiled from Science. March 8, 2002, 295: 1808-1809 and http://www.businessweek.com/magazine/content/02_11/b3774095.htm

8.5.17 Transformation Of Heat Pollution Into Electricity

Scientists at M.I.T. and a small company in Salt Lake City will announce that they have developed technology that can efficiently and inexpensively transform heat pollution into electricity.

8.5.18 Wind Power
Currently, the U.S. generates about 0.1 percent of its power using wind—a minuscule contribution, especially compared to Denmark's 10 percent. The Department of Energy wants to increase wind's contribution to U.S. energy production to 5 percent by 2020. The U.S. wind energy industry left previous records in the dust with a blowout year in 2001, installing nearly 1,700 megawatts (MW) or $1.7 billion worth of new generating equipment in 16 states, according to the Washington, D.C.-based American Wind Energy Association (AWEA).

- Paul Hetzel. Wind Power Picks Up. MIT Technology Review. November 2, 2001;

8.5.19 Ocean Thermal Energy Conversion (OTEC).
The basic idea, proposed a century earlier, was simple: vast stretches of tropical and subtropical seas show a difference of around 20 °C between warm surface waters and near-freezing waters a kilometer or two below. That temperature difference could drive massive turbines, producing electrical power around the clock with minimal environmental degradation. In 2002, if all goes well, construction will begin on the first commercial ocean thermal plant, a one-megawatt operation at the Natural Energy Laboratory of Hawaii Authority on the island of Hawaii. Unlike the earlier work, today's ocean thermal projects don't stop at electrical power but focus on a mix of products appropriate for a given site. These could include: fresh water (often in high demand); use of nutrient-rich deep water for aquaculture (including farming of coldwater fish) coastal cooling (running cold water across heat exchangers to drive air conditioners may prove cost effective against high-priced island electricity).


8.6 Inventing and Managing Artificial Worlds
Overview
For some time, we have pointed out that because of increased numbers and technological power of humans on the planet, "nature" (in the sense of processes that operate without human interference or management) is essentially dead, while "artificial" processes requiring increasing human attention and care are proliferating. However, most humans seem either ignorant or uncaring about that fact, which leads others to despair about a viable future.

There is continuing evidence to support that thesis and concern: Mark Pesce, virtual reality pioneer and author of The Playful World: How Technology Is Transforming Our Imagination (Ballantine Books, 2000), believes our children will grow up in a world where everyday objects will be imbued with computer intelligence. "Objects will have this persistent ongoing relationship with you because they remember, they have learned from prior experience, and they are always engaging you," Pesce says (imagine the Furby-ization of toothbrushes, toasters, pickup trucks). Children who grow up surrounded by such charmed
objects will become "technoanimists," he says. They will "have a very dynamic relations. Here's another angle on the same thing. Tom Regan, writing in the "Christian Science Monitor", says computers are disappearing as an artifact, becoming ephemeral.


8.6.1 Humans As The World's Greatest Evolutionary Force

"Human impact on the global biosphere now controls many major facets of ecosystem function. Currently, a large fraction of the worlds' available fresh water, arable land, fisheries production, nitrogen budget, Co2 balance, and biotic turnover are dominated by human effects. Human ecological impact has enormous evolutionary consequences as well and can greatly accelerate evolutionary change in the species around us, especially disease organism, agricultural pests, commensals and species hunted commercially. For example, some forms of bacterial infection are insensitive to all but the most powerful antibiotics, yet these infections are increasingly common in hospitals. Some insects are tolerant of so many different insecticides that chemical control is useless. Such examples illustrate the pervasive intersection of biological evolution with human life, effects that generate substantial daily impacts and produce increasingly economic burden. Accelerated evolutionary changes are easy to understand--they derive from strong natural selection exerted by human technology." (1786)

"Evolution is responsible for large costs...." "The annual evolution bill in the US...probably exceeds $100 billion overall. However, the social price of evolution is far higher" "Thus, evolution expands the class of diseases that are medically manageable but economically incurable." (1788) "Ignoring the speed of evolution requires us to play an expensive catch-up game when chemical control agents and medications fail. Because our impact on the biosphere is not likely to decline, we must use our knowledge about the process of evolution to mitigate the evolutionary changes we impose on species around us." (1790)


8.6.2 Human Frontiers, Environments And Disease: Past Patterns Uncertain Futures.

"Without preaching or reaching for political correctness, he leads the reluctant reader to a state of worry. By the last chapter, we have come not just to learn but to understand why humans are standing at the edge of disaster. There are already six billion people on our planet, and the global population continues to grow at a great rate. Our societies haven't imploded yet only because most of the world lives at a level of privation Westerners would not accept, beyond the reach of the very resources Westerners cannot live without.

"And therein lies the dilemma. To the extent that Westerners support development in, and extension of their prosperity to, the rest of the world, they sow the seeds of everyone's destruction. As McMichael stresses, thee may already be too many people in the world to support universal living standards at a level Westerners consider minimal. There isn't enough land, enough water, or enough resources. In a zero sum game, reality trumps altruism. The price of comfort for some being the misery of others. Reading Human Frontiers after the September 11 attacks was a particularly eerie experience: the horrible pictures on television somehow seemed a logical consequence of the book's complex ecological truths."

Tony McMichael, Cambridge University Press, 2001
From a review by David Morens. *Science*. 294, 23 November 2001, 1658f

8.6.3 Historical Overfishing And The Recent Collapse Of Coastal Ecosystems

Few modern ecological studies take into account the former natural abundances of large marine vertebrates. There are dozens of places in the Caribbean named after large sea turtles whose adult populations now number in the tens of thousands rather than the tens of millions a few centuries ago. Whales, manatees, dugongs, sea cows, monk seals, crocodiles, codfish, jewfish, swordfish, sharks and rays are other large marine vertebrates that are now functionally or entirely extinct in most coastal ecosystems. Place names for oysters, pearls, and conches conjure up other
ecological ghosts of marine invertebrates that were once so abundant as to pose hazards to navigation, but are witnessed now only by massive garbage heaps of empty shells." (629)

(Uses archaeological as well as historical data to show the practice is as old as humanity, but now made worse by overpopulation, pollution, and improved fishing technologies.)

"Even seemingly gloomy estimates of the global percentage of fish stocks that are overfished are almost certainly far too low. The shifting baseline syndrome is thus even more insidious and ecologically widespread that is commonly realized." "The central point for successful restoration is that loss of economically important fisheries, degradation of habitat attractive to landowners and tourists, and emergence of noxious, toxic, and life-threatening microbial diseases are all part of the same standard sequence of ecosystem deterioration that has deep historical roots. Responding only to current events on a case-by-case basis cannot solve these problems. Instead, they need to be addressed by a series of bold experiments to test the success of integrated management for multiple goals on the scale of entire ecosystems." (636)

(Has three excellent diagrams showing changes in Kelp Forest, Coral Reef and Estuary ecosystems before and after fishing (p. 630))


8.6.4 Primates On The Brink Of Extinction

"Scientists begin a series of meetings to devise strategies to deal with the declining populations of man's closest relatives." "Renewed surges of deforestation and poaching in the 1990s, as well as shrinking genetic diversity, suddenly are thinning the ranks of many species to just a few hundred individuals, or a few dozen. At any moment, they could vanish forever."


8.6.5 Kilauea Sea Slide Could Be Catastrophic

"Quiet signs that a huge chunk of Kilauea [one of the world's most active volcanoes on the Big Island of Hawaii] may fall into the sea--perhaps touching off a dangerous tsunami--were recently recorded by several sensing instruments, scientists in Hawaii announced yesterday." "If the flank breaks and slides, it could touch off a tsunami that could endanger people in cities all around the Pacific basin. If the wave is big enough, and if it comes without warning, untold thousands of people might die. In a report published in the journal Nature, [geophysicists] warned that massive failure of the mountain's flank could be very dangerous and urged that the site be watched closely for additional signs of movement."


8.6.6 Drowning New Orleans

New Orleans is a disaster waiting to happen. The city lies below sea level and is sinking. An acre of the Mississippi Delta marsh vanishes under water every 24 minutes. "If a big, slow-moving hurricane crossed the Gulf of Mexico on the right track, it would drive a sea surge that would drown New Orleans under 20 feet of water. Extensive evacuation would be impossible because the surging water would cut off the few escape routes. A direct hit is inevitable."


8.6.7 What Drives Societal Collapse

"The archaeological and historical record is replete with evidence for prehistoric, ancient, and premodern societal collapse. These collapses occurred quite suddenly and frequently involved regional abandonment, replacement of one subsistence base by another (such as agriculture by pastoralism) or conversion to a lower energy sociopolitical organization (such as local state from interregional empire. Each of these collapse episodes has been discussed intensively within the archaeological community, commonly leading to the conclusion that combinations of social, political, and economic factors were their root causes. That perspective is now changing with the accumulation of high-resolution paleoclimatic data that provide an independent measure of the timing, amplitude, and duration of past climate events. These climatic events were abrupt, involved new conditions that were unfamiliar to the inhabitants of the time, and persisted for
decades to centuries. They were therefore highly disruptive, leading to societal collapse—an adaptive response to otherwise insurmountable stresses."

"The past climatic changes were unrelated to human activities. In contrast, future climatic change will involve both natural and anthropogenic forces and will be increasingly dominated by the latter; current estimates show that we can expect them to be large and rapid."

"We do, however, have distinct advantages over societies in the past because we can anticipate the future. Though far from perfect and perhaps subject to unexpected nonlinearities, general circulation models provide a road map for how the climate system is likely to evolve in the future. We also know where population growth will be greatest. We must use this information to design strategies that minimize the impact of climate change on societies that are at greatest risk. This will require substantial international cooperation, without which the 21st century will likely witness unprecedented social disruptions."


8.6.8 Sustainability Science

"A new field of sustainability science is emerging that seeks to understand the fundamental character of interaction between nature and society. "The sustainability science that is necessary to address these questions differs to a considerable degree in structure, methods, and content from science as we know it."


8.6.9 State Of The World 2002

Every scan we have done for the Virginia Judiciary has featured the annual *State of the World* reports as a major source for reliable information on the futures, especially of environmental and related matters.

The 2002 edition is a special "World Summit Edition" with chapters seeking to define the agenda for the World Summit on Sustainable Development to be held in Johannesburg in September 2002. Topics include, "Creating a more secure world", "Moving the climate change agenda forward", "Farming in the public interest", "Reducing our toxic burden", "Redirecting international tourism", "Rethinking population", "Breaking the link between resources and repression", and "Reshaping global governance."


8.6.10 Sustainable Consumption

"In order to achieve all-round sustainability of our economies and lifestyles, we need to revise our consumption patterns." "A first step towards sustainable consumption is to recognize that consumption patterns will inevitably change in the future, if only by force of environmental circumstance—notably global warming, among a host of environmental problems. As that future arrives, we must ensure that there is an increase in consumption by the three billion people with incomes of less than $3 per day. At the same time, the 800 million people in developing and transition countries who earn enough to move into the high-consuming classes should be able to enjoy the fruits of their newfound affluence. How to enable them to do so without undue disruption of environmental systems, especially those of global scope such as the climate?"

"One answer may lie with the business sector. Were human communities to deploy all of the ecotechnologies that are already available from innovative business (such as energy efficiency, pollution controls, waste management, recycling, cradle-to-cradle products, and zero-emission industry), we could enjoy twice as much material welfare while consuming only half as many natural resources and causing only have as much pollution and waste." "There are big profits ahead for truly enterprising business."

"Three policy initiatives could promote the transition to sustainable consumption. We could abandon gross national product (GNP) as an indicator economic well-being; it suggests to the consumer that our economies need take no account of sustainability." "Several alternative indicators, such as Net National Product, are being developed by Canada, Britain, Sweden, the
Netherlands, and Austria. Second we could ensure that prices reflect all environmental social costs. For example, US society ultimately pays at least $6 to burn a gallon of gasoline. Pricing gasoline realistically would curtail the excessive car culture and open up huge market demand for improved public transportation [NOTE: encouraging telework to end "rush hours" would do even more]. Similar considerations apply to the true price of a hamburger, a shirt, and even a house.

"Yet (and herein lies the third initiative) consumers are encouraged to practice environmental ignorance thanks to subsidies that, for example, support fossil fuels 10 to 15 times more than clean and renewable sources of energy such as solar energy and wind power. Were all these subsidies to be phased out and a marketplace with a level playing field established, the energy alternatives would soon become commercially competitive. There are hosts of other subsidies that promote the car culture, over-intensive agriculture, wasteful use of water, overlogging of forests, and overharvesting of marine fisheries."

"However hard it will be to live with the drastic changes required, it will not be so hard as to live in a world drastically impoverished by the environmental injuries of current consumption."  


**8.6.11 Toward Sustainable Chemistry**  
"The present economy remains utterly dependent on a massive inward flow of natural resources that includes vast amounts of nonrenewables. This is followed by a reverse flow of economically spent matter back to the ecosphere." "It has become an imperative that chemists lead in developing the technological dimension of a sustainable civilization."


**8.6.12 Precautionary Principle**  
The Precautionary Principle, a vague and controversial concept, has entered mainstream social and political discourse. The principle, which is being used to engage science and policy makers over issues such as genetically engineered foods, can be summed up as follows: if an issue or action carries a threat of harm to human health or the environment, then precautions should be taken even if science has not yet established all of the cause-and-effect relationships. While potentially enlightening (it can take into account the sheer complexity of the systems humans affect and the inherent inability of humans to understand and identify all relevant factors), the principle can also be used to dampen or halt scientific investigation because of a conservative agenda.

- *Scientific American*. January 2001  

**8.6.13 Juneau Tourism Management Plan**  
In a paper prepared for the residents and government of Juneau, Alaska, The Egret Communications and ARA Consulting firm recommended that the community may want to identify special places, events, or even times that leisure visitors are not invited to enjoy. Although such restrictions cannot be extended to federal lands, which belong to the people, the authors encourage the residents of Juneau to consider the concept of "special places and times" for local places. Juneau’s residents may agree not to share some things that are special to the people who live there. Usually, this agreement becomes a common understanding, but sometimes it is reflected in ordinance. While such action typically arises from the need to protect religious or
The Environment

cultural events, it has, in places, been used to keep traditional community and swimming and fishing holes for locals, and for other similar purposes. As Juneau begins to see past the conflict over tourism growth and impacts, the community may want to identify some places and times of refuge, when community can, without outside distraction, commune with itself or with nature.


8.6.14 A Precautionary Tale: Y2K And The Politics Of Foresight

While some people considered action taken in anticipation of "Y2K" (that a computer meltdown would occur as 1999 turned to 2000 around the world) to be at best wasted money and perhaps even a purposeful fraud, the authors conclude that the fact nothing serious happened after actions were taken to be a good example of the precautionary principle in operation. They urge similar action in response to warnings about global warming, climate change, and sea level rise.

Overview

A development we have been tracking for many years is the transformation of homosapiens into other sapiential forms.

9.1 Unnatural Selection

Genetic engineering is about to produce a new breed of athlete who will obliterate the limits of human performance.


9.2 Evolution Of A New Species.


9.3 The Future Of Human Evolution

The rapid development in silicon and biotechnology could soon bring the human race to a critical point in its evolution where it can break free of its Darwinian biological roots. The potential impact is profound. The key thesis of this article is that the remaining lifetime of both Darwinian evolution and Homo Sapiens are both short and limited. Homo Sapiens’ descendants will soon be able to seize control of their own evolution. To explain why this is so we will first examine how Darwinian evolution may be near its end for Homo Sapiens; then explore whether there are any fundamental biological limits which will block progress via genetic engineering; and finally examine how technology, and silicon in particular, can help us transcend these barriers.


9.4 French Best-Selling Novel Celebrates A Post-Human Future

The new literary-artistic embrace of the techno-eugenic vision continues with publication in English of the 1998 French bestseller *The Elementary Particles* by Michel Houellebecq (Knopf, 2000). Houellebecq offers an unrelentingly dreary, dispiriting assessment of the possibility of meaningful human relationships at the turn of the millennium, but holds out the promise that genetic engineering and cloning will allow creation of a new post-human species that transcends humanity’s tragic flaws.

*From the book* (pp 262-264):

"There remain some humans of the old species. At present their extinction seems inevitable. Contrary to the doomsayers, this extinction is taking place peaceably, despite occasional acts of violence, which also continue to decline. It has been surprising to note the meekness, resignation, perhaps even secret relief with which humans have consented to their own passing."

*From the reviews:*

- "This remarkable best-seller is France's biggest literary sensation since Francois Sagan...or since Albert Camus" -- The Economist
- "The great novel of the end of the millenium" -- Elle (France)
- "Here are ideas, here are dreams, here is a great novel" -- Le Monde
- "A tragically beautiful book that constitutes a kind of epitaph for the hopes of the twentieth century" -- The Sunday Times

9.5 External Artificial Wombs

- [http://www.observer.co.uk/international/story/0,6903,648024,00.html](http://www.observer.co.uk/international/story/0,6903,648024,00.html)
Overview

Futures studies, futures research, and foresight capabilities generally have been growing and spreading recently. Students are flocking to futures courses as never before, and the demand by business and government agencies for information from and about the futures has never been greater since the heady days of the 1960s and early 70s.

In part this may be because of the increased uncertainy about the futures caused by the collapse of the dot.com businesses and the general economic downturn. But it more likely reflects the rise towards power and influence of the GenX cohort—who take futures studies much more in stride than did earlier generations.

There is also a growing recognition of the practical need for foresight, not only in business and government, but also in the scientific community concerned about climate change, global warming, and other potential future environmental challenges.

In 2001, the Israeli Knesset (Parliament) passed a law creating "The Next Generations Commissioner". The law was introduced by the secular Sinnhui ("Change") Party. The Commissioner is to advocate for coming generations when pending legislation is debated. He will work with Knesset committees, reviewing all new legislative proposals and laws. The Commissioner does not have veto power so his real influence is not clear yet. (www.hinam.net/halachot/content/hakika_18.asp)

One of the more reassuring developments in the US also occurred in 2001 when the Nebraska Legislature passed LB 722, creating the Nebraska Futures Center. The main sponsor of the bill was William R. "Bob" Wickersham. The Center has not yet become operational, but the explanation for the Center contained in the first paragraph of the justification for the bill indicates that the sponsors understand futures studies very well:

"The legislation was patterned somewhat after the Kentucky Long Term Policy Center and was intended as a tool for the Nebraska Unicameral Legislature and other entities of state government to chart a more proactive course in managing the state's business. The Nebraska Futures Center was proposed to assist Nebraskans in general and the Legislature in particular in preparing for the challenges and changes that would be brought in an increasingly complex world. Identification of future trends and possible response would likely enhance the ability of a legislature to shape the laws of the state to best serve its people."

10.1 Foresight and Prediction

10.1.1 The Future As A Factor In Business Planning And Management

Seven articles on how businesses in Europe and the US use futures.

"One conclusion for this relatively small sample of businesses, is that the location, responsibility and continuity of the examination of the future varies in all conceivable ways. What does seem to be a core requirement is top management forbearance, a willingness to explore the future and to see what comes of it. Even better is top management's enthusiastic support and eager reception of results." "No one organizational model works for everyone." "The futures study brings about intellectual change and a reorientation of thinking on the part of the participants."

"There are still real problems with getting the message to, and the follow-up action from, the
topmost level of the business." "A commitment to exploration of the future can sometimes permeate the organization, sometimes down so far that nearly everyone is involved. At other times, only a hundred or fewer people appreciate or participate in futures work." (From the introduction by Joe Coates, p. 8f)


10.1.2 Foresight As A Core Competence

The authors show "how the concept of foresight can be seen as a core competence. All of the recognized characteristics of a core competence are fulfilled." "Presenting foresight as something to help firms build up a vital core competence will make it much more relevant to industry." "Nations as well as firms can hold core competencies. Studying national competencies fosters understanding of the effects of national cultural differences on business."


10.1.3 20/20 Foresight: Crafting Strategy In An Uncertain World

"The book is built around a simple but powerful insight: The key to making better strategic choices in turbulent markets lies in understanding the level of uncertainty faced in a given situation. The author argues that most executives suffer from an all-or-nothing view of strategy in which future events are either certain or uncertain. Instead, 20/20 Foresight comes from learning to separate what can be known from what can't--and then using that residual uncertainty to tailor every aspect of the decision-making process. Based on a large-scale review of the strategy problems faced by leading companies, Courtney provides a framework for diagnosing which of the four levels of uncertainty a specific business decision corresponds to. Then, he shows how this level of uncertainty defines the tools, frameworks and strategic planning processes the decision-maker should use when crafting answers to three key strategic questions: 1) Should one attempt to shape or adapt to uncertainty? 2) Make strategic commitments now or later? and 3) Follow a focused or diversified strategy? Applicable to businesses in every industry, this essential guide presents an integrated approach to building and sustaining winning strategies in a changing world."

- Hugh Courtney

10.1.4 Predicting The Unpredictable

"Disease predictions have reached epidemic proportions. Predicting the course of a disease in a population certainly fulfills a morbid fascination, but predictions that vary by two or three orders of magnitude are, for all intents and purposes meaningless." (1663)

(Examples of failures in the UK to predict the course of Mad Cow disease, HIV, AIDS and the human version of Mad Cow disease).

"So, are predictions worth the effort? I believe they are, but not for the numerical values. Their intrinsic importance lies in developing an understanding of the processes underpinning these epidemics, and in providing an external validation of this understanding--if the predictions turn out to be wrong, we have to ask why." (1664)


10.1.5 Forecasting Agriculturally Driven Global Environmental Change

"During the next 50 years, which is likely to be the final period of rapid agricultural expansion, demand for food by a wealthier and 50% large global population will be a major driver of global environmental change. Should past dependencies of the global environmental impacts of agriculture on human population and consumption continue, 10 to the 9th hectares of natural ecosystems would be converted to agriculture by 2050. This would be accompanied by 2.4 to 2.7 fold increases in nitrogen- and phosphorus-driven eutrophication of terrestrial, freshwater, and near-shore marine ecosystems, and comparable increases in pesticide use. This eutrophication and habitat destruction would cause unprecedented ecosystem simplification, loss of ecosystem services, and species extinctions. Significant scientific advances and regulatory, technological, and policy changes are needed to control the environmental impacts of agricultural expansion."

10.1.6 Ecological Forecasts: An Emerging Imperative

"Scientists and policy-makers can agree that success in dealing with environmental change rests with a capacity to anticipate. Rapid change in climate and chemical cycles, depletion of the natural resources that support regional economies, proliferation of exotic species, spread of disease, and deterioration of air, waters, and soils pose unprecedented threats to human civilization. Continued food, fiber and freshwater supplies and the maintenance of human health depend on our ability to anticipate and prepare for the uncertain future." "Forecastable ecosystem attributes are ones for which uncertainty can be reduced to the point where a forecast reports a useful amount of information." "Most daunting is the inherent uncertainty that results from strong nonlinearities and stochasticity."

"Linking science with decision-making will depend on scientific accuracy and effective communication." "Two broad classes of recommendations address these goals. First is a definition of forecasting priorities through dialogue involving scientists, managers, and policy-makers." "The second recommendation involves definition of a science agenda..." "Focus should be on the problems for which forecasts are now possible and those that are not presently forecastable but could become forecastable within a decade."


10.1.7 Modeling The Future

Jonathan Rauch considers the new science of artificial societies that studies through computer animation simulations of subjects like genocide, segregation of neighborhoods, shocks in financial markets, crime waves, and epidemics caused by bioterrorism.

Atlantic Monthly Apr 2002

10.1.8 Improving Science And Technology Advice For Congress

Arguing the need a new Office of Technology Assessment (OTA) to replace the one killed by the Gingrich revolution of 1994.


10.1.9 Communicating Statistical Information

"Decisions based on statistical information can mean the difference between life and death...." "Unfortunately, most of us, experts included, have difficulty understanding and combining statistical information effectively."


10.2 Age-Cohort Analysis
Age-cohort analysis is a major theory and method used by futurists to anticipate future developments. It has been a feature in all of our previous scans. William Stauss and Neil Howe, co-authors in 1991 of the first definitive source for age-cohort analysis (Generations: The History of America's Future, 1584 to 2069) more recently wrote Millennials Rising (Vintage Books, 2000). The new book describes the generation coming after "Gen X", the Millennials. They will be the dominant generation during the mid years of the 21st Century. The "echo" of the Baby Boomers, they are more numerous than Gen X, and have been socialized in very different ways. The first of the Millennials were born about 1982 and since they are "Civics" (accepting and striving to realize the values of the Boomer cohort) they are expected to play a social role like that of the GIs who ruled (in contest with the Boomers) during the latter half of the 20th Century.

As we pointed out in our most recent scan, Millennials are typically "only children" or have no more than one sibling. They are accustomed to being pampered and cared for, and of having their lives constantly "enriched" by various organized educational, cultural, and athletic activities. They are emphatically team players. Accustomed to continuous oversight by parents and other adults, they play in groups, study in groups, and prefer to be in groups. They are seldom alone, and often have never experienced "free time" to do what they want to.

Life is a game, with rules, coaches and (very importantly) umpires. You do your best, play by the rules, but whether you win or lose, you all go out together for ice cream and cookies, certain that you will play again another day.

The Millennials are also the least race-conscious generation in American history, in part, Strauss and Howe feel, because they value unity far more than they value diversity. They study hard, play fairly, and expect to be graded and evaluated accordingly.

Since their time is scripted from one activity to another over the course of any given week, Millennials learn early how to carry out an agenda set by others, rather than to create goals of their own. Their improving scholastic record is largely the result of curricula oriented more toward the mastery of facts than toward creative thinking. They accept the legitimacy of the major institutions of their world, from the local school district to the presidency. They should be good soldiers all their lives, even if that means they must be real soldiers. And this well might be the case, because a year after Strauss and Howe wrote their book, something very bad did go wrong, and the Millennials seem fully capable of abiding by the new rules without a hint of protest and concern--just as long as the new rules keep them safe and sound.

10.2.1 Bush Gives Silent Generation A Voice

Even though Bush is a "Boomer" he has appointed a unusually large number of members of the aged "Silent" generation to his administration, giving it a tone and perspective quite at odds with that of the country generally.


10.2.2 A Generation Unfamiliar With Feeling Vulnerable

As night fell Wednesday evening on a tight knot of about 75 people gathered in a vigil on Columbia University's plaza to discuss the World Trade Center attacks, one young man hidden in the crowd hesitantly described his stab at taking a stand. He had, he said, hung a poster on his door that said, "Forgive." But, he added, when he told his parents about the poster, they told him to take it down, saying the attacks were "an act of war" that could not be forgiven. The young man paused, then added in a frightened voice, "I just want to say that for the first time in my life, I'm utterly, completely confused."
For American college students, a generation that grew up in a period of virtually unalloyed prosperity, for whom Vietnam is a history lesson and the cold war a dim childhood memory, the attacks on the World Trade Center were a sudden, stark discovery of their nation's vulnerability and the scope of anger in the world. Many debated the best way to defend freedom and what the price might be.

"We grew up with nothing bad ever happening to us," said Jessie Kindig, a Barnard College sophomore from Seattle who had traipsed from hospital to hospital on Tuesday trying to give blood. "Not the Bay of Pigs, not the cold war, not the threat of nuclear terror." She said that as she had trekked from St. Luke's-Roosevelt Hospital Center to Mount Sinai Hospital to Beth Israel Medical Center, she knew that she, too, had lived through a pivotal historic moment.

At the vigil, one of many participants who spoke out in scatter-shot fashion called the trade center events "a kind of reality check to help us remember how free we are." Another participant who identified herself as someone "struggling for social justice," warned that "in the past, the reaction to things like this has been to destroy civil liberties and create further tragedies." "We need to mourn," she said, "but if we try to bomb, I will stand against that just as I stand against the events that took place yesterday."

One man who identified himself as the father of two dissented. "I'd like to forgive and forget," he said. "But to a certain degree, violence may be necessary to maintain our freedom. Look at the Revolutionary War." Campus responses around the country were hardly uniform. Some colleges suspended classes; others urged their professors to use the time to talk about Tuesday's events. Some approached the attack directly, while others were more oblique.

Despite those efforts, students yesterday were feeling far less innocent than they did a few days earlier. "I used to think of America as invincible, a sphere of influence ready to challenge any global conflict," said Lauren Hodge, a freshman at the University of Michigan. "But these past couple of days have put my life into perspective, and the emotional stability I once had is gone."

Karen W. Arenson

10.2.3 New Report Shows Encouraging Trends in American Education

Increasing numbers of children and adults are "hitting the books," more high school students are taking advanced courses in mathematics and science, and mathematics and science performance has improved, according to The Condition of Education: 2000, released today by the U.S. Department of Education's National Center for Education Statistics (NCES).

The annual report summarizes the health of U.S. education and shows that more Americans are participating in education - from preschoolers to adult learners.

"This report shows a very positive trend toward creating a 'nation of learners,'" said U.S. Deputy Secretary of Education Frank S. Holleman, III. "With more children starting school earlier and more adults going to college and seeking to upgrade their careers, the American public is saying it recognizes the value and importance of education." "There are many encouraging trends emerging in education, as well as some continuing challenges," said Gary W. Phillips, acting commissioner of education statistics.


10.2.4 The Numbers of Children Homeschooled Are Increasing

An estimated 850,000 students nation-wider were being schooled at home in the spring of 1999. The National Center for Education Statistics conducted a survey and found that 1.7% of U.S. students aged 5 to 17 were receiving school lessons at home. Trends include: surges in alternate learning, home school cooperatives, home schoolers taking classes in community colleges, and growing number of home schooled teens. There is also a growth among secular home schoolers. Parents seeking better education rather than a religious experience.

American School & University. September 2001. v74 i1 p3
Some Thoughtful Words To End On

"The person who does not worry about the future will shortly have worries about the present" (Chinese proverb; Confucian Analects). From the Copenhagen Institute for Future Studies. Cited by The Arlington Institute)

"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist." Kenneth Boulding (according to Steve Kurtz of Ottawa)

"A forecast needs to be believable, plausible and internally consistent. Reality, of course, labors under no such constraints." Paul Saffo

"I think computer viruses should count as life. I think it says something about human nature that the only form of life we have created so far is purely destructive. We've created life in our own image." -Stephen Hawking