

**SUPREME COURT  
STATE OF VIRGINIA  
ENVIRONMENTAL SCAN  
1995**

**\*\*\*DRAFT\*\*\***

**HAWAII RESEARCH CENTER FOR FUTURES STUDIES**

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## INTRODUCTION

The following paragraphs comprise the primary findings of an environmental scan performed as part of the strategic planning process for the Virginia Courts. Loosely organized into five sectors of change (DEMOGRAPHY, GOVERNANCE, ECONOMICS, ENVIRONMENT, and SCIENCE & TECHNOLOGY), the findings present both macro trends in each sector, and more finely focused trends where appropriate. Where trends are emerging in a complex context, they are prefaced by an explanatory discussion. Possible implications and potential time horizons are both identified, as are citations for sources in the literature, where applicable.

While endlessly fascinating, this has in many ways proved a sobering exercise. We do indeed live in interesting times. The United States has experienced an overwhelming change in the national mood. While the population has never recaptured the sunny, optimistic outlook of the Fifties, there have been moments of confidence in the last half century. But America currently seems to be facing the millennium in a state of stress, unhappiness, and outright fear. We are afraid for our jobs and our economic security, afraid for our health and well-being in a context of environmental degradation, afraid for the safety of our children, our vulnerable parents, and our own lives and property in the context of societal and community decay, and we are afraid for the future. Even with the economy actually improving, we do not feel that it offers any guarantees for our own individual long-term security. We are a society seriously out of balance, facing a major social, political, economic, environmental, and technological watershed at the turn of the millennium, and we have no vision of how to regain our balance. Many of the technological changes moving us to that watershed could change human circumstances greatly for the better -- providing we are aware of their potential and apply them wisely.

The key to the positive application of these innovations will be equity of access to them, and equity of representation within the information flows that will power them. This is perhaps the greatest niche for positive court involvement in creating a better future out of the maelstrom of change surrounding us: acting as the steward of everyone's rights to the fruits of human creativity in the new millennium.

## EMERGING ISSUES ANALYSIS

### **DEMOGRAPHY: WOMEN, THE BRONZE TIDE, and AGING.**

**DISCUSSION:** The 21st Century future of the world looks grim because of very rapid global population growth in most of South America, Asia, the Pacific, the Middle East, and Africa. Combined with a stagnating or actually declining population in Europe, Japan, and North America, a "bronzing" of the planet is occurring. The long range future for all is hopeful as women everywhere gain control over their fertility and have smaller families. The increasing population of world elders will have a dramatic impact on all futures. "Research into how the vast demographic changes sweeping the world interact with other critical global issues is still required. What once seemed obvious is now exceedingly opaque. Research does change perspective -- or it should." With sustained and effective action, the global population may begin to decline in the latter half of the 21st century, and stabilize at levels which permit a more equitable and sustainable world to emerge.

**TREND -- WOMEN: Right to Choice and Reproductive Health.** The message from the UN's Population Conference at Cairo was a positive one, with the conference seen as "a victory for enlightenment, and for women". The concepts and agreements of the September 1994, UN Cairo Conference on Population, gave primacy to women's right to choice and reproductive health rather than coercive population control, the means for which China was applauded 10 years earlier. "At the last UN Conference, in Mexico City in 1984, the best contraceptive was thought to be economic development. Since then it has become clear that women want smaller families regardless of economic status". Despite the widespread belief that the poorest countries are not ready for modern contraception, it is argued that there is a huge unmet need, "demand for family planning is a "moving target" -- the greater the access, the greater the take-up...women will have to be given more say -- men will have to be involved." Nafis Sadik, who heads the UN Population Fund, which ran the conference, pointed to "the extraordinary way in which people around the world have adopted contraceptives and reduced family size, the rapidly falling barriers to further progress, and the absence of a major dispute about funding a tidy \$17 billion for future programmes".

**IMPLICATIONS -- GENERAL:** The best news from Cairo is that we appear to have stepped out of the loop of identifying, attempting to solve, and often reproducing a problem without a clear analysis of what it really means. Can we maintain this position, and even expand it? Hopefully. The worst of our times demand it: the futures of humankind and all life on the planet, not only that of womenkind, depend on it. **FOR VIRGINIA:** These are not

only global issues. Many present themselves to the courts at local, state, and national levels. Women's rights to reproductive health and choice has become an explosive issue in the US, and will continue to be debated in the Virginia courts for some time. We must attempt to "step out of the loop" at all levels.

TIME HORIZON: Immediate to long-term.

CITATIONS: "Women Empowered: The Earth's Last Hope" Nafis Sadik, New Perspectives Quarterly, Fall 1994: 11.4; p.13; "Thoroughly Modern Families" Rajamani Rowley, New Scientist, 3 September 1994; p. 30.

TREND -- THE BRONZE TIDE: Rapid Growth of Asian, Pacific, Latin, Middle Eastern, and African Populations. By the year 2000, 60% of the world's population will be Asian; by 2025, only 3% of the world will be European. Given the political, economic, and environmental challenges which Asia and the Pacific will face, it is likely that many of those people will migrate out of Asia and the Pacific region, bringing a "bronze tide" to the aging European-derived populations in the developed countries.

IMPLICATIONS -- GENERAL: In the international context, the tensions will only be heightened by the fact that the "youngers" are of Asian-Pacific-African descent, and the "elders" of European descent. While there will be increased demands and attempts to limit immigration, migration, legal or illegal, will continue to the US, and elsewhere. FOR VIRGINIA: As it is clear that, with demographic and migration trends, fewer and fewer Americans will be of Anglo-Saxon or other European backgrounds, cultural support for the current judicial system will weaken, and the demand for other more "culturally appropriate" forms will increase.

TIME HORIZON: Immediate to long-term.

CITATION: "Europe at the Dawn of the Third Millennium" H. de Jouvenel, Futures, October 1988: 20.5; pp.505-518.

TREND -- AGING: Exponential Growth of Elders. The OECD population will be, at the turn of the millennium, midway through a century of demographic transition. Between 1950 and 2050, the proportion of the population aged 65 or over may double, from 10% to 20%. In the United States, the most rapidly growing segment of the retired population early next century will be those over 85.

IMPLICATIONS -- GENERAL: In the US, problems of the elderly will predominate social debate: long-term care, post-retirement entitlements, and issues of personal and property safety and financial security. As a voting bloc, this group will entrench the status

quo and attempt to remake the past. However, as we learn more about ourselves and about halting debilitating effects of aging, "wise" elders may increasingly re-emerge in society as a valued and great resource. Refer to SCIENCE & TECHNOLOGY, UNFOLDING DEVELOPMENT OF EXISTING TECHNOLOGY, Rapid Advances in Genetics and Developmental Biology. FOR VIRGINIA: Demographic trends have not significantly altered since the state's initial scanning effort; the implications elaborated there still apply.

TIME HORIZON: Immediate to medium-term.

CITATION: "Who looks after the elderly?" OECD Observer, No. 188, June-July 1994, pp. 15-18; National Underwriter, 2 May 1994: 98.18.

**GOVERNANCE:** CYBERSOCIETY, THE SOCIAL CONTRACT, and GLOBAL TRANSFORMATION.

DISCUSSION -- CYBERSOCIETY: Wildfire growth of the Internet and the WorldWideWeb offset some of the more negative trends reported above. The "Net" provides an exponentially growing medium for expanding, disseminating, and sharing knowledge, particularly new knowledge and different perspectives from voices previously not connected, as well as transmitting accumulated and up to the nanosecond knowledge from individuals, NGOs, academic organizations, scientific institutions and research, and government. Self-published print and online communications, email, essays, listservs, teleconferences, newsletters, and research projects abound, addressing multitudes of varied interests. This internet-working represents a new departure from TV/videotext, with higher visibility for "communicating". The interactive Internet creates an "involving" environment as opposed to a more "informing" environment.

The boom has come, and will accelerate, with increasingly powerful, user friendly computers, telecommunications links, and software. Only the programming cognoscenti (rapidly becoming unnecessary due to advances in software development) could easily use the Internet in its first days. Now, with the advent of the WorldWideWeb (WWW, a hypertext-based, multimedia version of the Internet) and menu and icon-driven Web browsers, such as Mosaic and Netscape, not only children can "surf" the Internet, but adults can as well, at least with a little patience and practice.

The "Net", as it is evolving, will be characterized by its broadband nature and its increasing in-built intelligence. Optical fiber can provide high speed communication lines capable of moving large files very quickly and will make multimedia applications via the Net easier and faster. Telephony services will be leaving optical cable for the air. With the

advent of wireless communication networks, people will be able to access the Internet on their intelligent wireless personal data assistants literally anywhere in the world. It will be accessible by more people in more places not only because the technology is becoming easier to use, as telecommunications costs are becoming virtually independent of the distance, and while still slightly dependent on the bit rate, memory costs and processing speed costs are steadily decreasing.

Within the near future, international computer linkages will provide broadband services which will guarantee universal connectivity and internet-working, and worldwide access to all sources of information whatever the storage and communication medium used. The network will be flexible in meeting user requirements, reliable and safe, able to reach both persons and locations, and support a full range of services for private and public operations whether wired or wireless.

The information superhighway will be people and machines exchanging information in a simple, reliable, secure and cost-effective manner at anytime and in any place, using the medium of their choice, be it voice, image, data, or multimedia.

TREND -- The Electronic Legal Frontier: Over the last two decades the Internet has demonstrated that the result of so much interconnectivity and raw communications power is the creation of a self-organizing, anarchic society. This "cyberpolity" is composed, at the moment, of some of the best educated, most highly skilled minds on the planet. As such, it is a tremendous force for political and social change. Cyberspace as it exists today has a distinct culture, with distinct mores and customs, unwritten laws, and an evolving notion of what constitutes a virtual crime. It was originally the domain of a scientific and programming elite, but access has been blown wide open to almost anyone who can get their hands on a computer and a modem. Realistically, while no longer limited to an elite, Internet use is still a middle-class and upper-middle-class activity, except in schools. Obviously, even the Republicans recognize that access will be in the future a fundamental right, as they are proposing a bill offering tax breaks to the lower economic strata for buying personal computers. It will, in the future, be the arena of most of our political, social, and economic activity.

The entire United States, with much of the rest of the world, is moving onto the Internet: universities, public schools, private non-profits, corporations, churches, hate groups, the President and Vice-President, the Senate, the House, and everybody in-between. And they are meeting the rest of the world there. To reach Bill Clinton by email just send to --

President@whitehouse.gov -- any comments or questions for Speaker of the House, Newt Gingrich, should be sent to -- georgia6@hr.house.gov -- access to house proceedings is available on the Internet through the WWW.

Of particular Internet interest to the courts is a recent electronic conference, "Law in a Digital World", sponsored by the West Publishing Corporation, and moderated by Ethan Katsh, Professor in the Department of Legal Studies of the University of Massachusetts, Amherst. Fifty law professors, legal librarians, lawyers and judicial futurists participated in the virtual conference which was held on the Internet as a closed listserv. The conference began on October 3 and ended on October 21, 1994.

In an invitation to participate, Marc Baer of West Publishing said: "The need to focus on challenges presented by technology and the law is significant in light of growth along the "information superhighway." There are suddenly countless new ways to acquire, receive, and process data; old information is being expanded by new at a frenzied pace; traditional expectations of legal professionals are changing; and ethical issues are emerging as rapidly as the superhighway can be built. Ethan Katsh has said, "new technologies are not simply tools that help one do a job more quickly but are something that change how the job is conceived of and defined". The goal of the conference, therefore, is to address how we can better understand changes in the role and nature of law as we truly become a "digital world".

Introductory material sent to all participants included the following statement by Professor Katsh:

"Changes in our information environment are important for all institutions in society. They may, however, be particularly important for law. Law is not only a process that touches all other societal institutions but it is...an institution that is fundamentally oriented around information and communication. When information is whizzing by in the air, or in the wires in the wall, and is moving much faster than it ever has, when more people and groups are collecting, producing, and distributing information than ever before, when information is an animated picture rather than an open or closed book, legal doctrines, processes and values that grew up in the relatively tranquil era of print, and even television, cannot help but be affected. We are, therefore, likely to encounter some surprises as novel conflicts are generated and as we endeavor to develop new norms and standards."

"Displacement presents us with many challenging questions, most of which fall into two categories. There are, first, questions about particular artifacts of the old environment, such as legal doctrines, that have been

transplanted to the new. Technology is changing rapidly and it will be increasingly asked whether our legal doctrines and our ways of using or applying law can be extended to activities in this new place. During the transition period, we will, with increasing frequency, be asked about revising or stretching familiar doctrines. Yet, in addition to the presence of new objects and the accelerated movement of these objects, there is a second category, one concerning new values and expectations, new ways of speaking and thinking, new relationships being formed, new concerns of style and culture. We need to understand that we are being spoken to in new ways and that we have new opportunities to speak. As we engage in new activities, it is not only what we hear and see but assumptions we have long held that need our attention."

**IMPLICATIONS -- GENERAL:** Widespread use of the Internet will increase people's writing skills, increase creativity, increase the amount of information any single person can access, increase our ability to monitor and investigate the activities of governments and corporations, increase our ability to organize political and social action, increase the speed of human thought and activities, and political, social, and scientific exchange all around the world. It breaks down geographic, disciplinary, ethnic, age, and gender borders and is, generally, a force for decentralization of power structures around the world. Because it was designed to be virtually indestructible via decentralization, it is difficult to control or monitor. Anyone not online within the next five years will be seriously disenfranchised in any political, social or economic transaction.

On the dark side, cyberspace will quickly develop virtual counterparts for every crime in the book, where it has not already done so. It also offers a wealth of opportunities for both licit and illicit invasion of privacy. This would be more of a worry were its growth slightly less explosive: just as the government found it impossible to hire enough people to monitor foreign telephone calls, any attempt at effective monitoring of cyberspace communications would bankrupt any organization. Encryption and security issues for individual users will become more important as the already fluid boundaries between individual physical computers become nonsensical in the age of the ubiquitous microchip, and the personal data assistant that follows you through machine boundaries from room to room to car to distant site to vacation cottage. Indeed, the spreading use of electronic surveillance and security in the private sector and especially in the public sector, raises serious privacy concerns.

Cyberspace is an "electronic legal frontier" because no ethical or legal standards exist for it. It is "neither here nor there", yet it is a place in every sense of the word except for physical tangibility. Because the Internet is a virtual society, it produces some of the same sorts of transactions and problems any society does, and so will generate fraud, libel,

harassment, assault, and other personal injury cases; more and more, questions of copyright for ideas and writing on the net are arising. Unimagined legal issues are beginning to emerge and as people move into the electronic community, they will increase dramatically over the next ten years.

The "information super highway" and cyberspace in general is a recent and increasing source of conflict, and thus adjudication. At the same time, courts and the legal system will continue to use it, and to modify and eliminate previous procedures, modifying or challenging certain long held or asserted "rights" based on those older procedures. The rules will be continually changing for our lifetime. We won't be able to say we "have it".

FOR VIRGINIA: How many offices in state, county, and city governments have online access? Are the courts online? If not, what would it cost? How fast are subscriptions for the online services growing in the state? Have any public access programs been implemented? Do all public schools offer online access to schoolchildren? What sort of support is available to students for gaining computer access? Distance learning with telecommunications technology is key to the transformation of education, if education is to have any meaning or connection to knowledge and employment, now and in the future. Lifelong learning for all ages is part of this picture.

TIME HORIZON: Immediate to short-term; this is happening now and the social implications will rebound past the turn of the millennium.

CITATIONS: "Politics in a Parallel Universe: Is there a Future for Cyberdemocracy?" M.R. Ogden, Futures, September 1994: 26.7; p. 13; "2005: a vision of the network of the future" T. Landegem, M. De Prycker, and F. Van den Brande, Electrical Communication, 3rd Quarter 1994; for expanded governmental electronic surveillance and security, see Electrical Communication, 2nd Quarter 1994; "C31 Systems and Application to Security Forces", "TETRA, A Standard for Police Communication", "Automatic Vehicle Location System", "Command Control Centres for Police and Security C31", "Urban Video Surveillance System", "SAFARI - An Advance C31 Approach to Crisis Management", and "BorderMaster 2000 - An Advanced Border Surveillance System"; "Telecommunications in Transition: A Global Perspective" IEEE Communications, November 1994: 32.11; "Securing the Information Superhighway" IEEE Communications, September 1994: 32.9; "Community Networks: Building a New Participatory Medium" Doug Schuler, Communications of the ACM, January 1994: 37.1; p 38; Journal of the American Society for Information Science, Special issue: "Information

Resources and Democracy" July 1994: 45.6; Guest Editor, Leah A. Lievrouw; and the Westlaw electronic conference, "Law in a Digital World" sponsored by the West Publishing Corporation, and moderated by Ethan Katsh. Professor Katsh is author of The Electronic Media and the Transformation of Law, Oxford University Press, 1989, and Law in a Digital World, also to be published in print and electronic form by Oxford.

COUNTERTREND -- A Little "Bit Tax": In a forthcoming book by the Club of Rome, entitled The New Wealth of Nations, Canadian co-authors Arthur Cordell and Ran Ide acknowledge that primarily because of automation and more "rational" forms of organization and management, "it will not be possible in the future for most people to find good, secure, well-paying jobs. There will be some jobs (at least well-paying, if not secure) for some people, but most will be unemployed".

Yet wealth will be abundant in the new information society. So how can that be put to public and social purposes, as well as to private purposes? Cordell and Idea propose a "Bit Tax" on EVERY digital transaction which is so small no one will notice it, or mind, but so extensive it will soon have governments everywhere awash in their share of the wealth, some of which can be used to help the permanently unemployed or underemployed live useful and peaceful lives.

IMPLICATIONS -- GENERAL: The "Net" is transforming the form and function of everything in our world. The "Bit Tax" is an idea with stunning positive potential for society. It illuminates a point of hope. It also points to other questions relating to money in cyberspace. What will be the meaning of "virtual wealth", and how will it be regulated and taxed? How will the electronic bonus be spent -- who benefits -- who profits? The courts will be asked to decide on critical issues. The distribution of wealth, virtual or not, has major impacts. The social, political and economic transformations taking place now directly impact private, public, and government finances. FOR VIRGINIA: The challenge to the States is to recognize and deal effectively, fairly, and equitably with funding. Failure to do so will, at the least, hobble creative policy-making for several decades, and, at worst, run the risk of total societal collapse. State courts themselves will experience a funding crisis while being asked to resolve economic questions for the rest of society. A "Bit Tax," as promoted, could go a long way to easing many of the problematic issues facing Virginia. Court administrators should begin investigating the implementation of this idea now. This COUNTERTREND offers an alternative which can be applied to all sectors of this report.

TIME HORIZON: Immediate to long-term.

CITATION: The New Wealth of Nations, Arthur Cordell and Ran Ide, co-authors, a forthcoming book published by the Club of Rome. Mr. Cordell is also involved with the FUTUREWORK listserv cited in the section, ECONOMY: DISAPPEARING EMPLOYMENT, Total Job Insecurity.

TREND -- My Electronic Purse: Could you hold my coat while I look in my electronic purse for the digital keys to my personal transport device? "Electronic purses" have the capacity to take cash and coins out of circulation. Alternate instruments of exchange are moving beyond credit cards to "smart cards." Smart cards (with read-write capabilities which allow stored values to be incremented or decremented as required) make supplying value-added services easier. In fact, because ubiquitous use of "electronic purses" (read-write smart cards) would require huge infrastructural investments -- new cards, chips, point-of-sale terminals, software development -- the smart card providers would almost have to sell some of the memory space to third parties for ads, phone cards, and utility payments, etc. Going electronic would substantially reduce costs to banks and retailers. Widespread use of electronic purses requires a resilient card authentication method to prevent fraud. However, smart cards -- even the less smart "memory" cards -- are more difficult to counterfeit or use fraudulently. French banks implementing memory card use for their ATMs experienced a 36% decrease in card fraud from 1991 to 1993.

IMPLICATIONS -- GENERAL: The increasing use of portable electronic means of economic exchange, such as the "electronic purse", is another example of money in cyberspace. Although we are lagging France, the UK, and Japan in regard to smart cards, money in cyberspace is already here. Entrepreneurs stand ready develop cyberbusiness. Years ago Bugsy Malone and his vision of Las Vegas in the middle of the desert seemed outrageous. Today's Bugsy is ready to take gambling, or at least gaming, to the Internet. FOR VIRGINIA: What are the current rates of petty theft involving cash? Cases of bank-card fraud? What is the population of ATM users in Virginia, or the number of ATM machines statewide? How many are smart card friendly? In addition to reducing card fraud, this concept could also encourage the design of 24-hour unmanned shops consisting solely of self-service vending machines. As the machines contain no money, they would be less of a target for thieves or vandals.

TIME HORIZON: Short to medium-term. Full implementation of the technology will be put in place within the next fifteen years.

CITATION: Banker, October 1994, pp. 14-17, 75-78, 113.

TREND -- Voting Your Uncertainty: Moving from binary logic to fuzzy logic in voting: "fuzzy logic" is a mathematical technique for dealing with vagueness and ambiguity, and one mathematician suggests that it is only natural that people should express, rather than suppress, their uncertainty. Perhaps "fuzzy logic" polling techniques could allow the "maybes" to win out in a democracy by quantifying the degree of conviction. The application of this innovative polling approach will probably be directly linked to the emergence of "teledemocracy" or "direct democracy" - polling in cyberspace.

IMPLICATIONS -- GENERAL: This would enhance the flexibility with which voters expressed their opinions, and perhaps would come to be used as a bargaining tool by voters: a "maybe" implies a qualifier - "maybe I'd support this IF you could cut the cost." It could also immobilize the decision-making process, if the "maybe's" increasingly win elections. It would certainly offer elected officials a much more sensitive measure of people's support, although it seems likely to be used first as a means to vote on proposals and referenda. FOR VIRGINIA: What are the mechanisms for voting on issues statewide? How are proposals or referenda put on the ballot? How might this change the voting structure in the state? How would it affect the legitimacy of proposals passed using this technique? Would this challenge aspects of the state's constitution?

TIME HORIZON: Medium to long-term.

CITATION: "Vote, vote, vote for fuzzy logic" Arturo Sangalli, New Scientist, No. 1951, 12 November 94.

TREND -- Database Bias and Inequity: No consumption without representation. Linked to consumer demand and economic exchange via the advent of the "800" number and widespread credit card ownership, the development of customer-based, relational databases loaded onto minicomputers and networked PCs enabled the catalogue boom of the 80s. They have become a primary marketing tool, and the best of them are characterized by intelligence, speed of access, depth of information, and friendliness of the screens and search menus (operators must quickly and easily get enough information on the customer to personalize the service). Recently, marketing databases with very personal information are being linked to accounts databases. These allow marketers to create "triggers" within the databases linked to particular life events: recent marriages, incipient graduations, etc. This is the personal data assistant writ large and indentured to corporate marketing, and represents the next step in the escalation of market devices to support and intensify consumerism in already consumption-rampant America.

Unfortunately, biases are built into databases. Three of the more obvious are gender bias, racial bias, and economic bias. As computing power grows more massive and more massively parallel in processing structure, defining links across universes of data will become easier and easier; the software of relating and sifting data will likewise improve. For those people adequately and accurately represented by those databases, access to products uniquely tailored to their specifications and needs will be instantaneous; as will access to health regimens and treatment protocols tailored to their physiology; feedback into the system of production and infrastructure safeguarding the quality of life will be assured. But some sectors of the population will fall through the info collection cracks, and end up being consumers without a product to call their own.

The increasing focus on tailoring services, products, and even medical treatment protocols to the specific individual consumer means an increasing reliance on regularly updated, detailed, relational databases describing the populations being served. Electronic equality of representation will increasingly mean equality of informational representation, as it will be one form of guarantee for access to desired and appropriate services and products.

**IMPLICATIONS -- GENERAL:** Heightened incidence of lawsuits centered around issues of differential access to services or products due to inequality of data representation; more medical lawsuits, particularly class action, with regard to subgroups of the population inappropriately treated due to bias in designing treatment protocols because of unequal representation in treatment trials. **FOR VIRGINIA:** In 1990, over one-fifth of Virginia's population was "non-white;" by 2010, that percentage will reach about one-quarter. Representational equity in databases will be a relevant issue to one-quarter of the population, based on ethnicity alone. With regard to medical treatment, it is a relevant issue now to half the population: women. But particularly the growing population of older women: the population aged 85 and over is expected to be the fastest growing age group, doubling in size from 1990 to 2010. In 1990, almost 75% of that age group was female; that percentage will only have dropped slightly. It will be this group that most requires health care, and for whom treatment protocols are a critical issue. It would help if treatment were designed based on information about the effect of drugs and therapies on the female system.

**TIME HORIZON:** Immediate to medium-term, several projects are underway to correct bias, at least in medical and genetic databases. The coalescing of commercial databases will be slower.

**CITATIONS:** Banker, April 1994, p. 84.; Science, Vol. 266, November 4 1994; New Scientist, No. 1959, 7 January 1995, p. 38.

DISCUSSION -- THE SOCIAL CONTRACT: Interpreting the 1994 Election. The majority of the American voters in the November national and state elections may have done to the American political system what the majority of Soviet citizens did to the Soviet political system in 1991: they acted so as to destroy a hated but functioning system before there was a preferred but functioning system available as a replacement.

The citizens of both countries acted so as to destroy the old system not only because of their pent-up frustrations with the failures and follies of the old system, but also because some of them may have been inspired by a vision of a better, leaner, more effective and more responsive polity. In the American case, this vision basically was contained in the "Contract with America," forged by Newt Gingrich and other Republican candidates for election to the United States House of Representatives.

Unfortunately, it is not clear what the details of the envisioned political system in the US might actually be. "The Contract with America" which inspired some Americans seems to propose a number of mutually contradictory things, and includes some things most Americans seem to be opposed to while failing to address some problems Americans feel deeply concerned about.

In spite of the feeling by many Americans, and expressed and encouraged by the Contract, that the US government is too big, intrusive, and expensive to be tolerated any more, the US federal government and most state and local governments have in fact been progressively weakened by the political-economic actions, distortions, omissions, and impacts of the late 1970s and especially the 1980s. Indeed, many of the legislative, executive, and fiscal actions of the 1980s were specifically intended to weaken and shrink the US federal government. But while it did not shrink overall, the budget, personnel, and debt structures of the government in fact were all fundamentally transformed from what they had been in the 1970s and earlier. Thus, while the will of the American government may have remained strong, its power was already quite weak by the early 1990s. It had lost not only a mandate to govern, but even much of the ability to govern effectively.

The Contract, if enacted, may thus indeed destroy what is left of the existing system of governance in America -- as it specifically intends and hopes to do. However it does not seem likely that the consequence of the Contract fulfilled will be a more orderly, prosperous, and content society, as many voting Americans may have hoped and intended.

To the contrary, because the ability of elected politicians and administrators to govern at the national and state levels will be so seriously crippled, a political vacuum may exist throughout America.

Of course, this vacuum might be filled by the invisible hand of individuals pursuing their own enlightened self-interest through whatever political and other social fora are currently available or can be created. This is the promise of the vision underlying the Contract. And there is growing evidence that certain systems, left properly "out of control," do self-organize, survive, and evolve successfully.

But dismantling the political structures of the state does not directly result in decentralization of power. To the contrary, it seems more likely that weak, scattered, and cross purposed political units will simply leave the political field wide open to those strong, concentrated, and focused forces of power which do exist unencumbered, and indeed now unleashed and emboldened, in America and in many other parts of the world.

Among those forces which might try to fill the political vacuum are (1) the many and growing transnational corporations which are the most dynamic, aggressive, and largely uncontrollable sources of power anywhere (and everywhere) in the world today (and are much more a threat to the values and concerns of most Americans than is the US federal government); (2) the large and increasing number of gangs (mafia, yakuza, and their counterparts in Russia, China, and elsewhere) on the one hand, and the expanding number of paramilitarized gun-bearing citizens, on the other who together or separately provide perhaps the best image of what a true free market anarchy might be like; and (3) the frustrated and diminished US military perhaps in concert with military forces elsewhere.

Thus it seems almost certain that the vision which inspired some American voters to act so as to support the destruction of their political system will not be fulfilled in reality, and that America will, in the next few years, come to resemble Russia today. That is to say, the immediate political future of the US is very likely to be a period of considerable turmoil, uncertainty, and substantially increased violence.

Also as in Russia, those who profited from or otherwise are loyal to the older political order might well propose and attempt to create some kind of Strong Man, dictatorial system of governance (whether religious or secular, and whether with the cooperation of the US military or with private paramilitary forces) in order to quell the chaos. There are several persons now on the scene who might try to fulfill such a role if they thought they had a

chance, and the American presidentialist system makes that a comparatively feasible and attractive option.

**IMPLICATIONS -- GENERAL:** The longer range consequence of all this must be that some kind of a new form of governance -- a new social contract -- will eventually be envisioned and created at some point in the 21st Century, one which is neither a return to the forms and assumptions of the old and properly discredited American political system, nor based upon the impossible dreams of the Contract.

It might well be a new form of more truly democratic, equitable, and future-oriented concordance, based not only on more familial, local, and regional arenas, but globally as well; and also on new forms and modes of communication and community (including, for example, the growing number of "virtual communities" of cyberspace, and their successors); and on newly understood and accepted responsibilities towards the future as well as present generations of all humans and of all life everywhere on Earth.

But it will be nothing like this unless more people now seize the opportunity which the coming anarchy provides to envision, design, and try out such new modes and forms. It is clear that most American voters are not ready now to consider what these new forms, opportunities, and responsibilities might be. Indeed, it seems that America must go through a period of considerable self-inflicted torment before a new generation of Americans can emerge which is ready and able to think and act positively, cooperatively, globally, and futuristically. **FOR VIRGINIA:** It is the opportunity and duty of more of us now to try to continue to envision, re-envision, experiment with, and continuously work towards new forms and processes of anticipatory, democratic, local, and global governance so that many different suggestions and possibilities will be available for consideration when the time is finally ripe. The Virginia Courts are perhaps best situated to be the leaders in modeling decision-making in the face of the complex issues of the present and emerging implications for an even more complex future: their experience in considering the links among the courts, society, and emerging issues of change is among the longest-standing in any court system in the United States.

**TIME HORIZON:** Present to long-term.

**CITATION:** "The Future of US Governance" James A. Dator, December 1994.

**TREND -- Random Acts of Anger and Senseless Acts of Violence:** Random violence is so called because it can happen anytime, anywhere. Although random violence has been around awhile, it has been dramatically increasing in frequency, and is often shown to

accompany unemployment. Domestic violence, attacks at the White House, escalating anti-abortion violence, subway bombings by the unemployed -- are but a few of many in the news every day. These incidents can be seen as signs of the political, social, and economic stress driving growing numbers of Americans into a state of being "Angry at the World". As the crippling of the federal government accelerates under the contradictory demands and requirements implicit in the Republican "Contract with America", we can expect increasing random and senseless violence throughout society.

**IMPLICATIONS -- GENERAL:** The trends of voluntarism and increased political involvement and organization among some communities of interest within the United States may not coalesce in time to provide an organizing force, infrastructure, and the experienced leadership necessary to prevent more pernicious forces from stepping into any power vacuum that emerges. The competition among those more organized and pernicious power structures has the capacity to transform the United States into a violent mosaic of shifting turf wars. It is unlikely that antagonists in such competitions would see the need for court arbitration, however under these conditions the courts may be able to provide stabilizing influences within their local communities. The United States will not escape some very dramatic transformational forces. The processes underlying this transformation will determine the emerging definition of governance. The transition very likely won't be "pretty". The courts hold a unique position for ensuring justice and equity. These are times that will try the soul of the nation, and hopefully, it is within the courts we are quaranteed not to lose it. **FOR VIRGINIA:** Any city in Virginia is subject to an explosion of violence. Incidents that present themselves will create even more anger and fear as communities grapple with the "unthinkable", whatever it may be, in their own families and neighborhoods. The more Virginia can strengthen its communities and enhance inter-communication at all levels, the better off it will be. States must act to identify and stop the drift toward violence.

**TIME HORIZON:** Immediate to long-term.

**CITATIONS:** The New York Times, The Honolulu Advertiser, CNN, and various other news sources.

**TREND -- Paramilitary Organizations with Attitude:** Experts agree they are multiplying and membership is expanding. Furthermore, they are working smarter not harder, distancing themselves from other fringe groups, saying they are non-racist, non-political, etc. Most of these groups focus on a generalized fear of Big Government robbing individuals of their inalienable rights -- especially the right to bear arms. The rhetoric of Rush Limbaugh exemplifies the style of their arguments and wild accusations. Researchers

say many of these new paramilitary groups are still connected to the older hate-mongering groups -- they are just more canny about hiding the links. They have also joined the information age, using a variety of communications media, such as "The Informed Citizen" talk show in northern California, and the Patriot Network, a system of linked bulletin boards on the Internet.

**IMPLICATION -- GENERAL:** Such groups form to define and protect a privileged place in society, and do so first by identifying scapegoats to blame for perceived threats to that privileged status. They are in one sense the last bastion of what might be called a fundamentalism of the individual. They engender "us-them" thinking, wherein "they" are always the evil at the root of American social decay. As their intolerance breeds actions that barely skirt legality with the aid of free speech provisions, they are likely to show up in court even when not the perpetrators of overtly violent acts - and, no doubt, lawyers from the ACLU will argue both sides of such cases! In the short to medium term these organizations will increase the levels of suspicion, fear, and violence which will accompany the social, political, and economic transition American society is about to undergo. **FOR VIRGINIA:** Is any data available on the existence of such groups in the state? What is the local opinion regarding gun control? Any related cases in the courts in the last decade? Have incidents of inter-ethnic, or other violence been on the rise?

**TIME HORIZON:** Short to medium-term.

**CITATIONS:** "Patriot Games", Time, December 19, 1994, p.48. Also related news stories from various newspapers.

**TREND -- Increasing Challenges to the Individual's Priority over the Community:** The former Prime Minister of Singapore, Lee Kuan Yew, led the charge internationally against the cultural imposition of Western notions of individuality and individual human rights globally. The current Prime Minister of Malaysia, Mahathir, has continued the argument, and it has been exemplified by recent controversies in the transfer of Hong Kong, with respect to "the Court of Last Resort". It is uncertain just what the supreme court of Hong Kong will look like after 1997.

Lee had affirmed that Singapore's culture was based not on individuality but on a Confucian attitude that values the corporate, communal, or familial interest above the individual. In the case of Hong Kong, it currently operates on the assumption that the individual's control of personal property is paramount. Any court created by the PRC is likely to operate in complete contradiction to that assumption. These and other challenges to Western notions of human rights will continue to arise in the global arena and will reverberate locally.

IMPLICATIONS -- GENERAL: Increasing challenges internationally to the Western, individual-based notion of human rights will reverberate down to local courts, even as these same local courts continue to be challenged by national fundamentalist individualist groups. The argument in Singapore is that individual rights must take the back seat to the rights and good of the community. As American taxpayers become increasingly frantic about rampant crime and growing social chaos, they might well see the logic to the argument that community safety is paramount to individual rights. They might even see the logic to the older Confucian argument that not only are individuals and individuals' rights of less importance than community cohesiveness, but that the individuals' families should be held responsible for the wrong-doing of their members. The absorption of this value from the international arena would only reinforce the "get tough" attitude increasingly popular among American taxpayers/voters. FOR VIRGINIA: Virginia has already "gotten tough" once by abolishing discretionary parole for newly convicted felons. This will require an estimated 30 new prisons. Cheap alternatives are required, and work camps are one such. Turning felons to work improving community infrastructure, even if their labor comes at the cost of denying their right to potential parole, would seem an appropriate arrangement in a neo-Confucian system.

TIME HORIZON: Medium-term. Challenges will grow over the next ten years, arguments will be spotlighted during Hong Kong's transition beginning in 1997.

CITATIONS: J.B. Lewis, December 1994.

TREND -- GLOBAL TRANSFORMATION: Disintegrations, Emerging Entities, and Global Governance. Internationally, the dissolution of large nation states, emergence of new sovereign states, and the transformation of old political bonds and structures will continue. As new forms of governance will emerge from struggle at the national and state levels, they will also continue to emerge in struggle at the global level. In addition to the numerous religious, nationalist battles raging on the planet, there is a planet-wide movement to self-determination by indigenous peoples. They have taken their case to the arena of international law. The State of Hawai'i is in the midst of a question of sovereignty at this time, and we need only to look across the border at Quebec to watch an unfolding separatist process. We are well aware of the many violent transformations. The good news is the emergence of flickers of hope, appearing during several recent discussions within the movement toward democratic global governance. The potential of the innovative "Bit Tax" is to create "governments awash in their share of the wealth". Virtual wealth could virtually

transform life as we know it. Refer to GOVERNANCE, CYBERSOCIETY, A Little "Bit Tax".

**IMPLICATIONS -- GENERAL:** The wider trend of the transformation and re-formation of nation-states around the world raises interesting questions of international law, jurisdiction, power, and wealth. What is the status of international treaties, legal accords, international trade agreements, transnational environmental and population accords, extradition treaties and other documents when some of the signatories to them have fragmented into entirely new countries? Globalizing forces are creating changes in international relationships. Transnational corporate entities have a great deal of power and influence on the global economy, and directly affect us locally. **FOR VIRGINIA:** Boundaries and space are being transformed. States are another entity finding the world at their door. The greater the involvement of the courts, the better positioned they will be to provide leadership and the infrastructure to support it in the face of completely moribund executive or legislative branches. What will be the evolving mission of the state judicial branch in the global arena? What globalizing factors can be identified today?

**TIME HORIZON:** Short to medium-term. The roots of these changes are visible now; population, economic, and environmental pressures accelerating in this decade will produce leverage events within the next ten to fifteen years that will tip these trends one way or another.

**CITATION:** Various news sources and discussions.

**ECONOMY:** DISAPPEARING EMPLOYMENT and FISCAL POLITICS.

**DISCUSSION -- DISAPPEARING EMPLOYMENT:** Basic changes are occurring in the nature of work in all industrialized countries. Information technology has hastened the advent of the global economic village. Jobs that workers at all skills levels in developed countries once held are now filled by smart machines and/or people in low-wage countries. "We no longer keep people in jobs because we need their labor, but because we need their purchasing power...20% of the current labor force could do 100% of the truly-needed human labor. Employment is just a socially acceptable way to keep people off the streets and out of trouble, and with one-third of the work-force at or below the poverty level its obvious why it's not working. The hope of moving up out of poverty ended with Reaganomics in the 80s. Today the nation is preparing to follow the State of Wisconsin, with plans to cut welfare if recipients don't work. The puzzle is, where will the jobs -- real, socially and personally important, secure, well-paid jobs -- come from?"

TREND -- Total Job Insecurity: Contemporary rhetoric proclaims the need for ever-escalating competition, leaner and meaner ways of doing business, a totally "flexible" workforce, jobless growth. "What would a large permanent reduction in the number of secure, adequately-waged jobs mean for communities, families and individuals? This is not being adequately discussed, nor are the implications for income distribution and education. Even less adequately addressed are questions of how to take back control of these events, how to turn technological change into the opportunity for a richer life rather than the recipe for a bladerunner society." Despite the fact that this trend can be forcefully summed up without lengthy discussion, it is one of the most critical -- in fact, to the average person, the most catastrophic -- trends listed here.

Downsizing and outsourcing will continue to erode the concepts of lifelong careers and lifetime jobs. What work exists will be characterized by constant mobility within and across organizations and business, continuous retraining, adapting to part-time and temporary positions as a way of life, and the creation of "insider" and "outsider" classes of workers as businesses cut back to a core of permanent employees backed up by short-term sub-contracts and temporary help. Refer to GOVERNANCE: CYBERSOCIETY, COUNTERTREND, A Little "Bit Tax".

IMPLICATIONS -- GENERAL: This will drastically reduce the ability of most people to take on long-term financial commitments; heighten demand for short-term rental housing; spur revisions of unemployment insurance to cover short-term "between jobs" unemployment of professionals and increase the need for entitlements programs such as Social Security and Medicaid, or government-sponsored health insurance, since short-term and part-time employees do not receive benefits packages. FOR VIRGINIA: Virginia's old production sectors of agricultural and mining are experiencing slowed growth, with service and information-based businesses experiencing the highest growth. The service and information sectors are the most fluid in their demands for and demands on employees, however, with the former requiring employees in situ but with flexible hours, and the latter not necessarily even requiring that employees be in situ. As businesses compete by expanding what services they offer, the concept of "regular working hours" -- the old nine to five -- degrades. As the information sector expands, with more employees opting out of stressed urban lives and into teleworking, it becomes harder to predict where the workforce attached to new jobs generated will actually reside. The long-term trend will be away from "metropolitanization" back out to the countryside's calm, green spaces. This will be

reinforced by the cost of living in the metropolitan areas; people working fewer hours or less regularly will search for lower cost housing.

TIME HORIZON: Immediate to short-term. This is a transition: the pain is occurring now, and will continue for a decade; the adjustment, and subsequent optimization of the opportunities this represents, will play out in the medium and long-term.

CITATIONS: Of particular interest is "FUTUREWORK", a new international electronic forum for discussions of how to deal with the new realities created by economic globalization and technological change, with a focus on "Re-designing Work, Income Distribution, and Education", comments by Sally Lerner, listserv coordinator; "Linkages Between Work and Education" James A Dator, The Manoa Journal of Fried and Half-Fried Ideas (about the future), Occasional Paper 3, May 94, pp. 24-46; "The Future of Education and Work" is the special focus of this entire issue of the journal of the Hawai'i Research Center for Futures Studies; "The Nature of Work in the Twenty-First Century: Certain Uncertainties" Business Horizons, Nov/Dec 93: 36.6; "Will the future work?", IEEE News, 1 September 94, p. 6; and the entire issue of Looking Ahead, the journal of the National Planning Association, Vol. XVI, No. 2-3, centered around the topic of "The Restructuring of Employment".

TREND -- Prisons as Home and Work: Increasingly, communities are using anti-vagrancy laws and laws about the use of public space to clear out the homeless. A new study of 49 cities by the National Law Center on Homelessness and Poverty, a homeless advocacy group, found 62 percent of cities enacted or enforced anti-panhandling laws this year. "One-fourth of them conducted police sweeps of shopping districts or trendy neighborhoods, restricted homeless people's use of public places or targeted them for arrest. Some cities also enforced zoning or building codes to shut down homeless service providers or prevent new service centers". "For many cities, doing something about homelessness has increasingly meant doing something to homeless people instead of doing something to address their plight", researchers said in the study, which was released last week. Most cities nationwide have anti-vagrancy laws, and 42 of these 49 used them specifically to curtail homeless people's activities in the past year, the center said. Five cities -- Cleveland, San Francisco, Santa Ana, Santa Monica, and Seattle -- were noted as having the "meanest streets", mainly by blocking use of public facilities or expelling the homeless from the city." The other seven in contrast, made efforts to help the homeless without cracking down on them. The center also found that some of the 42 cities that took punitive

actions toward the homeless also made attempts to help them. The survey found that 31 percent of the 49 cities adopted new programs to aid homeless people, 23 percent developed training and outreach for police and 38 percent adopted alternatives to anti panhandling ordinances, such as allowing citizens to give vouchers for services to beggars, rather than cash.

**IMPLICATIONS -- GENERAL:** As the ranks of the poor grow, amidst diminishing city, state, and federal funds, more will become homeless (many average American families are classified "at risk" of being homeless: one paycheck away from being unable to pay their housing costs). In any continuation of the current anti-crime mood, anyone on the street is likely to be perceived as a threat and so become a target for arrest. Many more will hit the road, as lonely individuals or as newly forming families, or tribes. The real and imagined threat of these groups will encourage even greater government intervention. Increased vigilante justice will proliferate and may prevail in areas. Of course, given the lack of jail space and the potential increase in work camps, people unable to find work "on the outside" may well be fully employed, with training, "on the inside." This could, in fact, ultimately be a boon to the revival of the American economy: in the last half a century our high wage rates have put us at a competitive disadvantage in the production of goods. It would certainly lower US production costs to be paying only prison wages. **FOR VIRGINIA:** How would Virginia share the wealth generated electronically with the "Bit Tax"? What retraining programs are available to help people make the transition to jobs in high-growth sectors? The demand for people to work can only succeed if working at least guarantees basic survival. Equity and justice are central concerns when increasing numbers of poor seem destined for hunger, lack of basic health care, homelessness, violence, crime, and prison. What are the current numbers of homeless in Virginia? How many people are "at risk" of homelessness?

**TIME HORIZON:** Immediate to long-term. These have been with us for some time, however, they can be expected to worsen dramatically as transformations get underway in our social, political, and economic systems.

**CITATIONS:** "Family Values", New Scientist Supplement, 15 October 1994, p.31 "Homeless won't go away" Honolulu Advertiser, Sunday, December 18, 1994, p. D-9.

**DISCUSSION -- FISCAL POLITICS:** Discussions about the rationale behind and the implications of the "Contract with America" are illustrative. Many of the people who support it believe that it is a positive response to technological change, and indeed an

anticipation of others yet to come. It is an attempt to remove the shackles which they feel the present obsolete system of government places on all of us so that individuals can respond more quickly and satisfactorily to the opportunities all around us. Certainly this is what Newt Gingrich believes, following the insights of Alvin Toffler. It may be, however, that some of the people who support the Contract do so for very different reasons, such as simple anger and frustration over the downturn of their lives and fortunes, and may not themselves be able to take advantage of the opportunities which the Contract intends to provide. So, the question still remains of what, if anything, should be done about those who cannot fend satisfactorily for themselves in the Brave New World? The confluence of demands on the federal and state governments from health, education, environment, welfare, law enforcement, physical infrastructure sectors, and other areas of service could immobilize policy and budgeting processes. Several trends are discussed: the exorbitant price tag to locking people up and throwing away the key, the continued weakening of the US dollar, and the disparate equity of intergenerational accounting. Refer to GOVERNANCE, CYBERPOLITY, COUNTERTREND, A Little "Bit Tax".

TREND -- The Price of Getting Tough: Self-preservation demands politicians be "slap'em-inside tough on crime these days", even though the effectiveness of toughness has not been categorically proven. The prison population has doubled from 1982, to one million, while violent crime has risen by two-fifths, according to the FBI. And in the context of uncertain budgetary futures, the real dilemma is the cost of locking people up and throwing away the key. Nevertheless, the recent response to the public's frustration and fear regarding increased crime has been to toughen incarceration and parole regulations.

Virginia, whose capital has the country's second-highest homicide rate, is no exception; recently the General Assembly voted to lengthen prison terms for violent criminals and -- like 12 other states and the federal government -- to abolish discretionary parole for newly convicted felons. That would require nearly 30 new prisons, at an estimated cost of almost \$2 billion. New Republican governor, George Allen, says that the true cost is closer to \$1 billion, and that the state's prison population would anyway have doubled, without the new measure, by 2005. Estimates became irrelevant after the legislature allocated only \$40 million, to be used to construct work camps to accommodate the waiting list of prisoners without jail beds.

Virginia is not alone; Oregon abolished parole in 1989, opting to redesign their sentencing structure to lower costs, providing more funding for corrections using alternative sentencing for non-violent crimes, in order to free prison space for violent offenders. This approach has also been tried in states with some of the highest levels of incarceration in the

US -- Florida and Georgia. These states have implemented "intermediate sanctions" such as house arrest and work programs. For nonviolent felons, these are considerably cheaper than prison: Florida estimates costs of \$6.49 per day compared to \$40 for prison. In addition, they may actually be working to lower recidivism. The National Council on Crime and Delinquency has data suggesting that offenders sentenced to alternatives are less likely to be arrested within 18 months of having completed their sentences than similar offenders incarcerated between 12 and 30 months.

IMPLICATIONS -- GENERAL: The tensions between society's desire to punish offenders and their inability to fund sufficient prison space may result in the proliferation of underhanded "work camps", degenerating into alternative housing for violent and non-violent offenders, including the growing numbers of the very poor, homeless and turning to crime to survive. On the up side, using prison as an enforced educational and job training/apprenticeship program may actually offer some positive benefits for those prisoners who turned to crime because of lack of opportunities. Or, at some point in the near future, it seems likely that the privileged classes will decide it is easier and cheaper to isolate and protect themselves from the masses than it is to imprison them. This might lead to privileged groups building more of the walled, fortified, and protected housing and shopping communities which already exist. Moving between these sheltered communities might be dangerous, requiring armed escorts. Continuously improving satellite-based wireless and other telecommunications technologies might well accelerate this response. Refer to GOVERNANCE: CYBERSOCIETY, The Electronic Frontier. FOR VIRGINIA: For the moment, budget constraints have forced Virginia to opt for the "work camp" approach. In the long run, those budget constraints are only likely to get worse. Innovative alternatives to incarceration are being discussed even now, such as community service coupled with house arrest or electronic versions of the ball and chain, linked to advance telecommunications/positioning systems. How many of those alternatives are in use in Virginia today? To what percentage of convictions might they be applicable? What sort of reduction could such sentencing alternatives make in the total prison projected prison population over the next ten years?

TIME HORIZON: Immediate to medium-term.

CITATIONS: "Alternatives to prison. Cheaper is better", The Economist, November 19, 1994, p. 33.

TREND -- Structural Decline of US Currency: The "ongoing structural decline" of the US currency is overwhelming the merely cyclical benefits of the current economic recovery. In the context of falling unemployment, continued balance of payments problems, and

market fears, the Federal Reserve will raise interest rates. As a result, contributing to the dollar's long-term decline, it will cease to be in demand internationally as a reserve currency, and will exacerbate the ongoing uncompetitiveness of the American economy. The southeast Asian "tigers" may well begin to convert their burgeoning dollar reserves into yen, creating a de facto yen bloc (the "Asiayen," the Pacific parallel to the "Eurodollar"). As Eastern European economies recover, and Germany pulls out of the worst effects of reunification, the Deutschmark will grow stronger, perhaps even forming the core of a single currency in Europe, eroding the entire practical concept of the "Eurodollar". Note, however, that these "replacements" are regional, not global, in nature, and that bitter history may work against this trend to regionalize reserve currencies.

The dollar's continued weakness overseas may jeopardize its long-term use internationally as a reserve currency, depriving the US. economy of one more pillar of support. The international economic scene is no longer dominated by one player; the next several decades will see additional players added to international monetary dynamics.

**IMPLICATIONS -- GENERAL:** Short-term economic gains are unlikely to last; the federal pie will continue to shrink. This in turn will intensify fiscal pressures on state governments. The courts, as the least well-funded branch of government, will be even harder pressed fiscally in the future; monies for new programs will be nearly impossible to come by. The challenge will be finding base operating funds. The courts will have to scramble ever harder to look for funds. **FOR VIRGINIA:** Military and government restructuring will continue to remove jobs. It is estimated there will be 52,800 fewer jobs by 2000, than there were in 1990. Where state economists forecast modest but positive economic growth for Virginia through 2000, the long-term stability of that growth -- and thus of the state's general funds -- will depend on the ability of Virginia businesses to adapt to changing business conditions and link themselves firmly to international economic drivers. See **GOVERNANCE, CYBERPOLITY, COUNTERTREND, A Little "Bit Tax"**.

**TIME HORIZON:** Medium term. World financial economic and fiscal markets are restructuring with the entrance of new players; it may take a decade for the forces of change to work through and a new equilibrium to be reached.

**CITATIONS:** Banker, November 1994, page 19.

**TREND -- Generational Inequities:** Intergenerational accounting looks at demographic trends and analyzes the flow of funds to and from each group. Common conclusion: too much is currently being spent on elders, too little on youngsters. This disparity will increase. Further, the same pattern writ large describes the increasing inequities on the world stage:

populations in developed and newly developed countries will be older and richer; populations in developing countries will be younger and poorer. The same pattern writ small describes the increasing inequities between the urban and suburban spaces.

**IMPLICATIONS -- GENERAL:** Controversial issues will in the future even more than now develop into generational wars, especially with regard to the environment: the impoverished younger generation holding their elders at fault for having used up or degraded irreplaceable resources. **FOR VIRGINIA:** Demographic trends have not altered significantly since the state's initial scanning effort; the implications elaborated there still apply.

**TIME HORIZON:** Present to long-term. Demographic changes, when undisturbed by sudden, catastrophic change (plague, famine, meteor strikes, etc.) have a great deal of inertia, hence the sweeping time horizons here.

**CITATION:** "Long-Term Care Policies: The Next Generation?" D.L. Christopher, Journal of the American Society of CLU and ChFC, Vol. 43, No. 2, March 1989, pp. 46-56.

## **ENVIRONMENT: THE REVENGE OF NATURE.**

**DISCUSSION -- THE REVENGE OF NATURE:** The "end of nature" has already been declared by Walter Truett Anderson in To Govern Evolution. Very little of the "nature" we see around us is actually in its pristine original state; humanity has affected most of the planet's "natural systems." Having disturbed, possibly fatally, the inbuilt balancing, correction, and adaptation processes of "nature", we are belatedly studying them. As a result, we are learning that some of our artificial systems would do better to mimic nature: artificial wetlands being created to treat raw sewage, as an example. Thus, while we have irretrievably transformed Nature's systems, a reverse trend is growing: Nature is irretrievably transforming our system design. In addition, recent and numerous planet-wide natural disasters also show Nature reclaiming and reforming the environment herself.

**TREND -- Erosion of the Historical:** Borobudur, Nan Madol, Stonehenge, Jaisalmer - increasingly, we are degrading our historical environment, a legacy of identity which tracks our evolution as a species. More and more historical treasures are suffering irretrievable damage from increases in their admirers, as travel becomes easier, or are increasingly closed off from visitation. In the cases of many of those suffering damage, insufficient funds exist in ready amounts for restoration.

IMPLICATIONS -- GENERAL: As gaining access to nature in pristine condition, and specific historical resources, becomes more exclusionary, "rights to access" cases will emerge, and will be met by arguments defending the legal right of the resource itself to exist in the face of human desires to experience it to dust. New categories of trespassing and vandalism will develop as the environmentally and historically dispossessed attempt to experience old sites in the old ways. FOR VIRGINIA: What access issues are arising now in Virginia's federal, state, and county parks and recreational areas? How many historic sites are registered in Virginia and where do the funds to maintain them originate? What would be the impact on the people of the state and the nation if those sites were abandoned?

TIME HORIZON: Immediate to short-term. The increasing emphasis on eco-tourism and educational tourism will exacerbate the problem.

CITATIONS: To Govern Evolution, W.T. Anderson, 1987; New Scientist, No. 1956, 17 December 1994.

TREND -- The Disintegrating Infrastructure: What's critical to the future state of infrastructure maintenance in the US. is the economic inequity between the era in which most of America's modern infrastructure was designed and constructed, and current and future eras in which it will need to be replaced. The 50s will perhaps be remembered as the great golden decade of both the industrial and information ages: a time of relative peace, building and rebuilding, and strong economic growth. During that era, the US put in place a monument to infrastructure in the forms of roads and other ubiquitous, high-quality public structures. Those children are now the voters and taxpayers and business people and service providers, and assume that level and extent of public infrastructure almost as a national right. However, in the immediate aftermath of WWII, the American national budget was an expanding pie; now it is, for all practical purposes, shrinking, as the national debt becomes more and more of a burden. With demands made to rebuild modern infrastructure, it is time to ask if humanity's frenetic building and creating has had limited vision, and open up the design process, incorporating natural systems. Natural entities have built-in waste disposal, repair, and regeneration systems. Current human systems designs only repair and regenerate where the funding exists to do so. Such long-term repair was not built into the costs of our highways, bridges, water pipes, or electrical conduits. We may (by applying innovations as the "Bit Tax"), or may not have the wherewithal to "govern evolution". If we do, what infrastructure is needed for the future worlds evolving?

IMPLICATIONS -- GENERAL: Basic infrastructure worldwide is either naturally or prematurely reaching the end of its useful life in a context of uncertain economic growth, even in the developing "tigers" of Asia. The resulting demands on government revenues

will radically curtail expenditures in other sectors. In a zero-sum context, it is likely that voters will choose roads, schools, and long-term health care over courts and jails. Any monies directed at rising crime will go to law enforcement, not the courts - following the pattern set by the recent crime omnibus bill. Taxpayers will grow increasingly surly with regard to America's crime problem as they struggle with the knee-jerk reaction to "throw the bums in jail and throw away the key," in the knowledge that voting more funds to build more jails means less money for maintaining basic infrastructure, improving schools, and expanding access to health care. FOR VIRGINIA: Virginia has already been caught in this dilemma and responded by creating more work camps. This in itself is a growing trend, which may result in a future wherein it is easier to find a job in jail than out.

TIME HORIZON: Short-term. This one is on us now.

CITATION: International Herald Tribune, Business/Finance, December 8 1994, p. 15.

TREND -- Spreading Environmental Blame: Environmental crimes are being traced by litigants back to second-order and even third-order participants: e.g., a lending company foreclosing on a printworks was held liable for environmental cleanup under Superfund. Liability at such a removal poses threats to banking and financial institutions, and will limit the circumstances under which they are willing to invest in any but the cleanest businesses. And, as scientific and technical advances are made, standards change and levels of pollution previously unmeasurable become detectable and said to cause damage.

IMPLICATIONS -- GENERAL: This is an offshoot of the growing shift to environmental values at all levels of society, and the transformation of the economy to the internalize costs of waste disposal and environmental degradation that have previously been externalized. Spreading the financial liability throughout the business community insures, from the government's point of view, that somebody pays, even if the original culprit has long since disbanded. FOR VIRGINIA: How many environmentally-related cases do the Virginia Courts, or the Supreme Court, hear yearly? Has the number been increasing? How much have the cases cost the state's business community? How aggressively do the state regulatory agencies look for responsible parties - do they include investors along with the responsible corporate entity?

TIME HORIZON: Immediate to long-term. This is happening now, and yet is just the beginning of a restructuring of business and government practice due to strengthening environmental values. The trend may be slowed somewhat by the attitudes, and subsequent policies, of the new Republican incumbents with regard to penalizing businesses for environmental mistakes.

CITATION: Banker, January 1994, pp. 10-11.

**SCIENCE & TECHNOLOGY: SLOWER PACE FOR SCIENCE, WITH UNFOLDING DEVELOPMENT OF EXISTING TECHNOLOGIES.**

DISCUSSION -- SLOWER PACE FOR SCIENCE, WITH UNFOLDING DEVELOPMENT OF EXISTING TECHNOLOGIES: The debt of nations is becoming a shackle to science.

Science activities around the world are downsizing in response to budget cuts. To pay for the \$148 billion in tax breaks promised in their "Contract with America", the Republicans propose \$176 billion in spending cuts, which includes \$11.2 billion in science programs, such as the Advanced Technology Program, the Geological and Biological Surveys of the Interior Department, energy research, high-performance computing, and agricultural research. A Republican spokesperson commented that much of the research in question could be done in the private sector. While these cuts may not constitute a barrier to the progress of scientific advance, they are at least an obstacle. For the next decade or so, the rate of scientific innovation may slow. However, unfolding development and expanding applications of existing technologies will continue to be a source of great social and environmental change.

IMPLICATIONS -- GENERAL: To the extent that new technology is an impetus for social and environmental change, it is possible that the slowdown in funding for basic science and technological innovation will result in less technology, and a slower pace of social and environmental change. The results of the science slowdown now might well take thirty years to surface. However, questions of ethics, equity, access, and others concerns will be with the courts for some time to come as existing technologies, especially in the areas of electronic and biological technologies, continue to be diffused. FOR VIRGINIA: Half of Virginia's general fund budget goes to education (over \$6 billion dollars in the 1992-94 budget), and higher education and K-12 education are considered two of the five programs that drive the budget. But from 1985 through 1994, they were the two programs whose funding increased the least. In order to maintain the interest of corporations who might also be persuaded to contribute to scientific research, Virginia will need to invest in its scientific education and research infrastructure. Although given prospective budget constraints, adopting a team approach and encouraging the business sector to heighten their support for scientific research in public settings might be most effective. Does Virginia have, or have any plans for, the sort of academic-industrial-research complex exemplified by North Carolina's Research Triangle?

TIME HORIZON: Immediate to long-term

CITATIONS: "House Republicans Promise Science Cuts" Science, Vol. 266, 28 October 1994, p. 531; "Colliding Forces: Life after the SSC" W. Roush, Science, Vol. 266, 28 October 1994, pp. 532-534.

TREND -- From Basic Science to Business Science: Increasingly, as the previous paragraph noted, scientists are being forced to forge links with industry in order to pursue research. More and more universities are revamping science curricula to produce researchers more focused on the commercial research environment and commercial applications. Increasingly, scientists are discovering the joys of patent rights for potentially lucrative discoveries. As a result, the patterns of communication within the scientific community are changing: the teams working on developing room-temperature superconductors, for example, did not follow tradition and rush their results off to a major journal to establish pre-eminence. They kept the results under wraps while establishing their rights, and then held a press conference. This growing commercialism could also slow the rate of scientific innovation by slowing the rate of cross-fertilization that occurs with the unfettered dissemination of experimental results.

IMPLICATIONS -- GENERAL: This may also contribute to the slowing of scientific innovation as a whole, although in individual cases might actually move selected innovations through the testing stage and into applications development and marketing faster. It will also mean more argument about precedence in scientific discovery will be brought to courts, as the legal opinion will be relevant to the patent cases. FOR VIRGINIA: What is the difference between the amounts spent on pure vs. applied research in Virginia's universities? How many joint university-corporate research projects are in place? Do most science departments prepare their students for academia, or for business? How many patent-related cases do the courts hear annually? Has the number been increasing? Out of the number of patents filed in the US annually, how many are filed by Virginia residents?

TIME HORIZON: Immediate to long-term.

CITATION: Various news items and discussion.

TREND -- Super Rice: "Plant breeders have developed a variety of rice that has the potential to yield a staggering 25 percent more than today's best", the International Rice Research Institute (IRRI) announced this week. This is the first time in nearly thirty years that researchers have raised the ceiling on yields of rice, the grain that feeds half the world's population. "And that, world food experts say, allows much needed room for population growth." "Until the super rice proves itself in commercial use, however, some experts fear

that Murphy's Law may whittle down the 25 per cent yield increase the IRRI is claiming...to "more like 10 per cent". There still exists the "possibility the new super rice could hasten the slow bleeding away of the soil's capacity to produce after centuries of intensive rice culture." "Even skeptics agree, however, that IRRI's new rice variety is sure to be a crucial stage in the race to keep food production abreast of population growth."

**IMPLICATIONS -- GENERAL:** The first positive breakthrough in rice yield for thirty years. Right on the heels of the positive breakthrough at the Cairo Population Conference, it is another source of hope for the future, allowing more time and space for a sustainable world to emerge. **FOR VIRGINIA:** At the state and local level, this could be applied to the hunger/poverty/homeless crisis impacting Virginia and every other state.

**TIME HORIZON:** Short to medium-term.

**CITATION:** "Super rice extends limits to growth", Bob Holmes, New Scientist, 29 October 1994, p. 4.

**TREND -- Accelerated Acquisition of Physical Keys to Human Mind:** Scientists studying brain/mind interactions have previously focused on cognitive abilities and neural functions; more recent studies have looked at the role the amygdala (a tiny structure found deep within the brain) plays in the formation of memories about significant emotional experiences. Initial findings suggest that 1) emotional memories involving fear are permanently ingrained into the brain - they can be suppressed but never erased; 2) the body is the frame of reference for what humans experience as mind -- our thoughts and actions use the body as a yardstick; 3) emotions are an integral part of the ability to reason - both too much AND too little emotion can impair the ability to reason; and 4) gut feelings and intuition are indispensable tools for rational decision-making -- without them, humans would have great difficulty thinking about the future.

The fields of neurobiological and neurochemical research are expanding to include studies of other links between emotional states and brain function, and among emotional states, brain and other organ function, and the overall functioning of the human body. These frontiers are being explored with the aid of advanced imaging techniques linked to powerful computer processing: as these non-invasive technologies of observation become more powerful it is likely that discoveries will accelerate. Thus more and more links are being created between what scientists are willing to believe and discuss, and some of the older, traditional and alternative practices and disciplines relating to the human body and health.

**IMPLICATIONS -- GENERAL:** The fields of neurochemistry and neurobiology will progress rapidly, providing some of the most startling scientific discoveries of the next decade. Advanced mapping/imaging techniques allow increasingly detailed investigation of the processes of emotion and cognition; linked with neurochemistry, they are providing unique insights into memory, the storage and retrieval of fear experiences, and the physiology of addiction. These will affect the way witnesses are processed, the means of treating both victim and perpetrator psychologically, and the therapies for addiction. Understanding what triggers and re-triggers fear is critical to understanding many of the social pathologies which produce court cases. It is known many violent offenders were abused as children; understanding possible links between their memories of trauma and their current behavior could lead to more effective rehabilitation strategies, and lowered rates of recidivism. **FOR VIRGINIA:** What are the rehabilitative strategies, if any, currently in use in Virginia's correction system? What is the incidence of child abuse in the state, and how high is the correlation between childhood abuse and violent criminal behavior in adults? What psychological counseling or support is offered to victims, especially during the process of trial?

**TIME HORIZON:** Medium-term -- ten to fifteen years.

**CITATIONS:** "Will a New Type of Drug Make Memory-Making Easier?" R.F. Service, Science, Vol. 266, 14 October 1994, pp. 218-219; "Average Brains Pinpoint a Site for Schizophrenia" G. Taubes, Science, Vol. 266, 14 October 1994, p. 221.

**TREND -- Rapid Advances in Genetics and Developmental Biology:** Genetically engineered therapies are already here (witness recently developed treatments for cystic fibrosis); on the way are various trigger mechanisms for healing derived from new understandings of the processes that trigger differentiated cell development in growth. On the one hundredth anniversary of the founding of developmental biology, a survey of leading developmental biologists prioritized the following list of unanswered questions and areas to watch for the greatest progress in the next five years. The top choice for unanswered question concerned morphogenesis, or how the body's specialized organs and tissues are formed. This was followed by interest in how the mechanisms of development have evolved, and third, the question of how evolutionary processes act on development to change its outcome and generate new species. Following evolution, three topics emerge in a dead heat: how patterns form in the embryo that tell different organs what to become; how cells receive and respond to signals during development; and how individual cells become committed to particular developmental fates. Generally, the scientists surveyed felt that

rapid progress is occurring in all areas. Also on the way are hormone treatments to lessen or hold back the effects of aging using DHEA (dehydroepiandrosterone), by far the most abundant steroid in the body - and understanding what genetic coding controls early decreases in its production in some people, and later decreases in others. This could radically affect the quality of life and long-term care issues for the burgeoning population of the aged.

**IMPLICATIONS -- GENERAL:** This will revolutionize how we think of injuries, the disabled, and the aged. Deciphering the secrets of cell development, and the biochemical triggers that turn the process on and off, implies at least a rudimentary form of organ regeneration. This could be used to combat both congenital and acquired handicaps, possibly leading to the obsolescence of the Americans with Disabilities Act. It would drastically change the face of personal injury litigation, possibly even eradicate it. People might simply carry the equivalent of "no-fault" insurance on themselves, which would pay for regeneration in the event of any personal injury. Or it simply might become an entitlement, cheaper to provide than long-term workman's compensation. Not a happy picture either for ambulance-chasers or insurance companies. Slowing, halting, or even reversing the effects of aging could solve the Social Security/Medicare entitlements funding crisis in one go. Perhaps, rather than being the victims of criminal youth, the cadre of vigorous seniors could mentor children, stopping criminal behavior before it starts. At the least, national medical costs and long-term care requirements would drop - provided the regeneration and anti-aging treatments themselves are not extremely expensive. Pension plans and life insurance would need to be completely restructured.

The critical questions, of course, are those of reliability, expense, and access. Organ regeneration could radically cut the numbers of liability cases in the courts, but if unreliable could lead to some very interesting malpractice suits. These techniques could be prohibitively expensive, and thus available only to the rich. If an anti-aging trigger is found, it had better be easily and cheaply produced and administered, because everyone on the planet will want their daily dose. The differential administration of an effective anti-aging protocol would cause social revolt the likes of which the world has not before seen. **FOR VIRGINIA:** Slightly over 24% of Virginia's total 1992-1994 General Fund budget goes to Health and Human Resources. Of the five major programs that "drive Virginia's budget," it is Medicaid that saw the greatest increase between 1985 and 1994, an increase of 292% -- almost three times as great as the next highest increase, which was of 104% in the Corrections budget. Medicaid represents over half the state's total medical costs currently, and the number of residents eligible for Medicaid is expected to more than double during

the 1990s. These regenerative/preventive techniques could potentially greatly reduce state expenditures in this area. As for the liability issues, what is the current liability-related caseload in the Virginia courts? To what extent would the eradication of personal injury cases free up time and reduce costs?

TIME HORIZON: Medium-term. The biggest impacts will be starting in about seven to twelve years, after therapies are developed, tested, and reach a wide market.

CITATIONS: "Looking to Development's Future" *Frontiers in Biology: Development*, *Science*, vol. 266, 28 Oct. 94, a special issue; "Safer gene therapy in sight for cystic fibrosis" P. Aldhous, *New Scientist*, No. 1959, 7 January, 1994, p. 6; "Natural hormone may soften the blows of age" *The Times*, [London], Monday, January 9 1995, front page.

TREND -- Nanotechnologies are closer than we think: Recent advances include the creation of a working transistor on the border of the nanoscale range using a tool created for nanoscale observation, the atomic force microscope (AFM). Many delegates believe this is the first example of a working device made with an AFM and, while just on the border of the nanoscale range, the fact that AFMs have the potential to make devices much smaller is getting people excited, as now its seen that it's possible to use the AFM for fabrication not just observation.

This is particularly noteworthy in the light of another recent advance. Scientists recently produced "nanomagnets" using "buckytubes," creating what are essentially the smallest bar magnets in the world. In addition to applications such as molecular-scale wires for tiny electronic circuits, buckytubes can also be used as molecular-scale filters which target, for example, specific metals - allowing the development of entirely new approaches to mining. This development is particularly ironic, as Bruce Hobbs, chief of the CSIRO Division of Exploration and Mining in Australia, recently presented a paper, written as if from the year 2020, to the Australia and New Zealand Association for the Advancement of Science. In it, he suggested that "a combination of tiny robots and designer molecules capable of scavenging for specific metals will open the way to the mining of environmentally sensitive areas. Quarries, smelters, opencast mines...will be obsolete within thirty years. Waste will be eliminated...only the target mineral will be extracted." Thirty years may be an over-estimate. Not only are machines being made tiny, they are being modeled on organic systems: cells, after all, are productive factories/engines on a very small scale. Biosensor development can be viewed as the short term objective of molecular electronics research, with molecular implementation of neural network and biocomputer development the long-

term objective. Rapidly advancing abilities to sense, image, analyze, and manipulate substances on atomic scales accelerate the timeline for the design, production, and commercial application of nanomachines.

**IMPLICATIONS -- GENERAL:** The widespread development and application of nanomachinery (machines, micro-processors -- built on the molecular or atomic scale) could well change the world as we know it. In their ideal form, these micro-machines are programmable, energy efficient, and self-duplicating. They have applications in all forms of material processing, in goods production, in health (the 21st century equivalent of the polio inoculations: the nanite inoculations, for life-long protection against artery blockage, stroke, etc.), and in house cleaning (it could be more like house dust mining: if they are going to be programmed to wander endlessly and chomp dust, they might as well recycle it into piles of usable elements), to name just a few. Applications of the initial crude devices, however, are likely to be as various sorts of filters and biosensors, which would improve both chemical and biochemical processing, and also medical technologies. Difficulties would arise over aspects of control. Once nanites are programmed and set loose, how do you recall them quickly if need be? How do you set boundaries on their processing territory? How do you prevent their being used maliciously, in vandalism, or even as weapons? What sort of environmental considerations might arise - environmental degradation by nanite pollution? **FOR VIRGINIA:** Among the more startling social, physical, and environmental impacts of nanotechnology use, Virginia could very simply see the revival of mining as an industry. Nanotechnology mining as described above wouldn't be limited to rich veins of ore: nanofilter mining could be implemented in garbage dumps, or wherever large piles of stuff potentially rich in the sought-after mineral might be found. Nanotechnology presents us with the ultimate in recycling technology.

**TIME HORIZON:** Medium-term. Applications will be available in approximately ten years.

**CITATIONS:** "Molecular Electronics: Science and Technology for the Future" IEEE Engineering in Medicine and Biology, February/March 94, p. 25; "Micromachines on the March" IEEE Spectrum, May 1994, pp. 20-31; "Metal guru predicts a future of mini miners" New Scientist, No. 1946, 8 October 1994, p. 10; "AFM Fabricates a Tiny Transistor" Science, Vol. 266, 28 October 1994, p. 543; "Minute Magnets made from tiny tubes" A. Coghlan, New Scientist, No.1959, 7 January, 1994, p. 18.

**DISCUSSION -- A Revolution in Processing Complex Mathematics:** Two physicists have devised a revolutionary mathematical technique that makes many problems in four-

dimensional space far easier to calculate, and may ultimately help explain how quarks combine to form protons, neutrons, and other components of solid matter. Edward Witten, IAS/Princeton, and Nathan Seiberg, Rutgers, call their technique "supersymmetry". It converts four-dimensional equations, so complex that previously they were only partially solvable via supercomputers, into a two-dimensional form that can be calculated with pencil and paper. This will enable physicists to work more easily on problems in particle physics, in the basic construction of matter, in the fundamental forces of nature (the weak force, the strong force, gravity, and electromagnetism), and in any problems involving the three spatial dimensions and time.

In the long-term, this implies a more effective and efficient path to creating commercially viable fusion power; to understanding gravity; and on to a prospective Theory of Everything (TOE). In addition, "by harnessing the bizarre properties of the quantum world, physicists believe they could construct a computer with undreamed of power". Using the hypothetical design of quantum parallelism, a small quantum computer could behave like an immense parallel processing machine. One limitation: you can't look at the results of each computational path separately because they are all in different universes. The only way you can take advantage of the simultaneous calculations is to let the universes interfere with each other. This is done by making a measurement, (like interference in the classic two-slit experiment), and observing the result of a calculation. What you get is not the result from just one universe but a sum over all universes. The possibilities arising out of this unique processing approach are enormous. Are there applications that could aid in modeling complexity? Would this provide a helpful processing approach for direct democracy? From another perspective, the common model of encryption relies on the extreme difficulty not only people but even powerful computers have factorizing very large numbers. The advent of quantum computing raises the possibility that anyone who can get access to a quantum computer could crack the secret transactions of governments, the armed forces, banks, and other commercial networks.

**IMPLICATIONS -- GENERAL:** Potential ability to deconstruct/reconstruct matter on the atomic level with high degree of precision and with much lower energy inputs than currently used; potential ability to manipulate fundamental forces of nature. The rapid advances in computing power, in computing "intelligence" and "creativity," in advanced imaging in biology, physics, and astronomy is accelerating our investigations of our own selves as well as the world around us. The more we can observe, the more we can figure out -- or the more our creative personal data assistants can figure out without us. At what point

will our computational assistants become our colleagues and then our teachers? In the long run, scientific investigation could be the hobby and the joy of artificial intelligences linked to powerful sensing, imaging, and analytic arrays. However, wherever there is power, there is also misuse, and in any future where information is the context of society, massive computational power will be used both for play and for crime. But the criminals may be silicon. FOR VIRGINIA: How far is Virginia already into this future - what levels of computational power do researchers, students, residents have? How many people in state are linked to the Internet (through which one can call on the resources of massively parallel supercomputers, such as Thinking Machine's online Connection Machine, or the Maui supercomputer)?

TIME HORIZON: Long-term - twenty to thirty years.

CITATIONS: "A Quantum Revolution for Computing" Julian Brown, New Scientist, 24 September 1994; International Herald Tribune, Health/Science, December 8, 1994, p 8; "Computers at the Dawn of Creativity" R. Matthews, New Scientist, No. 1955, 10 December 1994, pp. 30-34.

TREND -- The Expanding Concept of Property Rights: The concept of "property rights" is undergoing explosive expansion in definition and application. Where it once was applied to land, water, and hunting, pasturage, or mineral resources, it has expanded to include airspace, airtime, ideas, media, genetic resources, biological entities, and whole systems. Indigenous peoples are claiming property rights not only to land, but also to the gene pool and biodiversity of their lands and even to their own racial genetic pool. Email exchanges and conversations via computer are copyrightable. Interestingly, restraint is being shown in some quarters: a university geneticist recently appointed the head of research at Merck announced the company's official policy to release into the public domain any information it discovered about the human genome, given that information is, after all, the common heritage of mankind.

IMPLICATIONS -- GENERAL: People are copyrighting everything: the next boom in litigation will probably center on copyright cases and patent challenges. Particularly interesting is the notion of property rights to one's own genetic code, and, in the case of states, property rights to the genetic code of the plants and animals unique to that state (used here also to mean country). With the prospective of a booming genetics industry in the next century, everyone is, in essence, buying genetic futures: trying to nail down now the rights to genetic structures -- small biological machines -- that might prove useful in medicine, agriculture, or other applications. FOR VIRGINIA: What unique indigenous plants and

animals can the State of Virginia claim? Has any move been made to place their unique code under protection as the common heritage/resource of the people of Virginia?

TIME HORIZON: Immediate to long-term.

CITATIONS: "Trade and the biodiversity convention" D.M. Putterman, Nature, Vol. 371, No. 6498, 13 October 1994, pp. 553; "A Showdown Over Gene Framents" E. Marshall, Science, Vol. 266, 14 October 1994, pp. 208-210; "Genetic Diversity Project Tries Again" P. Kahn, Science, Vol. 266, 4 November 1994, pp. 720-722.

DISCUSSION: Inhabiting Other Dimensions: The next watershed in human development will come with the evolution of the power of mind. Humans will experience expanding degrees of freedom in space as we explore and expand awareness and perception. Our concepts of mind-body links will be radically reshaped, altering our assumptions about what it is possible for "normal" human beings to do in use of their own bodies. Increasing power and potential of mind will be achieved, carrying us far beyond the mind and world as we know it today. "Paracultures" will evolve. These future communities will be consensual and extremely cohesive, though extremely diverse. They will have transcended hardware, needing only the energetic wetware within. Whole communities will migrate as a group, disappearing into other dimensions of spacetime, creating and maintaining these places through the power of their cohesive vision and intent. They will inhabit worlds beyond.

IMPLICATIONS -- GENERAL: This trend implies the transformation of human society from the individual outward. The kind of discipline, self-awareness and self-critique, and mental balance which will be the end result of "ordinary" education in the fruition of this trend will preclude the existence of many of the social pathologies addressed or implied by the other trends described here: greed, selfishness, xenophobia, intolerance, callousness, violence, addiction. Which is not to say every human will be perfect; wickedness, insanity, and obstructiveness are the balances without which we would be unable to measure goodness, rationality, and creativity. In its mature state, this trend implies the fading away of the courts: people would self-mediate, communities would move to resolve disputes as they saw them arise. Think of it as the ultimate decentralization of the third branch of government: people would carry the best of the traditions and the techniques of adjudication within themselves.

TIME HORIZON: Beyond the horizon - but the seeds are all around us.

CITATION: Phenomenology of the Cultural Disciplines, Mano Daniel and Lester Embree, eds., Kluwer Academic Publishers, 1994. "What are the Greatest Challenges to Evolutionary Theory in Our Time?" Jan Huston, The

Manoa Journal of Fried and Half-Fried Ideas (about the future), Occasional Paper 1, August 1993, p. 13-32; "The Future of Human Consciousness" Charles D. Laughlin and Sheila Richardson, Futures, June 1986; The Art of Dreaming, Carlos Castaneda, Harper Collins, 1993.

**SUMMARY:** To complicate the complications, these trends will all interact with each other, in some cases to reinforce impacts, in others to dilute them. For example, take the social problems associated with aging and increased generational inequities. The increased desire for personal and property security assurances of the elderly will reinforce any trend to focus on the community good over the rights of the individual, especially with regard to violent and property crimes. A new focus on the community good over individual rights would also be heightened by constraints on use of natural and historical reserves. The seniors' concern over security will heighten pressure to enforce and enhance anti-vagrancy laws, and is likely to nix any attempt to rationalize drug laws. As senior citizens prefer low-risk investments, they are unlikely to drive innovation and entrepreneurship with their investments - but are likely to support municipal projects rebuilding decaying infrastructure, via bond markets. If they can get used to the technology, they are likely to support "electronic purses" as a deterrent to crime. Finally, if advances in developmental biology pan out as ameliorators/delayers of the effects of aging, communities' chief worry in the next century regarding seniors is more likely to be resources for long-term leisure rather than resources for long-term care.

Long run economic uncertainties also interact with many of these trends. The slowdown in public investment in science, and wrangling over intellectual, biological, media and other property rights will contribute to economic slowdown, although the trend towards greater science-industry links could offset those constraints. Long-run economic uncertainties will reinforce total job insecurity, which will also reinforce generational inequity - as youngsters find themselves shut out of full-time jobs and benefits such as the retirement accounts on which their elders are living. This will be further exacerbated by successes in the war on aging, as youngsters find themselves competing for scarce jobs with bored seniors.

As unemployment and joblessness grow, the "work camping" of minor offenders could provide a driver for economic growth in the US: our high cost of labor has always been a competitive disadvantage internationally; if US companies could "outsource" production to prisoners, they could substantially reduce costs while performing the valuable public service

of teaching criminals professional skills. Long-run economic slowdown for the US and increasing demands for infrastructure maintenance, not to mention the deficit, entitlements demands, and public security issues, will contribute to the crippling of the federal government, as it makes promises impossible to carry out (impossible only barring breakthroughs like the successful implementation of the "Bit Tax". Development of fuzzy logic polling would further democratize decision-making by more accurately capturing the degree of public uncertainty. On the other hand, nanotech repair crews could substantially reduce the cost of infrastructure maintenance -- and everything else -- offsetting some of the government's economic burden.

Finally, as a self-organizing anarchy nearly impossible to police or shut down effectively, the Internet and the communities of interest, expertise, and critique that it links could provide the seeds for a new approach to governance. Virginia and its courts find themselves within these shifting patterns of change. What are the state's long-term goals? What are the long-term goals of the court? Where do these emerging issues intersect those goals? How might the courts weigh the tradeoffs implicit in these issues for themselves, and how might they explain their decisions, and model an effective decision-making process, to their communities?

## **AFTERWORD**

Future shock is clearly still upon us. As insecurity grows in the face of complex issues, many members of the voting public will increasingly respond to simple stories explaining those issues and offering simple solutions. It is the responsibility of people who study both the complexities and their implications to explain the limitations of those simple stories to the voting public, and to try to clarify the complex issues and their attendant tradeoffs.

One of the primary activities of courts is elucidating complex problems clearly enough that the tradeoffs might be weighed and decisions reached despite the complexity. Neither lawyers nor judges usually do so via simple stories, of course, one of the great complaints about the justice system in America. That, with effort and commitment and training, can be changed. In order to provide a model for decision-making in the face of complexity, as members of the justice system are uniquely suited to do, the justice system could encourage its members to make the decisions more (electronically) accessible to the wider community. Further, since the conflicts resulting from the clashing waves of change most often reach the courts before any other branch of government pays them attention, courts have the strategic advantage of being first on the spot in characterizing a new issue and the tradeoffs it presents society.

## APPENDIX

Selections from "Law in a Digital World", a virtual conference held on the Internet, October 3 through October 21, 1994, moderated by Ethan Katsh, Professor in the Department of Legal Studies, University of Massachusetts, Amherst, sponsored by West Publishing Corporation. The goal of the conference was to "address how we can better understand changes in the role and nature of law as we truly become a "digital world".

One of the online participants said:

"I started clerking for a federal judge the year the Xerox came into to general use. While that may not have been the dawn of the technological era in law practice it was close. Most of what has followed is just technology enabling faster and much more voluminous production of traditional legal work. The major impact has been upon how we do what we do, not upon what we do. In the courtroom, however, technology is changing the very fabric of what we do. Multi-media presentation may seem like 'bells and whistles', but in the courtroom it has caused a revolution. I hate the phrase 'paradigm shift' but it is apt in the courtroom context. Video, scanned document databases, digital imaging, digital projection equipment, real time transcription, advanced visualization techniques, and other technological tools like Elmos and Pointmakers are radically and rapidly changing the way we resolve disputes both in the courtroom and by alternative means."

Another participant observed:

"Early on, [someone] wrote that "The biggest change has been in the dimension of time." I don't disagree with this but I would like to shift the focus away from time and how fast we can perform informational tasks, to the dimension of space and distance. Indeed, I would argue that if we wish to understand where greater than superficial change is likely to take place and which of our institutions are most vulnerable to change, we should explore those facets of law which are tied to a particular place or space. Information that was far away is no longer far away. What was separate is no longer separate. What was inaccessible is no longer inaccessible. What was tangible and existed only in a physical setting is now intangible. Of course, we are not yet in a digital world but isn't this at least the direction in which we are moving? And the vanishing of boundaries, whether they be physical, professional, or conceptual, that several of you have mentioned, does, I think, constitute a recognition that large changes in the space dimension are clearly on the horizon."

"Libraries seem an obvious place to begin considering they have occupied such a prominent place in law, physically, symbolically, and operationally. So what does it mean that information is no longer tied to place and what does it mean for the librarian, part of, perhaps even most of whose role has been tied to management of this space?"

Another asked:

"What if all informational activity in all courts that is presently reduced to writing (e.g., all pleadings, opinions, transcripts, calendars, etc.) was routinely accessible over the Net as one virtual distributed database? What if all cases were represented as WWW pages based upon some broadly adopted data structure in which key information about litigants, counsel, judges, claims, defenses, outcomes, and all related documents and events were expressed? Is it the manifest destiny of the court system to evolve into a vast web of self-archiving communicational activity, the history of which can be exploited for planning and analysis purposes by increasingly sophisticated data analysis tools?"

Yet another observed:

"Lawyers and lawyering, of course, will not vanish as the world goes digital. But: (1) lawyers now are paid to collect and process information; lowered costs of information access mean that some of the activities lawyers are now paid to perform will no longer have a market. (2) The economics of the law firms is likely to shift dramatically; whether or not 'virtual law firms' emerge, to the extent law firms exist as a means of lowering the 'search costs' for legal expertise -- and I believe it is a significant extent -- they lose some of their competitive advantage in the new environment. (3) Niche specialization is likely to increase (part and parcel of the 'disaggregation' of firms), as smaller units (up to and including individuals) find it economically viable to find markets among much larger and more far-flung audiences for their wares."

At the end, one participant commented and added further questions in conclusion:

"My own perspective on the entrance of new information technologies into our legal environment is that they are likely to have fairly broad ramifications. I have some sympathy, for example, with McLuhan's statement that when "a new technology comes into a social milieu it cannot cease to permeate that milieu until every institution is saturated". (Understanding Media, p. 161).

"Can we expect the computer's influence to be limited only to institutions that process information and to those doctrines that are oriented around information, e.g. copyright, privacy, obscenity, First Amendment, etc. Or is it likely that the effect will be much more pervasive, touching, for example, contracts, torts, procedure, and the other traditional elements of the first year curriculum that are oriented around relationships, problem solving processes, and concepts of rights (all of which involve information and communication)?"

"Even if there are broad long-term implications for change, what immediate goals for copyright law, privacy law, obscenity law, and the First Amendment, should we set for the near term? If, for the purpose of developing policy, we look at these areas as discrete issues, what kinds of "first principles" should instruct and guide us? And where do such "first principles" come from?"