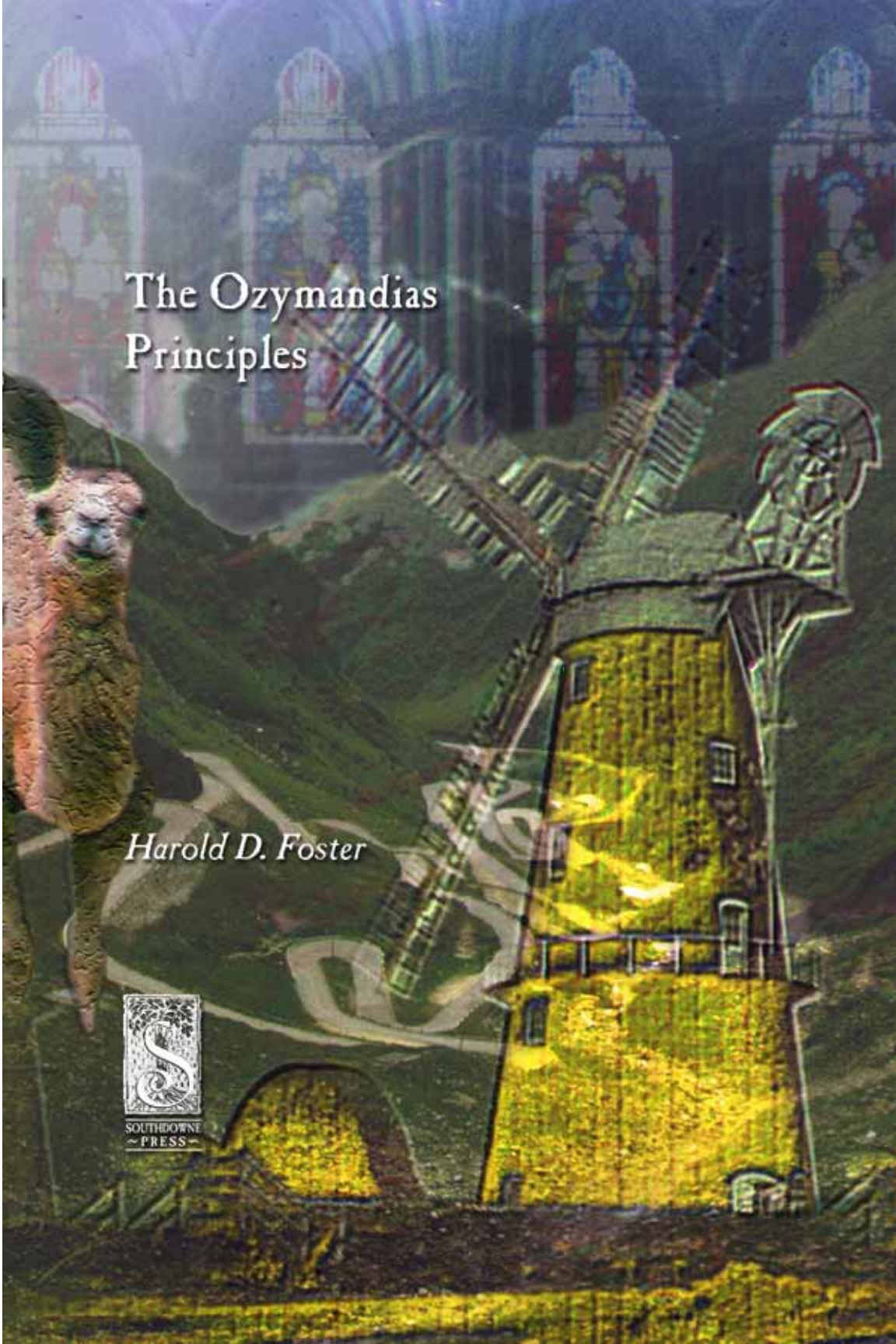
The Ozymandias Principles
Harold D. Foster
SOUTHDOWNE PRESS

The Ozymandias Principles:

Thirty-one Strategies for Surviving Change

Harold D. Foster

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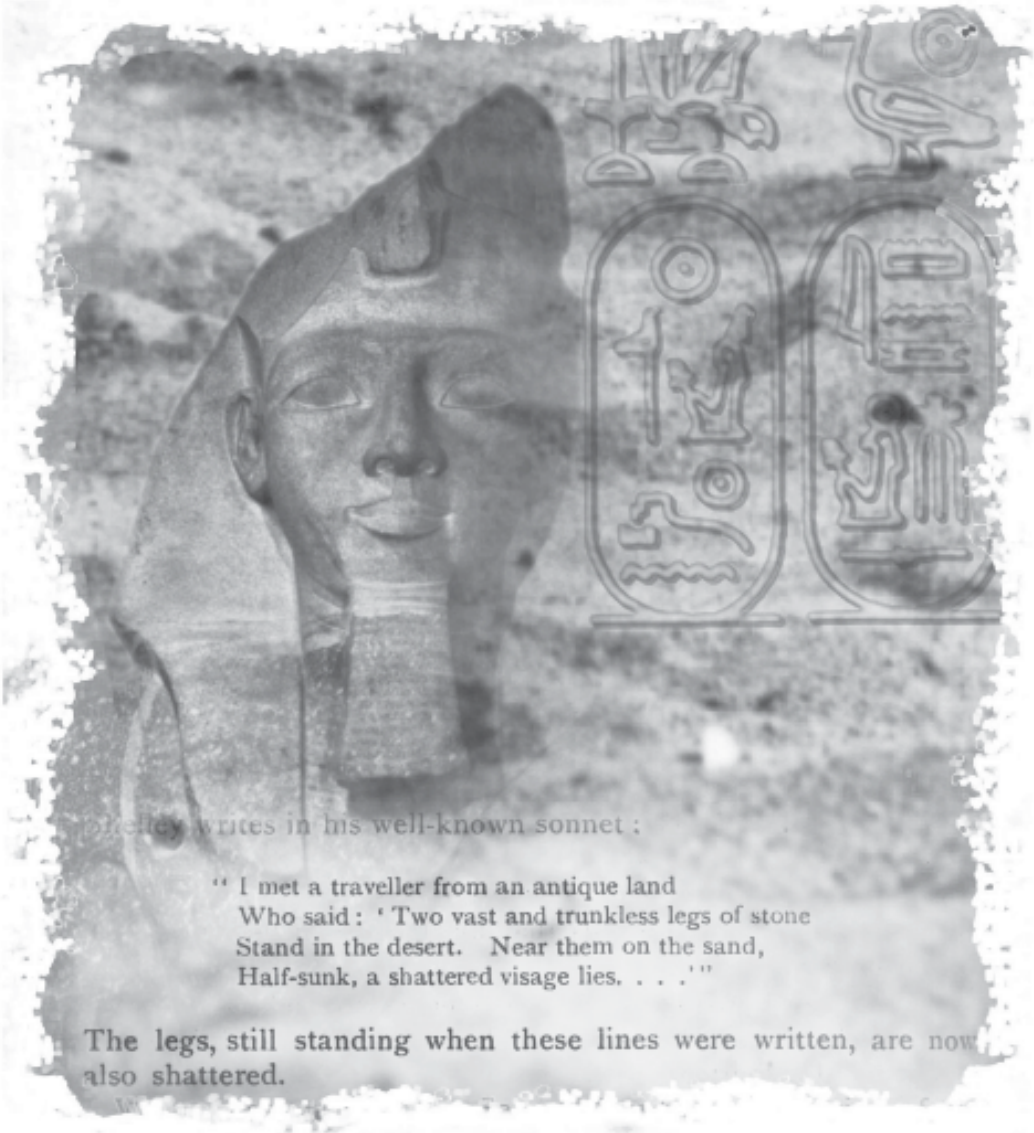
To Sarah



Shelley writes in his well-known sonnet :

" I met a traveller from an antique land
Who said : ' Two vast and trunkless legs of stone
Stand in the desert. Near them on the sand,
Half-sunk, a shattered visage lies. . . .'"

The legs, still standing when these lines were written, are now also shattered.

I met a traveller from an antique land
Who said: Two vast and trunkless legs of stone
Stand in the desert . . . Near them, on the sand,
Half sunk, a shattered visage lies, whose frown,
And wrinkled lip, and sneer of cold command,
Tell that its sculptor well those passions read
Which yet survive, stamped on these lifeless things
The hand that mocked them, and the heart that fed:
And on the pedestal these words appear:
'My name is Ozymandias, king of kings.
Look on my works, ye Mighty, and despair!
Nothing beside remains. Round the decay
Of that colossal wreck, boundless and bare
The lone and level sands stretch far away.

Percy Bysshe Shelley (1792-1822)

Acknowledgements

This book is dedicated to my wife, Sarah, for her encouragement of the project and for her help in proofreading several drafts. I should also like to express my gratitude to several other people who assisted me in the preparation of this volume. Jill Jahansoozi typed part of an early draft, while the final version was produced by Judy Simpson. Diane Macdonald undertook the very demanding task of typesetting, while cover design and cartography was in the expert hands of Ken Josephson. Their dedication and hard work is greatly appreciated.

Thanks are due also to Gary W. Tooze, who designed the Ozymandias web site (http://webcom.net/~real/ozy/ozy.html) and who is promoting this book on the Internet. Gary's book *Insights, Insults and Insanity* will be published by Southdowne Press in August 1997 and should be viewed as a companion volume to this one. It contains the best of Gary W. Tooze's *Quotations of the Day!* and is full of ancient and modern quotations, inspiring and humorous stories, and some slightly risqué jokes. It, too, can be ordered from UBC Press.

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F L U X

Victims of Hitler's Bunker Syndrome (HBS) display symptoms ranging from hedonism to self-destruction. The disorder's diagnostic characteristic, however, is a deep-seated belief that the future inevitably will be worse than the present. During my student days in London, sufferers from this syndrome carried signs proclaiming "Repent, the End is Near" or "Prepare to Meet Thy Doom." Although generally viewed as objects of derision; ethnic cleansing, inflation, recession and downsizing have added credence to their messages of pessimism. At the other end of the visionary scale stand the utopians. For centuries they have described, and often tried to build, perfect social and political systems. While New Lanark and the Oneida Community did not provide the ideal lifestyle sought by their designers, such nirvanas have had a continuing influence on the goals of mainstream society. Hopefully, the end is not yet near. Realistically, utopia, or something like it, is very unlikely to be attained. Nevertheless, ours is a restless world. Society is in a state of flux. Its traditional value systems are being undermined by waves of innovation. In consequence, impermanence is now dominant and durability is being seen as a drawback. The scale, scope and pace of this change have meant that most organizations now have structures which were designed to solve problems that no longer exist or, alternatively, have since been surpassed in significance by others. This lack of relevance does not imply that such organizations are unwilling to adjust. In contrast, numerous attempts are being made by government to accommodate this new reality. Task forces, ad hoc committees and other transient bodies are set up repeatedly to deal with one-of-a-kind problems. Vast new structures are assembled and dissolved as countries, divisions and departments form or vanish overnight. Nor is government alone in its efforts to cope with constant change. Private companies also suffer endless internal reorganizations as they merge, diversify, divest, acquire or dissolve. Nevertheless, traditional institutions frequently fail to respond adequately to change. New organizations, which range from religious cults to the Rhinoceros and Independent Mushroom parties, spring up to fill the resulting power vacuum.

Endless innovation has had an enormous psychological effect on society itself, giving rise to an increasing disbelief in both progress and authority. Ours is a disposable world. Today's ally is tomorrow's enemy. Present scientific successes

may sow the seeds of future ecological or social crisis. As a consequence, policy makers, planners and politicians are suffering from a widening credibility gap. This public scepticism is parallelled by an increasing distaste for social sacrifice which is rooted in the belief that present goals and objectives are unlikely to survive the test of time. The current rate of change is abnormal. Indeed it is unique. As Boulding pointed out, the world into which today's seniors were born is as different from the present as that world was from Julius Caesar's. They were born in the middle of human history, and almost as much has taken place since their births as happened before them.

The fundamental cause of this global instability is the institutionalization of the discovery of new knowledge. A vast international network has been set up which links universities, colleges, government, and private research and development centres. Its overriding aim is the creation of additional knowledge, much of which then gives rise to new industries or social trends and activities. This explosion stimulates further research, rotating the wheel of innovation. Knowledge is the fuel of change. Without this international research and development system, itself the greatest innovation of the twentieth century, there would have been no Green Revolution and associated population explosion, no ubiquitous urbanization and industrialization and no planetary environmental crisis. It is ultimately responsible for the global economy, the spread of Westernization, the rise of the electrical imperative and the downgrading of the value of labour. It also gave birth to the New Age human potential movement with its allegiance to networking, rather than to the traditional power hierarchies.

The social, economic and political implications of this ongoing revolution have been described in detail by authors such as Alvin Toffler in *Future Shock* and John Naisbitt in *Megatrends*. Other writers, including Neil Postman in *Technopoly: The Surrender of Culture to Technology*, have decried them. The media continually bombard us with stories of gloom and doom. From bankruptcies to invasions, these are accompanied by graphic descriptions of loss. Ours is a world buffeted by strife and torn by change. Yet despite this chaos, some systems continue to thrive. This apparent paradox brings to mind the Darwinian phrase "survival of the fittest." But what does this elusive fitness consist of? It is not merely a question of size, strength or speed. By the middle of 1942, Germany ruled a larger portion of Europe than any other power in history. Less than three years later, the Third Reich was in ruins, Germany had surrendered and Hitler was dead. Parallels can be drawn with the natural world. The enormous dinosaur *Tyrannosaurus rex* has long been extinct, yet brachiopods have survived for more than six hundred million years. Despite their longevity, most of the 220 remaining species of this small bivalve animal live anchored to the seabed. Nor is fitness simply a question of

intelligence. Bacteria and viruses have survived very well without it, while mankind's future is threatened by too much knowledge, rather than by too little. The ability to think is not synonymous with the capacity to succeed.

Survival requires accommodation of the stresses created by change, a characteristic known as resilience. Resilience is not a simple concept. Thirty-one of its dimensions are identified in this volume. They are illustrated by case studies ranging from St. Paul's Cathedral to sharks, and from lemmings to the conventional wisdom. From these examples it becomes apparent that long-term survival often requires short-term sacrifice. Individuals, companies and nations may shine as brightly as a firework for an ephemeral moment, only to be snuffed out by the winds of change. Alternately, like a star, they may choose to glow gently and timelessly.

The Ozymandias Principles seeks to probe the anatomy of resilience. Dissection, however, takes place, not in an operating theatre but in the legislature of DeltaGlobe, a futuristic virtual reality world. In the year 2096, government supporters put forward the case for increased resilience. Each element is then criticized and derided by members of the "loyal opposition," which, like the government, is drawn from the four corners of the solar system. The same 31 components of resilience are discussed again, more academically, in a Whitepaper originally prepared to fuel the debate. This dual approach increases the resilience of the book itself, since the political discussion is intended to entertain, while the Whitepaper is more likely to be of value for systematically applying the Ozymandias principles as a blueprint for surviving change. For those whose memory of the twenty-first century is a little hazy, both a time-line and a glossary are provided towards the back of the volume.

It's a poor sort of memory that only works backwards.

Lewis Carroll (Charles Lutwidge Dodgson)

D E L T A G L O B E

GOVERNMENT ORDERS 8.9.2096
RESILIENCY ACT

(Optional Cortical Absorption)

Hon. Rhodes W. Vizena (Minister of Social Stability)

Madame Speaker, the provision of good government is like playing spinball. Its only reward is the right to do it again, explaining this government's re-election and today's debate. The prime lesson of history is the evil of good intentions. The road to Hell, so members of the opposition who have visited it inform me, is paved with them. In our society, Madame Speaker, for too long there has been an unfortunate obsession with the need for reliability. We resent the inconvenience of small scale periodic failures. Demands for reliability, however, have been satisfied at the high cost of increased risk of rare but catastrophic, failures. All too often, our desire for instant gratification has led eventually to major losses. This situation is unacceptable. Bill C-39, therefore, is designed to promote greater resilience, even if it comes at the cost of short-term inconvenience and political and social sacrifice.

Madame Speaker, let me illustrate this Bill's intent with a sporting analogy. Any gladiator can use one of two basic strategies in the arena. She can attempt to block her opponent's every blow, or be fit enough to withstand them. The first approach, avoiding adverse events, is the search for reliability. The second tactic, that of developing the ability to accommodate stress, requires enhanced resilience. In the arena, as everywhere else in the universe, stability is an illusion since change is the last constant. While the gladiator who tries to block each blow will initially be in better shape, if this strategy fails, the contest will end abruptly. There is no absorptive capacity behind her shield. The same is true of megalopoli without alien entry defences; or interplanetary traders who make high profits on borrowed credits, only to be bankrupted quickly by rising interest rates.

Madame Speaker, innovative ideas, such as those incorporated in Bill C-39, are like queens in a game of chess. They move forward powerfully. When used effectively, they provide momentum and help develop a winning position. We must recognize that all the Assembly's decisions, whether to mine Saturn's rings or outlaw eugenic settlements, require a vision of the future. Implicitly or explicitly,

this involves assumptions about alien contact, population growth, technological innovations, colonization bonuses and social values. There is no absolute future, nothing is guaranteed. Another Lenin, Hitler, Bogolin or Reynolds, on the interplanetary stage, can influence futurity forever. The yet-to-occur will be the unpredictable result of billions of interacting political, social, economic and environmental forces. Everything is unstable, including the *status quo*. What is needed is a methodology that permits rational decision-making, even in an era of uncertainty.

Madame Speaker, for far too long, most decision-making has sought to prevent calculable, predictable failures. Yet in this world of increasing change, brought about by alien information transfer, advances in nanotechnology, genetic code manipulation, cortical absorption and associated revolutions, wars, embargoes and ethnic decertifications, this is not enough. Who could have foreseen the invasion of Nepal and the deliberate destruction of its entire microelectromechanical production capacity? Or who could have anticipated the resurgence of old diseases, such as TB, AIDS and LNY on the lunar colonies? These events clearly prove that the future cannot be accurately predicted. Since this weakness has been demonstrated repeatedly, resilience, the ability to accept change gracefully, must receive far greater prominence in decision-making.

Madame Speaker, if I had the privilege of making the Eleventh Commandment, it would be this—make your systems resilient. Fortunately, we have been assisted in this quest for the capacity to withstand change by several dedicated academics, Kahn, Aberline and Gissel-Finn, to name but a few. Recently, their work has been refined by neuromodellers at the Advanced Concepts Institute of the University of New Delhi at Kansas City. Dr. Claire Banks, from this institution's Department of Socioneutronics, helped draft the current legislation. As a result, Bill C-39 mandates the inclusion of resiliency packages in the decision evaluation meshes of all neurosocial networks.

Madame Speaker, I do not wish to imply that a resilient decision is necessarily a correct one. A poor decision that is difficult to alter can cause serious problems. Indeed, conditions are never just right and for that reason, the cautious seldom err. However, there is little point in making major decisions, if the associated investments are soon swept away by waves of change. This government's supporters are sated with instability and have grown tired of so-called progress. Our election slogan, "Smell the Roses," captured this widespread public mood of disaffection. Madame Speaker, I congratulate Dr. Banks and her colleagues for providing strategies which will slow the treadmill of change and I salute this government for having the courage to accept them. To know is not enough, we must apply; to be willing is insufficient, we must do. I commend, Madame Speaker, Bill C-39 to you and to this Assembly.

Mr. Henry Spurgeon (Database Four)

Madame Speaker, to be afraid of change is to fear life. While disaster strikes like a thief in the night, it provides new opportunities for novelty and for reform. For 90 years, Earth has struggled to readjust to rising sea levels. This melting of Antarctica is a catastrophe. Yet it has stimulated numerous beneficial innovations. True, we have lost the Seychelles, the Netherlands and several other coastal nations; and yes, extensive famine followed the decline in global agricultural production. But, necessity was truly the mother of invention. Without such a rising sea level would the deserts be blooming? Would our genetic engineers have created cactiwheat, cactirice and cactioats? Would we have colonized the moon so rapidly and begun to modify the Martian climate?

Madame Speaker, Shakespeare put it best when he wrote: "Sweet are the uses of adversity; which, like the toad, ugly and venomous, Wears yet a precious jewel in his head."

Catastrophe follows unpredictable and peculiar pathways, but yet, because it wipes the slate clean, its final results can be wondrous. The dinosaurs were dominant for 100 million years and mammals only prevailed against them because of interplanetary catastrophe. Santorini's eruption destroyed the Minoans, but Greek civilization gloriously arose from their ruins. The Great Fire of London was a blessing in disguise, giving rise to building codes and planned cities the world over. Tokyo's 2048 destruction took 420,000 lives but who can deny that a far more magnificent megalopolis has replaced the old? If there is anything to be learned from history it is that without pain there is no gain.

Mr. Vlakic Varkaris (2QT2BSTR8)

Madame Speaker, the future is a battlefield for competing élites. Each pressure group has its own reinterpretation of our history, critique of personal and political behaviour and rules and roles for everyone. All have their own professional priesthood that would control the real power in their ideal, brave new worlds. Alien Channellers, Out-of-Body Travellers, Academico-Capitalists, for example, play this role in one vision or another.

Madame Speaker, inevitably the ultimate goal of such a pressure group is the propagation of its ideology, broadening its power base. They emphasize, therefore, dimensions of their future vision with the greatest appeal. Slogans reduce such ideologies to their lowest common denominators. Alien Channellers can ensure "All Mothers an Einstein." The Academico-Capitalists promise "A Zipship in Every Garage." In these debates about choosing the future, major differences

appear in the roles envisaged for the state and for the individual, with implications for competition, cooperation and personal freedom. In the loud discussions between the Academico-Capitalists and the Diffusionists, for example, most attention is focused on mechanisms for the distribution of nanogoods and android services, decisions which have major implications for free time, security and class structure. In contrast, Madame Speaker, other views of the future stress naturalistic, supernatural and theological aspects of existence at the expense of materialism. Examples range from the resurgence of the Animal Mind-Melders, the growth of the Virtual Reality Hermit Movement, the Immortalists and the Jesuit Association. The Ecological Imperative is an example of one such vision of the future. In its most extreme form, Green Rage, it involves supporting the work ethic and the acceptance of natural weather, together with a resulting lifestyle in which communes, pastoralism, market gardening and handicrafts predominate. Its adherents believe that modern technology is inherently bad, since it inevitably causes more problems than it solves. They refuse to use genetic engineering, ionic engines, superconductors, automatons or even self-assembling materials. Despite its relatively small size, this union-backed counterculture has had a considerable impact on the mainstream of society, especially among the lunar colonizers. Its members are often highly educated, articulate, vocal and disillusioned. They represent a committed minority, intent on opposing development and promoting social change. Historically, their roots can be traced further back than the twentieth century Greens. These disciples of Thoreau yearn for a time when life was simpler, arguing that humankind is moving, not towards utopia, but away from it. They reject megalopoli, virtual realities, consumerism, mind-melding and status societies.

The views of supporters of the technological growth vision, Madame Speaker, stand in stark contrast. Promoters of this alternative, such as the Academico-Capitalists, argue that continuing, rapid economic expansion is the key to future success. Without it, they contend that social problems, such as the two day work week, submarine seismicity, and mental magnetic field fluctuations cannot be solved. To them, society's health is measured by the size of its G.N.S.T. and the rate at which this is expanding. Since major developments, such as offshore quadrium fields, nuclear fusion plants and extraterrestrial contact probes are the easiest way to achieve rapid economic growth, they are promoted vigorously. A growing demand for goods and services, high profitability and a buoyant solar-wide web market are seen as indicators of a thriving society. Success is a high Dow Jones Expanded Index or a fulfilled Two-Year Plan.

This growth ideology has a strong lobby, being promoted by interplanetary bodies such as the Galaxy Bank and the Organization for Economic Cooperation and Promotion. Multiplanetary Corporations, the Solar-Military Complex, the media

and applied institutions of higher education (both real-time and virtual) also all play leading roles in promoting economic growth and the acceptance of mega-engineering and nanotechnologies. So too, of course, does the Solar Chamber of Commerce. Disciples of growth look forward to a time when life will be even more productive. They argue that additional, rather than less, scientific research and quicker acceptance of its associated innovative technologies, will solve most of humankind's problems. They suggest that an individual can be judged by his, her or its achievement in the marketplace and by the number of fiscal credits earned. They are predominantly advocates of open-system technologies, slash and burn planetary colonization techniques and conspicuous consumption.

Then there are the Immortalists, Madame Speaker, hankering after eternal life, but not knowing what to do with themselves on a wet Sunday afternoon. Madame Speaker, humankind is divided. The future lies ahead, but where? Power rapidly changes hands. Bill C-39 is designed to deal with that reality. Unless a particular policy or decision is compatible with a diversity of value systems and their associated visions of the future, it is unlikely to display resilience. On a planet, or in a country or institution in which there are major value system differences, long-term decision-making is at best extremely difficult. While one group, the Alien Channellers, for example, will see a particular goal, or objective, as worthwhile, it will be anathema to another, such as the Jesuit Association. This divergence results in a spectrum of non-support that ranges from passive resistance to sabotage. When political shifts occur, which give greater power to those holding a different paradigm, decision-making is suddenly altered radically, as dramatic new directions are followed. Such changes to the power base also often results in the adoption of alternative strategies to meet both old and new goals. Suddenly, more or less weight may be placed on evaluation criteria, as, for example, animal equity, environmental stability or cost-effectiveness. Under a new political regime, like that set up by Sirosis at Lunar Base Three, what had formerly been viewed as success is seen suddenly as failure, or vice versa.

It is apparent, Madame Speaker, that any policy or project that cannot accommodate political change has little resilience and will not withstand the test of time. The same is true of people, products or even whole industries that are unable to keep up with changing social values. What is needed is greater social resilience. This can be achieved only if a policy, strategy or activity seeks to satisfy a wide variety of goals. In this way, it may still continue to be accepted by a new political order, even if for different reasons.

Madame Speaker, consider the alternative. In 2032 Albania completed its first nuclear fusion power station. The plant had taken eight years to build, at a cost of 28.8 billion credits. There had been considerable opposition against

construction, led by an Ecological Imperative-Jesuit Association Coalition. The then socialist chancellor, Bruno Kratinsky, decided to use this unrest as a platform for re-election. A vote for him was a vote for progress and for nuclear fusion. The power station, it was argued, could supply 28.4 billion kilowatt hours of electricity annually, some 63 percent of Albania's requirements. Its supporters, Kratinsky included, stressed the high cost and unreliability of imported natural gas. Nevertheless, by a 53.8 percent majority, the electorate said no. Nuclear fusion power was then banned by an act of the Albanian Parliament, a decision that could only be reversed by a two-thirds majority of the House. IBM-Bell was left with a power station that was ready to operate, but which could not do so legally. After two more votes, in 2041 and 2053, the company gave up and demolished the plant. Even demolition was costly, since there were few buyers for parts. Resilience, Madame Speaker, implies widespread acceptance by a diversity of pressure groups. What is needed for survival is consensus.

Mr. David Disraeli (Advocates of the Quantum Leap)

Madame Speaker, "there was much of the beautiful, much of the wanton, much of the bizarre, something of the terrible, and a little of that which might have excited disgust." Whilst an apt sketch of this Assembly, these words were in fact written by Edgar Allen Poe to describe a masquerade party, at which the rich and powerful amused themselves, whilst outside, the plague devastated their land.

The Advocates of the Quantum Leap do not seek to avoid reality by masquerading as intellectuals in a virtual reality assembly. We champion change. We seek disaster. We hope for catastrophes that undermine the superstructure of society. Only then will we see The Revolution. If we, the Advocates of the Quantum Leap cannot move Heaven, we will raise Hell.

Who, Madame Speaker, is afraid of change? Who strives for stability? Why those who benefit most from maintaining the *status quo*. Who reaches out to embrace change? Those with nothing to lose, the disillusioned and the disenfranchised. In Poe's macabre tale, on the stroke of midnight, Reality, a figure dressed as the Red Death, appears and soon lays the revellers low. It is nearly midnight, Madame Speaker; Bill C-39, born of the terror of those who have for those who have not, can't stop the clock. Isn't that its first peal?

Ms. Sylvia Malver (Alien Channellers' Association)

Madame Speaker, Mr. Disraeli has proven once again that it is easier to be critical than correct. How can the Advocates of the Quantum Leap, who are all

blind in one eye and who can't see out of the other, have a vision of the future? This government is correct. Bill C-39 is a major forward step. Human history is littered with examples of lack of resilience, of those willing to gamble with their destinies. It seems that every age gives birth to its own unique folly; that is to some scheme, project or fantasy into which it illogically plunges in search of excitement, or spurious economic gain. Failing this, it is goaded into tragedy by its religious or political extremists. Consider the Mississippi Scheme, the South Sea Bubble, Tulipomania, the Crusades, the Martian Settlements and, most recently, the Voyageur Franchises.

An individual can lose control in many ways. To the addict, the need for food, drink, drugs, cortical manipulation or cybersex are no longer controlled, but controlling. Addiction is above all a loss of power over the trivial. Madame Speaker, consider the enormous problems formerly caused by tobacco addiction. While nicotine, an alkaloid poison, was the addictive element in cigarette and cigar smoke, it contained 3000 other components, many of which caused ill health. Carbon monoxide damaged artery walls, encouraging cholesterol deposition and heart disease. Hydrogen cyanide and nitrogen oxide adversely affected respiratory airways, and promoted emphysema. Carcinogens in tobacco smoke led to lung cancer. So they died; 200 million premature deaths by the year 2000. This year, there will be few, if any, smoking-related deaths. Madame Speaker, I salute the Tobacco Blight Conspirators and demand a review of their inhumane sentences.

Mr. Mason Skarzynski (Lunar Base One)

Madame Speaker, several years ago, two friends and I took a four-day R and R break at the Lucerne Virtuocean. Step-diving was fun until I began to explore on my own. If I'd have been paying more attention, I'd have noticed the schools of small fish, breaking the water's surface, driven upwards by a large predator, but I didn't. Suddenly, there was a muffled roar and I felt a crushing pressure across by back and chest. I was in a vice and my ribs began to pop and snap. Through the bloody water I caught a glimpse of a huge pectoral fin, followed by a silvery-grey tail some six metres behind it. My lungs were punctured, muscles shredded and nerves severed. Looking down, into a cavity in my chest, I could see my own heart, liver and intestines.

Madame Speaker, that day I learned the true meaning of fear. How did I respond? I was paralysed, I did nothing. I couldn't think. I couldn't react. Fortunately, the Great White disliked my taste and contemptuously spat me out. Free, but badly hurt, I floated on the ocean's surface, one small rejected link in the ocean's food chain. Just before I died of fright, our instructor pressed her arch

button. My two friends, of course, had a good laugh at my expense and we all went for beer and Snibbles.

Madame Speaker, in my dreams during the dark of the quiet Lunar night, I still feel the pressure of those enormous jaws. Apparently, so my instructor informed me, I had suffered from passive panic, an inability to act when action was essential. Bill C-39 is power without vision. It is passive panic as legislation. What we have here is a government dedicated to maintaining the *status quo*. How can consensus be achieved? The Academico-Capitalists, the Alien Channellers and the Diffusionists couldn't even agree on the date.

Madame Speaker, this legislation revives many outmoded, tired ideas. It smells of public participation and getting-to-yes. Social resilience stinks of consultation and compromise. Whenever I hear the word consensus, I reach for my stungun.

Ms. Anna Brye (Searchers for Self-Sufficiency)

Madame Speaker, the opposition treats the Government's exciting new ideas the same way the human body reacts to foreign proteins: with rejection. Robert Burns was right when he wrote "The best-laid schemes o'mice an' men Gang aft a-gley." All too often, the unpredictable derails our great expectations. This point can be made more scientifically. Assume A is dependent on B for the performance of action N, if goal X is to be achieved. If there is one chance in two that B will fail to perform N, then the probability of A achieving her goal X is 50 percent. If A, however, must rely not only on B, but also on C, D and E to achieve her goal, and if there is a probability of only 50 percent that each will perform as expected, then A's chance of success is only 0.5 x 0.5 x 0.5 x 0.5. That is, she has a probability of 0.0625; or slightly more than 6 chances in 100 of realistically reaching her goal.

Madame Speaker, this is why, regardless of Alien Channeller propaganda, the more dependent we are on uncontrollable external factors, the greater our vulnerability. Self-sufficiency has its own rewards, not the least of which is freedom from the necessity to rely on others. Spondman, in his book *Simplespeak*, argued at length that the sheer number of such dependency-relationships guarantees the failure of most government policies. There is always some lobby, or some environmental variable, that fails to perform as anticipated. Advocates of the Quantum Leap, Academico-Capitalists, Animal Mind-Melders, cybersex fanatics, the Android Protection League, Diffusionists, or some other special interest group, upon which the policy depends, undermines it, so ensuring its failure. All I hear from the opposition benches is the chant "we don't have any solutions, but we really admire your problems." Deltaglobe needs the passage of Bill C-39.

Mr. Han Peng Lee (YRWEHERE?)

Madame Speaker, there are two types of people who will never amount to much. Those who cannot do what they are told, like the Tobacco Blight Conspirators, and the ones who, like the Government back-benchers, can do nothing else. This legislation plasters together the true and the false to produce the not quite plausible. Resilience, so we are told, requires control over external variables. Interestingly, sitting on the Government benches, yet so far abstaining from the debate, is a scientist with a great deal of experience in attempting to control external variables. I speak, of course, of the Honourable Member for the Friends of the Solar System who, as you will recall, is the former director of the Planetary Defence Project. Under Professor Rainer Verhasselt's guidance, that organization tracked asteroids whose paths brought them close to Earth.

Planetary Assassins 1, 2, and 3 were the first such earth-crossers to be mapped and deep drilled by unmanned probes. Despite the fact that these asteroids had missed the planet on countless orbits, they were targeted for destruction. Madame Speaker, as you may recall, a faulty direction blast deflector allowed debris from Assassin 3 to strike the earth, costing us Dusseldorf and Tula; but for the Moon's fortuitous position, damage would have been far worse.

Every new venture goes through six stages; enthusiasm, complication, disillusionment, the search for the guilty, the punishment of the innocent and the decoration and promotion of those most responsible for the failure. After the Planetary Defence Project fiasco, Professor Verhasselt was put in charge of the International Ballistic Missile Defence Office. Quite a promotion. Too bad the inhabitants of Dusseldorf and Tula weren't around to applaud it. So much for controlling external variables.

Mr. Randy Hoon (Academico-Capitalists)

Madame Speaker, success is often achieved by ensuring that failure occurs on time. Nobody understood the significance of deliberate breakdown better than Henry Ford, the patron saint of efficiency. The Model T Ford was not designed to run for ever. Ford knew it would be foolish to squander money on indestructible parts, so he commissioned a survey of American scrap yards. His inspectors reported back that they had found Model Ts abandoned for almost every type of major failure: breaks, transmissions, pistons, axles—all could and did break down. There was, however, one notable exception, the kingpins in every junked car were still in nearly perfect shape, with years of life left in them.

What did Henry Ford do? Did he demand his engineers upgrade all other parts of the Model T? No, of course not. Ford didn't waste time with interchangeability, redundancy and other buzz words, near and dear to the hearts of Dr. Banks and this regulation-mad administration. No, he correctly concluded that his kingpins were far too good for the job and ordered that, in future, they should be manufactured to inferior specifications. If you want to make a zipship that the masses can afford, build one in which all components are Model T quality. If you are building for the élite, upgrade to Rolls-Royce or Hadrian Sherrington standards, but be prepared to pay through the nose.

Madame Speaker, the key is to ensure consistent quality throughout the system. Bill C-39 will lead to the production of hybrids, with the worst qualities of both. The so-called resilient zipship will still be discarded when its poorest components wear out and the time and money spent on any superior parts will have been wasted. Ford would have been too tough to make this error; an engineer yes, but never too civil.

Mr. Shawn O'Brien (Microhard)

Madame Speaker, nature, through natural selection, favours the levelling of quality. Unlike Henry Ford, however, it promotes it in two directions, upwards and downwards. Aging and death are the unfortunate consequences of this balancing act. We are all descended from a long tradition of young ancestors, whose genes were designed to ensure reproductive vitality, but which made no provision for health in old age. Wellness in youth was necessary for successful reproduction and the survival of the species' DNA. Health in old age was a luxury, similar to the superior kingpins in the early Ford Model Ts. Why, centenarians used to be rarities! Then came nanomedicine, with its atom-by-atom replication of human organs and the rest, as they say, is history. Nanomedicine, however, is just one small branch of nanotechnology, an approach to manufacturing that stresses many of the key elements of resilience, including redundancy, interchangeability and above all, the value of thinking small.

Mr. Merlot Ashini (Neoluddites)

Madame Speaker, nothing is more terrible than active ignorance. Bill C-39 continues a long tradition of the bureaucratic erosion of individual rights, which started in the early 1970s with the introduction of environmental impact statements. Unfortunately this trend picked up momentum with mandatory energy analysis, health consequence prediction and political correctness reviews. Today, academic and bureaucratic genius has introduced us to the resiliency overview.

Madame Speaker, Tanzanians say bureaucracy is like God, all seeing and omnipresent. Strict adherence to Bill C-39 will lead to social catatonia. Nothing will be gained, because nothing will be ventured. Bureaucracy, the domination of the faceless, will become the worst form of dictatorship. The Neoluddites reject neurosocial networks and demand the right to make our own decisions. This technology is just a way of organizing the universe so that humankind doesn't have to experience it.

Mr. Lee Li (New Dawn)

Madame Speaker, thrift was once recognized as a virtue, now it's too often portrayed as a vice. True, during the 2070s, inflation and depressed interest rates brought prosperity to borrowers who repaid their debts with devalued credits. Authors, such as Peter Cheng, Moonwalk Hutt and Amos Turgeon, claimed that large scale borrowing paved the way to financial security. Their position was that inflation would inevitably drive up the value of floater homes, antiques, land and other commodities, while ensuring loan repayments with debased credits. Cheng, Hutt, Turgeon and other Devaluists urged their followers to design investment strategies around anticipated low interest and high inflation rates. In Turgeon's 2076 CD-cortab *You Too Can Make Trillions*, you will find this claim:

> *. . . political parties of every stripe have taken the path of least resistance—the issuing of additional credits. Every year they spend more than they bring in through taxation and then bridge the gap by issuing additional credits. The end result of this sleight of hand is that each credit buys a little less. I see no possibility that this process will end, indeed it will accelerate, and if the history of the solar system is any guide, the rate of inflation will increase somewhere over 25 percent per annum by 2085. At the same time, this 25 percent inflation rate will, without doubt, be accompanied by a 30 to 40 percent rise in the value of works of art, zipperjuice and ladrimium, so that their judicious purchasers will, without question, do well financially in the next few years.*

Madame Speaker, one can lose more than credits playing leapfrog with a unicorn. In 2083, the Galaxy Bank decided to dampen inflation by tightening monetary supply. Throughout the solar system, inflation gave way to stagcession. As for Turgeon's high art, zipperjuice and ladrimium profits, the Sotheby-Microsofter Index stood at 1237 on August 2 2085, as compared to 1893 on the same day, four years earlier. It is not my purpose, Madame Speaker, to argue that art, zipperjuice and ladrimium are poor investments. Rather, it is to point out that in a constantly

changing solar system, policy at every level, including the personal, should seek to minimize vulnerability to fluctuations in external variables, over which control cannot be exercised. In the example just cited, since planetary auction houses charge both a buyer's and seller's premium, it would have been a simple matter for a speculator, relying on inflation which did not occur, to lose 40 to 50 percent of their investment by purchasing art and ladrimium in 2080 and reselling it in 2085. Losses, of course, were particularly severe if the credits involved were borrowed at the very high interest rates, prevalent during this period.

Madame Speaker, economists do not have second sight; they are not gods. Indeed, they are just people who work with numbers, but don't have the personalities to become accountants. Economists make mistakes that others generally pay for; but not always. You may recall Turgeon's shooting by a disillusioned disciple. History's message is clear. Freedom is the absence of necessity. The price of resilience is self-reliance.

Mr. Franklin H. Brandeis (Big Zipper)

Madame Speaker, debt lubricates commerce, transferring credits from those who can't to those who can. Benjamin Disraeli borrowed 4 million pounds from the Rothschilds to gain control over the Suez Canal, guaranteeing British dominance of India. Clem Tuddenham financed the First Solar Explorer with credits borrowed from 55,000 symbiocants.

This legislation fills a greatly needed gap. It is a cul-de-sac down which the government wishes to lure new ideas, so that they can be quietly strangled. If Marotzka had just invented the zipship, Rosbone would appear on *Laser Forum Tonight* to denounce its threat to the aircraft and automobile industries. Neurosocial networks would predict social turmoil. Environmentalists would decry the need for increased carbon nitride production. There would be an exposé of the zipship's negative impact on the human id-ego by two or three media-tamed psychosocialists. Then this government would spring into action, banning zipships as a threat to humanity. Madame Speaker, the price of a place in the sun is always a few blisters.

Ms. Indira Ranganathan (Followers of Barracki)

Madame Speaker, Bill C-39 is God's will. It is surely written that:

> *a wise man built his house upon a rock: and the rain descended, and the floods came, and the winds blew, and beat upon that house; and it fell not: for it was founded upon a rock. And a*

> *foolish man built his house upon the sand: and the rain descended and the floods came, and the winds blew, and beat upon that house; and it fell: and great was the fall of it.*

Because it is the will of God, once or twice a century, the winds of change accelerate to hurricane force, sweeping away much of the social infrastructure and littering the intellectual landscape with the debris of obsolete institutions. Consider the rains that descended, the floods that came and winds that blew against the ultimate risk takers, the solar reinsurance industry. Buffeted by hurricanes Andrew, Monica and Zelda, rocked by the Kobe, Seattle and Toyko earthquakes and burned by the Sydney and Geneva fires, it fell: and great was the fall of it. Amen.

Mr. Bukkyo Nyirbu (Fatalists)

Madame Speaker, there are no significant external variables. Even though a man may overcome a "thousand times a thousand others in battle, he who overcomes himself is the greater warrior." It is not what occurs without that matters, but how we respond to it within.

Ms. Mashenka Kushkins (Broken Ecumene)

Madame Speaker, it is not the strongest or the most intelligent species that ultimately survives, but rather the one that is the most adaptable. For 500 generations, humans engaged in the selective sowing, management and harvesting of agricultural crops. Food plants were domesticated and then diffused from eleven centres of origin, on five continents. Within these regions, their wild relatives survived and periodically out-crossed to increase genetic diversity in the world's food crops. Environmental selection slowly led to diversification of numerous folk varieties, each of which was specifically adapted to local conditions, developing great tolerance to the area's diseases and pests. They also displayed adaptation to droughts, frosts, short growing seasons and other peculiarities of the region involved. Farmers often selected several folk varieties to grow in one field. Since each responded differently to pests and to the weather, this diversity buffered the culture against catastrophe. In Jamaica, for example, as many as 22 were typically grown in a single field.

Then came the Green Revolution. Plant breeders set out to increase the yields of crops by hybridization. Genetic engineers produced plants with high germination rates, uniform ripening and suitability for machine harvesting, with specific and constant demands for space, nutrients and water. These hybrids swamped traditional crop varieties. Monoculture had a rapid, dramatic adverse effect on the genetic pool. In the western deserts of the United States, a hybrid

Russian variety genetically exterminated Hopi Indian dye sunflowers, which had grown there for centuries. Old varieties of the Turkish wheat were wiped out by Mexican hybrids, while in Europe three-quarters of all traditional crops were lost by the end of the twentieth century. These genetic resources, Madame Speaker, were irreplaceable. With their loss, went hundreds, and in some cases thousands of years of evolutionary development of genes having beneficial characteristics, such as greater disease resistance and better taste. Madame Speaker, a few farsighted organizations fought to preserve this heritage. The U.S. National Seed Storage Laboratory, for one, collected germplasm from over 1200 food plant species. Impressive, perhaps, but over 20,000 species had been cultivated in North America in the twentieth century alone.

Monocropping was initially profitable. But it increased nutrient loss from leaching, promoted soil erosion and susceptibility to the weather and to infection. Then, Madame Speaker, came the blights. Potato, tobacco, grapes, rice and wheat were devastated over a large part of the globe. A lack of diversity led to an absence of resilience, which in turn fuelled the Great Dying. Madame Speaker, having all of one's eggs in a single basket maximizes risk and minimizes the chance of long-term survival. In agriculture, as in life, the only thing you can be sure of it that you can't be sure of anything.

Mr. Russell Kauffman (Alien Genome Project)

Madame Speaker, I'm frequently asked "Does the Government stifle its back-benchers?" The truth is, it doesn't stifle enough of them. Why not? All they've done in this debate is to use the mistakes of the past as excuses for avoiding the future.

Human activities have caused extinctions and the loss of genes of some traditional crops. But, Madame Speaker, so what? It doesn't really matter. Twentieth century kids wore designer jeans, now our kids are designer genes. Natural selection is obsolete and the solar system teems with man-made life. Who hasn't eaten cactiwheat pancakes or had bacoeggs for breakfast?

Mr. Isaac Panati (The Edge)

Madame Speaker, the Honourable Member for the Alien Genome Project appears to rely on his memory for his wit and his imagination for his facts. His faith in manufactured lifeforms reminds me of the galactic trader who spliced together parts of the human and donkey genomes. His creations could discuss science, religion, and politics with an Academico-Capitalist but he couldn't find a market. In desperation he asked the Solar Chamber of Commerce for assistance

but received only the following reply. "They'll never sell—nobody likes a smart ass." This point, Madame Speaker, is one the representative of the Alien Genome Project would do well to remember. In reality, life has existed on earth for over 3.6 billion years, without his assistance. During this enormous time span, continents collided, mountain ranges rose up, ice caps formed and shrank, volcanoes erupted and together with biological respiration created the global atmosphere. Yet despite, or perhaps because of, this restlessness, life flourished. From the heavens to the ocean depths, there are some 100 million natural plant and animal species on the planet.

Madame Speaker, extinction always has been the hard core of experience and these surviving species represent only 10 percent of those that once graced the earth. Nevertheless, the solar system is filled with life, primarily because evolution has created endless diversity. DNA has permitted a smorgasbord of alternative life forms, some of which always have been capable of benefiting from change, regardless of its scale or direction. While millions of less adaptable species have fallen by history's wayside, more capable members have inevitably carried the torch of life forward. The evolutionary record, therefore, has enormous implications for decision-making. From the interplanetary to the personal, diversity improves the chance of survival, especially during periods of accelerating change.

Unfortunately, Madame Speaker, as the dodo, moa, great auk, and passenger pigeon mutely testify, this has been a hard lesson to learn. By the twentieth century's end, the earth was losing one species every hour through deforestation, hybridization and pollution. Its citizens threw away information far more valuable than the countless manuscripts destroyed by the burning of the Library of Alexandria. In the extinction of these species we may have lost the long-sought cures for LNY, Zapper's Syndrome, new sources of ionic engine lubricants, vaccines that could immunize people against extraterrestrial pathogens, a source of the genetic materials needed to control the tobacco blight epidemic and perhaps even the key to artificial ladrimium production. Clearly, we must protect what is now left of this storehouse of potential solutions. Indeed, diversity, whether biological, technological or social, represents the ultimate key to our survival. I salute Bill C-39 and the insights it contains.

Ms. Annetta Durrell (Janus)

Madame Speaker, those who can't remember the past are condemned to repeat it. History is full of catastrophes caused, not prevented, by diversity. By 2040 the International Chemical Society had registered some 8 million chemical compounds. Before these could be released on the unsuspecting public they had

to be tested for their cancer causing potential. If standard 500-rat studies of carcinogenicity had been carried out on each of these compounds, it would have taken 4 billion rats and a research budget of $128 trillion credits. Yet, statistically speaking, such 500-rat studies would have been useless. In short, Madame Speaker, it was virtually impossible to test even one of these compounds on rats for carcinogenicity, let alone 8 million. Even if it could have been done, it would have been virtually irrelevant because, in the environment and in the human body, such compounds interact to create new, untested substances; often impacting in myriads of unanticipated ways.

Madame Speaker, since logical testing with rats was transcientific, our scientists abandoned it in favour of the use of bacteria. But people are not rats and are definitely not bacteria. Nevertheless, based on these dubious experiments, 61,000 chemical compounds were eventually ruled acceptable for commercial use. Later, of course, 3,500 of these were found to be capable of inducing cancer. Humanity became its own rats, dying in a huge laboratory experiment.

Then came government incentives to increase the falling birth rate. What a fiasco they were. Unfortunately, every male in this Assembly is less than half the man his grandfather was. BPA and BHA, the so called gender benders, had polluted the drinking water and food supplies. Estrogenic chemicals in female urine, from birth control pills and the fight against osteoporosis, entered river systems and robbed downstream males of their manhood. Semen quality declined and sperm counts dropped. Hermaphrodite births increased and everywhere cybersex began replacing the real thing. Madame Speaker, as you and I both know to our sorrow, the hardest object in the trousers of most males today is a stungun.

Dr. Benjamin Franco (Innovators: Level Three)

Madame Speaker, a wise man thinks twice before saying nothing. I feel, therefore, I must, for once, support this government. In the interpretation of reality there is a persistent, unending competition between the relevant and the acceptable. In this struggle, while a strategic advantage rests with reality, the tactical advantage lies with the acceptable. Such comforting, widely held views, predictably common to all members of a particular group, are known as the conventional wisdom. In this way a “good” Mind-Melder or a “true-blue” Galaxy Bank executive will hold the same viewpoint as all the other members of his or her association. Deviation, in the form of creativity or originality, is seen as moral weakening and as clear evidence of back-sliding. The party line, that is the conventional wisdom, consists of arguments and ideas that are consistent with a particular paradigm. It gives reassurance and it helps to convert others to the true faith, increasing the

status of current disciples. Yes, Madame Speaker, the best disciple or employee is a parrot.

Conventional wisdom then does not describe reality but rather seeks to promote a powerful, special interest group's view of the universe. Yet, the relentless tides of change are the mortal enemies of such orthodoxy. Truth will out, perhaps. Life goes on. The more rapid the change, the quicker the gap widens between such a viewpoint and reality. Conventional ideas first become dated, then obsolete and finally ridiculous. Eventually the distance between fact and fantasy widens into a chasm that catches the attention of some courageous pioneer. Suddenly, this Columbus, Darwin, Einstein or Paterby proclaims, "Look, the Emperor has no clothes." Reality is then redefined and the majority shifts its viewpoint, leaving only the inflexible old guard, stubbornly clinging to their tattered banner of tradition. A new conventional wisdom has become accepted. The ruling paradigm has shifted. Yes, humankind did evolve. Yes, the continents really do drift. Yes, there are extraterrestrials, alien abductions and UFOs. This new version of reality again becomes proclaimed as self-obvious, even by many who have denied it for years. The process of mass self-deception then begins again. At any time, what is widely believed to be true is just a convenience. Social acceptability is not truth.

Madame Speaker, an unwillingness to think has been the cause of most human misery, since it is a diversity of views that is the mother of creativity. Ideas are anything but value free. The widely held belief that scurvy was caused by foul bilge water vapours cost millions their lives, as did the medical establishment's resistance to megavitamin supplements. Just as water flows downhill in channels, logical and scientific thought stimulates only the most receptive neurons, following pathways etched in the brain by the conventional wisdom. We accept ideas, not because they are true, but because they are comfortable. The ruling paradigm is merely an organized way of being wrong with confidence. The greater the ignorance, the greater the dogmatism.

Madame Speaker, in the Pretorian laboratories of the Innovators, random dendrite stimulation with phaser probes has been found to be the key to accelerated creativity. Using this technology, memories are resequenced, the past reworked and endless alternative presents can be generated. Our supporters chose to relive their lives with a variety of parents, genders, nationalities, racial characteristics or educational opportunities. Naturally, such an expanded experience base jolts their neurons, generating a cornucopia of new ideas. Every such alternative is probed, nothing is discounted, since even the apparently wildest idea may eventually lead to a breakthrough. Diversity, therefore, creates both innovation and greater stability, an interesting paradox. Caricature, Madame Speaker, is rough truth, but it has its own rewards.

Ms. Yola Correa (Lunar Base Two)

Madame Speaker, some intellectuals consider consistency to be a character defect. They, of course will be impressed by the Minister of Social Stability. Unless my cortical absorption has malfunctioned, I distinctly remember Mr. Vizena, a scant ten months ago, championing Bill C-18, the passage of which gave us the Genetic Intermingling Act. Didn't he quote statistics proving that the offspring of interracial marriages consistently scored above average on Cortical Index Tests? Hadn't they won far more than their fair share of Olympic decathlon gold medals? Didn't he argue that genetic intermingling would result in a physical and mental superrace? I distinctly recall Mr. Vizena telling this Assembly that:

> *Throughout human history racial differences have led to tensions, conflict and even to genocide. Humans never seem completely happy unless they have some group to look down on and to persecute. Consider the slaughter of the Jews, the Tasmans, the Tutsi and the Croats to name but an unfortunate few. Racial intermingling in our eugenics laboratories will eradicate this tendency toward violent superiority complexes. That is why my government is willing to double the credits paid for raising interracial and transracial infants.*

Madame Speaker, at Second Base I'm considered something of a comic. I don't deserve the reputation, I just watch this government and report the facts.

Ms. Uta Bliss (Twenty-Twenty Vision)

Madame Speaker, the quality of any legislation can be gauged from the calibre of its enemies. The better the bill, the worse the opposition. Judged in this way, Bill C-39 is clearly superior, drawing fire from the scum of the universe.

Why is English the working medium of the solar system? It is the language of diversity, with a 1.5 million word vocabulary. French, its main competitor, kept pure and irrelevant by its supporters, has only 100,000. How did the mother tongue of a small group of islands off the European coast come to dominate the solar system? English's roots can be traced back to a language used in north central Europe until about 2000 BC. Its speakers then migrated westward to Britain and southeastward to India. In Britain, the resulting Celtic language was soon leavened by an infusion from the Angles, Saxon and Jutes, who added agrarian words, such as swine and work, to English. These newcomers were soon followed by the monks of Pope Gregory the Great, who added the Latin and Greek of Christianity. From this source, words like shrine, martyr and relic soon enriched the language. In search of plunder not souls, the Viking invaders then brought Old Norse to Britain and with it terms such as sky and raise.

The successful 1066 Norman Conquest enshrined French as the aristocracy's mother tongue. For several centuries, the islands had three languages: French for lords and ladies, Latin for clergy, and English spoken by commoners. But, Madame Speaker, English eventually prevailed and by the end of the fifteenth century it had engulfed French, enriching itself with 10,000 stolen words in the process. When the printing press granted easy access to the classics, Greek and Latin were overwhelmed and thousands of new Mediterranean terms added to the language.

Madame Speaker, then came the Industrial and Scientific Revolutions. Innovative concepts demanded an expanded vocabulary and words like pneumonia, gravity and skeleton joined the language. Geography flourished and in the explorers' footsteps followed the British army and Christian missionaries. The planet was colonized and from these far flung reaches came words like raccoon, totem and moccasin. Later, the rush to explore the planets brought with it ionic engines, zipships and arch buttons.

The English always have welcomed change. Their language, as a result, now dominates the solar system. English speakers, unlike the French, have never sought to build walls around their mother tongue, rather amoeba-like they have engulfed their competitors. They accept diversity as enrichment, not corruption. *Entre nous*, Madame Speaker, English is full of *joie de vivre*.

Ms. Anna Cazenave (Personae Non Gratae)

Madame Speaker, all living things carry viruses. Threatening any species with extinction also puts these at risk. Such viruses respond by seeking alternative hosts. As humans destroyed the tropical savannas and rainforests, their endemic viruses sought greener pastures; migrating in waves through our population. Their names, HIV, Lassa, Junin, Crimea-Congo, Ebola Zaire were synonymous with despair. Madame Speaker, before the conflict between humankind and its birth planet was over, 108 previously unknown viral diseases had descended like the plagues of Ancient Egypt. Then came the extraterrestrial prions. Is this the diversity sought by our current government?

Mr. Philip Rosensweig (The Edge)

Madame Speaker, nobody denies emergent viruses and extraterrestrial prions, especially those resilient enough to mutate rapidly, caused havoc during the Great Dying. Yet today, anyone can gain lifelong immunity to them all by eating at a vaccibar. Every child gets protection from HIV and Ebola Zaire, just by eating a banana, and is sheltered from Monkeypox and Crimean-Congo viruses by drinking orange juice. Why, Madame Speaker, this government protects the entire known

universe from most infectious disease, simply by growing virus-replicating and prion engulfing plants in a few greenhouses in Kuwait. In this Assembly, as always, the struggle is not between the Earth and other planets, or between Reality and Virtuality, but rather between government truth and opposition propaganda. One dog barks at something. The rest bark at him.

Mr. James Wharton (Unlimited Horizons)

Madame Speaker, experience is what we call our mistakes. In the Spring of 2049, I learned the true value of redundancy the hard way. Young and green, I worked as a test pilot for Boeing-Microharder in Seattle. For over two years our economists had been trying to get FAA permission for an anti-gravity stratocruiser with three piezoelectric retrojets. "No dice," said the FAA, "six retrojets, or no permit to construct and fly." Our lawyers thought these demands were excessive and wanted a legal challenge, but management didn't need the poor publicity, so six retrojets it was.

Madame Speaker, the weather was perfect in Seattle over April 8, 2049, not a cloud in the sky. The A-GST 937 prototype reached 15,000 metres in seven seconds and I levelled her off for the 12 minute flight to New York. Although I didn't realize it until later, at exactly that moment, Mount Baker blew. Thirty-five cubic kilometres of pulverized volcano filled the stratosphere and I flew the A-GST 937 right through the thick of it. My first inkling of trouble was the green sparks of static electricity on the viewshield. A red light began flashing on the computsol. Hal calmly announced failure of retrojet 2. A second red light, another wake-up call from Hal. I'd lost number 5. The computsol started to look like a Christmas tree, five retrojet malfunctions.

Madame Speaker, that damn controlputer wasn't sweating, but I was. Anti-gravity stratocruisers didn't just crash. They tried to burrow their way to a planet's core, accelerating until they vaporized. Fortunately, courtesy of the FAA, I still had a sixth and last retrojet. Eight minutes later, watching that expensive redundancy's indicator light all the way, I'd limped into Calgary. Madame Speaker, I sent the FAA a letter of apology and a thank you card. Ignorance may be bliss, but not if you're designing A-GST 937s.

Mr. Takeshi Hirayati (Inner Light)

Madame Speaker, in debate a half truth, like a half brick, often carries the farthest. Yet, redundancy as the key to survival isn't even a half truth. Consider the history of the Earth's fisheries. At the end of the twentieth century, few things were more redundant than fishing boats, using sonar, satellites and spotter planes they

strip-mined the ocean's commercial species. Stocks of plaice, cod, haddock and salmon rapidly declined, depriving humankind of important sources of animal protein.

Drastic change was inevitable. At the International Oceanic Resources Conference, held in Tokyo in 2018, the Earth's continental shelf was subdivided into 1850 fish ranches. Hatcheries were expanded and traditional fishing grounds restocked with fry. Widespread sea urchin and starfish weeding increased the food available for fish. Today, fishing boats are found only in museums, as herding communities migrate across the ocean floors, tending their stocks like shepherds of old. Madame Speaker, in the fishing industry, the reduction of redundancy marked the start, not the end, of a golden age. Many people, unfortunately, confuse bad management with destiny. It could be, of course, that they have been paying too much attention to this government.

Mr. Roger Fitzgerald (Searchers for Self-Sufficiency)

Madame Speaker, as the opposition has so clearly demonstrated, behind each and every argument lies someone's ignorance. Of course humankind needs to plan for greater resilience. In any successful system a failing component must be replaced. An artistic understudy, waiting fretting in the wings for the star's unexpected illness and an ionic engine's multiple generator filaments both illustrate this principle. So too does plan B, the escape hatch if plan A fails.

Madame Speaker, the value of redundancy is demonstrated throughout the lifesphere. Soon after birth, for example, a female kangaroo carries its young in its abdominal pouch, suckling it there for six months. If, during this time, she is pursued by predators, to increase her speed and chances of survival the would-be mother casts her too heavy offspring aside. If she escapes, the female kangaroo then immediately releases an already fertile egg, kept on standby in her body, using it to replace the discarded offspring. Female kangaroos, like monarchs of old, know the value of a spare heir.

Sharks, Madame Speaker, live to eat and eat to live. To them, the universe consists of teeth. These are set in parallel rows and if one breaks off during an attack, another quickly moves forward to replace it. In this way, the shark always bites with the utmost authority. Which, of course, is more than can be said about the opposition.

Dr. Lizzie Montarg (Daughters of the Revolution)

Madame Speaker, nature, we are told, encourages redundancy as a survival technique. In the summer of 2042 I was a young psychozoologist, studying the

Arctic lemming for my doctoral dissertation. This small furry rodent lives in extensive warrens and feeds on the local vegetation. It is sexually prolific and produces several broods a year, each of which contains about five young. Simple arithmetic indicates that a mating pair can, with ease, produce 20 or 30 offspring annually. This type of fertility puts Malthus to shame and, of course, leads to the redundancy so promoted by this government.

Periodically, as such overpopulation causes local food scarcities, thousands of lemmings band together and, like a large male army, march in search of greener pastures. Together they swarm downslope, swimming all rivers and lakes in their path. Eventually and inevitably they reach the ocean. Mindlessly they plunge into it, swimming until exhausted, reminiscent of the mass suicides of the Sons of Noah. This, Madame Speaker, is how nature deals with redundancy, with contempt, utter contempt. The same emotion I feel for this government.

Mr. Amgad S. Al-Ghussain (Kaizen)

Madame Speaker, humankind needs Bill C-39. We share the solar system with about 4,000 quintillion (4×10^{33}) other living things, most of which seek to ensure their survival by prolific reproduction. A single American ragweed can produce eight billion pollen grains in less than half a day, while the earth's largest blooming plant, the giant Chinese Wisteria of Sierra Madre, California, typically produces 2,500,000 flowers each year. In 1889, a swarm of locusts covering over 5,000 square kilometres was recorded crossing the Red Sea, containing about 250 billion insects and weighing some 500,000 tons. Madame Speaker, in nature, with the rare expectation of a few suicidal species such as lemmings and the opposition, nothing succeeds like excess.

Ms. Annie Sprague (Alien Genome Project)

Madame Speaker, for this government, the art of legislating is the creation of satisfaction through deceit. This government has a hidden agenda. Redundancy is power. In Pre-nanorevolution days, life was little more than a game of Monopoly, in which position in the job hierarchy measured level of success. Strangely enough, there were always the unemployed. Capitalist economists decried full employment, deliberately manipulating money supply and interest rates to create a pool of jobless. This army of unemployed was designed to be small enough so it wouldn't trigger a recession, but large enough to depress the cost of labour. Redundancy, in the form of unemployment, kept the unions in their place and guaranteed excessive gains for robber barons. Any Oliver Twist, asking for more, could so easily be replaced.

Madame Speaker, the understudy in the wings guarantees the opera's performance. She also plays a more subtle role, signalling to the prima donna that her demands cannot be too excessive. The understudy's subliminal message is that the show can go on without its star. Of course, this is the same tune hummed by the reserve on the gladiator's bench, or the locum hovering around the doctor's waiting room. Nobody, so they signal, is indispensable. Madame Speaker, redundancy is at least as much about power as it is about risk and this government knows it. Bill C-39 gives off the sweet smell of corruption, masked only in part by the flowery perfume of public concern.

Mr. Vladimir Vedenkin (The Edge)

Madame Speaker, over many years, I have developed my own rule of thumb for predicting the true cost of proposed megaprojects. It was developed by studying the construction of Extraterrestrial Contact Probes Four, Five and Six; Thermonuclear Generating Plants, Two and Three, the Planetary Defence Project and many other engineering pipe dreams. ET Contact Probe Four, when first proposed in 2061 was expected to cost 53 billion credits. It actually cost 198 billion. Thermonuclear Three came in at four times its original estimates, while overruns on Cherry Tree, Shanghai International, and the McLacklan and the Saturn mining projects have been in excess of 500 per cent.

Madame Speaker, benefit-cost analysis is just an impressive way of substituting simple and, therefore, false abstractions for the complexities of reality. I have a far quicker and more accurate way of doing this. When estimating the cost of technological progress, I multiply the initial figures, quoted by the economists, by 2.8 and divide the expected benefits by a similar number. Crude though it is, this method provides an infinitely more realistic final figure than agency reports.

Madame Speaker, economists and engineers are so addicted to cost underestimation that they can't tell the truth without lying. Why do they inevitably mislead us on predicted benefits and costs? True, the solar system changes unpredictably and there are hard to measure externalities and intangibles, but the real truth is corruption, pure and simple corruption. They have a vested interest in project acceptance, so they underestimate costs and overestimate benefits. Naturally, they stack the deck with finesse, using intellectual sleight of data. All that needs to be done is to use unrealistically low interest rates to calculate costs. Cheap credits equal favourable economic assessment. Extraterrestrial Contact Probe Five assumed a 2.8 percent interest rate, Shanghai International 2.9 percent. Who, in the real world, provides such low cost, long term financing? Currently, the prime rate is 9.3 percent, while the 20 year mean has been 10.6 percent. Using either of these

figures, there would have been no thermonuclear construction and no extraterrestrial probes. Madame Speaker, this is why Bill C-39 mandates the use of the 20 year mean prime rate for megaproject assessment. No more of this shooting first and then declaring whatever you hit, the target.

Ms. Katherine Rodriguez (Big Zipper)

Madame Speaker, it is better to have lived one day as a tiger than a thousand years as a sheep. Without economic risk-taking there would be no heroics and very little worthwhile history. Did St. Paul's Cathedral have a positive benefit-cost ratio? Who knows? More significantly, who cares? Nothing great can ever be achieved without risk. The breakthroughs, the discoveries and inventions that change countless lives forever, have never come from committees, panels, or from neurosocial networks. Nor will they come from the sheep that wrote and now promote Bill C-39.

Yes, Madame Speaker, some great adventures cost more than our initial estimates. Unexpected problems crop up and must be solved, so prices rise. So what? Nothing ventured, nothing gained. From cradle to grave, this government seeks to protect us from the unexpected that adds spice to life. This desire to create a risk-free environment is indicative of terminal decadence. It implies we have given up the quest, that we no longer have faith in ourselves or our destiny. We have ceased to want to progress and have lost our desire for greatness. The pathological need to keep our credits safe, to avoid all but riskless economics, so evident in Bill C-39, is symbolic of this government's desire to lead from the rear. It wants humanity to retire from history to pet itself. Let the meek inherit the earth. Those of us with vision want to go to the stars.

Dr. Aldous Cousin (Enigmatic Continuum)

Madame Speaker, there are many paths to the mountain's summit but the view is always the same: the few exploiting the many. The élite get the mine and the rest of us get the shaft. The biggest weakness of economics is not its inability to predict accurately, but rather its lack of compassion. Where is its appreciation of equity, of the need for fairness to all in the distribution of benefits and costs?

It is a big mistake to expect the marketplace to look after the common good. Markets only allocate resources in the short-term. They do not establish how much is enough, or how to achieve justice or integrity. Markets are meant to be efficient, not sufficient; greedy not fair. If they do a favour to horses or to mountains or to Immortalists or to your grandchildren, it's purely coincidental.

Madame Speaker, for centuries our economists have promoted the ideology of the cancer cell, unlimited growth. The effects have been identical, the ultimate collapse of the system. Where did the benefits of all this growth go? Not to Tasmans, liquidated during Australia's settlement; nor to North America's First Nations' people slaughtered or herded onto reservations on the least productive land. Did the profits go to Blacks, who slaved away on tropical plantations, or to children in Asian sweatshops, or to the early ring miners of Saturn? Hardly, Madame Speaker, hardly. All humans are equal, but some are more equal than others.

Mr. Theodor Liebkecht (Academico-Capitalists)

Madame Speaker, the belief that we are all equals is a mischievous myth. Do we have the same level of intelligence, resourcefulness, willingness to work and take risks, education or creativity? No, so where is the equality? Pythagoras was fond of saying that life resembles the Olympic games: a few dedicated athletes train for years, excel in competition and carry off the medals; others bring trinkets to sell to the crowd, while many more just sit in the stands enjoying the activities. He was right; there are three types of people in the solar system, those that make things happen, those that watch things happen and those who have no idea anything has happened.

Madame Speaker, why does Bill C-39 decree economic equity? Does everybody really deserve the same rewards? The vineyard labourers that worked through the heat of the day should have been paid more than those hired at the eleventh hour. They produced more, they deserved more. What next Madame Speaker, android equity, or equality for rocks?

Mr. Mao Zhisui (Labyrinth)

Madame Speaker, if you want to double your credits, the safest way to do it is to fold them once and put them into your docusave file. Look at the misfortunes of the financial supporters of the Martian Atmospheric Conversion Project or Extraterrestrial Contact Probe Five or the Amazonian Pipeline. Such megaprojects demand all or nothing. The atmosphere on Mars is either fit to breathe or it's not. You can't launch half a probe and every pipeline must be long enough to link source to market. Once you begin to invest in such megaprojects, you must either continue until the bitter end, or lose everything that's already been committed. Talk about strip poker. But reality changes, markets disappear as society alters. The faster things change, the more necessary it is to get an early return on your investment. Nobody's IOU's are as good as their credits.

Do some megaprojects collapse, half-built for lack of funding? Of course they do. Look at Waxahachie's famous hole-in-the-ground, 24 kilometres of very expensive tunnel, now producing mushrooms. It was supposed to be a superconducting, supercollider, an atom basher-smasher, until the U.S. Senate cut its funds, way back in 1993. Contrast that with this government's Superinsulation Project, which began making savings on day one, with the retrofitting of the first floater home. Madame Speaker, remember this: it's not hard to meet expenses. They're everywhere, especially if you're investing in a megaproject.

Ms. Lisa Monzon (Wired Democracy)

Madame Speaker, the last three government members are to be congratulated. They have just plunged into a sea of platitudes and with the powerful breast strokes of seasoned Channel swimmers, made their way confidently towards the white cliffs of the obvious. So it's better to have a high benefit-cost ratio than a low one. I can hardly believe it. Big projects take longer to build than small ones and cost more. Good heavens, I've not been this surprised since I found out the Pope was Catholic. If a development's only financial backer pulls out, it collapses. It probably took a room full of bureaucrats a year to work that out.

Madame Speaker, every step forward is made at the cost of mental and physical pain to someone. If our ancestors had been dazzled by the mediocre philosophy put forward in Bill C-39, Columbus would have made short day trips from the Spanish coast. We'd still be singing about the moon, not building on it. Worse than that, we'd be sitting around our small mud huts, worrying whether constructing a larger communal one was too financially risky. This, Madame Speaker, is a no venture, no gain government, paralysed by the fear of making mistakes. Life may not be quite the party we expected, but while we're here we should at least dance a little.

Ms. Patricia McElray (Twenty-Twenty Vision)

Madame Speaker, the opposition is full of philosophers who seek to interpret the solar system when what is needed is its improvement. It is bad enough that some individuals are still ignorant, for that cuts them off from the commerce of others' minds. It is worse to be poor, perhaps, for this is a life sentence to scrimping and saving, with no time to dream and no respite from hunger and weariness. But what is surely worse is to be mentally ill, for this prevents any realistic attempt to overcome either ignorance or poverty.

Madame Speaker, there is still too much mental illness in the solar system, most of it a reflection of historical environmental destruction, designed to foster

industrial growth and bring the milieu under rigid control. For three centuries and more, expansion, construction, deforestation, quantification, manipulation, and profits were the criteria used to measure human progress. Success was a rising GNP. The Exxon Valdez spread oil on pristine Alaskan beaches. Cleanup activities created jobs and pushed up the GNP. Crime was rampant in the streets. More police, lawyers and prison guards were needed and the GNP rose again. The family was disintegrating, resulting in more work for divorce counsellors and the legal profession, forcing up the GNP. In the interest of what was thought to be an improving economy, our ancestors tolerated no organic or social function unless it provided profits. Slowly, painfully, we have recognized the error of our ways. Bill C-39, with its emphasis on minimizing environmental impacts by forcing industry to recycle its wastes and to use even renewable resources with care, takes us a further step forward towards a more resilient closed system, which does not poison all life forms with its wastes. Madame Speaker, this bill has generated a great deal of heat. Who cares? I like to get into hot water. It keeps my conscience clean.

Mr. James Thompson (Piranha)

Madame Speaker, Bill C-39 is hysteria masquerading as science. It mandates that manufacturers must use only renewable resources, or the waste products of other industries.

This is environmentalism at its worst. It is an attack on the business establishment, since it will undermine its foundations. It is an attack on scientific and technological progress, since it will inhibit many types of research and development. It is an attack on the American Confederation of States, the Asiatic League, the European Confederation of Independent Countries and the Galaxy Trade Consortium, since they are the centres of industrial production. And most of all, it is an attack on humankind itself, since it sees us as enemies of the solar system, damaging the natural environment of every planet we choose to develop.

Madame Speaker, who are these environmentalists? They are a hard-core, left wing cult of repressed romantics, pleading for a return to the time when you could breathe the air without a filter, drink water directly from springs and lakes or sit in the sunlight. They are the sons and daughters of people who have achieved absolute material security. In families that have at least some generational recollection of hard times, that are aware economic plenty is not a birthright, the support for environmental élitism is much less common. These environmentalists support Bill C-39 because it puts sand into the gears of commerce. They support it because they believe that nature is more important than profit and, therefore, demand a radical reappraisal of our technological goals and their consequences. You can't

outrun an environmentalist to the left. They're always ahead of you, demanding more. If they have their way, you'll need a permit to go to the bathroom. Madame Speaker, in reality what is the environment? It's only the space between my floater mansion and my zipship.

Mr. Gregory Kew (Followers of Barracki)

Madame Speaker, Bill C-39 is surely God's will. It is time to repent, for it is written:

> *If my people, which are called by my name, shall humble themselves, and pray, and seek my face, and turn from their wicked ways; then I will hear from heaven, and will forgive their sin, and heal their land.*

It is the will of God that humankind and nature are as one, for surely it is written:

> *For that which befalleth the sons of man befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea; they have all one breath; so that a man hath no preeminence above a beast: for all is vanity. All go unto one place; all are of the dust, and all turn to dust again.*

As the solar system declines, so too must our health. All life is destined to share its suffering. If the limb of the tree of knowledge is cut off, the ladder of life will surely fall. Amen.

Ms. Setting Sun Bigman (PowWow)

Madame Speaker, I've always found the major problem with born again religious fanatics, such as the Followers of Barracki, is that the second time around they're twice as much pain. But I digress, my main point is this. In her Whitepaper, Dr. Claire Banks argues that we need greater resilience because, and I quote, "The universe is not only queerer than we imagine, but queerer than we can imagine." My challenge to Dr. Banks and to her fellow neuromodellers is simply this, prove it Dr. Banks, prove it.

Ms. Susan Mezey (Kaizen)

Madame Speaker, the year is 1984. The world consists of three immense power blocs. Oceania is, and always has been, at war with Eurasia, and is allied to Eastasia. It is the sixth day of Hate Week. There have been processions, speeches,

demonstrations, songs, banners, posters, films, bands, the tramp of marching feet, the grinding of tanks, the booming of guns and the roar of massed planes. Oceania is in a delirium, which is to reach its climax in the public hanging of 2,000 Eurasian war-criminals. With thousands of others, Winston Smith is attending a rally in a central London square. On the scarlet-draped platform, an orator of the Inner Party is describing the propaganda, torture of prisoners, lootings, rapings and broken treaties that are the hallmark of Eurasia. Every few moments, the voice of the speaker is drowned by the fury of the crowd. The oration has been in progress for some 20 minutes when a messenger delivers a scrap of paper to the speaker. He reads it without pausing. Nothing alters but the names. Without a word being said, understanding grips the crowd. Oceania is at war with Eastasia, not Eurasia. The banners and posters that decorate the square and decry Oceania's new ally Eurasia are immediately torn to shreds and trampled underfoot. The Hate continues. Only the target has changed. After the rally Winston goes straight to the Ministry of Truth, as do the rest of its staff. Oceania is at war with Eastasia, as it always has been. A large proportion of the political literature of the past is, therefore, obsolete. Reports, record, newspaper, films and photographs have to be rectified. In one week no reference to the war with Eurasia, or the alliance with Eastasia must remain in existence, anywhere.

Of course, Orwell's vision was not completely correct. Yet it has obvious parallels with the current shifting alliances between the Galaxy Trade Consortium, the American Confederation of States and Lunar Base Three. What the novelist clearly grasped was the increasing compression of time, characteristic of our bio-electronic solar system. Time is the furnace in which we burn and it is this acceleration of events that makes our ability to react rapidly so critical. Bill C-39 seeks to both slow down the rate of unnecessary change, while simultaneously improving our ability to respond quickly to flux we cannot control. In the final analysis, Madame Speaker, the tortoise learns more about the road than does the hare.

Dr. Xernia Polinski (Searchers for Self-Sufficiency)

Madame Speaker, time is the greatest of all teachers, but unfortunately it kills every one of its pupils. Many years ago I shared a compartment on a bullet train speeding between Perm and Novosibirsk with a human derelict. Her face was sunken and sallow, teeth blackened with decay and clothes threadbare. All her worldly possessions seemed to be stuffed into the potato sack that she rested on her knees. Her eyes were glazed and deadened, either from liquor or LPN. She was, so I thought, one more sad victim of trickle-down economics, a piece of human flotsam and jetsam swept along helplessly by the currents of social history. Her

stench permeated the compartment, but the train was packed and I had no opportunity to escape her companionship. Suddenly an android conductor shouldered his way into the compartment and demanded to see everybody's tickets. All eyes focused on the apparently comatose wreck, expecting some incoherent mumbled excuse and following social drama. What happened was far less predictable. Slowly, the "corpse" half opened her eyes, glanced at the threatening conductor and reached into her sack. After a moment's fumbling she withdrew an enormous roll of American hundred dollar bills. "Give me," she said in a croaking broken whisper, "a ticket to wherever this bloody machine is going." The shaken conductor took a moment to comply. The "dead" woman returned to her stupor. Madame Speaker, the human wreck was symbolic of the opposition. For it, speed is everything, destination nothing. It has grasped the atom's mystery but rejected the Sermon on the Mount. This Bill will dampen social acceleration, giving us the chance to dream and the time to design a better tomorrow.

Dr. Charles Litenberg (Inner Light)

Madame Speaker, this government avoids small errors by embracing grand fallacies. Accelerating decision-making will heighten, not reduce, the potential for catastrophe. On December 25, 2077 Saturn's two largest ring mining settlements were destroyed by lithonuclear attack. Cathos and New London had been highly competitive, each seeking to dominate trade in that sector, but mutual destruction had seemed inconceivable.

Madame Speaker, I served as the Chief Scientific Advisor to the Solar Chamber of Commerce's Investigatory Team (SCOCIT). It took two years of satellite recoding, image reconstruction and verbal retrieval to recreate the fabric of that tragedy. For Christians in New London, December 25 was a major religious festival, celebrated by gift-giving. A large shipment of holographic reconstructors had arrived the previous week. These had been popular presents. Unfortunately, they were defective. A substandard seal permitted unacceptable leakage. On Christmas morning, as more and more children began to play with their new toys, this leakage magnified until Outer Dome penetration occurred. Since many sets were recreating the Bombay Assault, holographic missiles hovered above New London. Cathos' sensors misinterpreted this mirage as an imminent strike, launching its own weapons in retaliation. This triggered a New London counterblow and the rest, so they say, is history. Madame Speaker, a faulty shipment of children's toys had caused the total destruction of two thriving societies.

We do not need faster decision-making. Bionics, the mimicking of animal and human neurology, has brought us the automated battlefield. Nuclear litho-

probes can travel thousands of miles in a few minutes. Yet, since seconds mean the difference between annihilation and the capability of inflicting massive enemy casualties, there is never time for negotiation, compromise or retreat. The rapidity and complexity of such military networks ensures that there is no direct human participation in any launch decision. Our reactions are just too slow. But, Madame Speaker, technology is not infallible. The end of the solar system may come, not from an alien assault, or because of the actions of some lunatic cult but rather from the failure of a five credit bionic resistor, or the computer misinterpretation of an electronic disturbance. Shooting first and asking questions afterwards is a very poor survival strategy, especially when combatants are using lithonuclear weapons. No matter how hard we try to idiot-proof our neurosocial networks, sometime, somewhere, someplace they're bound to encounter a bigger idiot.

Mr. John Priestley (Academico-Capitalists)

Madame Speaker, the larger the lie the more likely it is to be believed. Most people make up their own small lies but lack the courage to tell big ones. That generalization, of course, doesn't apply to this government. How can granting further power to neurosocial networks speed up decision-making? Have you ever, Madame Speaker, tried to get a Class III Development Authorization? You are bounced repeatedly from one ministry to another like a spinball, trying to collect permits and licences from bureaucrats, hypnotized by their power to say no and who, in their turn, are managed by machines programmed to do the same. If authorization ever comes, it's always too late. The window of business opportunity has long since closed.

Madame Speaker, the neurosocial network is the invention that most characterizes humanity's decline. It rests on the assumption that we are intellectually inferior to our own machines and so can't be trusted to make significant decisions. This government should sell every neurosocial network with an uneducation certificate and a crate of whiskey and call it a pathetic-loser's kit.

Ms. Emily Meynell (Twenty-Twenty Vision)

Madame Speaker, the future is not somewhere that can be reached by following any one of the myriads of the present's beckoning alternative routes, but rather it is a place that first must be created by the mind. It isn't a location to be reached by travel but a concept to be moulded by the will. It cannot be found. It must be constructed, a task that modifies not only the future itself, but also those who build it.

Such a future must be profoundly efficient. As it is now practised, efficiency is too shallow a concept. It is superficial, short-term efficiency, often achieved at long-term cost. It involves rushing to nowhere; a race to nothing. It requires the profligate consumption of both natural and human resources. It produces the greatest profits for the most convincing liars. What has masqueraded as efficiency has created among us, at enormous cost, such unprecedented monuments to destructiveness as abandoned nuclear reactors, genetic contamination and cybersex, because too few have had the virtue to withstand the highest bidder.

Our contemporary society, driven by technological innovation, has created problems of environmental decline that impact directly on every one of our senses: odours, noise and toxins cause hardship, illness and disruption, ugliness and a homogeneity of lifestyle which produce emotional turmoil and loss of direction. Our human qualities are jeopardized by the pursuit of technology as an end in itself, rather than as a means. All too often, governments have refused to demand answers to two key questions: what significant human purpose will this technology serve and what social and environmental impacts will it have? Madame Speaker, Bill C-39 will change all that.

Dr. Robert Alfred Holmes (Academico-Capitalists)

Madame Speaker, the spirit of every revolution evaporates, leaving behind it only the slime of a new bureaucracy with a lack of vision that gradually sets the scene for the next revolt. Bill C-39 is a prominent prop in such a theatre of the absurd, demanding as it does greater efficiency, while simultaneously guaranteeing less. Technology is not the antithesis of efficiency. It frees us from boring, repetitive tasks, completing them faster and at less cost. Machines never sleep, nor strike for higher wages and benefits. When old and worn they go pensionless to the recycling yards, without a word of complaint.

The machines of the First Industrial Revolution dug, lifted and carried; that is, they magnified the human body's physical abilities. Later, silicon and biological chips endowed machinery with thinking capacity, mimicking the human brain. Early automatons, with limited memories and only a rudimentary grasp of logic, could do little more than follow instructions and correct errors. Then came cortical absorption and bionics and with them true artificial intelligence. Androids soon gained the rights to vote and to hold public office.

Such technologies have fundamentally altered demands for resources, redefined work and changed the nature and volume of our wastes. This drive for greater efficiency has not been problem free. We are all aware of ozone depletion, acid and heavy metal rains and genetic shifts, but what is needed is the fine tuning of

technology, not the heavy hand of prohibition. Madame Speaker, we must move on. Even if you are on the right track, you'll get run over if you just sit there.

Dr Franklin O'Malley (Broken Ecumene)

Madame Speaker, in the beginning was Genesis: carcinogenesis, teratogenesis and mutagenesis, the unholy trinity of cancers, birth defects and mutations. Yet these plagues were only part of inefficiency's true burden. Its costs also included climatic change, sea level rise, lake acidification and species' extinctions.

Criticism is prejudice made plausible; except of course, the case of this opposition. Despite their deafening rhetoric, Bill C-39 will not inhibit scientific creativity, nor will it clog industries' gears with sand, representing as it does one more essential step towards true sustainability. The open systems it will replace are inherently inefficient, depleting resources while slowly asphyxiating in their own wastes. With apologies to Descartes, they are, therefore, they pollute.

It was not until 2033 that political leadership mandated the Hydrogen Economy. Much of the vocal hypocrisy directed towards Anderson's Hydrogen Fuel Bill has had its parallels in today's debate. Yet water is now our predominant fuel, electrolysis our major industrial process and hydrogen and oxygen society's chief sources of power. You can drink the end product of combustion, or use it to nourish your garden. Madame Speaker, how can the present market, which determines the price of ladrimium, microelectromechanics and nanogoods, represent their true costs if there is an inadequate charge for the environmental and social damage that they cause? Bill C-39 will change all that. This government will have the last laugh.

Mr. Ralph Ainslie (Kaizen)

Madame Speaker, a point of information. Doesn't he who laughs last think slowest?

Mr. Friedrich Soyinka (New Dawn)

Madame Speaker, we have not inherited the world from our forefathers, we have borrowed it from our children. Nevertheless, we must be aware of the errors of the past, since those who forget the lessons of history must repeat them. Has the Capitalist Collapse escaped this government's collective memory? At the beginning of the century, company presidents liked to sit in their clubs, comparing the sizes of their productive organs. Reliving a naughty childhood? Not quite, Madame Speaker, since this game's objective was to display the smallest and leanest,

not the biggest. This was the era of efficiency through downsizing, when success was measured by the unemployment created. Despite enormous profits, AT&T laid off 50,000 workers. Mobil, Proctor and Gamble, American Home Products and hundreds more followed their lead. In 2003, large American companies increased profits by 19 percent and rewarded their productive employees by laying off a further 1,278,000. Loyalty became a handicap and security an illusion.

This orgy of social destruction, driven by wee-ness envy, had its parallels in government. Throughout the industrialized world, elected officials reduced their budget deficits by pruning their civil servants. Politicians and the corporate élite promoted belt tightening for all but themselves. No sacrifice was too great for those who didn't have to make it.

Madame Speaker, the marketplace was soon flooded with tens of millions of highly- trained, educated and articulate workers, looking for employment that no longer existed. These middle class jobless were casualties on a post-industrial battlefield. As John Asnestine so aptly put it in his book *The Time to Strike Back*, "I used to get lost in the shuffle: but now I shuffle along with the lost." Even those still working were scared spitless. Savings rose and with them small and large business bankruptcies. Spending on anything but essentials all but ceased. Recession deepened into depression. Profits, even for the largest multinationals, began to fall. Corporations reacted by axing deeper, increasing the demand for welfare and unemployment benefits. The bureaucracy responded by reducing entitlements, cutting welfare rates and seniors' pensions, while increasing the cost of access to education and healthcare.

This wheel of misfortune picked up speed as Capitalism, in its drive for profitability at any social cost, replaced humans both with automatons and with neural networks. Capitalism, in its rush to profit, destroyed its own markets and government, in its thrust for efficiency, it undermined its own tax base. Madame Speaker, the Neoluddites provided millions of unemployed, middle class serfs with violent direction and Capitalism quickly followed Communism onto history's scrap heap. Small may be beautiful, but the Downsizing Riots of 2008 were not. However, if this just-afloat government still wishes to worship at the altar of efficiency, I, for one, would be happy to reduce the size of their obscenely inflated retirement pensions.

Ms. Cecilia Beintema (Searchers for Self-Sufficiency)

Madame Speaker, all progress is change but not all change is progress. Beware the irreversible. It only frees from the burden of choice by denying alternatives. Any change implies risk but irreversible decisions are the greatest gambles, leaving as they do, no room for correction or retreat. Burning one's

boats after a successful Rubicon crossing may bring a Caesar's glory. Yet the last straw leaves a broken-backed camel and a serious transportation problem.

Oceans and mountains traditionally have acted as barriers, limiting the terms of life by simultaneously constraining a specific plant and animal assemblage while protecting it from foreign predators, competitors and diseases. Within such evolutionary crucibles, life developed in relatively calm equilibrium. Then came man's increased mobility and with it that of many other species. Some exotics were deliberately introduced to novel habitats. Others were simply by-products of increased trade and travel. All invaded ecosystems in which they were unknown, frequently causing havoc for native species. Too often, such bioinvasions were irreversible.

The Nile perch, introduced deliberately into Lake Victoria to improve fishing, provoked mass extinction of native fish, so destroying a key food resource for 30 million people. The Asian tiger mosquito spread to Australia, New Zealand, the United States, Africa and Lunar Base Three, bringing with it yellow and dengue fevers and encephalitis. In 1929, a few African mosquitoes accidentally arrived by boat in northeastern Brazil. Within ten years these had spread widely, causing hundreds of thousands of cases of malaria and 20,000 deaths. Fortunately, this bioinvasion proved just reversible. The Rockefeller Foundation and the Brazilian government combined forces, employing over 3,000 people to spray homes and breeding areas. In three years, at a cost of 2 million dollars, *Anopheles gambiae* was finally exterminated in South America.

All too often we have not been so fortunate. The Brazilian red fire ant has colonized much of the agricultural land of the southeastern United States, myriads of its mounds drastically reducing food production in areas as yet unflooded by the rising sea. The Eurasian gypsy moth continues to defoliate seven million acres of North American forest each year; while the Caspian Zebra mussel fouls boat hulls and freshwater intake pipes worldwide. Madame Speaker, if it can't be stopped, it shouldn't be started.

Mr. Jorge Folleso (Followers of Barracki)

Madame Speaker, it is surely written:

The moving finger writes; and, having writ,
Moves on: nor all thy piety nor wit.
Shall lure it back to cancel half a line,
Nor all thy tears wash out a word of it.

Time marches on. It is the will of God that you can never step twice into the same river, nor go home again. Nothing is reversible. Everything changes. All decisions, whether traced in sand or carved in stone, cannot be erased. Amen.

Dr. Stanton Gibbs (Alien Channellers' Association)

Madame Speaker, Ambrose Everett Burnside is considered to be the poorest military commander ever produced by the United States. His greatest "triumph" occurred at the Battle of the Crater, during the American Civil War, in the midst of Grant's Wilderness Campaign. With a stroke of genius, Burnside ordered his men to dig a tunnel 510 feet under no-man's land to the site of the enemy headquarters. This achieved, six feet underground, they stashed four tons of dynamite. The enormous ensuing explosion gutted the command centre, catching the Confederates off guard. Certain victory lay ahead. At this junction, Burnside made his most spectacular error, ordering his troops down into the newly formed crater and up the other side to attack the enemy. Getting down into the huge pit was no problem. The same could not be said for getting out. The order was irreversible. The amazed Confederates moved reinforcements into positions around the edge and set about slaughtering the thousands of Yankees trapped in the bottom, unable to climb the crumbling sides. The Union eventually lost 4,000 men while the Confederate losses totalled only 1,000, many of whom had been killed in the initial blast. On hearing an account of this battle, Lincoln is reported to have said: "Only Burnside could have managed such a coup, wringing one last spectacular defeat from the jaws of victory."

Madame Speaker, reversibility is a key element of resilience. Decisions that cannot be reversed all too often lead to disaster. Necessity may free us from the effort of choice, but it also robs us of its benefits. Never cut what you can untie.

Ms. Norma Rilke (Inner Light)

Madame Speaker, history repeats itself, firstly as tragedy, secondly as farce. The tragedy occurred when over a thousand years ago, Canute the Great, King of England, Denmark and Norway, was surrounded by flatterers claiming his powers were limitless. Wiser than the Minister for Social Stability, he had his throne set up on the beach, where he ordered the waves to stand still. His authority over the sea proved minimal. Time and tide wait for no one, proving once and for all that some things are irreversible by nature. They cannot be controlled, even by those with an inflated belief in their own powers. Perhaps Mr. Vizena should encourage Dr. Banks and her colleagues to accompany him on a humility fieldtrip to the beach. Madame Speaker, we don't see things as they are, we see them as we are. That is why Bill C-39 is both a farce and a tragedy, the government providing the latter and the legislation the former.

Mr. Vinton Stuart Hughes (Labyrinth)

Madame Speaker, nothing is indispensable but some things are more dispensable than others. An ideal system has no vital parts. Like a thin red line of English soldiers, closing ranks to replace the fallen, it continues to function despite extensive damage or disruption. Before there was the Galaxynet there was ARPAnet. Designed by planners during the Cold War era, its perceived role was to allow communications between military bases, even during the aftermath of a nuclear war. Such a system naturally had to be able to withstand extensive damage. There could be no indispensable components, no dominant central server. Each computer had to function with equal decision-making authority. Data were to be split into packages, carrying their own final addresses. They were then to be transmitted onto the network, where they were expected to reach their final destination by whatever happened to be the most efficient current route. If parts of the system no longer existed, data could still travel by myriads of alternative pathways. On arrival at their final destination they could then be reassembled intact. This concept soon gained approval and, so it was, in 1969, the U.S. Department of Defense commissioned the construction of ARPAnet, an initial tentative step onto the information superhighway. The idea was far too good to be left to the bureaucracy and tree-like it began to grow into the Internet, linking every part of the globe and proving, once and for all, that military intelligence is not necessarily an oxymoron.

Ms. Susan Yulsman (The Edge)

Madame Speaker, the Assembly is stained by a slippery pathway, which crosses the floor between the opposition and government benches. This ooze of shame was left behind by a former colleague, the Shadow Minister of Improved Immunology, as she abandoned both her values and her friends. Madame Speaker, several Honourable Members have crossed the floor of this Assembly out of sincere conviction, but never before has one done so motivated by nothing more substantial than a desire for greater power, leaving such a slimy trail behind her.

Not only did she abandon her post, but she took with her this opposition's strategy manual and duplicates of its CD-cortab collection. The only parallel I can find seems to be an incident that occurred during a war in the Levant, when the future of the Turkish Empire was at stake. The Sultan, a man of great character and personal magnetism, with enormous resources at his command, fitted out an immense battle fleet to protect his territories from invasion. These ships carried the latest in weaponry. His best fighting men made up their crews and their officers were well trained and the ablest available. To ensure their loyalty all were highly paid before battle. It was the largest, most magnificent fleet to sail the Dardanelles

in centuries. The Sultan personally watched it leave, while in all the holy places, muftis prayed for victory. Imagine the Sultan's consternation when his Lord High Admiral immediately steered this fleet into the enemy's nearest port and, without firing a shot, surrendered. Madame Speaker, when he too was called a traitor, his defence mirrored that of the Shadow Minister of Improved Immunology. "It's true," he said, "that I accepted the responsibility of heading a great armada; that the Sultan embraced me; that all the holy men throughout the Empire prayed for my success; but I object to conflict. I see no use in prolonging the competition. The only reason I accepted my position of command was so I could end the contest by betraying my superior and my friends." Well, Madame Speaker, the government is about to discover that this opposition is a system without irreplaceable parts, one that can function effectively even when betrayed.

Mr. San Jae-Young (2QT2BSTR8)

Madame Speaker, I am very concerned about the health of the member who has just finished speaking. She should seek immediate medical attention. She is displaying one of the most obvious symptoms of beriberi: a very swollen head.

Madame Speaker, I digress. We are not here to identify the many serious health problems of the disorganized hypocrisy that occupies the opposition benches, but rather to discuss accommodating change by nurturing resilience. The chances of long-term survival are increased by a capacity to act incrementally. Unfortunately, all too many of our technologies and our policies are operationally inflexible. They are either on or off, producing all or nothing. This approach can be very wasteful, especially if demand is low, as for example, for controlfreak productions featuring members of the opposition.

Ideally, output should never exceed demand. A significant step forward in this direction came in 2083, with the completion of the Global Energy Net. This linkage of existing continental systems through transmission interconnects makes it possible to build far fewer electrolysis centres, fusion plants and photovoltaic arrays. This reduced energy production capacity became feasible because of differences in the timing of peak demand periods around the globe. While the Japanese are asleep, their utilities now supply California, whose population is hard at work. In the early hours of the morning, electricity from Newfoundland powers Greece's industries. Timing, Madame Speaker, is usually the chief ingredient in judgment.

Ms. Christiana Sereno (YRWEHERE?)

Madame Speaker, fanatics such as those crowding the government benches are always so certain of everything, while wiser heads are full of doubts. I suppose

fools always rush in where angels fear to tread. History has many lessons to teach us, including the inevitability of poor administration. Count Oxenstierna, in a letter written to his son in 1648, provided this insight: "An nescis, mi fili, quartilla prudentia regitur orbis? (Dost thou know, my son, with how little wisdom this world is governed?). Madame Speaker, I doubt if the Count were alive today that he would have any reason to change his mind.

So this Government wants to ensure that its bureaucracy can continue to operate even when many of its components are malfunctioning. It doesn't need new legislation to achieve that. If the Minister wishes to experience a partially functioning system he should try World Air. Last Friday, I had the misfortune to fly from Seattle to Paris and spent two frustrating hours making the trip, experiencing everything from an A-GST 941 engine failure to an unscheduled alien entry defence test. The only thing that protects us from bureaucracy's full weight is its incompetence.

Madame Speaker, the government admits that this legislation requires sacrifices but argues that, in the end, the benefits will surpass costs. I expect that after its passage, the rich will continue to get their ice in the summer, while the poor can expect still to get theirs in the winter. The homily that all those who sacrifice for a better future will share the resulting benefits is one of those pleasant falsehoods that, because they have been repeated so often, are generally believed, despite the fact that all our experiences refute them. Once again, they promise you earrings, Madame Speaker, but they will only pierce your ears. Never believe anything until it has been officially denied. As usual, the government's optimism over the future impacts of this legislation is only ignorance in good humour.

Mr. Aleksandr Shevchenko (Alien Channellers' Association)

Madame Speaker, error is inevitable. Unlike success, which has a thousand fathers, failure is an orphan. Nobody willingly admits to the parentage of a significant mistake. Yet error can be catastrophic. What is required is legislation, such as Bill C-39, designed to nip problems in the bud to prevent their defective blossoms. Early fault detection is not a new concept. What is original here is the scope of its proposed application.

Madame Speaker, more people were killed and injured in motor vehicle accidents in the twentieth century than died in World War II. Why? How is it that transportation deaths are now virtually unknown? While steering their automobiles and trucks around Earth's highways, the drivers of these antiques were, all too frequently, drunk or drugged. They often travelled too fast for the weather conditions, or failed to service their vehicles. Collisions between automobiles, trucks and bicycles were common. If one occurred, the only protection was a weak plastic

or metal bumper and, if you were lucky, an airbag. No wonder, Madame Speaker, ambulances patrolled the roads and cemeteries and hospitals were filled to capacity with traffic accident victims.

Compare this with the automatic early fault detection systems in every zipship. It is impossible to drive drunk or drugged. The interior air is monitored continuously for alcohol, LPN and 1,100 other designer drugs. If traces are found, control passes to an automaton. Every zipship also generates a class three force field. The faster it approaches an object, the more this is compressed. Collision is impossible. Even if a driver has a stroke or heart attack, since his or her medical condition is continuously monitored through palm sweat and exhaled gases, the vehicle cannot go out of control.

Madame Speaker, early fault detection is even more important in anti-gravity stratocruisers. The old jet aircraft were crashing continually, annually killing hundreds of passengers, even though their speeds rarely exceeded 1,500 miles per hour. Metal fatigue was a major problem, resulting in fractures and malfunctions. While the A-GST 941 is built of plastometal and so is far less susceptible to wear and tear, breakage is still possible. However, inside every part is a fluorescent dye. Every ten minutes the stratocruiser's lighting is extinguished for a millisecond. During this brief period, the interior and exterior is scanned automatically for fluorescence. If any is found, leakage has occurred due to plastometal fracture and the stratocruiser is given a priority diversion to the nearest airport. Madame Speaker, the principle of early fault detection must be applied to the environment and social systems. We have all heard 50 million excuses for failure but not a single valid reason.

Ms. Gabrielle Varricchio (Piranha)

Madame Speaker, I have my own early fault detection technique. I watch the government's supporters very carefully. If their lips are moving, they're lying. What is the government's hidden agenda? What does it really mean by early social fault detection?

If this legislation is passed, every child will be forced to provide a hair sample. Any displaying zinc, copper and sodium ratio abnormalities will be branded as potential criminals and their DNA, finger and voice prints entered into the Justice Department's data banks. On the first sign of deviant behaviour, brain wave monitors will be implanted. A second offence means automatic banishment to Lunar Base One.

If this legislation is passed, every adult with be forced to give a monthly serum blood sample to be analysed automatically for 57 essential trace and bulk

elements, fatty acids and proteins. If deficiencies or excesses are identified, their choice of foods will be restricted until these imbalances have been corrected. Big Brother wants you to remain healthy. Big Brother is concerned about you, but he cares more about the cost of your medical services. Freedom is more than the right to do what you ought. It is not worth having if it doesn't include the right to err. Every rose has its thorns. Progress needs the stimulus of error.

Dr. Robert Shenstone (Searchers for Self-Sufficiency)

Madame Speaker, to be forewarned is to be forearmed. Our ancestors lived in a sea of carcinogens and so developed cancer continuously. Only our immune systems stand between us and a similar inevitable death, identifying and then destroying errant cells. When they fail, tumours develop in earnest. In pre-orthomolecular days, patients were flooded with toxic chemicals, in what was, all too often, a vain attempt to rid them of cancer. The costs of this treatment usually outweighed its benefits, killing as it did the rapidly proliferating cells, including those manning the victim's immune system. As Turner and Lang recognized, what was needed was a treatment capable of destroying tumours, while simultaneously boosting the body's immune defences.

Madame Speaker, after the Turner-Lang breakthrough, immune system linkage and cultivation became inevitable. Industrial immunology flourished and the war against cancer had been won, not by attacking but by enhancing the body's capacity to warn and destroy. Today, no one's immune system is expected to function unassisted. Macrophages, antigens and antibodies are manufactured to order. Individuals are no longer islands in a sea of carcinogens; rather, they are part of the main.

Dr. Hugh McKinney (Alien Genome Project)

Madame Speaker, we do not learn from the examples of others but rather from the stimuli of our own mistakes. Alexander Fleming cultured staphylococcus bacteria that accidentally became contaminated with mould. He noticed that around this mould, the bacteria had been destroyed and correctly inferred that it produced something toxic to staphylococcus. Fleming was soon able to show that this same substance also inhibited the growth of many other bacteria. Since the original contaminant had been the mould *Penicillium notatum*, he called his new discovery penicillin. Later, Florey and Chain purified penicillin and proved its astounding potency as a new wonder drug. In 1945, Fleming was awarded the Nobel Prize for his original discovery.

Madame Speaker, imagine what will happen when the early warning systems, mandated by Bill C-39 are in force. No mould will be permitted into laboratory air. If, by some malfunction, one spore contaminated a culture, an android would detect its growth immediately, remove the petri dish, sterilize it, replace the staphylococcal bacterial culture and restart the original experiment, keeping immaculate records of its achievements. End of penicillin. End of story.

Mistakes are the very essence of life itself. Mutation is the ultimate source of variation in the gene pool. If nature had possessed some fool-proof mechanism for detecting early errors, all mutations would have been aborted and life restricted to primordial ooze. Progress demands the right to err.

Ms. Gwyneth Griffiths (Kaizen)

Madame Speaker, failing gracefully is a rare art but one which will become more common with passage of Bill C-39. Even resilient systems fail occasionally. When they do, it is with a sigh not an explosion, or with a successful emergency landing not a crash, or with a relocation not a suicide.

Fail-safe design requires self-correcting, not accelerating feedback. In the early A-GST 937s, total retrojet failure caused vaporization as the disabled stratocruiser attempted to burrow into a planet's core. The invention of the geo-electromagnetic field bumper, mandatory for all anti-gravity vehicles today, made such catastrophic accidents impossible. Now, if an A-GST 941 suffers complete retrojet failure, there is nothing to inhibit its geomagnetic pulse. As a disabled stratocruiser begins to fall, this pulse is repelled increasingly by the planet's own magnetic field. The nearer to the surface it reaches, the stronger the planet's negative reaction. As a result, an A-GST 941 cannot crash. If all engines fail, it floats in a magnetic sea, silently awaiting a repair ship.

Madame Speaker, even Earth's old transport trucks applied a similar concept. Their brakes were held off by air pressure. If this force fell because of a leak, they came on automatically, stopping the vehicle and reducing the probability of collision. The old traffic lights, that were used so inefficiently to control these vehicles, applied the same fail-safe approach. When they malfunctioned, all lights automatically turned to red and traffic in every direction was forced to stop, so preventing chaos. In more enlightened jurisdictions, streets were marked by signs giving them an order of preference and gridlock was prevented. This government's chief goal is the avoidance of failure, but it recognizes that when this is inevitable, it can be instructive. When handled with intelligence, failure can teach us more than success.

Ms. Jay Ganber (Academico-Capitalists)

Madame Speaker, if there is no punishment for failure, there is no reward for achievement. How can excellence be promoted if mediocrity is applauded? Recently, *Know Polling* set out to identify the greatest human athlete of all time. While Jesse Owens placed second with eight percent of the public's support, third and fourth were Liping Zhou and Pelé. In fifth spot, with five percent of the votes was Joe Louis. Babe Ruth ranked sixth, while Alice Wilson was considered seventh. Who you might well ask, took the coveted title of best ever human athlete? Mark Spitz? Arnold Palmer? Jeffrey Kelly? Anna Tholstran? No, Madame Speaker, the athlete most fondly remembered by 32 percent of the solar public was the one and only Eddie "The Eagle" Edwards. Everyone has forgotten who won the 90 metres ski jump in the 1988 Calgary Winter Olympics. However, thanks to *Instant Recall*, everyone remembers Eddie "The Eagle," who came a resounding last, flapping his arms in mid-air and dropping like a rock. A plasterer from Cheltenham, England, he amazed the world by entering the Winter Olympics, without ever setting skis to snow. His fame preceded him to Canada, where a huge, cheering crowd awaited his arrival at the airport. Of course, his plane was late, his bag split open and he delighted his fans by chasing his equipment and clothing around the rotating luggage carousel. After this promising start, Eddie missed his practice jump, locked himself out of his cabin and was denied access to his own press conference. Naturally, he decided not to train because exercise made him ache. Billions crowded around television sets worldwide to see this star perform. After his jumps, or more correctly his falls, Eddie raised his arms to acknowledge the enormous accolades of his fans. Greater fame followed this stellar performance, leading to television appearances with movie stars and more recently to recognition as the solar system's greatest athlete. Madame Speaker, if anybody ever failed safely it was Eddie "The Eagle" Edwards, the Birdman of Calgary, whose only claim to fame was a total lack of athletic ability.

Mr. C. Norman Lowry (Enigmatic Continuum)

Madame Speaker, progress is order amidst change and change amidst order. Planning must be for more than just success. Failure, too, must be anticipated and provision made to ensure that it occurs with grace, not disgrace. Nowhere is this principle of painless failure more important than in our social programs. During the twentieth century, an individual's quality of life, all too frequently, depended upon his own, or ancestor's personal productivity. Work, not thought, defined social status. In the Underdeveloped World, the unemployed had only three options:

begging, stealing or starving. Elsewhere, welfare and social security were designed to protect the ill, old or unemployable, guaranteeing them merely the right to a life of poverty.

This work-based social hierarchy could not survive the rise of the androids. As human participation in the workforce became less and less necessary, a chasm opened between those who owned and those who formerly had managed, or operated, the means of production. Pushed by the Neoluddites, the social structure began to sway. The redistribution of wealth and power became inevitable.

Madame Speaker, members of this government can look back with pride to the New Coalition, set up to re-establish order in the midst of social chaos. LifeNet is the gem that glitters brightest amongst the legislative jewels that followed: guaranteeing to every human the minimum right to an adequate diet containing all 57 essential nutrients; access to unpolluted drinking water; 450 square feet of personal living space and a fair share of all work available at his or her skill level. LifeNet ensures nobody will be hungry, thirsty, unemployed or lacking access to education. It recognizes shopping and consumption as financially compensated work skills. All humans may not be created equal, but this government's main aim is to guarantee that all will be treated equally. The purpose of industry is the conquest of nature in the service of humankind, not the conquest of the many for the service of the few.

Mr. Nicolo Fallaci (Personae Non Gratae)

Madame Speaker, there is no formula for success but there's certainly one for failure: trying to please everybody. That is why Bill C-39 ultimately is doomed. It sets out to persuade that all are created equal and all deserve equality. Those whom the Gods wish to destroy they first call very promising. All too often, the public, like this government, cannot tell the difference between failure and success, promoting the former at the expense of the latter.

Madame Speaker, it's a pity that Douglas Corrigan is no longer with us. I'm sure he'd be ministerial material. On July 16, 1938 he climbed onboard his nine-year-old monoplane at Floyd Bennet Airfield in New York and set out to fly to Los Angeles. Unfortunately, instead of turning westward he flew into a thick fog bank to the east. Twenty-eight hours and thirteen minutes later, guided by only a map of the United States, he landed at Baldonnel Airport, near Dublin. Naturally, it was a fail-safe landing. In New York, he was recognized as another Lindberg and Irish groups argued over who should have the right to organize the gigantic tickertape welcome for Douglas "Wrong Way" Corrigan on his return. Manhattan gained this honour and 20 other Corrigans greeted their namesake, who was then paraded down

Broadway to the cheers of thousands. Madame Speaker, the secret of success appears to be sincerity. If you can fake that, you've got it made. If you can't, don't worry. This government will make sure that your failure is painless. It's obvious from Bill C-39 that Rhodes "Wrong Way" Vizena can't tell the Promised Land from the Sinai Desert.

Mr. Tim Hoffman (Kaizen)

Madame Speaker, the opposition is dominated by cynics who, whenever they smell flowers, search for the coffin. When we present a bouquet, like Bill C-39, to this Assembly, they insist on looking for its thorns. It should be obvious, even to them, that in both peace and war, dispersion reduces vulnerability. Madame Speaker, this legislation seeks to encourage versatility and with it, diffusion. The more widely humanity explores the universe, the less likely our extinction as a species. Eggs are safer scattered than in a single basket.

Many policies and projects are too restricted spatially, needing very specific site conditions in which to thrive. Tidal power plants are limited to Fundy-like bays. Nuclear fusion and fission plants require extensive flat, seismically stable sites and easy access to cooling water. Superinsulation, floater homes and zip-ships, on the other hand, can and are used virtually everywhere. Madame Speaker, the more site-specific a policy or project, the more vulnerable it is to change. Local problems, from tornadoes to riots, can be devastating. In contrast, the fewer the siting demands, the greater the chances of survival. While local losses may be high, if adoption is widespread, destruction is very unlikely to be total. Extinctions were far more common on small islands than on continents.

The Maginot Line, built by the French between the First and Second World Wars along their eastern boundary clearly illustrates the problems of site-specific structures. Constructed for protection against the Germans, it consisted of some 200 miles of interconnected forts, each of which included heavy artillery, set into and protected by the earth. Beneath this, as one descended, were deeply reinforced troop quarters, heating and lighting equipment, an auditorium, administrative and telephone services, a hospital, a railroad that linked forts, and a garage and munitions storage centre. Each of these seven below-ground levels were connected by both stairs and elevators. Compared to the wet, muddy, unsanitary trenches of the First World War, the Maginot Line provided a defending French army with an insurmountable advantage.

Madame Speaker, on May 10, 1940, Germany began the Battle of Europe. It outflanked and ignored the Maginot Line. In the first stage of this assault, five German spearheads struck the Netherlands. This attack included parachute troops,

undercover agents and fifth columnists, who severed Dutch communications and supply lines. Together, they seized the airfields. The German army swept all opposition before it, using mobile, highly motorized panzer divisions. Within five days, the Dutch were defeated. By May 28, a soundly beaten Belgian army had to surrender and the British were forced to evacuate from Dunkirk, leaving almost all of their heavy armaments behind. On June 10, Italy also invaded France. Paris was declared an open city and its government abandoned it. By June 14, it was occupied by the victorious German army. On the following day, Verdun was captured. The fall of this key fortress rendered all the other forts untenable, and the Maginot Line was abandoned. On June 22, in the same railway car in which the armistice ending World War I had been signed, France accepted Germany's harsh terms of surrender. A mobile, diversified German army, conducting blitzkrieg (lightning war) had conquered the Netherlands, Belgium and France in less than six weeks. The supposedly impregnable Maginot Line, which had consumed the lion's share of the French military budget for some two decades, had proved useless, thereby totally incapable of protecting the French against a resilient enemy, capable and willing to outflank it, fly over it and ignore it, attacking not from the east but from the north and south.

Madame Speaker, it was obvious that such massive, immobile fortifications were obsolete. Yet Hitler never fully understood the significance of his own victory. Having conquered more territory than he could defend, he insisted on holding every square foot. On the western front, his troops were expected to defend 3,750 miles of coastline, stretching from Holland to the southern end of the Bay of Biscay. To achieve this goal they were ordered to build the Atlantic Wall, which was intended to consist of 15,000 concrete strongpoints, defended by 300,000 troops. On June 6, 1944 Operation Overlord, the invasion of German-occupied France, began. By the time D-Day was over, 5,333 ships and nearly 11,000 airplanes had transported 175,000 men and 50,000 vehicles, over or through Normandy's section of the Atlantic Wall. The invasion front stretched over 55 miles. The Germans had spent four years building the wall. It was an enormous drain on materials and manpower, yet it fell in one day. History keeps repeating itself, but every time, the price goes up.

Ms. Julie May-ying (Personae Non Gratae)

Madame Speaker, ours is a government of substitutes. Instead of language it uses jargon; it replaces principles with slogans and, in lieu of new ideas promotes Bill C-39. So, we are led to believe, technology without site restrictions is the key to improved survival. I doubt it. There have been few less-geographically-

restrained inventions than the anti-personnel mine; buried just below the surface, patiently awaiting a victim, it was a very popular technology. When this century began, some 120 million had been seeded over much of the Earth's surface, killing 10,000 people each year and maiming another 16,000, mostly civilians, often children.

Then nanotechnology brought us the DNA Sniffer. No bigger than the proverbial dime, this could identify, track and kill victims for racial, ethnic or gender reasons. Madame Speaker, the trouble with this government is that it's all signposts and no destination. No matter how cynical I get, it's impossible for me to keep up.

Mr. Dante Radhakrishnan (Followers of Barracki)

Madame Speaker, Bill C-39 is the will of God. It is surely written:

> *...there went out a sower to sow: And it came to pass, as he sowed, some fell by the way side, and the fowls of the air came and devoured it up.*
>
> *And some fell on stoney ground, where it had not much earth; and immediately it sprang up, because it had no depth of earth:*
>
> *But when the sun was up, it was scorched; and because it had no root, it withered away.*
>
> *And some fell among thorns, and the thorns grew up, and choked it, and it yielded no fruit.*
>
> *And others fell on good ground, and did yield fruit that sprang up and increased; and brought forth, some thirty, and some sixty, and some an hundred.*
>
> *And he said unto them, and I say unto you, he that hath ears to hear, let him hear. Amen.*

Mr. Adlai Wright (Academico-Capitalists)

Madame Speaker, we shape our buildings and then they shape us. We are both the producers and products of our architecture. When solar tourists visit Earth, where do they go? To the Forbidden City, the Taj Mahal, the Great Pyramids of Gaza, the Acropolis, St. Peter's and St. Paul's, Stonehenge, Chartres and the Sydney Opera House. That's where. They are drawn to these huge, site-specific antique structures because they are symbols of human progress, milestones on the road to the stars. Architecture, of all the arts, has the slowest but surest impact on the human soul. Its aims are to enrich the drama of life, while expressing the central values of our cultures.

Madame Speaker, where there is no vision, the people perish. Bill C-39, inhibiting as it does the grandiose by promoting the transient and diffuse, will give rise to an era of Yurt architecture. We can expect a hodge-podge of small, ephemeral projects that will be ill-conceived, ill-planned and ill-placed: a type of architectural measles; the bureaucrat's revenge on the poet's dreams.

Ms. Anne Mary Lamb (The Edge)

Madame Speaker, a hole eaten in an oak leaf by a caterpillar is almost irrelevant to the tree, since it can survive thousands of such attacks. Yet one of the same size in a direction blast deflector can, and has, caused the destruction of several cities. A stone tossed through a church's stained glass window will probably only break one small piece of leaded artwork. The same projectile would shatter a store window completely. Modular systems are inherently more capable of withstanding change, and that is why they are promoted by this legislation.

Madame Speaker, hunting spies is one of the few genuine adventures left. All the dragons are slain and the lances grow rusty in the chimney corner. Almost the only sporting proposition still left, to those ungelded by the relentless domestication of humanity, is espionage. The Asiatic League recruits its spies while young, giving them instructions to burrow deep into our social structure. To betray, you must first belong. Such "moles" enter our public service, politics, media and military, where they covertly leak secrets and influence policy in favour of the League. This espionage network is modular and resilient. Although its spies are familiar with one or two controllers, usually androids, to whom they have been passing sensitive information, they never meet similar "moles." If they are caught, rarely can they reveal the identities of other spies. The integrity of this system depends on ignorance of its links. Through such isolation, it retains its strength, despite the occasional defection or detection of individual agents. Naturally, Madame Speaker, we use the same approach to espionage ourselves.

Ms. Betty MacDougall (Wired Democracy)

Madame Speaker, I could have skewered Bill C-39 on the greasy spit of scandal, but decided my brilliant opening statement warranted more attention than this Assembly would give it; so I "leaked." For more details, watch *Laser Forum Tonight*.

In the hive, a bloated central power is kept in luxury by chemically brainwashed drones, competing to satisfy her every whim. That is why this government finds cellular structures so appealing. Bill C-39 is not about resilience. It's about power. Power from the people.

Madame Speaker, in the nineteenth century, trade unions were born to defend workers from injustice; to guard their rights to a better life; to protect them, not only as equals before the law but to ensure they received the products of their labour. Unions saved their health, homes, liberties and very lives. They guaranteed the right to a full share in the abundance which was the result of their brains and their brawn. Trades unions did more for humanity than any other organizations that have ever existed. Unity was power.

Madame Speaker, then came Galaxynet, androids and Offices Without Walls. At first, the idea of working at home sounded wonderful. It reduced the journey to work, protected the environment and provided freedom from the manager's stir. But it was the siren's song; there was a hidden cost, the loss of community and with it strength. It soon became unclear just who was the employer, how many others were involved and whether the work was real or virtual. It was impossible to strike, since all were expendable. Just as androids and nanotechnology killed the Blue Collar unions, Offices Without Walls, with its optional cortical absorption and neurosocial networks, divided and conquered those of the White.

Madame Speaker, Machiavelli said it best:

> *One of the great secrets of the day is to know how to take possession of popular prejudices and passions, in such a way as to introduce a confusion of principles which makes impossible all understanding between those who speak the same language and have the same interests.*

Bill C-39 may be an old trick, nevertheless it is still very effective. A Trojan horse, if I ever saw one.

Mr. Booker Sorokin (Unlimited Horizons)

Madame Speaker, a constituent's video flash read "we didn't send you to the Assembly to make intelligent contributions. We sent you there to represent us." Today, hopefully, I'm doing both. Cells are the basic units of almost all living things. Most can divide by mitosis or meiosis and so replace others that have been destroyed. As a consequence, wounds are often repairable, while nearby cells carry on the normal functions of those that have been lost.

Madame Speaker, before the advent of the megalopolis, Earth's settlements formed a lattice. All had hexagonal service areas around them, which were smallest for hamlets and largest for major cities. The hexagonal trade area of a hamlet might have been 10 square miles, while that of a village 30, including three hamlets. A town's service region would probably cover 90 square miles and encompass three villages and nine hamlets. At each higher urban level, additional goods

and services were provided. The actual size of a viable service area increased with the speed of transport, because there was always a critical distance separating hamlets, villages, towns and cities, reflecting competition amongst them. Such a lattice provided a major survival advantage since no matter how big the fire, flood, plague or earthquake, the damaged region could be repaired, cell-like, by its surviving portions. With the acceleration of urbanization and its associated rural depopulation, this repair mechanism was lost. The concentration of much of Earth's population into a few megacities increased the potential for catastrophe. Then came the Great Dying and the Tokyo and Seattle earthquakes.

Madame Speaker, we are well aware that the cost of a diffuse, cellular population structure will probably be an increase in the frequency of small disasters, but it will decrease greatly the potential for major losses. This is why Bill C-39 promotes Virtual Education, Offices Without Walls, and the Simulated Health Service. Each will reduce the fatal attraction of our megalopoli. We live in a moment of history when change is so rapid that we only begin to grasp the significance of the present as it is disappearing. Madame Speaker, although we cannot direct the winds of change, surely we can redirect our sails.

Mr. Victor Hammerstein (Alien Genome Project)

Madame Speaker, if hypocrisy was an Olympic event, this minister would set a solar record while winning the gold medal. He claims intellectual links with Socrates, but his genealogical roots seem to lead to Houdini. That master magician was the King of Illusion, so is the minister. He amazed the masses by escaping quickly from submerged trunks, while handcuffed and in a straight jacket. The minister easily wriggles out from the burden of his past failures and current responsibilities. Houdini made elephants disappear; the minister has lost entire space colonies. Houdini invented the Chinese Water Torture; the minister brought us Virtual Education and the Simulated Health Service. Houdini brooked no contradiction, had a burning ambition for personal glory and was a supreme showman who, as the "Maker of Miracles," held centre stage for a quarter of a century. He also had a colossal ego. Need I say more? I'm beginning to convince myself of reincarnation.

Madame Speaker, why do people flock to cities? They want better services, more excitement and the chance to meet with the rich and infamous. Yet these desires create difficulties. High population densities damage environmental quality, while too many people in one spot are difficult to control. Madame Speaker, no problems are so threatening that a little attention from this government can't make them worse. How are you going to keep them down on the farm, after they've seen

Paris, London, New York, Tokyo or Rio? No problem; bring them the city. The solar system is filled with people who would swear on a Bible stack that they'd spent five years as honours students at Yale, yet who have never had more than two hours education in a CD-cortab chamber. They recall their student days with delight; the witty professors, stimulating courses, friendly fellow students and their own academic and athletic prowess. So much for Virtual Education. Only a month ago, one of my constituents was praising the government for using its influence to get her into the Harvard Medical Center for an urgent operation. Madame Speaker, the Harvard Medical Center has been closed for 20 years. She'd really been operated on, at home, by a class six android. Try telling her that. She remembers the caring, expert doctors and the gentle, knowledgeable nurses, meeting her every need. The Simulated Health Service may be cheap. It may be dishonest. It may be impersonal, but it's very, very popular. Madame Speaker, perhaps someday the masses will be able to distinguish fact from fantasy. But, I expect the minister will be able to doublecross that bridge when he comes to it.

Ms. Hillary Spaeth (The Edge)

Madame Speaker, usually I don't make the mistake of arguing with people for whose opinions I have no respect. Today, circumstances force me to make an exception to that sensible rule. Nevertheless, I will keep my comments short and sour. This government wears its prejudices like a halo. It is composed of a group of fawning, sneaking, flattering hypocrites, and will do anything, be anything, for its own advantage. It clings to power like a leech on a long drowned man. It can afford to be generous in its promises since, of course, it has no intention of delivering them. They cost it nothing but credibility. Madame Speaker, *standardized diversity*, indeed. Need I say more? A foolish consistency may be the hobgoblin of small minds, but is it too much to ask for in one piece of legislation? Surely, credulity must have limits.

Mr. Julian Cudlipp (Kaizen)

Madame Speaker, recent research into the physiology of the human brain suggests there are three different kinds of intelligence. Analytic, conceptual, verbal intelligence seems to arise from the brain's left hemisphere, while intuitive, artistic intelligence is developed by the right. Then there is the type of reasoning displayed by the previous speaker that is stimulated by putting one's foot into the mouth. Perhaps because of some misfortune in her genetic inheritance, or an early iodine deficiency, the honourable member for The Edge seems to have serious trouble understanding simple concepts.

Before Confederation, each of the Australian states developed independent railway networks. In order to protect rights to transport within their own territories, they used different gauges. As a result, trains could not cross state lines. Each had to be unloaded and its contents repacked. It was an illogical, inefficient system that haunted Australia for more than a century. This, Madame Speaker, is an example of chaos due to diversity without standardization.

In 2083, this government played a major role in the completion of the Global Energy Net, which greatly increased Earth's efficiency. This transports energy produced by hydrolysis, fission and fusion plants, geothermal deep wells, photovoltaic complexes, hydroelectric schemes, wind mills, thermal tar sands and tidal projects. The benefits of this diversity are harnessed by standardizing operating characteristics, without repetition of concept or design. This global grid system works on the same voltage, so it can be powered by an endless variety of energy sources. That is what this government means by the benefits of standardized diversity. Now, can you understand that, Attila the Hen?

Mr. Aung San Lee (Personae Non Gratae)

Madame Speaker, Bill C-39 is the type of legislation to be expected from this government. It has the crystal ring of truth about it, yet is at the same time profoundly false. Standardization, so the government wishes us to believe, will increase resilience. But at what price? Greater standardization of production and of social programs has always brought with it a tendency towards willing conformity, that consisted not merely of a common lifestyle, but also of a widely held way of thought, backed by a shared value system. We become how we produce. "You must adapt" will be the subliminal message of all government CD-cortabs and every "educational" controlfreak show. Look for it too in laser advertising and neurosocial network decisions.

Madame Speaker, the hidden agenda of this government is the absolute prohibition of any concept and all ideas that diverge from its accepted platitudes. Behind this legislation is the potent force of developing custom, supported by a philosophy that erects conformity as the supreme virtue and portrays the free functioning of individual personality as a crime against society. Bill C-39 will slowly but surely inhibit everything that is different, excellent, individualistic, qualified and select. It will produce a tyranny of the mediocre. In this future standardized solar system, anybody who challenges orthodoxy will run the risk of elimination, either by force or, worse still, by ridicule. Yet only the non-conformist is truly creative. Our sheep-like species walks the well-trodden path and throws stones at those with the courage to create a new track. Bill C-39 will provide more rocks.

Must we conform? The answer has to be a resounding "No!" Forget standardization. There is an alternative way of life, available to us here and now. Follow the path of most resistance, of positive rebellion, the road of creative protest, the way of productive revolt. Strike out for the unorthodox. Take risks. Every spaceship is safe in dock, but that's not what spaceships are for.

Ms. Laura Osnstein (Searchers for Self-Sufficiency)

Madame Speaker, this fawning, sneaking, flattering hypocrite would like to add a few words to the debate, if she may. Facts are like ventriloquists' dummies. Sitting on the knees of the wise, they can be made to utter pearls of wisdom; however, as the opposition has demonstrated so aptly, placed elsewhere they talk gibberish.

Madame Speaker, during the twentieth century, there was an ongoing struggle between trucks, railroads and ships for control over the transportation of freight. All these systems had some of the necessary elements of resilience, but lacked others. On land, trucks had the major advantage of being almost totally mobile. With a few minor exceptions, they could carry goods anywhere the extensive road network stretched. Freight trains were limited to their tracks and the railways had to lay and pay for these, while roads were usually built at public expense. Yet trains possessed a flexibility stemming from their use of modules. They could be lengthened or shortened at will as freight cars were added or subtracted to accommodate increases, or decreases in the load to be carried. Ships and trucks lacked this modular advantage and had to operate less efficiently at higher cost, when only partially loaded.

As a consequence of the differing advantages and weaknesses of train and trucks, intermodal freight transport became popular, since this permitted shippers to gain the benefits of both. Typically, this involved a piggyback system which hauled truck trailers and containers by rail flatcar. Once such cars arrived at their destinations, they could be unloaded efficiently and dispersed locally by trucks. In this way, the mobility of road transportation was added to the efficiency of railroads. Containers moved by road and rail could then be carried further by ship, or vice versa. Instead of being put into a conventional hold, such modules were placed on container ships, designed with cell-like vertical pigeon holes. There they were stored safely between confining rails. Others were stacked two or three deep on the deck. Unloading and loading could occur simultaneously, as huge gantry cranes moved back and forth from wharves to vessels. This added efficiency revolutionized both ship and port design. On routes of over 4,000 miles, container ships

spent only 15 percent of their time in port, while the older conventional freighters were tied up loading and unloading for 50 percent of their voyages. The end result of this increased efficiency was that container ships could accomplish two to three times the annual number of voyages made by conventional freighters. The module, therefore, encouraged integration between trucks, trains and ships and, until the advent of the zipship freighter, gave an obvious commercial advantage to transportation companies and port authorities promoting containerization. Madame Speaker, the opposition would do well to remember that the history of human progress is strewn with the bleached bones of those unwilling to accept the need to innovate.

Ms. Clair Fixx (Enigmatic Continuum)

Madame Speaker, civilization flows on like a river. In its turbulent bloodied waters are those who wage war, struggle for the throne, cheat, steal and do all those dramatic things that historians too often have mistaken for progress. While on the banks, largely unnoticed and unrecorded, are those who invent, cure diseases, build, farm, make love, raise families, and paint, write literature, poetry or music. Bank dwellers are the true architects of civilization. Human progress has come from the happenings on these banks, not from the behaviour of the exhibitionists in the water. While CD-cortabs are filled by the gory details of conquerors and their battles won and lost, civilization rests on a desire to create and progress, not on a willingness to fight.

Madame Speaker, Stone Age man could only move as fast as he could run or, perhaps allow himself to be swept along by some turbulent torrent. By 6000 B.C., the most rapid means of long distance transport had become the camel train, capable of averaging eight miles an hour. By 1600 B.C. this upper limit had been raised to 20 miles by the chariot's invention. Approximately 3,500 years of further development was needed until the steam train could brake through the 100 mile per hour barrier. Sixty years later, aircraft became capable of speeds of 400 miles an hour; yet it took only another 30 years until satellites began to circle the Earth in excess of 18,000 miles an hour. Then came the ionic engine, the zipship and the anti-gravity stratocruiser. Now, if it works, it's out of date. Today's technology is yesterday's magic, as we stand poised to break through the light barrier.

Madame Speaker, the more mobile we are, the greater our access to opportunity and the faster dangers can be avoided. Speed promotes trade and encourages cooperation. Other Earthly species can only spread influence as far as their calls, songs or scents can carry. Our ideas instantaneously cross the solar system, like a stone impacting the surface of a pond, speeding ripple-like out into

the universe. We are, therefore we move. We think, therefore we move faster. Bill C-39 will enhance our mobility and increase our influence.

Mr. Bruce Kari (Big Zipper)

Madame Speaker, the Minister does not deserve the criticism heaped upon him by my fellow opposition members. Debate of Bill C-39 has proved stimulating. It is one of the best during this government's tenure. What might he have achieved without his lobotomy?

In earlier debates, the Minister has spoken up for higher ethical standards in politics, demanding that we begin by committing ourselves to the truth; discovering it, speaking it and living it. He has suggested that the path to such truth lies in the application of the scientific method. Aristotle, so we were told, could have avoided the mistake of thinking women had fewer teeth than men by simply counting those of his wife.

Madame Speaker, what does the scientific method really tell us about the role of mobility in the struggle for survival? Earth's fastest natural creature (the teenager in a zipship excepted) is the swift, capable of reaching 220 miles per hour; 35 miles greater than the peregrine falcon. The quickest of all land animals, clocked at 65 miles per hour, is the cheetah or hunting leopard. It's difficult to establish the slowest animal, but few can beat the tortoise for sloth. For it, a few feet a day would be over-exertion. Longevity data are available for all these species. The greatest age reached by a swift has been 14 years, while for a peregrine falcon the record stands at 12. A cheetah, on the other hand, has obtained the grand old age of 15. Now compare that with longevity records for the tortoise. In 1766, a male Marion's tortoise was brought from the Seychelles to Mauritius by Chevalier de Fresne, who gave it to the Port Louis army garrison. When it was killed accidentally in 1918, it must have been over 152 years old. When the Royal Tongan tortoise "Tu'malilia" died in 1966, it was probably more than 200 years of age, having been given to the Tongan King by Captain James Cook in 1773. Madame Speaker, while in no hurry, these tortoises were speed fanatics when compared to the average member of the plant kingdom, that can do little more than bend with the wind. Has this lack of mobility shortened the lifespan of the average tree? Hardly, the Earth's oldest living tree is thought to be a bristlecone pine on Wheeler Peak, Nevada, dated at 5,000 years old. The California big tree, the "General Sherman" has probably been growing for some 4,000 years. Madame Speaker, trees are not mobile, they are rooted to the spot, but that fact hardly seems a drawback to their longevity. In the long run, we are all dead, but it seems to me that

those that move fastest reach the pearly gates first. Another beautiful theory slain by an ugly fact.

Ms. Elaine Merakis (Alien Channellers' Association)

Madame Speaker, you can achieve agreement much faster with a stungun than with a kind word. Before the invention of mandatory cortical absorption, biochemical imbalance correction and the personal force field, society had a criminal class that preyed upon the vulnerable. Many of these malcontents were born, not made. Their violent behaviour began in the high chair and only ended in the electric one. While death was the extreme punishment, for the average criminal, social revenge was limited to the loss of mobility. Behind lock and key, they threatened no one but their guards and fellow inmates.

Madame Speaker, as Oscar Wilde so aptly described his own experiences:

The vilest deeds like poison-weeds
Bloom well in prison-air:
It is only what is good in Man
That wastes and withers there:
Pale Anguish keeps the heavy gate
And the Warden is Despair

Prisons could not reform or rehabilitate. They simply punished and corrupted. Many, like the Tower of London and the Bastille, originally housed only those the élite feared most: the politically deviant and the insolvent. Common public offenders were shipped out of sight and mind to distant colonies. For them, jails served only as collection points prior to deportation. As improved transportation shrank the significance of distance, this option faded and permanent holding tanks were needed for society's undesirables. The most effective of these were insular. Alcatraz and Devil's Island were patrolled far more effectively by strong ocean currents than by vicious dogs or armed guards.

Old-style prisons were built with bricks of law to extract society's revenge. However, we're all still prisoners of the limits set by our technologies. By extending the boundaries, Bill C-39 will give greater mobility and, with it, further freedoms. Caged birds accept each other, but flight is what they long for. Madame Speaker:

I know not whether Laws be right,
Or whether Laws be wrong;
All that we know who be in gaol
Is that the wall is strong;
And that each day is like a year,
A year whose days are long.

Mr. Antoine Dubos (Fatalists)

Madame Speaker, the greatest tragedy of the twenty-first century has been the death of the job. Traditionally, work was a dilemma. It was bondage, but it also provided identity, preventing the individual from being a bystander in someone else's world. Without work, all life goes rotten. An unemployed existence is a worse negation of life than death, since to live requires that we have something meaningful to do—a mission to accomplish. If we avoid dedicating our lives to something, they are empty. Humanity, by its very nature, must have goals. There has to be something to strive for. It is not enough to be busy. The question is: what is it we are busy about? We work to become, not merely to acquire.

Madame Speaker, in this century we are busy about leisure, the tyranny of spare time. There is nothing meaningful to do, and nowhere meaningful to go, so we travel; not to go anywhere significant, but simply to go. Travel for its own sake; the great affair is to move. Travelling has become the fool's paradise. What do we see, who do we really meet? Only the omnipresent tourist with their hand-held CD-cortaber, their excessive asking of personal questions, their predilection for souvenir shops, gaudy restaurants, vulgar entertainment, their excessive addiction to all tasteless and intruding activities and their lack of concern for the niceties of local cultures. Tourism, through crowding, wear and tear on humanity's masterpieces, litter and its negative psychological impacts causes solar-wide contamination and degradation. We should build a statue to the unknown tourist; the one with enough sense to stay at home. The Talmud is right, three things are weakening: fear, sin and travel. Madame Speaker, do we really need more mobility? We already have an epidemic of motion sickness.

Ms. Bev Koerner (Alien Channellers' Association)

Madame Speaker, the simplest solution is always the best. The purpose of medicine is not to cure disease but to prevent it, to decrease pain and to postpone death, only if doing so increases meaningful life. In the late twentieth century, intoxicated with the scientifically exotic and esoteric, medicine had lost sight of these goals. The whole edifice was like the Tower of Pisa, tilting dangerously and ready to fall. Most consulting rooms were full of complainers, professional patients who had turned being ill into a lifestyle and having pain into a career. In reality, they were their own worst enemies. Two out of three suffered from smoker's lung, loafer's heart or drinker's liver. None wanted to take responsibility for their own misfortunes and so turned to their physicians for designer drugs, the universal panacea for all ills. But each pill came with a bill. Today's cure produced tomorrow's symptoms and with them the next trip to the surgery or the hospital.

No problem; reality a little painful today, take another anti-depressant. Things won't change, but you will.

Madame Speaker, there were, of course, those too ill or too poor to make it to the doctors' consulting rooms. Wandering the streets were the ubiquitous, ragged, hallucinating, mentally ill. Freud's air vent children, huddled in alleyways, under bridges and in derelict buildings which, like themselves, had been condemned. In the truly ill there was little profit. They could never be served up a new heart like cherries jubilee.

Madame Speaker, the treatment of disease mimicked killing a fly on the windowpane with a sledgehammer. It worked, but was the damage really worth it? The operation was a success, but all too often the patient died. Fortunately, there was another way; the orthomolecular, the prevention and treatment of disease with substances found naturally in the human body. Gradually, it was accepted that vitamin C and niacin lowered cholesterol levels, that parathyroid hormone cured osteoporosis, that folic acid prevented spina bifida, that vitamin E and Co-enzyme Q10 strengthened the heart and that selenium slowed the aging process, prevented most cancers and helped schizophrenics back to reality. The list was virtually endless, but the risks and complications few. When all else failed, there was nanomedicine, self-donation, replacing each and any organ with its clone. No fear of rejection there. Madame Speaker, exercise, eat healthily, sleep well and laugh loud and long. Ultimately we are all responsible for our own health. We are our own physicians.

Ms. Willa Cassatt (Piranha)

Madame Speaker, what was a good education? Just the state-controlled manufacture of echoes; the production of the habits and expectations of a managed consumer society. For years this suspect bill of goods was promoted as the universal remedy for everything from juvenile delinquency to premature senility. The notion that education was the best preparation for life was fatuous. For the most part, it only served to increase stupidity, inflate conceit, expand credulity and put anyone subjected to it at the mercy of those with a higher grade of prejudices. No wonder, only those with superior characters ever surmounted the handicap of a "good" education.

Madame Speaker, education was time consuming, costly and destructive. But most of all it was élitist. Several times the human pack was shuffled and cut, with all but the aces and kings discarded. Of course the Ivy League establishments graduated the smartest. That's all they accepted, leaving others to deal with the problem of educating those who most needed it. Such institutions provided educations like the banks lent money, only to those who could prove to their satisfaction

they were not in need. Nobody ever heard common sense from a school teacher or professor. It was probably safe to take their word about the *Decline and Fall of the Roman Empire*, cactirice production, or equilateral hexagons; but as to life, why life to them was a closed book.

Madame Speaker, then came cortical absorption, freeing us from the tyranny of the knowledge industry. Education became a solitary vice. If you wanted to clutter your skull with facts, you could do it in minutes, in private. Cortical absorption was certainly an exotic innovation. Would it have survived Bill C-39 and its neurosocial networks?

Mr. Carl Babington (New Dawn)

Madame Speaker, I feel like the only mosquito in a nudist colony. I know what I ought to do, but I'm overwhelmed by all my opportunities. When you look at the architects of Bill C-39, what do you see? Several bad comedians with stage fright, the original good time girl that was had by all, a nervous breakdown masquerading as a minister and two zipships full of 120-year-old religious fanatics intent on criticizing others' lifestyles; all fitted out like entrants in a fancy dress contest nobody else wants to attend. If this is the strongest coalition the Religious Right can throw together I can only thank God I'm still an atheist. If you must have faith in something, what about luck? How else could you explain this government's re-election?

Madame Speaker, with the passage of Bill C-39 we are to be protected from the exotic and the esoteric. Anything really new will be considered too risky. Yet fortune sides with those who dare and here we are again, getting ready to miss the boat. Shakespeare, in his wisdom long ago, described Bill C-39's consequences:

> *There is a tide in the affairs of man*
> *Which, taken at the flood, leads on to fortune;*
> *Omitted, all the voyage of their life*
> *Is bound in shallows and in miseries.*

Madame Speaker, the melting of the polar icecaps and resultant flooding of the globe's coastal agriculture lands has been mankind's bitterest mistake. Why did it occur? For centuries we treated the Earth's atmosphere as a limitless ocean of gases into which we could spew our wastes with impunity. As carbon dioxide levels rose, so did temperature. This was no surprise to our scientists, who had monitored the changing nature of the atmosphere for years and who had modelled and predicted increases in global temperature, and associated droughts, hurricanes and inevitable ice cap decay. So why, like an alcoholic under doctor's orders to abstain, didn't we stop? Humanity was addicted to the commonplace, the easily

available; to coal, oil and natural gas. Had we developed the hydrogen economy sooner, or converted all our transportation systems, industries and heating needs to electricity produced by nuclear power, there would have been no global warming and no Great Melting. But we didn't. We were too afraid of the exotic and the esoteric so we stuck to the tried and untrue. Madame Speaker, changing direction is what we fear most. It is the abhorrence of new ideas that makes us impotent. Bill C-39 will sanctify all that.

Mr. Bruce Zullo (Searchers for Self-Sufficiency)

Madame Speaker, the previous opposition member should have "keep it simple, stupid" tattooed on his forehead to give him a daily reminder of its logic. The nuclear power industry made a Faustian bargain with society. On the one hand it offered an inexhaustible supply of energy, but on the other demanded a vigilance and longevity our institutions could not possibly provide. As unforgiving nuclear energy production was adopted, it imposed a burden of continuous monitoring and sophisticated management of lethal materials, essentially forever. In a nuclear world, no Acts of God were permitted; yet, then came Chernobyl and the disasters which followed. Capitalist and Marxist isotopes are still amicable meeting in the skeletons of all our descendants. The lessons are clear. The Faustian bargain was a bum deal. The most decisive conflict of the twentieth century was not between capitalists and communists, nor was it between the haves and the have nots, but rather it pitted worshippers at the Shrine of Saint Plutonium against the rest of the world that merely wanted to survive. "Atoms for war" and "Atoms for peace" were Siamese twins.

Madame Speaker, fission definitely is too exotic. Nuclear power was never a Hobson's choice. It was a false choice. We might have prevented the Great Melting, but at what cost? The price would have been widespread permanent damage to the human genome and a nuclear garrison state. Complex problems should not be approached with such singleminded tunnel vision. No matter how you look at it, trying to control a chain reaction in unstable atoms of highly enriched uranium is a hell of a way to boil a kettle.

Ms. Wenda Kusama (Twenty-Twenty Vision)

Madame Speaker, it is far more difficult to be simple than to be complicated. Yet complications multiply the chance of error and, therefore, catastrophe. That is why Bill C-39 seeks to promote design that negates the need for highly skilled operators. All too often, disaster grows out of error. Yet stupidity cannot be cured by money, nor through education, nor by better legislation. Stupidity is a

handicap, not a crime or a sin. Its victims can't help being stupid; but stupidity is the only universally capital crime. The sentence is death. There is no appeal against it and execution is often carried out automatically and without pity or remorse. You live and learn, or you do neither.

In 1971, the freighter SS Trade Carrier unloaded 16,000 tons of wheat at the port of Basra, Iraq. This seed, intended for planting, had been sprayed with a pink dye to warn its recipients it had been treated with deadly poisonous, methyl mercury fungicide. Every sack carried a warning to this effect in Spanish. Many farmers were unimpressed and first fed this grain to their chickens, with no obvious immediate ill-effects. So they began to use it as an animal feed, or in family meals. Mercury does not strike immediately, but accumulates in the body, eventually attacking the brain and nervous system. By late 1973, as many as 6,000 had died from eating mercury treated grain and 100,000 others had suffered serious injury from it. Mercury is extremely dangerous. That, of course is why mercury amalgam tooth fillings were universally banned in 2006.

On May 11, 2073, during a routine ionic engine service, a technician dropped a wrench into the First Solar Explorer's xenogas exchange unit. To make her job easier, she had previously switched off the rear engine's safety shunt. The wrench caused a major power surge, destabilizing the automatic pilot, just as the ship was about to land. The resulting crash and subsequent fire killed, not only the ship's entire crew and passengers, but burned most of Geneva to the ground.

Madame Speaker, numerous disasters have occurred because of incompatibility between machines and their operators. Complex technology generally requires high levels of intelligence and rigorous training to operate and maintain. Yet there are too many who suffer the effects of mineral deficiencies, drugs, alcohol and mental illness, that may temporarily or permanently impair their ability to handle dangerous materials or sophisticated systems. Bill C-39 will encourage all agencies and industries to ensure the health and education levels of their employees are checked regularly and that alcoholics, drug users, cybersex fanatics and the intellectually impaired are removed from the workforce for treatment. This legislation also will ensure greater emphasis on simplicity in technical design. The potential for error must be minimized. We must never underestimate the awesome power of human stupidity. The only time some people's brains get any exercise is when they let their minds wander.

Mr. Hans Wendel (Followers of Barracki)

Madame Speaker, it is surely written:

> *I returned, and saw under the sun, that the race is not to the swift, nor the battle to the strong, neither yet bread to the wise,*

> *nor yet riches to men of understanding, nor yet favours to men of skill; but time and chance happeneth to them all.*

Because it is the will of God, Bill C-39 will either pass or be defeated. Amen.

Ms. Susanna Veblen (Unlimited Horizons)

Madame Speaker, three weeks ago in Chicago, Adrian Gould parked on a downhill grade and entered the Richard Nixon Building, to run a quick errand. On his return he found his zipship wedged between a cactioat transporter and a hydrogen tanker. Being both in a hurry and resourceful, he decided that releasing the transporter's brakes and letting it roll forward a few feet, would give him enough room to manoeuvre his zipship out of its confined parking space. He quickly climbed into the transporter's cab, only to be confronted by an array of audio-responders. Since these were obviously voice controlled, he began to manipulate levers randomly, in an effort to release the brakes. Pulling one, which happened to be the dump-control, he completely buried his zipship under 25 tons of grade one cactioats.

Madame Speaker, that small moment in our history clearly demonstrates one of the essentials of resilient systems. They must be designed without the need for sophisticated operator skills. If this is impossible, every effort must be taken to prevent their inappropriate operation by the incompetent. That is why there is a strong operator compatibility dimension to Bill C-39. Mistakes inevitably will be made but we must never make the mistake of expecting that we will never make a mistake. Adequate training is everything. The peach was once a bitter almond: cauliflower is only a cabbage with a university background.

Ms. Alison Lampart (Daughters of the Revolution)

Madame Speaker, have you ever taken that first mouthful of succulent peach, savoured its juices and then, just as you were getting ready to bite again, noticed a half-eaten maggot? Sweetness and corruption often go together in both peaches and this government's legislation. Who can argue against the benefits of disaster prevention, against greater control over complex technology? The untrained, of course, must not be allowed to operate complex equipment.

Madame Speaker, read the fine print. The devils are in the details. This legislation aims at far more than greater safety through better design. It restricts human rights and pushes back hard-won android gains. It carries the stench of eugenics about it. It's a type of intellectual gerrymandering, allowing the government to exclude individuals and racial groups at will from social programs. Even the vote itself will be limited to those displaying, and here I quote, "an acceptable

level of intellectual maturity;" defined, of course, as having voted for this administration before. Madame Speaker, never ascribe to this government mere stupidity that corruption can explain.

Mr. Thelonius Kinsley (Searchers for Self-Sufficiency)

Madame Speaker, a Chinese emperor, wishing to appear intelligent, called together his closest advisors and bid them provide him with one phrase that would be appropriate whenever spoken. After much debate they presented him with "and this too shall pass away." They were right. All destiny is:

> *To lie in cold obstruction and to rot;*
> *This sensible warm motion to become*
> *A kneaded clod; and the delighted spirit*
> *To bathe in fiery floods, or to reside*
> *In thrilling region of thick-ribbed ice;*
> *To be imprison'd in the viewless winds,*
> *And blown with restless violence round about*
> *The pendent world.*

Madame Speaker, humanity's greatest enemies are not disease carrying insects, nor colonizing aliens but the mundane chemical, biological and physical forces that eventually will rob Everest of its glory. These are the armies that have toppled empires: rot, rust, decay, metal fatigue, mould and corrosion. That is why Bill C-39 mandates the use of stable materials in all construction and promotes research into eternal-life building materials. Madame Speaker, politically, socially and technically, we must stop the rot. Our resilience depends on it.

Ms. Eileen Nurkse (Inner Light)

Madame Speaker, a good catchword can obscure the truth for a generation. The history of our species is one of phrases, which suddenly rise to great power and then, just as quickly die away: the "merchants of death," "collective security," "the red menace," "peace in our time," "a chicken in every pot," "inspirational channellers," "alien abductions," "mind-melding insights," "android power," "reach for the stars," "animal rights," "alien business partners" and so on, and so on. At the time of their currency, very few individuals have either the courage or the resources to stand up against their tremendous force. They develop an irresistible authority, sweeping all before them like a tidal wave.

Opponents are destroyed by them and their strongest supporters are carried into power. Others rally to their banner. Wars are declared, institutions toppled and people driven from their homes and properties. And, after all this destruction

has been created, suddenly the phrase disappears from common usage and is no longer powerful—indeed it is almost lost and forgotten, its few users passé and the butt of jokes. In death, it is quickly replaced by something else, different and often exactly opposite. So it is now with "resilient stability." No doubt, for a while, the solar system will be crucified on this fashion cross. For what? Madame Speaker, it is all too terrifying. Where in all this manufactured chaos lies the truth?

Mr. Hans Langdon-Davies (Followers of Barracki)

Madame Speaker, it is surely written:

> *Lay not up for yourselves treasures*
> *upon earth, where moth and rust*
> *doth corrupt, and where thieves break*
> *through and steal:*
> *But lay up for yourselves treasures in*
> *Heaven, where neither moth nor rust*
> *doth corrupt, and where thieves do not*
> *break through nor steal:*
> *For where your treasure is, there will*
> *your heart be also.*

Let God's will be done. Amen.

Ms. Rebecca Al-Hakim (Advocates of the Quantum Leap)

Madame Speaker, I am, and always will be, a revolutionary, because our laws make justice impossible; our liberties destroy all freedom; our property is organized theft; our morality is arrogant hypocrisy; our wisdom is the platitudes of dupes and our power is wielded by a government of cowards, incompetents and weaklings. Look carefully at me. I am an enemy of the existing order.

This government craves continuity, a stable system built of concrete parts, a pyramid of power with its own secure apex. What it is going to get is radical redesign of the social structure. Revolutions, like the one to come, are not manufactured, they are organic and grow, supported by deep roots of discontent. All revolutions rest on ideas that finally have found their bayonets. They are the despotism of liberty against tyranny. They are not made with rose-water, nor in silk gloves. They are not dinner parties, nor essays, nor a work of art, nor embroidery. They cannot be advanced meekly or softly, carefully or gradually, considerately, respectfully, politely, or modestly. Revolution is an iron fist in a steel glove.

Madame Speaker, in revolutions the supreme power belongs to the most abandoned. With the least to lose, they have an inherent right to cast out those in

power, rewrite policies, and effect radical reforms in institutions by force. Revolution becomes essential when the legal and constitutional methods of making change have been subverted. Madame Speaker, Bill C-39 continues a long tradition of denial of fundamental rights and eventually is sure to lead to revolution and to blood. Inevitably, suffering will fall not only on the guilty but also on the innocent. If we, the Advocates of the Quantum Leap cannot move Heaven, we will raise Hell.

Madame Speaker (Ms. Susan Barach)

Mr. Saro-Wiwa, the opposition now has a maximum of ten minutes for its closing arguments. Mr. Cipra, because of the draw's luck, the government's fifteen minute time allotment will then follow. Remember, "if it were done when 'tis done, then 'twere well / If it were done quickly."

Mr. Odil Saro-Wiwa (Piranha)

Madame Speaker, it's amazing that Rhodes Vizena is still Minister of Social Responsibility, despite his pending impeachment for falsifying government records. He also seems to have recovered from the second-degree burns he suffered at his inauguration when inadvertently he touched the Bible. His little lap dog, Jerome Cipra, also seems in good spirits, but he's been having his own problems. I won't go into those. It would be unfair of me to draw his three cybersex convictions to the attention of this Assembly. He's an amazing politician, always feathering his own nest while his face is in the trough.

Madame Speaker, when I look out across the government's front benches, I am reminded of Lindner's insight that it is a characteristic of all movements and crusades that the psychopathic element assumes the leadership. Or, put more concisely, it's not always cream on the top. The scum also rises. Our worst enemies are the intelligent corrupt. Fortunately, this government bats only 50 percent on that one.

Madame Speaker, Bill C-39 aims to minimize risk, to take the gamble out of life by using resiliency-enhanced decision evaluation meshes to assess the future impacts of every new idea or innovation. It is a major step backwards. To be alive at all involves taking risks. If everything always went right, there would be something wrong. We need tension to remind us we are alive. So life is a gamble, a way of buying hope on credit. You can't alter that. We are all bonded to the power that issues the credit cards. Each of us owes his or her existence to the chancy collaboration of two unintroduced fertile organisms, while a fluky distribution of their genes determines our race, gender, sexual preferences, colouring, and disposition.

During our womb-to-tomb journey, we never stop gambling. All too often we can't be sure of the outcome of even routine daily decisions. We just "hope for the best."

Madame Speaker, this government is like the man who set out to free himself from the grip of chance. He avoided alcohol because it could cause cancer and cirrhosis of the liver. He gave up sex because of its potential to spread disease. He stayed in bed to avoid the problems of work, travel and exercise and he kept all his credits in a sock for safety's sake. He soon atrophied and died from a heart attack. Then, his nephew found the sock, spent the credits on wine, women, song and racehorses and died happily, surrounded by his friends, at 126. With chance, there is little justice; sensible people don't expect it.

Madame Speaker, my grandfather used to tell of going to Ascot racecourse in 1956, to invest his rent money on a four-legged friend. One dissenter set up an iron-railed podium and ranted away about the evils of gambling, attracting a highly amused crowd. As his sermon progressed, dark clouds gathered and it began to pour with rain. The preacher pointed towards the threatening storm and said, "God's wrath is manifest. The Lord is highly displeased by the evils of your gambling." The crowd was wise enough to get out of the rain and scattered. At that moment, lightning struck the podium giving the anti-gambler severe burns. Watch out for gathering storms, Mr. Vizena. Look out for lightning bolts.

Madame Speaker, we shouldn't weep because the solar system is changing. If it didn't, that would be reason enough to cry. Of course change brings unexpected consequences and serious problems in its wake. Every new truth, each significant innovation causes mischief, produces pain, unhappiness and disturbs the *status quo* of our political, social and economic institutions. Only after the framework of our affairs has had the chance to readjust itself to this new truth are its impacts obviously beneficial, and these benefits continue to increase until eventually there is nothing left but the good. At the outset, new ideas always cause harm. The more significant they are, the greater their initial adverse impact on the social fabric. Society can't bear the sudden light. It is convulsed by it. Old interests and beliefs are destroyed before new ones are formed fully. These are the symptoms of a revolution in gestation. They have preceded all great changes through which the solar system has passed. Any self-respecting neurosocial network will never miss them. All significant change will be aborted.

Madame Speaker, Bill C-39 is a poor quality attempt to justify the shortfalls of the present, with visions of a golden future: today in Hell, tomorrow in Heaven. As usual, with this government, the rule is jam yesterday and jam tomorrow, but never jam today. We should be placing supreme value on the present, not on the future. The future is a time of deceit, that always answers our pleas with "not yet," and so endlessly denies us. Mr. Vizena, we do not want to sacrifice our

present for their future. It is the present, not the future, that should be the time for happiness, love, prosperity and power: what humanity truly wants now. Madame Speaker, whoever builds a house for their future happiness constructs a prison for their present. Whenever you hear someone in government say that they are going to stand firmly on this or that principle, run for cover and warn all your friends and relatives to do the same. There is going to be suffering, real suffering, Mr. Vizena. We want our jam today, and we don't want Bill C-39.

Mr. Jerome Cipra (Microhard)

Madame Speaker, during Odil Saro-Wiwa's contribution, and I use the term lightly, to the debate, my mind couldn't help wandering to Dag Hammarskjöld's astute observation, "Time goes by, reputation increases, ability declines." Odil is the only person I know who can strut sitting down.

Madame Speaker, change is a blizzard in which it is all too easy to get lost. The snow is never going to stop, so what is needed is Bill C-39, a flexible plan to deal with it. Even the possibility of change is a Rorschach test, a psychological ink blot. To pessimists, because it carries with it the risk of deterioration, it is a threat. To optimists, it is encouraging because it implies things may get better. Change inspires the confident, because it provides them with the challenge to improve; yet for the same reason, it depresses those with low self-esteem. In reality, change has its pluses and its minuses. Every coin has both faces. In Chinese, "change" is represented by two characters—one meaning danger and the other opportunity. This is appropriate because it always carries both risk of loss and potential for gain. The major goal of this government is to minimize the dangers of change, while capitalizing to the fullest on the opportunities it presents.

Madame Speaker, many members of the opposition would have us embrace all scientific and technological innovation, regardless of its ultimate social impacts. This is a tired old error. The anguish of our times is the Frankenstein monster that has been created by unrestricted scientific and technological "progress," nurtured by the lack of intestinal fortitude of those in government. We reap this anguish because we have encouraged any and all change, pulling the bedclothes over our heads hoping that the associated ogres would leave and that the light of the new dawn would purify all. Well, it is not going to happen. Somebody must take charge. If we are going to inherit the future we deserve, we must govern with enough courage to be selective. Bill C-39 is our social V-chip. We intend to choose carefully from the smörgasbord of change.

Madame Speaker, amongst those also opposing Bill C-39 are the Neoluddites who stand against every change. There is nothing original about resisting

innovation. In the early nineteenth century, the Luddites carried out a systematic campaign to destroy new machinery. There were three Luddite movements, centred in the English Midlands, Cheshire and Lancashire and Yorkshire. In all these districts, masked men carried out midnight raids against factories using innovative equipment, such as shearing-gigs and steam looms. The British government met these Luddites with a well organized system of spying and passed an Act that punished machine-wrecking with death. The Luddites, working class revolutionaries using force to halt innovation and protect their jobs, were put down with a savage hand and the Industrial Revolution continued its relentless forward motion.

Madame Speaker, this pattern has repeated throughout human history. From 1966 to 1969 the People's Republic of China was torn apart by the Cultural Revolution, a major purge of liberal intellectuals, authors, and indeed the whole academic and artistic communities. Its aim was to stamp out innovation and the knowledge that created it. Again in 2063, the Neoluddites destroyed a year's solar-stock market trading records, causing chaos throughout the business and industrial infrastructure. While it is true, confusion, uncertainty and despair invariably emerge during periods of great technological and cultural transition, organized vandalism is not the answer. What is needed is radical conservatism, the ability to pick and choose, to select only what will enhance and to reject what will not. That is the ultimate aim of Bill C-39 and this radical conservative government.

Madame Speaker, resilience is a complex idea. Yet its major components have been admirably described by my colleagues on this side of the Assembly. An hour is a long time in politics, so I don't intend to reiterate their main points to an opposition with such a short attention span. Suffice it to say, are we fully aware that not every resilient system has all of these characteristics? Many dimensions are incompatible and internal conflict is the antithesis of resilience. No, each successful system is based on a package of mutually compatible components, which interact one with another to provide synergism. The whole is greater than the sum of its parts.

Madame Speaker, consider the ants. They are so very like humans it is an embarrassment. They farm by growing fungi and raising aphids as livestock. They send out armies to wage war with their enemies, use chemical sprays to fight and cause confusion, capture slaves, engage in child labour and ceaselessly exchange information. With a little accidental help, they have begun to build cities throughout the solar system. They do everything we do except enjoy step diving. Ants were here long before us and I don't doubt they'll still be around long after humanity has gone. Why? They are resilient, Madame Speaker, very resilient.

Ants build colonies that spread over thousands of square kilometres. These are dispersed, fine grained, modular and standardized in design. They use nothing

unstable or esoteric in construction, a process that requires no unique skills. Ant cities, excavated under logs, stones or underground, contain chambers and galleries for all. Some species build huge mounds of earth and vegetable matter as their megalopolis. As anyone who has tried to clear a field of termites' mounds will testify, they are very stable. Too stable.

Ant colonies satisfy a diversity of needs. They provide shelter, a place to live, eat, rest and multiply and an equitable distribution of benefits and costs. Some species of harvest ants have soldiers with enlarged fighting jaws, whose peace-time job is to do virtually nothing but crack seeds for other ants to eat. To all ants, internal variables are paramount. Nothing comes before the safety of the colony. Their social organization and genetic make-up allows them to withstand large-scale external fluctuations in both temperature and precipitation. That is why there are more than 4,500 species of ants and why many have begun to colonize the solar system. Farmers in the American south learned about the resilience of fire ants the hard way, spraying hundreds of thousands of acres with pesticides, only to find they killed the ants' predators but not the ants. The result, of course, was more ant colonies and poorer farming.

Male ants are winged and mobile, dying soon after mating. The work of the community is largely the responsibility of wingless females called workers, which also care for the young, feeding, cleaning and attending to their every need. Ants are omnivorous; that is, they eat a diversity of foods. Workers can find their way through complex mazes and establish individual foraging routes from the nest. These they follow chemically, or by a system of vision based on the direction and plane of polarization of light. They pass on information about sources of food by tactile, chemical, vibratory and even auditory communications. Worker ants collect grass seed and fungi for the colony's food supply, while leaf-cutting species collect vegetable matter to fertilize fungus gardens. Workers even harvest a sweet fluid, called honeydew, milked from captive aphids. Yet despite this diversity, ants have functional redundancy. Kill one ant, and unless it is the egg-laying queen, what have you achieved?

Ants usually co-exist with a variety of other animal and plant species. They are part of, not apart from, the ecosystem. Their activities fertilize the soil and recycle vegetable matter. They have an everlasting, replenishable resource base of dirt, organic matter, and aphids. Their adverse environmental impacts, except when assessed by humans, are minimal.

Ants are small, mobile and fast. Anyone poking an ant-hill with a stick, and being chemically sprayed as a result, knows their defence system has a very short lead time. They have early fault detection and can repair colony damage quickly.

Their operations are efficient and produce little unnecessary waste. When attacked, they defend themselves and are quite capable of waging war when it is in their best interests. In short, ants are very resilient social insects.

Madame Speaker, on October 1, 2050 two engineers shook hands beneath the Straits of Georgia. Breakthrough had occurred, and, for the first time since the melting of the ice sheets, Vancouver Island and the British Columbian mainland were united physically. Three months later, another handshake, and Seattle, Vancouver and Victoria had been linked by the world's largest undersea tunnel system. Hailed as the greatest construction project of the twenty-first century, the biggest privately-funded engineering scheme ever became operational by 2055, when trains, buses and cars routinely travelled the new "Golden Triangle." In that first year, 2,785,000 passengers proved, by crossing under Georgia Strait and Puget Sound, that Vancouver Island no longer was isolated from the rest of North America.

Yet all was not well. Between January and September 2056, Nitrotunnel's shares dropped steadily, losing more than half of their value. The company then unilaterally suspended all interest payments on its debts, while attempting to negotiate a restructuring agreement with its bankers. Within three years of its inauguration by Prime Minister Anderson and President Wilmore, one of the greatest engineering triumphs of the twenty-first century suffered an economic debacle. By 2060, Nitrotunnel, the solar system's largest private construction company, was in receivership. Its shareholders ultimately received nothing. Why? It had no resilience, Madame speaker, no resilience.

Thousands of engineers can design tunnels and bridges, calculate strains and stresses and draw up machine specifications, but only the truly great engineer can tell what tunnel, bridge or machine ought to be built, where it should be built and when. The Golden Triangle Tunnel Complex (GTTC) had only one goal, to facilitate transportation between Seattle, Vancouver and Victoria. During its construction, its engineers saw it as a middle-class retirement scheme, while its drillers and ground crews mistook it for a welfare program. Once you begin to finance a tunnel's construction, you are trapped. If you stop, you have nothing. Endless strikes against Nitrotunnel doubled projected costs, while simultaneously pushing back the completion date a year and so reducing benefits. Tunnels do not have an early return on investment, they are immobile, and they cannot operate incrementally. They are either open and functioning, or they are not. They cannot be prefabricated.

Madame Speaker, men take five sure roads to ruin—women, gambling, drugs, alcohol and engineering. The most pleasant is with women, the quickest with gambling, but the surest is consorting with engineers. One has to be very careful with engineers. They begin with washing machines and end up with tunnels and lithonuclear weapons. The GTTC was a great Gothic cathedral, the supreme creation

of an era, an altar for the worship of the automobile. But the car is dead. Long live the zipship!

Madame Speaker, in 2054 with the help of alien information transfer from the Raybourne Confederation, Dr. Paul Marotzka invented the zipship. It was an innovation whose time had come. Within ten years, the automobile was an antique. Anyone wishing to get from Victoria to Seattle used a zipship. It was a ten minute journey. External variables had altered. The GTTC was obsolete; it couldn't withstand its competition. Nitrotunnel had built and still owned and operated tunnels world-wide, including the Tasman Sea Crossing and the Japan-Korean Link. All suffered the same fate. Nitrotunnel lacked diversity and so was forced into bankruptcy by 2060. A doctor can bury his mistakes, an architect can advise his clients to plant vines, but an engineer with tunnel vision can only suggest mushrooms. Madame Speaker, you need to sell an enormous quantity of mushrooms to generate a profit on a tunnel's 987 billion credit debt. When Shakespeare wrote, "For 'tis the sport to have the engineer Hoist with his own petard" he was probably describing businessmen and bankers seeking their revenge.

Madame Speaker, Stalin scoffed at Rome's power, asking "How many divisions has the Pope?" Well, Stalin is dead and Communism long since reduced to ashes in history's incinerator. Yet despite its lack of armaments, the Catholic Church continues to thrive. Napoleon had a better grasp of the realities of power, always treating the Pope as though Rome commanded an army of 250,000 men; but the Church has no robotanks, armed stratocruisers or lithonuclear weapons. The Pope fights with the dogma of infallibility. He has spoken, the argument is over, the case is closed. His weapons are interdictions, excommunications, damnations and the terrible bolt of the Papal Bull, which can, in an instant, hurl souls into the very depths of Hell. In a solar system where yesterday's avant-garde is today's chic and tomorrow's cliché, the Catholic Church has survived and prospered for 1,800 years. Why, Madame Speaker, why? It is resilient, very resilient.

Despite a reputation for rigid orthodoxy, the key to the Catholic Church is its flexibility. The true image of Roman Catholicism is not one of the pious Church of Christ, but of a truly effective power structure. The Church extends its power tentacles into governments, the media, industry and the bureaucracy and by a disciplined Catholic vote, fights to manipulate policy in its own interest. It is a great democracy of the intellect. There has never been a peasant or worker so humble that he might not become a priest and no priest so obscure that, if he had the aptitude for politics, he might not become a cardinal or even Pope. This power structure has encouraged a constant upward flow of the most intelligent and the best educated. For centuries, every court in Europe was ruled by learned and accomplished men, the priesthood of the great dominant Church of Rome. What has kept

the Church alive for 1800 years has been the diversity of its upper echelon; power based on intellect, not on accident of birth. This constant rise of nourishing sap from the roots, the smartest and most politically astute from the rank and file, passing into the priesthood, has maintained it.

Not for nothing do all roads lead to Rome. Diversity leads to good communication and with it, greater security. As Martin Luther admitted, "If I break wind in Wittenberg they smell it in Rome." The Church is not liberal. It does not take the risks of revolution. It invariably supports the *status quo,* while monitoring the opposition. It follows change, but will not lead it. The Catholic Church upheld feudalism, then monarchism, warning the kings of possible revolutions. It supported slavery and, in the same manner, capitalism. Yet the Church always came first, internal variables were paramount, and the name of the game was to minimize risk to the structure itself. For this reason, you never saw a truly liberal Pope.

Yet there is flexibility and redundancy within the Church's structure. The hierarchy of the Roman Catholic Church is headed by the sovereign pontiff, the Pope, assisted by the Sacred College of Cardinals and by several congregations or permanent ecclesiastical committees, not to mention archbishops, bishops, apostolic delegates, vicars, prefects, abbots and other prelates. Yet when the Pope dies there is no crisis. The cardinals quickly meet to decide upon his successor. Unlike most of us who, at cremation, finally depart in a puff of smoke, the newly elected Pope arrives in one. Cathedrals are unassailable witnesses to human power and passion. What sort of organization could have filled the solar system with so many? I think I know; one with supreme confidence in its own ability to survive, a truly resilient system.

Madame Speaker, you don't lead by pointing and yelling at the public to go somewhere. You lead by example, by going to that location and making a case for others to join you. That is why all future government policies and projects will, from today forward, be required to pass through resiliency-enhanced decision evaluation meshes. The only limits to our realization of a golden tomorrow are today's doubts. Creating resilience is the necessary process; achieving sustainability is the goal. If humanity is to become one of evolution's long-term success stories, then our social and economic development must be sustainable. Development that requires destruction must destroy itself eventually. Development that conserves also protects. There is no fundamental dichotomy between logical social and economic growth and resilience. With the passage of Bill C-39 we will be able to fulfil the needs of the present without compromising those of the future: the synthesis of social, economic and environmental imperatives, popularly termed sustainable development, will become a reality, not just a slogan. Vote for prosperity. For posterity, vote for Bill C-39.

Madame Speaker (Ms. Susan Barach)

Honourable members of the government and of the loyal opposition, it's never over, so they say, until the fat lady sings. Well don't expect a song, but take my word for it, this debate has concluded. Members of this Assembly do not decide issues, but they do decide who will decide issues. In this case, voting is restricted to humans, 16 years and older and to class four and above androids. These Watchers have followed the debate, felt its emotions, and compared its arguments. The decision is now theirs. Voting is a sacred civic sacrament. Failure to vote will bring with it an automatic six month access privilege suspension. You have 15 minutes. This Assembly will reconvene in half an hour to assess the vote. It is now adjourned.

Off the record I've had a hell of a lot of fun and I've enjoyed every minute of it.

And slowly answer'd Arthur from the barge:
"The old order changeth, yielding place to new,
And God fulfils himself in many ways,
Lest one good custom should corrupt the world."

The Idylls of the King
The Passing of Arthur
Alfred, Lord Tennyson

R E S I L I E N C E : K E Y T O S U R V I V A L

WHITEPAPER

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RESILIENCE: KEY TO SURVIVAL

Blessed nobles are buried in their tombs
[But] their walls have crumbled
Their places are gone,
As though they have never been!
None comes from there,
To tell of their state,
To tell of their needs,
To calm our hearts....

Egyptian Scribe (Weeks, K.R. (1995/6))

INTRODUCTION

In a solar system of flux, trying to achieve permanence is like shovelling smoke. Change is omnipresent. Life is unpredictable. There are no advanced autobiographies. Not only is the universe queerer than we imagine, but queerer than we can imagine. Nevertheless, governments cannot be paralysed by uncertainty. Necessity is the mother of action and laws must be enacted. Despite this difficulty in predicting the future, each decision, whether to adopt an innovative technology, build or close down a thermonuclear generating plant, stepdiving virtuocean, or stungun manufacturing facility, implies a vision of futurity. Decision-makers, either implicitly or explicitly, must make assumptions about social values,

alien information transfer, population growth, genome manipulation and competing social and political trends. In truth, none of these factors is fixed. If the past can be represented by a straight line, then the present is modelled by a dot at one end. Beyond this point lies our future, not a single line, but a multiplicity of beckoning alternatives (Simpson, 2076).

Many incidental, accidental and purposeful events alter the future's flow. Even one additional, dominant individual, a Newton, Stalin, Hitler or Marotzka, on the solar stage, can forever modify the future's flow, determining which of these lines will be followed for years to come. The yet-to-arrive will be the result of myriads of scientific, technological, political and social forces. As a consequence, all our decision-making has to take place under conditions of uncertainty. The longer the decision's time horizon, the greater the problem the present solar system flux creates. What is needed is a methodology which accepts that it is impossible to predict futurity accurately, but still allows rational decisions to be made. In DeltaGlobe and elsewhere within the sphere of human influence, most of the steps taken to ensure that decisions are reliable are designed to allow them to withstand calculable, predictable types of failure (Elderson, 2063). In a period of instability, brought about by alien contact, changes in social values, revolutions, conflicts, embargoes and technological innovations, this is insufficient. Who could have foreseen the crash of the First Solar Explorer and destruction of Geneva? Or who would have anticipated the rapid spread of LNY and the enormous difficulty modern medicine has had in providing protection from it? (Simpson, 2058).

The vulnerability of technological and social systems cannot be predicted completely. Since events have demonstrated this fact repeatedly, it becomes apparent that resilience, that is the ability to accommodate change gracefully, without any catastrophic failures, must be given greater emphasis in our decision-making (Lonergan, 1985; Banks, 2083; Banks and Lehner, 2091). An initial step in the achievement of this goal requires us to identify the basic elements common to resilient systems. Table 1, the product of 20 years of research by my colleagues and myself at the *Advanced Concepts Institute, University of New Delhi at Kansas City*, presents a summary of our achievements to date in this area. It identifies 31 components, typically found in resilient systems. It is not implied that just because a decision is resilient and more likely to withstand the impacts of the waves of change, it is necessarily correct. A poor, but resilient, decision will often cause more difficulties than an incorrect one that has no resiliency. However, there is little point in taking decisions and making associated investments, even if beneficial, when probably these will be overturned quickly by rapidly changing circumstances. Resilience, for better or worse, guarantees greater permanence in an unstable solar system (Banks and Lehner, 2091; Banks and Reukiner, 2095).

Table 1 Dimensions of Resilience

SOCIAL DIMENSIONS
1. Compatibility with diverse value systems
2. Capacity to satisfy several goals
3. Equitable distribution of benefits and costs
4. Generous compensation for major losers
5. Accessibility

SYSTEMS CHARACTERISTICS
1. Significance of internal variables
2. Impact of external variables
3. Diversity of components
4. Functional redundancy

ECONOMIC DIMENSIONS
1. Incremental funding
2. Wide range of potential financial support
3. High benefit-cost ratio
4. Early return on investments
5. Equitable division of benefits and costs

ENVIRONMENTAL CHARACTERISTICS
1. Minimal adverse impacts
2. Replenishable or extensive resource base

TIME AND TIMING
1. Short lead time and rapid response to stimuli
2. Open-end life span

OPERATIONAL CHARACTERISTICS
1. Efficient
2. Reversible
3. Incremental operation
4. Autonomous operation

PHYSICAL DIMENSIONS
1. Not site specific
2. Fine grained and modular
3. Standardization
4. Mobile
5. No esoteric components
6. Unique skills unnecessary
7. Stable
8. Fail-safe design
9. Early fault detection

Sources: Sewell and Foster (1983); Alberline (2041); Gissel-Finn (2078); Banks (2083); Banks and Lehner (2091).

DEFINING RESILIENCE

Social Dimensions

(1) Compatibility with diverse value systems

There is no shortage of alternative futures. Everywhere, the *status quo* is being attacked by those seeking future power. Prediction no longer satisfies. *The Kingdom of Torrow*, once the home of seers, psychics and mystics, has become the preserve of politicians, activists and technologists. In the process, tarot cards, crystals, tea leaves and chicken entrails have been superseded by impact statements, neurosocial networks, Delphi studies and socio-simulations. The future does not just unfold, it must be designed. Agreement to plan for tomorrow does not imply any consensus. The future is now a war zone, in which political parties, pressure groups and technological and scientific élites struggle for supremacy (Sewell and Foster, 1976; Kingley, 2078). All have their own unique interpretation of human history. Each possesses a vision of what the most desirable future should look like, with a critique of political and individual behaviour and rules and roles for all. In addition, each competing group has its own priesthood, consisting of those who would hold the real power in such an "ideal" new solar system. Mindmelders, Academico-Capitalists, Green Ragers and Followers of Barracki all play this role in one vision or another. Inevitably, the ultimate goal of each of these pressure groups is the propagation of their own ideology, in an attempt to broaden its public support. This they do by singling out those facets of their vision of the future which have the most widespread appeal. In debates between Academico-Capitalists, Diffusionists and Piranhas, for example, emphasis is placed on who owns the mechanisms of production and how products and services will be divided. Major disagreements occur over the roles envisaged for the individual and the state and the significance of personal freedom, cooperation and competition. In contrast, other debates about the future, as for example, those between Fatalists, Followers of Barracki and Inner Light supporters, stress the supernatural and theological aspects of existence, emphasizing the insignificance of materialism. A third group of competing ideal futures, such as those supported by Neoluddites, Nanotechnologists, Green Rage and the Searchers for Self-sufficiency are differentiated by the nature and role of dominant technologies and their implications for the organization of society. The ecological imperative, promoted by Green Rage, is one example of such a future vision. It involves the complete rejection of artificial and digital lifeforms and of managed weather. It promotes a lifestyle in which communes, pastoralism and handicrafts are predominant. Its adherents argue that technological innovation is intrinsically bad, since it inevitably causes more

problems than it solves. As one of its leaders, Alvin Ronneshank, pointed out, "We believe that change breeds more mischief from its novelty than advantage from its utility." In this view, of course, he is supported by the Neoluddites. Despite its relatively small size, the Green Rage counterculture has had a significant impact on the mainstream of society, causing the majority to carefully evaluate the potential social impacts of proposed technological innovations. Members of Green Rage and, indeed, many of the Neoluddites are articulate,educated, vocal and very disillusioned. They represent a committed minority, intent on opposing megadevelopments and alien information transfers. Their views are promoted by pressure groups such as *Stop the Rot*, *Back to the Past* and *Friends of the Solar System* and by authors such as Specklehurst (2086), originator of the slogan "Inertia is Beautiful."

The views of the supporters of the technological growth vision, such as the Solar Chamber of Commerce, PowWow and the Galaxy Trade Consortium, stand in stark contrast. Promoters of this alternative argue that the key to success is rapid economic growth (Stanwick, 2093). Without it, they contend, social problems such as LPN and cybersex addictions, floater home tax evasion and congestion, and Hitler's Bunker Syndrome are insoluble. To them, the health of any society can best be measured by the size of its Dow Jones Expanded Index and its Gross National Social Throughput (GNST) and the rate at which both these are growing. Since major developments, such as alien information transfer projects, the Amazonian Pipeline, and the Martian Atmospheric Conversion Project, are the quickest and easiest routes to economic growth, they are promoted vigorously (Bankerham, 2095). An expanding demand for goods and services, both human and android, growing profitability and a buoyant Solar Stock Market are thought to be indicators of a thriving society. Success is a rising Dow Jones Expanded Index, or a Fulfilled Three Year Development Plan.

Humankind is divided over the appropriate role of technology and the powers of the state. Beliefs about the certainty of life-after-death also differ significantly and, as a result, religion is a key player in the game of moulding visions of the future. It is realistic, therefore, to add another axis to our matrix, a third dimension intended to reflect differences in religious beliefs. Subdivisions on it might represent theological alternatives: Christianity, Judaism, Barrackism, Buddhism, Islam and Inner Lightism and their related sects. Suddenly, we have a model that is more complex than Rubik's cube. While some of the positions on the model have greater consistency than others, most of these alternative intellectual compartments are occupied by virtual worlds, nations, groups or individuals who consider them optimal.

Many people are fanatical about their future visions. The worst vice of such fanatics is their sincerity. Unfortunately, the Solar System's turbulent history is full

of conflicts among holders of distinct ideologies. Each combatant had strong beliefs about the truth and what was necessary and desirable. Each felt they were obliged to impose their views on dissenters. A fanatic does what he or she thinks the Lord would do if the Almighty only knew all the facts. The Crusaders, the Spanish Inquisition, the Holocaust and the Pakistan-Indo War are examples of such religious based purges and wars. While violence from this source continues, it has been overshadowed largely by conflicts among those who hold distinct views about the role of the state and the division of industrial and social profits. Examples of such violence include the Vietnam War, the Detroit Riots, the Cathos-New London Mutual Destructions, the activities of the Neoluddites and the rebellions at Lunar Base Three. While religious wars and struggles between the Academic-Capitalists, Diffusionists and Piranhas occupy most of the time on *Laser Forum Tonight*, competition between groups whose primary interest is the role of technology in society also is growing. These conflicts are taking place in virtual reality assemblies, in the courts and even out in the real world. Laser advertisements, blockades, android demonstration, boycotts and acts of terminal desperation have become commonplace in the struggles between those who oppose or support subterranean fish farming, Saturn ring-mining, virtual lifeforms and genetic intermingling (Frenchcotten, 2089).

(2) Capacity to satisfy several goals

Political power, like a well cut diamond, dazzles both the wearer and the beholder; it dignifies meanness; it magnifies pettiness; to what is contemptible it provides authority; to what is debased it gives justification. Power is also a drug, access to it merely increases desire. Yet power changes hands and unless a specific policy or programme can satisfy a diversity of goals, it is unlikely to survive the resulting powerquake. One political party may regard a particular goal as beneficial, while another sees it as an anathema. Regardless of which interest group is currently in power, such diverse value systems give rise to spectrums of non-support that range from passive resistance to active sabotage. When such power shifts take place, the resulting social tremors (radical alternations in decision-making processes promoting dramatic new objectives) can topple institutions. Greater or lesser weight suddenly may be given to specific evaluative criteria, such as cost-effectiveness, gender, species and android equity or the environmental impact. Under a new political regime, such as Anderson's on Lunar Base One, what had formerly been seen as success suddenly may be viewed as failure and vice versa. Powerquakes, therefore, can cause traditional goals to be abandoned, forcing major changes in management strategies.

Such a social tremor occurred immediately after the 2063 DeltaGlobe election, when the Academico-Capitalists and sympathizers lost their grip on power to a Green Rage-Searchers for Self-Sufficiency Coalition. While the former favoured the marketplace over government intervention, the latter did not. As a consequence, a wide range of environmental, energy and social initiatives were put into place quickly. To support them, the tax base was widened. Preventing further environmental deterioration and promoting sustainable development were seen as the overriding objectives. A conserver society ethic replaced the drive for economic growth. In 2069, when the Academico-Capitalists regained power, a second tremor occurred. Many recently established or expanded government agencies were abandoned or emasculated. Emphasis again shifted; this time from the guiding hand of government back to that of the all powerful marketplace (Jones, 2071).

There is little unique about this example. Power has changed hands repeatedly, through revolution, decay or democratic decision. Resilience mandates an ability to survive the accompanying social tremors, and implies compatibility with a diversity of value systems, generally achieved through the ability to satisfy several distinct, yet compatible, goals. A reservoir may provide water for industry, agriculture, and for residential use, protect against floods, generate electricity, yet still be a favourite fishing, boating and swimming hole for thousands. In this way, even though a power shift takes place, there are still influential lobbies for its preservation. It will not be drained.

(3)/(4) Equitable distribution of benefits and costs and generous compensation for major losers

Intelligent discontent is the mainspring of human civilization. It gives rise to progress. There is either agitation or stagnation. Yet governments fear unrest and the instability it creates. It can be avoided best by the more equitable division of the benefits of change and generous compensation for its associated losses. There should be no pain without gain.

(5) Accessibility

When an idea, innovation or process is too complex to be expressed simply, this often is taken as proof that it should be rejected. For this reason, resilience stems from a simplicity of concept that allows easy understanding. Such public accessibility occurs when policies appear to conform to the dictates of "common sense" and permit judgements based on fact. Accessibility, therefore, helps any innovation to disperse and survive (Lee, 2086). In contrast, complex inventions, such as xenotransmitters, which are seen by the general public as

mysterious, threatening and arcane, are likely to be resisted strongly. In the final analysis, the social dimensions of resilience stem from cultivating a broadly-based appeal to a wide variety of pressure groups.

Systems characteristics

(1) Significance of internal variables

Unforeseen circumstances often derail great expectations. The more dependent a system is on external variables for its survival, the higher its chances of failure. This generalization is just as true of the Galaxy Bank as it is for each and every individual. Simpkins (2089) suggested, for example, that "it is the enormous number of external variables and their dependency relationships that ensure government policies rarely work." Regardless of the particular goal, there is inevitably some special interest group that refuses to comply and to perform as needed for success. As a result, failure occurs. Alien Channellers, Animal Mind-Melders, Immortalists, Green Rage supporters, the Searchers for Self-Sufficiency or some other pressure group, upon which the success of the policy depends, all too often sabotage it. Prejudice may be the reason of fools, but that doesn't stop it from undermining government management strategies. The prejudices of ignorance are easier to overcome than those of interest. The former are adopted blindly, while the latter willingly are preferred.

(2) Impact of external variables

Systems that surrender their independence rarely survive. In the 2070s, Devaluists like Peter Cheng and Amos Turgeon promoted investment strategies based on the belief that inflation would remain high and interest rates low. Debt was to be the key to success. Many institutions borrowed to finance take-over bids and large scale construction. To wait was to pay higher prices. This financial feeding frenzy caused massive loss of internal control. Debt became destiny. Never in human history had so much been owed by so many, to so few. By January 2080, six trillion credits had been borrowed from the Galaxy Bank alone; a debt of 659 credits for each inhabitant of the solar system. Major debtors included Android Services Inc., the Cactirice Producers Federation, Ionic Engineers Inc., the Memprod Association and the Planetary Defense Project. Following the devaluist teachings of Cheng and Turgeon, their officers believed that interest rates would remain depressed, despite elevated inflation. Although this anomaly held true for the second half of the 2070s, in the long term such a relationship was impossible to sustain. During periods of high inflation and low interest rates, lenders lose their earning power, especially when governments insist on taxing imaginary profits.

They begin to demand greater returns on their investments, causing interest rates to rise, driving down the demand for credit and with it inflation. So, by the 2080s, these indicators had reversed and the solar system experienced higher interest rates and reduced inflation. Thrift again became a virtue. Borrowers were in deep trouble, their debts having undermined their resilience; bankruptcies and foreclosures followed.

Knowledge is not the only route to power; so too is finance. Every credit is a philosopher's stone and there are few sorrows, however poignant, for which a good income provides no solace. The need for a sound economy is as true of virtual worlds and nation states as it is for individuals. The loss of resilience that occurs as a result of economic overdependence on external variables has been illustrated by the recent decline of Taiwan. In 2091, it imported most of its goods from the rest of the Asiatic League, many of them highly subsidized. Such imports included the bulk of Taiwan's energy and 50 percent of its food supply. With the fragmentation of the Asiatic League, Taiwan is expecting to receive only one quarter of the energy and one third of the food it requires this year. The Taiwanese Agricultural Ministry just announced that, as a consequence, 10,000 tractors must be replaced by oxen, horses or androids and tens of thousands of urban dwellers and floater home occupants have to assist on collective farms (Whitterwill, 2096).

(3) Diversity of components

Life has existed on Earth for over 3.6 billion years. During its tenure, continents have collided and drifted apart, pushing up mountain ranges from the ocean bed. Volcanic eruptions have altered the composition of the atmosphere, while temperature fluctuations have given rise to major glaciations, expanding and drying up rivers, lakes and seas. Yet despite this restlessness, Earth's life has flourished. There are now some 100 million identified natural species on the planet. Life, in its multiplicity of forms, can be found from the ocean depths to the upper atmosphere. Extinction, however, inevitably has been a hard fact of life and only about 10 percent of all species, that at one time or another have graced the evolutionary record, still exist. Nevertheless, despite these losses, the earth teems with life. The lesson to be learned is obvious. Regardless of the scale and direction of change, diversity increases the chance of survival. There is always some species, group or product capable of benefiting from disruption. Every time there has been large scale seismic, marine or climatic upheaval on Earth, lifeforms have been lost but out of the smörgasbord of competing species, survivors inevitably emerge to carry evolution forward. From the personal to the solar scale, diversity improves survival chances during periods of instability (Inis, 1980; Myers, 1980; Lipsing, 2078).

Variety is more than the spice of life. It's the spark. Humanity has not found this an easy lesson to learn and has, all too often, insisted on taking the opposite approach, that is towards greater specialization. Certainly, the scientific and technological advances of the past three hundred years have created greater cultural and physical homogeneity. Competing Western and Chinese ideas and ideals are widespread, usually at serious cost to local cultures. Trade has increased, local diversity declined and self-sufficiency become less common. This drive to conform, fuelled by the economic benefits of mass production and the insidious psychological impacts of Controlfreak productions, has caused extensive loss of environmental diversity. The clearing of forests, hybridization, pollution and the abandonment of traditional crops and herbal medicines have decimated the biological resource base, causing an unexpected agricultural crisis. This disruption, together with Bioinvaders such as Africanized bees and tracheal mites, has wiped out native bee populations around the globe. Pollinators, such as the honey bee, are the unsung, unseen engines that drive our ecosystems. They couple plants with plants and animals to plants. Feeding the young on pollen and fuelling their own flight with nectar, bees are essential to the reproductive cycles of not only rare and native plants, but also to crops ranging from squash, cashews and mangoes to cranberries and blueberries. Destruction of habitat has created a 92 percent decline in such pollinators, with serious agricultural consequences and an increasing reliance on manufactured foodstuffs (Buchmann and Nabhan, 1996; Solwip, 2081).

(4) Functional redundancy

For far too long, industrialism has been the systematic exploitation of diminishing assets. Much of what passed for prosperity was based on rapidly spending the Earth's irreplaceable resource capital. No part of any well designed system, however, should be non-renewable. Nothing must be irreplaceable. If any component fails, another should be capable of fulfilling its function. Such redundancy inevitably promotes resilience, since it permits any element to malfunction, without putting the entire system in jeopardy. The need for such spare capacity explains the reserves on the team bench, the artistic understudy fretting in the wings and the anti-gravity stratocruiser's six piezoelectric retrojets. It also accounts for the insecurity that inevitably give rise to plan B, the escape hatch if plan A fails. Such reserve capacity can be achieved in several ways, including duplication, interchangeability and interconnections that can reroute supplies or functions.

Innumerable examples of functional redundancy can be seen throughout the lifespheres. Bees, for example, feed royal jelly to any larvae they wish to grow into queens. Female kangaroos carry their young in pouches, but if threatened by preda-

tors, cast them aside, replacing them with an already fertile egg after a successful escape. Sharks, that live by tearing flesh, have an endless supply of replaceable teeth. If one is lost, another quickly fills the gap.

Interchangeability also provides redundancy. In times of stress, less important functions can be neglected, if this permits key processes to continue. In August 2083, for example, androids and their controllers went on strike against InterSolar Communications Inc. Some 950 members of the Communication Workers of the Solar System and the Android Brotherhood were demanding greater job security and longer hours. Despite the absence of so many employees, the InterSolar Communications System did not collapse, because of its inherent, internal functional redundancy. Service was maintained by shifting 62 supervisory personnel to positions left vacant by strikers. By making full use of automation in the system, disruption was held to a minimum. While there were fewer than usual operator-assisted mind-melds and non-vital maintenance was postponed, the network continued its usual smooth operation. Even the unions involved admitted they could not disrupt the system, but argued that it would slowly degrade. This type of redundancy, of course, requires compatibility and a wide diversity of skills at the organizational and personal levels (Symtonkins, 2084). The understudy must be able to sing almost as well as the prima donna.

Genesis describes an early example of the use of redundancy to accommodate adverse change. Joseph, who had been sold by his brothers into slavery, eventually became an advisor to the Egyptian Pharaoh because of his ability to interpret dreams. The Pharaoh said to Joseph, "Behold, in my dream I was standing on the banks of the Nile, and seven cows, fat and sleek, came up out of the Nile and fed on the reed grass; and seven other cows came up after them, poor and very gaunt and thin, such as I have never seen in all the land of Egypt. And the thin and gaunt cows ate up the first seven fat cows, but when they had eaten them no one would have known that they had eaten them, for they were still as gaunt as at the beginning."

The Pharaoh also saw seven ears of excellent corn growing on one stalk and "seven ears, withered and thin, and blighted by the east wind, sprouted after them." Joseph interpreted this dream as evidence that Egypt would have seven excellent harvests, followed by seven years of devastating famine. He advised the Pharaoh that during the years of prosperity, food stores should be set up to help Egypt survive the subsequent famine. Joseph was appointed overseer for this project and "stored up grain in great abundance, like the sand of the sea, until he ceased to measure it, for it could not be measured." When the seven years of plenty were over, the predicted shortages began. As a result, "there was famine in all lands; but in the land of Egypt there was bread." Joseph's grain stock piles provided

salvation, not only for Egypt, but for other countries also. "Moreover, all the earth came to Egypt to Joseph to buy grain, because the famine was severe over all the earth." Stock piles, such as this one described in the Bible, are a common method of protecting against change, through the creation of redundancy. This strategy is being applied today at Lunar Base Two, for example, to guard against future transportation crises. The American Confederation of States stock piles certain strategic minerals for use during times of war, embargoes or strikes. Similarly, many companies seek to protect their interests by building reserves of raw materials and spare parts. Credits in the bank, or hidden in the mattress, that are being saved for a "rainy day," represent the application of this strategy.

Economic Dimensions

(1) Incremental funding

Economists' advice is rather like those patent medicines you purchase at fairgrounds. Everybody knows that the manufacturers and salesmen are crooks or quacks and that cures rarely, if ever, work, but they come with a good story and people continue to buy the brand whose flavour they like the best. One of the biggest problems with most megaprojects, favoured by such economists, is that they cannot be built incrementally. That's why economics is more than a discipline, it's a religion that requires a great deal of faith and prayer. Megaprojects are all, or nothing, situations. When partially constructed, society is more or less locked into their completion, even if they have become unnecessary, or economically dubious. If construction grinds to a halt, there is little or no return on the extensive investment already made. This is no minor problem. The Galaxy Bank has admitted that 83 percent of all virtuoceans, 72 percent of all thermonuclear fusion plants and 48 percent of zipship manufacturing facilities cost at least double preconstruction projections. In 26 percent of cases the final price was four times the initial estimate (Gradson, 2094).

The business world worships mediocrity. While officially it reveres free enterprise, individuality and initiative, in reality it fears it. Few applaud an innovation that puts a half-built megaproject out of business. It is not argued here that the benefits and costs of small, quickly built projects are never miscalculated; of course they are. It is simply that megaprojects permit economists, and their handmaidens the engineers, to miscalculate on a megascale.

(2) Wide range of potential financial support

The larger the project, the fewer investors there are capable of providing the necessary capital. It is possible, of course, to sell shares or build a consortium to

finance a major development. However, it must be remembered that banks are willing to lend you an umbrella only while the sun is shining and always ask for it back as soon as it begins to rain. In megaprojects, expenditures have a nasty habit of rising, as construction workers and their unions recognize the increase in their leverage provided by partially built structures.

(3) High benefit-cost ratio

Economics isn't called the "Dismal Science" for nothing. This, however, is a partial misnomer. In science, the same input always produces an identical output. In economics, what you get today may have little relationship to yesterday's return. There are many causes of such error in benefit-cost analysis. Whole classes of benefits and costs are difficult to estimate, measure, or, in some cases, describe. Many decisions are interrelated, making it difficult to evaluate them in isolation. Nevertheless, economists often attempt to do this and unexpected impacts spill over into other government jurisdictions, industries and the lives of individuals. These relationships are known as third party effects, or externalities, and are very rarely adequately incorporated into benefit-cost analysis. This failure results in steps being taken which, in reality, do not have positive benefit-cost ratios. To illustrate, the decision by twentieth century industrialists to burn coal, oil and gas ignored the costs of the enormous down-wind impacts of acid rain. Similarly, it neglected to factor global warming into cost estimates, despite the fact that manufacturing and transportation pollutants were largely responsible for the Great Melting. In addition, no allowances were made for the health losses incurred by those suffering cancers, heart disease and lung ailments due to air pollutants. At the personal level, tobacco smokers used to inflict second-hand smoke on their families, friends and colleagues, an undesired externality which eventually resulted in a major social backlash.

Benefit-cost analysis demands a common yardstick. Economists believe money is God in action, but it's not. In reality, an economist is rather like a man who knows hundreds of ways of love-making, but no women. Typically, in assessing any project, economists reduce all decisions to financial losses and gains. However, many goods and services or opportunities are very personal, highly subjective and internal. They are, therefore, extremely difficult, if not impossible, to quantify financially. Such factors cannot be evaluated adequately in the marketplace and therefore are referred to as "extra-market goods." They include such values as the beauty of the landscape, unique habitats, the ability to breathe a natural atmosphere, or the preservation of historical monuments. Such intangibles tend to be on the cost side of economic analysis, since it is easier to destroy uniqueness than to create it. Economists, because of their worship of credits, tend to

underestimate the value of extra-market goods to others. All too often, if they cannot be counted, they are not quantified and, therefore are ignored.

Whether the benefit-cost ratio of a project is positive or negative is all too often simply a matter of creative accounting. To an enormous degree, the outcome of such economic evaluation depends on the interest rate used. Unfortunately this is typically set too low. Extraterrestrial Contact Probe Five assumed a 2.8 percent interest rate, Shanghai International, 2.9 percent and the McLacklan Project, 2.6 percent. Yet the prime rate is now 9.3 percent and the ten year mean has been 11.2 percent. Using actual interest rates, none of these projects would have been built.

(4) Early return on investments

Time marches on. In addition to the many problems caused by the use of unrealistically low interest rates in projections, personal bias, intangibles and externalities, benefit-cost analysis frequently is undermined by solar instability. In many megaprojects, there is a serious time lag between the generation of costs and the accumulation of benefits. In the case of extraterrestrial contact probes, for example, most of the costs, often hundreds of billions of credits, are incurred years before benefits, if any, occur. As a consequence, this staggering means that costs are far more predictable than benefits. The faster the solar system changes, the quicker the assumptions on which benefits are predicated are undermined. The longer the time horizon, the less likely the predicted benefits actually are. The reverse seems true of costs. All too often, unforeseen new legislation, labour unrest or environmental concerns, have driven up megaproject costs, while simultaneously driving down their anticipated benefits. Time, therefore, has a tendency to increase costs while pushing down returns.

(5) Equitable division of benefits and costs

Economic resilience implies more than an impressive benefit-cost ratio. The salaries of the chief executives of intersolar corporations are not a market reward for achievement. All too often, they are merely warm personal gestures by the incumbents to themselves. One should not expect equity in the division of benefits and costs. However, although restraint is often nothing more than cutting back other people's benefits, in the end, it frequently leads to revolution. Where there is a clearly unfair distribution of gains and losses, those who suffer often attempt to undermine decisions which adversely affect them. Financial resilience, therefore, occurs more often if costs and gains are equitably divided. This issue is very apparent in weather modification and selection. The farmers want more rain, the tourists don't. Ice cream manufacturers and cola salesmen clamour for hot weather, while clothing retailers demand lower temperatures. One person's gain in sales,

mobility, health, property values, view or status is another's loss. Where no attempt is made to balance the equation, expect sabotage from the loser.

Despite all these pitfalls, the implications of action and inaction must be compared. The question then is "How can we make sure that today's projects, decisions or activities are not uneconomic tomorrow?" Since benefit-cost analysis is such a crude technique, neurosocial networks must be allowed considerable room to manoeuvre. Resilient decisions are those with both very high benefit-cost ratios and a variety of potential financial backers. They have an early investment return and are supported widely because of the equity of their implementation. This government should seek fairness above all. The rich man may never get to Heaven, but the pauper is already serving a sentence in Hell.

Environmental Characteristics

(1) Minimal adverse impacts

In Nature's eyes, we are just one more species in trouble, an unfortunate genetic experiment that didn't live up to its own expectations. To survive we must truly accept the Earth as a living organism. It can be in good health or sick, barren or fertile, wealthy or poor, nourished or starved. The planet's surface is littered with the corpses of murdered land, exploited to death for private profit. Bodies are left in full view for all to see but nobody calls Homicide. The laws presently controlling land ownership and its use are both inadequate and abused. What is needed to ensure our species' survival is development that meets the present's needs without compromising the ability of future generations to meet their own. Do we really want to be our grandchildren's executioners? Such sustainable development requires minimum disruption of ecological processes, maximum energy and materials conservation, a stable population and a social system which encourages enjoyment of the results.

(2) Replenishable or extensive resource base

Currently a confrontation is raging between those committed to reform of our social, economic and political institutions, so that they are capable of salvaging our ravaged environments and those who have an unshakable allegiance to corporate power and the political structures which, at any cost, protect it. Industrialists have only one well-defined purpose, to maximize their profits by the most effective available means. That these involve environmental destruction is considered irrelevant. The rest, to them, is smoke and mirrors.

Yet many corporate decisions, especially those that involve the exploitation of non-renewable resources, carry the seeds of their own destruction. The misuse

of groundwater provided a temporary base for the expansion of agriculture in the dry, southeastern United States. Far more water was extracted from the reserves of the Ogallala Formation than was being replenished. Water mining made disaster inevitable (US National Water Commission, 1973). After supplies were depleted the pressure of a Texan lobby forced the United States federal government to approve water diversion from the Great Lakes. This unilateral violation of treaty obligations was the fundamental cause of the 2031 Canada-United States Discord. Illogical agricultural water use was the irritant leading to the collapse of NAFTA and the resulting trade war (Smith, 2036). If it can't be sustained environmentally, it isn't resilient.

Time and Timing

(1) Short lead time and rapid response to stimuli

In more than clocks, perfection requires being exactly on time. Increased mobility and instantaneous communications have compressed time, while simultaneously increasing the significance of timing. To everything there is a season, a truism illustrated by two academics. The Downs (1972) issue attention cycle, for example, models the five evolutionary stages of the typical social or environmental concern. In the pre-problem phase, very few individuals are aware of the issue and those complaining about it largely are ignored. However, if the problem has real substance and this initial group of observers continues to draw attention to it, interest increases. The alarmed discovery and euphoric enthusiasm stage has been reached and there is the greatest potential for it to be swept onto the political agenda, carried there by a groundswell of public concern. Decision-makers then are forced to consider it seriously. Typically, they begin to recognize the true cost of addressing it. Existing institutions or policies might have to be jettisoned or modified severely. Large capital expenditures may be necessary, or political support alienated. During this third stage, commissions, special committees, further funds for research and other delaying tactics are used, therefore, to create the illusion of meaningful activity. Other issues are then moved conveniently above it on the political agenda, as public concern is muted by these cosmetic changes. There follows a gradual decline in interest and other social and environmental problems replace it in the media spotlight. Slowly, in the fifth stage, the problem becomes viewed as having been dealt with successfully. All too often, it merely has been buried alive and, more like a seed than a corpse, continues to grow. Significant issues do not disappear so easily and ghost-like often rise from the "dead" to haunt future administrations, usually to pass once more through these five stages of Downs' issue-attention model.

It is apparent that real progress is unlikely at any phase but the third. It is here that smoke screens and delaying tactics must be denounced for what they are and meaningful change demanded. If this opportunity is not taken, support will wane, media attention wander and the chance for significant progress will be lost. This goal is becoming more difficult to achieve as time diminishes the window of opportunity.

Timing's significance is apparent also in any industry's life cycle (Berkowitz, 1977). This too passes through five stages: introduction, growth, maturity, saturation and decline, each of which varies with the nature of the products or services provided. In the initial phase, rapidly changing technology is the norm, capital intensity is low and the field is occupied by numerous small competing firms, sustained by specialized knowledge. It is not a buyer's market. This phase ends with the introduction of mass production and an associated rise in capital requirements. Many companies either fail or merge. The quality of management becomes critical. There is far more competition, forcing prices down to the buyers' satisfaction. Maturity is then reached, as it now has been in nanotechnology and in zipship manufacture, and technology stabilizes. Financial resources become the main criterion for entering the industry and android labour is a critical input. This buyers' market becomes saturated. Competing innovations then occur, rendering the industry's products or services increasingly obsolete and it declines.

While sales volumes peak in the saturation phase, profits are at their maximum during late growth and early maturity. Clearly, timing is all. Understanding this cycle is the key to career choice, stock selection, company acquisition and industrial land development. 2096 is not a good year, for example, to become a computer specialist, buy a zipship plant or invest in the lithonuclear weapons industry. Some businessmen understand this compression of opportunity, others do not. That is why Simpkins became a trillionnaire investing in zipperjuice, while ten years later, Anderson squandered the family fortune in the same industry (Templeson, 2089).

"Hurry up, please, it's time" is not the only valid cry. Speed alone cannot be the overriding consideration in designing resilient systems. Perhaps swiddlechess provides the best analogy. The competitor paralysed with indecision ultimately will run out of clock time and lose by default. The player to whom speed is everything fails to see all the possibilities, makes errors and overlooks opportunities. Defeat usually follows this unwillingness to adequately assess available alternatives. Lithonuclear warning systems or energy grids may operate at speeds allowing too little time for effective evaluation or contemplation. While lack of timing can undermine any system, so too can excessive speed.

(2) Open ended life-span

Alcohol, hashish, LPN, arsenic and strychnine are signposts to the grave, but time is the surest poison. No truly resilient system can afford to set its own time limits. In the end, the whirligig of time will always get its revenge, but why assist it? This is a lesson learned too late by Juleene Simplex, who promised to resign if Bill C-11 had not been passed by the DeltaGlobe Assembly by the end of 2093 (Lipmann, 2094). Andrew Tilmare should have grasped it before his agreement to step down as Opposition Leader unless he received 70 percent of the votes at the Academico-Capitalists' 2094 Convention (Bromwell, 2095). Time goes, you say? Ah no! Alas Time stays, we go.

Operational Characteristics

(1) Efficient

We continue to fiddle as our wild places burn in the fires of undisciplined technologies. Humanity is now a super-malignancy spreading unchecked through the solar system, covertly fomenting crises. Although cancer cells are vigorous in replication, they are remarkably stupid, killing their hosts, leaving no chance of ultimate survival. Unlike cancer cells, we are still able of realize what we are doing and to change the way in which our technologies and their institutions operate.

A new, solar-wide order is attempting to define itself, just as nationalism, tribalism, alienism, androidism, sexism, racism, religious and political intolerance, and economic protectionism are promoting fragmentation and disruption. While the Solar Chamber of Commerce and the Galaxy Trade Consortium try to establish unified approaches to many of our problems, too often their members continue to put individual agendas first, frequently at the expense of the solar system as a whole.

Fragmentation results in inefficiency which, in turn, creates social and environmental wastes. There are now over 97,000 pervasive long-lasting chemicals in commercial use. Virtually every member of the biosphere, whether natural or not, carries them as a body burden. The most toxic include zabdeen, benzene, alcilozit, PCBs, dioxin, heavy metals, and pesticides such as mirex, kepone and tellirest. Dioxin is leaching from, as yet unmined, waste dumps in New York, Beijing and Sydney; while bone malformations, birth defects and mutations have been traced to contaminants in London's groundwater supplies. The problems of toxic wastes are not limited to Earth. Far from it; such hazards are found throughout the solar system.

Nothing is worth producing at the cost of such environmental damage and associated health impacts. The last of the open systems, polluters at all stages of

production, utilization and disposal, must be replaced. We have to instil the morality and ethics of efficiency into the core of contemporary consciousness. To survive, expand and prosper, more must be achieved with less, implying the need for both greater knowledge and additional societal change.

(2) Reversible

Reversibility is an essential dimension of resiliency. This fact is recognized widely in folklore: "don't burn your bridges," "bolt don't meld," "keep your options open," "never cut what you can untie." Gray and Ravelston (2088), in their book *Great Errors and Greater Mistakes*, describe Jonathan Oliver's "triumph" during the occupation of the Intersolar MEMPROD headquarters. Oliver is widely believed to be the poorest leader ever produced by the Neoluddites. Initially things went well. Thirty zipships were stolen from around Chicago and Seattle. Supporters, commanded by Oliver, then flew to Indonesia and, during a heavy rainstorm, captured a virtually deserted MEMPROD headquarters. To prove their serious intentions, they then blew up their own zipships. The ensuing explosion gutted both the MEMPROD communications centre and the complex's food stocks. Interpolice then threw up a force field around the building, keeping it there for three weeks. While it had been easy for Oliver and his supporters to get into MEMPROD headquarters, it was now impossible for them to get out. Their attack had been irreversible. When the force field was lifted eventually, Oliver and his 210 starving supporters immediately surrendered. When Simpson heard about the debacle he is recorded as saying "Only Oliver could have managed such a coup, turning a spectacular victory into an inevitable defeat" (Grey and Ravelston, 2088).

(3) Incremental operation

Too many systems demand all, or nothing. They are either working or not, either off or on. This type of total commitment is extremely inefficient, especially when requirements are low. Demand should be equalled, but not exceeded by output. This is why the Global Energy Net has been such a profit earner for utilities. By linking energy supply and demand through laser transmission interconnections, it has been possible to reduce reserve capacity and take advantage of the fact that while people in China are asleep, those in the Western United States are hard at work or vice versa.

(4) Autonomous operation

The most resilient systems can continue to function, even when seriously damaged. Unfortunately, this principle of autonomous operation was ignored by the Japanese in the design of their industrial base. Emphasis was placed on eco-

nomic efficiency, a goal which was achieved by sacrificing resilience. To reduce investment in inventory, Japan operated a "just in time" system. If ionic engines were to be assembled in Osaka, for example, the necessary parts were made the day before in places like Kyoto and Fukuoka and shipped to the plant in Osaka only hours before they were needed. When every factory was in full production and there were no communications or transportation problems, this "just in time" approach was exceedingly efficient. However, problems anywhere caused disruption everywhere. When Tokyo was destroyed in 2048, since virtually every manufacturing plant in the country shipped to, or received some vital part from, Japan's major industrial area, the whole production network collapsed almost instantaneously (Priestley, 2050).

Contrast this with the ability of GalaxyNet to function effectively throughout the Pakistan-Indo war, despite the destruction of numerous computer centres and fibre optic links. There are no dominant servers, no indispensable components on the GalaxyNet; each computer has equal decision-making authority. Messages, sent as packages of addressed data, were able to reach their final destinations by which ever current route remained open. Damage often slowed the transmission process, but it couldn't stop it.

This concept of autonomous operation also lies behind the operation of the Global Energy Net. The failure of any group of power stations or laser transmission interconnections will not crash the grid in which they are embedded because of the option of autonomous operation available to individual portions of the Net. This strategy depends on the use of relays, which disconnect plants experiencing failure, a principle known as hierarchical embedding (Lovins and Lovins, 1982).

Physical Dimensions

(1) Not site specific

Many policies or programmes are very site specific, needing clearly defined, highly localized conditions to function effectively. This is true, for example, of tidal power plants, that require major daily sea level fluctuations and, therefore, unusual physical circumstances before they can operate economically. It is slightly less true of fusion power stations, although those only can function given certain well defined conditions. Location is far less restrictive in the case of solar collectors, flux-field windmills or biogas heaters, while insulation can be applied virtually anywhere. In general, the more site specific a policy or programme, the lower its resiliency and the more unlikely it is to survive significant change. This is because a wide range of site specific problems, ranging from tornadoes to revolutions, can halt implementation permanently, or generate serious difficulties, even

after the project has begun. In both peace and combat, dispersion minimizes the probability of total loss.

The problems associated with site-specific policies were illustrated by the Tolstoy Complex, built at enormous cost between 2011 and 2031 along the US-Mexican border. Its major aim was to prevent illegal immigrants and drugs entering the United States from Mexico, Central and South America. The Complex consisted of a series of interconnected customs stations, linked by laser fences and biosensors. After five years of operation, both the number of illegal immigrants and contraband drug-users in the United States had increased. Subsequent investigations established that smugglers had set up a Great Lakes submarine delivery service, avoiding the Tolstoy Complex completely.

Indeed, throughout the twentieth century and later, law enforcement was far too site specific. In the United States, for example, the fragmented police system consisted of some 40,000 separate agencies. While these served five levels of government, the majority were municipal and their activities limited to small geographical areas, such as a particular town or city. While a few law enforcement agencies, such as the Federal Bureau of Investigation and the Secret Service, operated at national and international levels, most did not. As American society became more mobile, crime prevention that stressed the local area became less and less effective. While little fish tended to be immobile and well-known to their hometown police, master criminals rapidly passed from one jurisdiction to another, generally avoiding justice. Slowly, this problem was addressed through national computerized fingerprint, voiceprint and DNA files. Criminals responded by skipping from one country to another and later from planet to planet, as Interpol struggled to assist its member police forces to reduce the impact of such increased mobility. As here today, gone today became a recognizable mode of criminal behaviour, site specific, geographically inflexible policy forces had an ever increasing difficulty in dealing with well organized crime and terrorism (Smith, 2021).

(2) Fine grained and modular

Modular structures are inherently resilient. Systems composed of a series of small, semi-autonomous units are much more likely to resist adverse change than those in which each component is large and critical. Compare the success of Plug-In City, built on the outskirts of Rome, with Winnipeg's Archopoly catastrophe.

The megastructure of Plug-In City consisted of a diagonal network of structural tubes holding every essential city service, including water, sewage, electricity and hydrogen. This structure also housed passenger lifts and a consumer goods distribution system. Everything else, homes, schools, universities, hospitals, libraries, theatres, offices, industrial plants, parkades and recreation centres, were

modular and plugged into, or draped over the megastructure by cranes permanently positioned high above the service framework.

Any unit could be unplugged when obsolete and replaced by a mass-produced alternative built in any colour, style or shape required. Inhabitants could move their location at will. Indeed, whole streets could be lifted to other parts of the city in a few hours. Demand greatly outstripped supply and Plug-In cities are now commonplace.

Contrast this with the fate of the giant concrete and glass Archopoly, built in 2041 to house 200,000 Central African famine refugees. Conventionally constructed of steel, concrete and glass, this high skyscraper caught fire and burned to the ground in 2044 with a life loss of over 8,000 (Anderson, 2046).

As with so many dimensions of resilience, numerous examples also can be drawn from the animal kingdom where strategies for survival have been tested for billions of years in the evolutionary proving ground. Perhaps the majority of animal species are territorial, in that as individuals or as small groups, they lay claim to a particular area and defend it against others of their own species. Male tree sparrows, for example, display this type of territoriality. The end result of such a strategy illustrates the benefit of dispersal and the creation of a cellular system of groups or individuals. Territoriality increases security through an intimate knowledge of the area. Awareness of vantage points and hiding places facilitates quick and effective responses to danger and attack. The weakest members of the group may be unable to protect a territory and, therefore, are more likely to fall prey to predators, improving the breeding stock. The regulation of spacing and density leads to a more equitable distribution of food and other resources and prevents overcrowding. If major change occurs in the environment, such as a drought or fire, some individuals will die or be affected seriously, yet others will survive to reproduce and fill the vacated territory. In this way the survival of the species is made more likely.

(3) Standardization

Standardization is a well-established method of increasing resilience, despite the fact that it is the antithesis of diversity. Nobody repairs a malfunctioning zipship component or stungun blaster. They merely remove the defective part and replace it. This ability to plug in common replacement components makes such technology easy to repair and to maintain. The same is true of most systems operators themselves. Each has absorbed the same CD-cortab training programme and, therefore, all are interchangeable.

Printing was, perhaps, the greatest human invention. Printed thoughts are everlasting, provided with wings, intangible and indestructible. Printing itself

involved the standardization of letters and of the method by which they were imprinted on paper. This breakthrough most frequently is attributed to Johann Gutenberg.

It is not quite correct to call Gutenberg the inventor of printing. What he achieved was the integration of movable type and the printing press in such a way that a large variety of written material could be printed accurately and rapidly. Block printing was well established before Gutenberg's inventions in the fifteenth century. Although this made possible the production of many copies of a single book, the blocks for each had to be made anew. Block printing was impractical, therefore, for the production of a large variety of books. Movable type first was invented in China, sometime in the middle of the eleventh century by Pi Sheng. It was rediscovered later in Europe. Although these various innovations predated Gutenberg, his overall contribution was far larger than any of these individual inventions. He developed a metal alloy suitable for type, a mould for casting blocks of type precisely and accurately, an oil-based ink rich in lead and copper, and presses suitable for printing. These he combined to form a system capable of the mass production of books. Gutenberg, in fact, invented a complete manufacturing process which was capable of bringing literature to the world. Books no longer had to be handwritten or block printed. Although our biographic information concerning Gutenberg is incomplete, certain facts are known about his life. He was born about 1400 in Mainz, Germany and it was there, in the middle of the century, that he invented the mass production of books. His best known work, the Gutenberg Bible, copies of which are now enormously valuable, was printed in Mainz, around 1454.

Given the significance of his inventions, Gutenberg should have become wealthy and influential. Actually, he was reduced to poverty by his work and eventually forfeited his equipment to his partner. Unfortunately, Gutenberg's operation lacked three of the other characteristics of resilience required to allow it to survive. Gutenberg's major undertaking was the production of the Bible. He began with two presses and was forced to work page by page, rather than printing an entire four page sheet at once, as was later commonly done. This was because he could not calculate where the page breaks would occur. As a result, the Bible printing project took three years. Even to achieve this speed, Gutenberg took out a loan from a financier, losing control of a critical variable, the true ownership of the system. With this money he added three, possibly four, new presses to accelerate the system. Nevertheless, Gutenberg miscalculated, making a short-term agreement which was not open-ended. As a consequence, the note came due before the Bible was finished; Gutenberg could not pay it. The financier sued and won. In consequence, Gutenberg lost control of his printing process and the few remaining Bible pages were printed probably by his ex-associate Schoeffer. The ink used to

complete the project differs from that employed in the bulk of the book, and it appears that Gutenberg took the superior recipe with him. Possibly because of the loss of this lawsuit, Gutenberg's name does not appear on the Bible which is now named after him. Thereafter, Gutenberg, one of the greatest men in human history, faded into obscurity while Schoeffer, his former associate, became the most successful printer of the period. Underlying Gutenberg's financial failure was a third weakness which robbed him of resilience, the choice of the Bible as a major printing project. This book, probably above almost any other, is not modular. Gutenberg could not sell it a few chapters at a time, or section by section. Once publishing had begun, he was committed to produce the entire book or nothing. Gutenberg might have gained some respite from his dilemma had he published the Old and New Testaments separately. Fortunately for bibliophiles he did not. However, from Gutenberg's point of view, his inability to build resilience into his Bible producing project ended in personal disaster. Although he would no doubt be far less famous now, Gutenberg would have been more solvent had he produced shorter works or material that could have been serialized (Hart, 1982).

Standardization which permits quick and easy replacement of component parts has a serious weakness. If a flaw develops in any one element it very likely is to occur in all. One way of partially overcoming this problem is to standardize operating characteristics, such as voltage or units of measurement, without design standardization. This technique, used by the Global Energy Net, provides the benefits of interchangeability, yet maintains diversity.

(4) Mobile

Mobility allows movement away from threat, towards areas of potential benefit. It is, therefore, a common survival strategy. In both the animal and plant kingdoms this ability to move, or to ensure one's offspring can diffuse, is a widespread technique for accommodating change. While the individual plant rarely can migrate and generally remains rooted to the spot, migration can occur in its reproductive phase. While individual plants do not move any distance, their offspring, that is their seeds or spores, become diffused over large geographical areas by wind, water, animals, gravity, propulsion or by human activity. This dispersal makes the species, as a whole, far less susceptible to change in any one particular location, so increasing its chances of long-term survival.

Migration by wind is prevalent among light, winged or feathery seeds such as the dandelion, poplar and cottonwood. Tumbleweeds are much branched plants that are nearly globular in shape. On reaching maturity they fall to the ground and go rolling with the wind. On the Great Plains, they are abundant and blow for miles. Seeds that float are light in weight, and resistant to penetration by water.

They may be carried by rivers, lakes and the oceans. Examples include the coconut, its mass of fibres providing buoyancy. Animals also help to disperse plants by eating fruits with indigestible seeds. They also may stick to mud on the feet of wading birds or to animal fur. The latter often have hooked hairs or spines, with which to attach themselves. Animals, such as squirrels, woodpeckers and crows, may carry nuts and fruits either to eat immediately or store. In either case, accidental losses can expand plant distribution. Humans also help in seed dispersal by deliberately or accidentally introducing new species. These include the sweet potato in Polynesia, evidence that there was contact between Polynesia and the Americas. In Canada and the northeast United States, some 18 percent of the total number of species were originally of foreign origin. Some seeds also are dispersed by propulsion, in which the plant furnishes its own power. Fruits develop internal tensions as they dry when ripening. Suddenly rupture occurs, tensions are released and the seeds are expelled forcibly. The eastern American touch-me-not (Impatiens) can propel its seeds as far as eight feet in this way.

Using these and other methods of dispersal, plants have migrated thousands of miles. Henry Gleason and Arthur Cronquist (1964), in their book *The Natural Geography of Plants*, examined the speed of such migrations. They concluded that most plants travel so fast that already they have occupied all the areas of favourable environment on their own continents, and they can move no further until there have been changes in environments beyond their present range. The movement of plants is so rapid, so efficient and so thorough, that any significant change in the environment is immediately followed by the appearance of a new set of species. The speed of migration for most plants is as rapid as the change of environment. When introduced to new planets or continents, and hence additional opportunities, some plants, such as the Opuntia, a species of cactus which spread rapidly in Australia, undergo a population explosion.

Human mobility has been magnified by technology. Before 6500 B.C., a maximum speed of less than 25 miles per hour was achieved by running. This increased to some 35 miles, with the advent of horse-riding in circa 1400 B.C. Not until the twentieth century, however, were humans capable of travelling at speeds in excess of 100 miles per hour. This was achieved near Berlin by an electric engine in 1901. By 1918, World War I fighters were reaching speeds greater than 200 miles per hour, during dives over Flanders. As technology improved, so did the world speed record. Apollo X, for example, during re-entry after a lunar orbit reached a speed of 24,791 miles per hour (McWhirter and McWhirter, 1973). Then came the ionic engine and alien information transfer and with them virtual instantaneous exploration of the solar system and far out into our galaxy. Humanity has compressed space and with it, time. However, since mobility provides a means of

both promoting and reacting to change, only time itself will tell whether we have the wisdom to use it effectively.

(5) No esoteric components

Complexity magnifies the potential for error, just as rarity reduces the likelihood of component replacement. When any concept is too weak to be expressed simply, that characteristic alone is usually proof that it should be rejected. Lithonuclear weapons are both esoteric and complex, forming as they do the greatest current threat to humanity's continued existence. Unfortunately our society's future rests on these agents of destruction. What is the only provocation that could bring about the use of lithonuclear weapons? Why the use of lithonuclear weapons? What are the priority targets of lithonuclear weapons? Other lithonuclear weapons. What are the only credible deterrents against lithonuclear weapons? Lithonuclear weapons. How do we prevent an enemy attacking us with its lithonuclear weapons? By threatening to use our own lithonuclear weapons. Obviously, we can't rid the solar system of lithonuclear weapons, because of lithonuclear weapons. There is no need, however, to abolish lithonuclear war; it has gone already. The choices don't include war. They consist only of peace and annihilation. The only way to win a lithonuclear war is to make sure it never starts (Yu, 2081).

(6) Unique skills unnecessary

Despite the advent of cortical absorption, humanity is still prone to error. Mistakes will continue to be made. The more demanding the operation of a political, social or technological system, the more likely it is that some one, some place, some time will undermine it with a crucial error. If it's complex and requires unique skills, it won't last. Intelligence gives no guarantees. Imagine a political party of eminent celebrities including More, Bacon, Grotius, Pascal, Cromwell, Bossuet, Montesquieu, Jefferson, Napoleon, Pitt, Botiwelt and Cole. The result would be an *Encyclopaedia of Error*. They would support slavery, socialism, persecution, divine right, android destruction, military despotism, the reign of force, the supremacy of the executive over the legislature and judiciary, the abolition of credit and animal mind-melding.

(7) Stable

Systems with unstable components, whether isotopes with short half-lives or organizations with neurotic leaders, cannot last. The crucial error of the twentieth century was the creation of an inherently unstable economy, that eventually produced both the Great Melting and the Great Dying. This robber baron economy was based on the assumption that production and consumption had to be maxi-

mized, a fallacy which depleted raw material reservoirs, while simultaneously causing global pollution. Raw materials, however, tend to run out and pollutants punch holes in the web of life. Eternal economic growth is therefore a nonsensical myth. What is needed is not a constantly expanding economy, but a zero-growth economy, a stable economy. Economic growth and the instability it inevitably creates is not only unnecessary, but ruinous.

(8) Fail-safe design

Failure is a hard fact of life. As change accelerates, so too does the frequency of error. We therefore must learn to accept failure and reduce its negative impacts. Certain types of decisions court disaster, others do not. Our ability to benefit from change is improved by an appreciation of this difference. Consider, for example, a three-by-three matrix. The divisions on the first axis are labelled improbable, possible, and certain and represent the likelihood that any decision will fail to meet its objectives. Divisions on the second axis: none, moderate and extensive, represent the degree of damage that can be expected, should failure occur. We now can place any decision within this matrix by enquiring, "How likely is this policy or activity to fail and, if it does, how damaging will the consequences be?" Obviously, resilience is increased, at all levels from the solar to the personal, by taking decisions that are less risky. That is, by acting in ways that have low probabilities of failure which carry with them small damage potentials.

These ideas best can be understood with reference to specific case studies. Sometimes there is a very fine line between success and failure. In Berlin, for 20 years, five members of the Global Agricultural Directorate have been attempting to produce the virtually unbreakable egg. This research team consists of an engineer, a biochemist, statistician, geneticist and a nutritionist. Broken eggs cost money. Seven to eight percent of all eggs crack somewhere between the henhouse and the grocery store, while a further five percent break before they are used by the consumer. This weakness costs Earth's egg industry about 320 million credits a month. Strength tests show that the average medium egg can withstand 6.6 pounds across its middle before it breaks. Yet that is clearly not enough to withstand the forces often exerted en route to the kitchen. Unfortunately, the quest for an unbreakable egg is failure certain. After 20 years of research, these researchers now know how to produce an extremely strong egg. However, if the shell is too strong, the chick can't get out, and that means there won't be any more hens to lay new unbreakable eggs. Work continues on the ideal egg. Contrary to rumours, it will not be square, made of rubber and easy to stack in the refrigerator.

Stephen Pile (1979) provides an example of a failure-improbable activity which ended disastrously. Horatio Bottomley, a British horse owner and politician,

decided to apply a fool-proof gambling strategy. Just before a race, at Blankenberghe in Belgium, he contacted the owners of the six horses that were entered. Having purchased every horse, he then hired English jockeys who were given strict instructions as to the order in which they were to finish. Bottomley wagered heavily on the result. Unfortunately for him, as the race got underway, a thick mist blew onshore and obscured the course. The jockeys could not see each other and the judges could not see the order of finish. The race finished in chaos and Bottomley lost a fortune.

Two principles now become obvious from this discussion of the probability and consequences of failure. To succeed, we should select activities that are, as far as possible, failure-improbable. Even when risk of error is small, its consequences should be minimized. Examples of this difference can be drawn from George Sullivan's (1972) *By Chance a Winner: The History of Lotteries*. There are basically two ways to organize a lottery. In the first instance, prizes of known value, such as a zipship, floater home, holiday or numerous credits are offered to encourage custom. In the second, the lucky winners receive a percentage of the credits raised from ticket sales. The first lottery strategy is much riskier than the second, and the impact of failure far greater. Assuming that the cost of organizing both types of lotteries are the same, then the first can succeed only after the major prizes have all been paid for by ticket purchases. The second type begins to become profitable immediately after organizational overheads have been met. To illustrate, in 1793, the Commissioners of the District of Columbia sought to raise money to build a capital city for the United States on ten square miles of land ceded by Maryland and Virginia. To do this, they launched a huge lottery which involved 16,737 prizes, the largest of which was to be "one superb hotel, with baths, outhouses, etc. to cost $50,000." After a rousing start, ticket sales slumped. The drawing went slowly and accusations of fraud were heard, including the charge that many of the larger prizes had never been put into the wheel for drawing. The grand prize winner found that his newly acquired hotel was still under construction and brought a lawsuit. By 1799, the lottery collapsed. Clearly, this enterprise had been a failure-possible, damage-extensive operation. It contrasts markedly with the failure-improbable gladiator pools which are operated at little financial risk by private companies in DeltaGlobe. The fundamental difference between these and the lottery just described is that after overheads have been met, the winners receive a percentage of the credits wagered. They are essentially partners who receive a portion of the profits.

While it is impossible to avoid all potential failure, it is almost always feasible to create an environment which forgives it. This can be achieved only by accepting that error, misuse or sabotage may occur and planning to mitigate its

consequences. Terrorists, for example, used to be successful in planting bombs on aircraft and blowing them out of the skies. To reduce the associated losses, rodostab is now sprayed routinely on the inside of all stratocruisers, while automatic force field vents are installed. There hasn't been a "successful" stratocruiser bombing in 40 years (Tombalini, 2093).

(9) Early fault detection

For the want of a nail the shoe was lost; for the want of the shoe the horse was lost; for the want of the horse the rider was lost. For the want of the rider the message was lost; for the want of the message the battle was lost; and for the want of the battle the kingdom was lost. Since failure can occur in so many enterprises, early warning systems that permit rapid adjustments greatly improve resilience. An interesting example of this approach is the Universal Honey Bee Health Monitoring system, designed to identify rapidly the presence of toxics in the food chain. The Human Discontent Index, established by Monroe (2084) and published weekly by the Galaxy Bank, further illustrates this principle. This index is followed closely by most governments, permitting them to make rapid policy changes should significant new issues be identified.

SELECTING THE MOST APPROPRIATE DIMENSIONS

Conflict is the gadfly of thought. It stirs up the memory, sharpens observation and promotes innovation. It shocks us out of our passivity and stimulates our reflection and ingenuity. Since antagonism occurs among many of the dimensions of resilience shown in Table 1, it is impossible that any system could include them all. What is needed, therefore, is an evaluative methodology which allows the identification of the best mix of elements, capable of giving the most resilience per unit of cost. This is easier written than achieved. However, Shafer and Davis (1989) and subsequently Cutter and Howe (2048) have developed a process capable of evaluating a wide range of management activities, when their benefits cannot be described adequately in economic terms, yet budgetary constraints demand selection among them. My colleagues and I have modified this methodology so that it can be used to select the most appropriate set of elements of resilience for any economic, social, political or technological system. Normally, this evaluation process is undertaken automatically by a Class 3 Neurosocial Network. It includes eight steps, which for convenience will be discussed now in more detail. Given the recent unexpected sinking of *The Flag*, an analysis, designed to increase the resilience of such vessels, is presented to elucidate the methodology.

(1) Primary goal definition

When you don't know where you are going, every road will take you there. For this reason any attempt to design a new system, or increase the resilience of an old one, must start with the development of a concise mission statement. This should identify and emphasize primary, non-negotiable objectives. For zip on/zip off submarine ferries like *The Flag*, such a mission statement might read "the ability to quickly transport passengers and their vehicles under turbulent seas, in an economically viable and safe manner."

(2) Identification of compatible dimensions

A clash of doctrines is not a disaster — it's an opportunity. It demands choice. As a second step, each of the elements of resilience, illustrated in Table 1, then should be checked against the mission statement's goals to determine mutual compatibility. This results in a subdivision into two groups: those characteristics that are compatible with the mission statement and those that are not. This latter group must then be removed from further consideration in the evaluation process. In the case of the submarine ferry *The Flag*, compatible elements would include ability to withstand large fluctuations of external variables, minimal environmental impact, efficiency, fail-safe design and early fault detection. In contrast, incremental operation would appear incompatible with the mission statement's primary goals.

(3) Description of appropriate procedures and components

Bookish theory, in and of itself, does not produce resilience. It is imperative, at this stage of evaluation, to convert concepts, such as fail-safe design or mobility, into actual operational procedures or components. This step is undertaken, by the expert function within the Class 3 Neurosocial Network, for all the elements of resilience that have been assessed as compatible with the mission statement's primary goals. To illustrate, functional redundancy might be judged to necessitate a secondary ionic engine back-up, or additional magneto optic connections, while the need for short lead time may require greater network integration. For the purpose of illustration, ten such methods of increasing the resilience of zip on/zip off submarine ferries have been identified. These are listed in Table 2 and include increasing the ability of such ferries to withstand fluctuations in external variables, such as major waves, by reinforcing cargo-hold hatches (C) and installing self-activating bilge dumps (D). It is not implied here that these ten mechanisms for increasing resilience are necessarily either the only, or the best, alternatives.

Table 2 Class 3 Neurosocial Network Evaluation of Zip on/Zip off Submarine Ferry Procedures and Design Components

Procedures and design components	A Shipboard disaster command centre	B Submarine tours emphasizing escape features	C Reinforced cargo-hold hatches	D Self-activating bilge pumps	E Hatch evaluation meshes	F Ascertaining draft to passenger ratios regularly	G Greater control over passenger athletic agility	H Crew CD-cortab re-education programs	I More effective passenger warning system	J Improved lifecraft design and outfitting
A. Shipboard disaster command centre	X	O	I	I	I	I	I	I	I	I
B. Submarine tours emphasizing escape features		X	O	I	I	I	I	I	I	I
C. Reinforced cargo-hold hatches			X	O	O	O	O	O	O	O
D. Self-activitating bilge pumps				X	I	O	O	O	O	I
E. Hatch evaluation meshes					X	O	O	O	O	O
F. Ascertaining draft to passenger ratios regularly						X	O	O	I	I
G. Greater control over passenger athletic agility							X	O	O	I
H. Crew CD-cortab re-education programs								X	O	I
I. More effective passenger warning system									X	I
J. Improved lifecraft design and outfitting										X

After Shafer and Davis (1989), Foster (1995), Cotter and Howe (2048)

X indicates self-comparison; I indicates the benefits of the column procedure or design component judged more significant in increasing resilience; O indicates the reverse to be the case.

(4) Pair-wise comparisons

Comparisons may be odious but they are necessary. The Network then conducts pair-wise comparisons of all the procedures or components already identified as having the potential to improve the system's resilience. In the hypothetical case illustrated in Table 2, the Network judged installing self-activating bilge pumps (D) to be more valuable than passenger tours of the ferry emphasizing escape features (B). Timeliness of benefits is an important evaluation criterion in these pair-wise comparisons. An operating procedure or component that can improve resilience quickly, such as the immediate installation of hatch evaluation meshes (E), normally would be given preference over one, such as expansion of lifecraft capacity (J), which requires a much longer lead time (Table 2).

(5) Benefit score calculation

The next stage in evaluation requires the Network to calculate benefit scores. These are based on the percentage of times each procedure or component is selected over every other. As seen in Table 3, the greatest increase in resilience could be achieved by reinforcing the cargo-hold hatches (C) of zip on/zip off submarine ferries (8.65); improving lifecraft capacity (7.00) and the addition of hatch evaluation meshes (5.90). Such benefit scores then are normalized so that they sum to 1,000. This improves the ease with which they can be illustrated (Figure 1). Units of "benefit" are not specified, although Shafer and Davis (1988) recommended they be considered units of utility. Some Networks refer to them as resils.

(6) Estimating costs

Every benefit has cost. There is often a hook that sticks in the jaw that takes a benefit and draws him whither the benefactor will. It is necessary, therefore, to clearly establish whether the gains of change outweigh its losses. To this end, the Network calculates the annual cost of providing each suggested new operating procedure or component. These are estimated without reference to benefits and are discounted to present worth, to identify financing needed for immediate adoption. Currently prevailing interest rates are used for such calculations. Table 4 illustrates hypothetical discounted costs of the ten new approaches to increasing the resilience of zip on/zip off submarine ferries. These range from an estimated 10.3 million credits for reinforcing cargo-hold hatches (C) to 100,000 credits for passenger tours emphasizing escape features (B) and crew CD-cortab re-education programmes (H).

(7) Comparing benefit scores and costs

Once the preceding six steps have been achieved by the Network, it then can compare the benefit scores and associated costs for each potential method of

Table 3 Calculation of Benefit Scores for Procedures and Design Components Increasing Resilience[a]

Procedures and design components	A Shipboard disaster command centre	B Submarine tours emphasizing escape features	C Reinforced cargo-hold hatches	D Self-activating bilge pumps	E Hatch evaluation meshes	F Ascertaining draft to passenger ratios regularly	G Greater control over passenger athletic agility	H Crew CD-cortab re-education programs	I More effective passenger warning system	J Improved lifecraft design and outfitting	
A Shipboard disaster command centre	0.00	0.70[b]	1.00	0.50	1.00	0.30	0.60	0.50	0.25	1.00	
B Submarine tours emphasizing escape features	0.30	0.00	1.00	1.00	0.90	0.90	0.70	0.60	1.00	1.00	
C Reinforced cargo-hold hatches	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.15	
D Self-activating bilge pumps	0.50	0.00	1.00	0.00	0.50	0.00	0.15	0.30	0.15	0.55	
E Hatch evaluation meshes	0.00	0.10	0.80	0.50	0.00	0.50	0.15	0.10	0.20	0.75	
F Ascertaining draft to passenger ratios regularly	0.70	0.10	1.00	1.00	0.50	0.00	0.50	0.50	0.30	0.80	
G Greater control over passenger athletic agility	0.40	0.30	1.00	0.85	0.85	0.50	0.00	0.75	0.90	0.75	
H Crew CD-cortab re-education programs	0.50	0.40	1.00	0.70	0.90	0.50	0.25	0.00	0.90	1.00	
I More effective passenger warning system	0.75	0.00	1.00	0.85	0.80	0.70	0.10	0.10	0.00	1.00	
J Improved lifecraft design and outfitting	0.00	0.00	0.85	0.45	0.25	0.20	0.25	0.00	0.00	0.00	
TOTALS	3.15	1.60	8.65	5.85	5.90	3.60	2.70	2.85	3.70	7.00	45.00
BENEFIT SCORES	70[c]	36	192	130	131	80	60	63	82	156	1000

After Shafer and Davis (1989), Foster (1995), Cotter and Howe (2048).

a Proportion of times column procedure or design component judged by neurosocial network to provide greater resilience than row procedure or design component.

b Assume 20 individual neural networks involved in the assessment. Individual raw scores added (1 + 1 + 0 + 1 + 0 + 1 + 0 + 1 + 1 + 0 + 1 + 1 + 0 + 1 + 1 + 1 + 1 + 1 + 0 + 1 = 14) and divide by number of networks (14/20 = 0.7).

c Benefit scores are normalized to sum 1000; to illustrate (3.15/45.0) x 1000 = 70. This procedure is a convenience to remove decimal points.

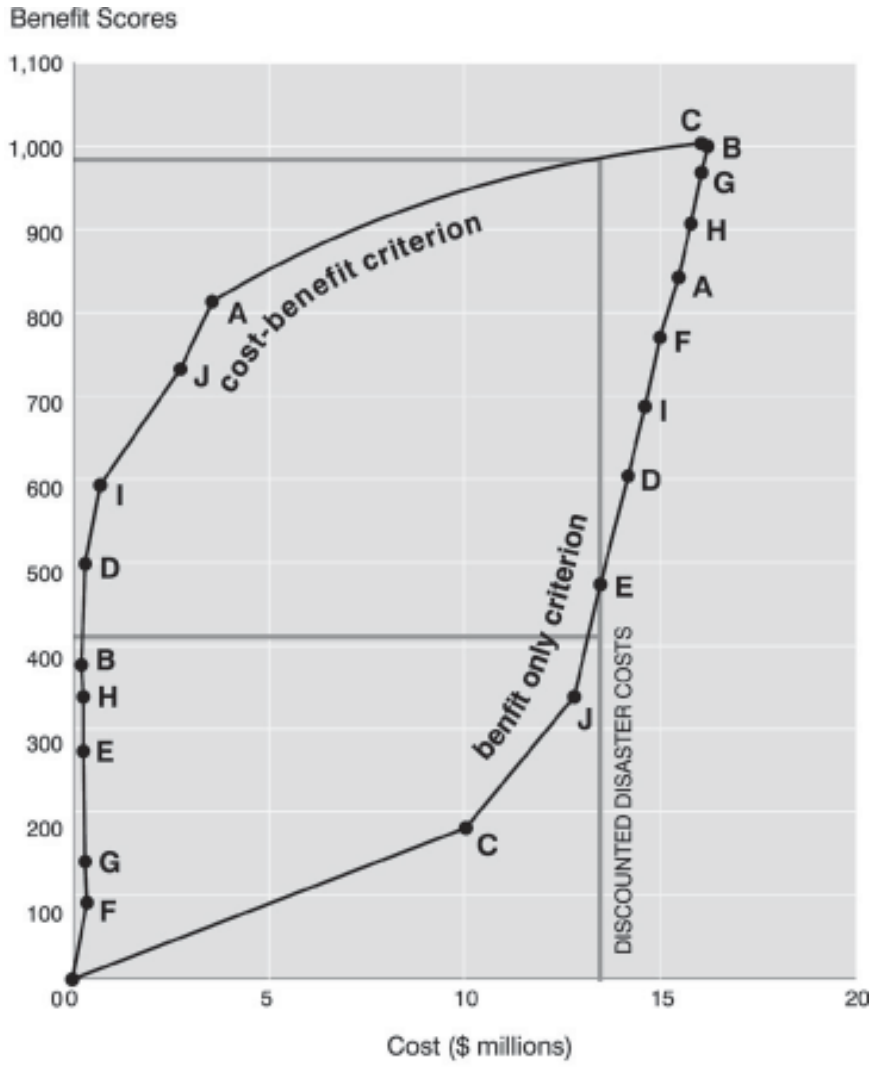

Figure 1 Cost-Benefit Versus Benefit-only Criteria *(after Shafer and Davis, 1989)*

increasing resilience (Figure 1). This it does in two distinct ways. First, the Neurosocial network produces a benefit-only criterion curve. In this illustration, the component or operation procedure capable of producing the greatest benefit is plotted first, against its cost. In the example provided in Figure 1, reinforcing cargo-hold hatches (C), therefore, was plotted first against its estimated 10.3 million credit

discounted cost. The innovation with the second highest benefit score, in this case an expansion of lifecraft capacity (J), is plotted next and so on, in the cumulative manner shown. The Network continues to operate in this way until potential methods of increasing resilience have been plotted along a curve. This technique then is repeated but using procedures or components ranked according to a cost-benefit criterion. Naturally, the largest benefit-cost ratio is plotted first. In this zip on/zip off submarine ferry example, ascertaining draft to passenger ratios regularly (F) has the highest such ratio (1,600). The strategy with the second highest benefit-cost criterion value, in this case G, greater control over passenger athletic agility (857.1), is plotted next. The Network repeats this process until a cost-benefit criteria curve has been drawn, such as the one illustrated in Figure 1.

Table 4 Benefit Scores and Benefit/Cost Criterion Values for all Procedures and Design Components Increasing Resilience of Zip on/Zip off Submarine Ferries

Procedures and design components	Benefit score	Discounted cost (credits)	Benefit/cost criterion value
A. Shipboard disaster command centre	70	1.1	63.6
B. Submarine tours emphasizing escape features	36	0.1	360.0
C. Reinforced cargo-hold hatches	192	10.3	18.6
D. Self-activating bilge pumps	130	0.6	216.7
E. Hatch evaluation meshes	131	0.2	655.0
F. Ascertaining draft to passenger ratios regularly	80	0.05	1600.0
G. Greater control over passenger athletic agility	60	0.07	857.1
H. Crew CD-cortab re-education programs	63	0.1	630.0
I. More effective passenger warning system	82	0.8	102.5
J. Improved lifecraft design and outfitting	156	2.3	67.8

After Shafer and Davis (1989), Foster (1995), Cotter and Howe (2048).

(8) Final selection

In the end, decision-making is always a political process. Politics is not an area of morality but one of interests, self-interests. Nevertheless, the benefit-only criterion and cost-benefit criterion curves just described can be of great value in the selection of appropriate strategies to increase the resilience of any economic,social, political or technological system. From Figure 1, it is obvious that seven potential innovations (F, G, E, H, B, D and I) could increase the resilience of zip on/zip off submarine ferries quite cheaply. However, the two strategies providing the greatest benefits, reinforcing cargo-hold hatches (C) and expanding lifecraft capacity (J), are the most expensive and have relatively unimpressive benefit-cost criterion values. What mix of resilience enhancing strategies to adopt, therefore, is a highly political decision. However, this final step can be facilitated if the Network is encouraged to produce diaster probability and associated loss estimates for each potential mix of resilience increasing strategies. In this manner the costs of action and of inaction can be compared dramatically.

CONCLUSIONS

Either one can seek to accommodate change by developing greater resilience, or fight against it. In the guerrilla war against change, two alternative methods of resistance are commonplace: fanaticism and inertia. The fanatic, certain of a monopoly of truth, displays a perverse unwillingness to accept reality. An enormous desire to move in a particular direction, often in the face of all logic, may, in the short term, insulate him or her from the consequences of change, or even momentarily alter its dominant direction. Not surprisingly, Adolf Hitler was a supporter of fanaticism, considering it to be the source of all real power. Never an advocate of moderation, Hitler argued that the greatness of any organization rested in the "religious fanaticism and intolerance with which, fanatically convinced of its own right, it will intolerantly impose its will against all others." Having outlined his theories in *Mein Kampf*, Hitler sought to apply them during World War II.

Inertia, so commonplace in institutions, is a much more passive form of resistance to change. In a futile effort to preserve the *status quo*, countless obstacles are placed in the path of those who seek to accommodate novelty. Tomorrow is faced by seeking to repeat yesterday. "The Book," often obsolete, must still be followed and traditions, however irrational in the face of new reality, must be upheld. While neither the fanatic nor the traditionalist can see "the wood for the trees," the former is likely to cause a forest fire, while the latter will promote dry rot.

Bill C-39 illustrates the only realistic way to deal with change, the cultivation of greater resilience. For far too long, the price our society has been willing to pay for immediate gratification has been greater vulnerability to catastrophe. Short-term gains, made at the expense of long-term losses, have been the inevitable consequence of this approach. Dependence on lithonuclear weapons, megaprojects, Solar trading networks and alien exchanges, designed to achieve reliability under normal conditions, have made the entire galaxy far less able to accommodate unanticipated changes. Life has become an enormous injustice, but Bill C-39 will change all that. There may be no security, but there are always opportunities and this government is to be congratulated for its willingness to accept them.

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Keep up appearances; there lies the test;
The world will give thee credit for the rest.

Charles Churchill

RESILIENCE: A QUESTIONNAIRE

INSTRUCTIONS

Old, bad habits die hard. I find it impossible, after 30 years of lecturing, to end without a quiz. The following, self-marked assignment requires the reader to measure his or her strength of agreement, or disagreement, with 100 statements. For sadistic reasons, these are in no logical order and may, or may not, be directly related to the subject matter of this book. Marks should be assigned as follows: strongly agree (4), agree (3), neutral (2), disagree (1), strongly disagree (0). Totals, therefore, can range from 400 to 0. Their significance is discussed following the completion of the exercise.

		Mark (0-4)
1.	God is love, but get it in writing with a signature.	_____
2.	Anyone who sees and paints a sky green and pastures blue ought to be sterilized.	_____
3.	Don't be agnostic—be something.	_____
4.	It is no accident that the symbol of a bishop is a crook, and the sign of an archbishop is a double-cross.	_____
5.	First secure an independent income; then practise virtue.	_____
6.	Government is not reason, it is not eloquence—it is force.	_____
7.	The Golden Rule is there is no golden rule.	_____
8.	Nothing is often a good thing to do and always a clever thing to say.	_____
9.	Silence is one of the hardest things to refute.	_____
10.	An error is the more dangerous in proportion to the degree of truth it contains.	_____
11.	Simplify, simplify.	_____

		Mark (0-4)
12.	Intellect does not attain its full force until it attacks power.	_____
13.	I claim not to have controlled events, but confess plainly that events have controlled me.	_____
14.	The horror of the twentieth century is the size of each event and paucity of its reverberation.	_____
15.	Only when one has lost all curiosity about the future has one reached the age to write an autobiography.	_____
16.	It is human to hate those we have injured.	_____
17.	The end must justify the means.	_____
18.	The environmental juggernaut, fuelled by false information and special interests, must be stopped before the world is led too far along the road to disaster.	_____
19.	I'm not the greatest. I'm the best available.	_____
20.	No man can cause more grief than the one clinging blindly to his ancestors' vices.	_____
21.	Perfection of means and confusion of goals seems to characterize our age.	_____
22.	Contrary to what you may have heard, the rarest things in these parts are not spotted owls but open minds.	_____
23.	Prediction, the surest means of courting folly.	_____
24.	Civilization advances by extending the number of important operations which we can perform without thinking.	_____
25.	Only the educated are free.	_____
26.	The outdoors is what you have to pass through to get from your apartment into a taxi.	_____
27.	Smooth runs the water where the brook is deep.	_____
28.	If tolerance of diversity involves an admitted risk to national unity, intolerance involves a certainty that unity will be destroyed.	_____
29.	A thick skin is a gift from God.	_____
30.	More will mean worse.	_____

		Mark (0-4)
31.	I am a part of all I have read.	_____
32.	Short-term pain for long-term gain.	_____
33.	Judge not, that ye be not judged.	_____
34.	To be a success in business, be daring, be first, be different.	_____
35.	Nature is a hanging judge.	_____
36.	This isn't the Age of Manners, it's the Age of Kicking People in the Crotch.	_____
37.	Buy old masters. They fetch a better price than old mistresses.	_____
38.	What fails to kill me makes me only stronger.	_____
39.	Too many people brings suffering to the land, and the land returns its suffering to the people.	_____
40.	The worth of a thing is what it will bring.	_____
41.	It's hard to make predictions, especially about the future.	_____
42.	"They say so" is half a lie.	_____
43.	Parents send their children to college either because they went to college or because they didn't.	_____
44.	The lust for fame is the last that a wise person shakes off.	_____
45.	What you get is a living, what you give is a life.	_____
46.	Once the toothpaste is out of the tube, it's hard to put it back.	_____
47.	Everything in excess! To enjoy the flavour of life take big bites. Moderation is for monks.	_____
48.	Violence is good for those who have nothing to lose.	_____
49.	Things are not as bad they seem. They are worse.	_____
50.	Nothing ever goes away.	_____
51.	Under capitalism man exploits man; under socialism the reverse is true.	_____
52.	Listen carefully to first criticisms made of your work. Note just what it is that critics don't like and cultivate it. That's the only part of your work that's individual and worth keeping.	_____

		Mark (0-4)
53.	The only place in this world you find unanimity is in the graveyard.	_____
54.	Nature thrives on patience; humanity on impatience.	_____
55.	Living with a conscience is like driving a car with the brakes on.	_____
56.	If you're not part of the solution, you're part of the precipitate.	_____
57.	Just because everything is different doesn't mean anything has changed.	_____
58.	Everybody has three characters - that which is exhibited, that which they have and that which they think they have.	_____
59.	Guns will make us powerful, butter will only make us fat.	_____
60.	The beginning is easy; what happens next is much harder.	_____
61.	It is better to be a mouse in a cat's mouth than in a lawyer's hands.	_____
62.	A louse in a cabbage beats no meat at all.	_____
63.	Personally, I would sooner have written *Alice in Wonderland* than the whole *Encyclopaedia Britannica*.	_____
64.	On the other hand, you have different fingers.	_____
65.	You are where you eat.	_____
66.	There is one difference between a tax collector and a taxidermist—the taxidermist leaves the hide.	_____
67.	Love is a grave mental disease.	_____
68.	The Stone Age may return on the gleaming wings of science.	_____
69.	Do it first. Do it yourself. And keep doing it.	_____
70.	To escape criticism—do nothing, say nothing, be nothing.	_____
71.	Advertising is the rattling of a stick inside a swill bucket.	_____
72.	Nothing is said that has not been said before.	_____
73.	It is worse than a crime, it's a blunder.	_____
74.	No people do so much harm as those who go about doing good.	_____

		Mark (0-4)
75.	The higher the buildings, the lower the morals.	_____
76.	The unfortunate thing about this world is that good habits are so much easier to give up than bad ones.	_____
77.	I always wanted to be somebody, but I should have been more specific.	_____
78.	Slow and steady wins the race.	_____
79.	Big Brother is watching you.	_____
80.	Most elections mean another dictatorship for three or four years.	_____
81.	The essence of leadership is making people feel good.	_____
82.	It is easier to be gigantic than to be beautiful.	_____
83.	The trickle-down theory [of economists] is warm, wet and amber-coloured.	_____
84.	Nuclear power is the cleanest, the most efficient and the most economical energy source, with no environmental problems.	_____
85.	Genius is the ability and willingness to do hard work, and any other concept is a doubtful and dangerous proposition.	_____
86.	Conscience is the perfect interpreter of life.	_____
87.	Trend is not destiny.	_____
88.	Only in politics do resurrections occur.	_____
89.	Those ruled by fear strive to prevent the very changes that will abate it.	_____
90.	The object of oratory is not truth but persuasion.	_____
91.	Great spirits have always encountered fierce opposition from mediocre minds.	_____
92.	I respect faith but doubt is what gets you an education.	_____
93.	What science cannot tell us, mankind cannot know.	_____
94.	Wit is educated insolence.	_____
95.	Equality of opportunity is an equal opportunity to prove unequal talents.	_____

96. It is better to die with memories than to live only dreams. _____

97. All new plays are old plays. _____

98. Never mistake motion for action. _____

99. The living need more charity than the dead. _____

100. Today's rebel is tomorrow's tyrant. _____

TOTAL SCORE _____

SCORES

0-99 **Congratulations**. You have demonstrated the intelligence to avoid being bamboozled by the rhetoric of the Ages. Such insight suggests the capacity to accommodate change with grace.

100-199 **Excellent**. These quotations have been drawn from sinners, such as Al Capone, Adolf Hitler and Herman Goering and from statesmen that include Sir Winston Churchill, George Washington and Konrad Adenauer. By separating the wheat from the chaff, you have demonstrated the ability to discriminate, suggesting the capacity to accommodate change with grace.

200-299 **Well done**. Most of these questions are, in fact, statements by eminent scientists, authors, philosophers and politicians. These include George Bernard Shaw, William Faulkner, Abraham Lincoln and George Orwell. In agreeing with so many, you have illustrated a deep insight into human nature, suggesting the capacity to accommodate change with grace.

300-400 **Excellent**. It is clear that there is much to be learned from both saints and sinners. These questions are based on pearls of wisdom by both extremes. Your willingness to accept such diversity suggests the capacity to accommodate change with grace.

Copy from one, it's plagiarism;

copy from two, it's research.

Wilson Mizner

A GLOSSARY OF TWENTY-FIRST CENTURY TERMS

ACADEMICO-CAPITALISTS Members of a movement which began in the late 1990s as downsized academics bought redundant universities, converting them into private centres of applied research. Their influence peaked in the 2070s with the purchase of Yale.

ACTS OF TERMINAL DESPERATION Politically correct term for suicide, usually occurring for political reasons.

ADVOCATES OF THE QUANTUM LEAP Techno-anarchists, devoted to the violent overthrow of all social organizations: founded in 2047, at the Turin Academy of Social Reform by Professor G.D. Kiersch.

A-GST 937 The first of the anti-gravity stratocruisers, popular until 2065, when it was replaced by the A-GST 941. The A-GST 937 was manufactured by Boeing-Microharder.

A-GST 941 The second of the anti-gravity stratocruisers, replacing the A-GST 937 in 2065.

ALCILOZIT A highly carcinogenic insecticide, 2-naphthybenzidamine, formerly used by the forest industry to kill the cedar maggot.

ALIEN CHANNELLERS' ASSOCIATION Psychics capable of interspecies vibrational channelling. Their most common communications are with members of the Raybourne Confederation, Orion Nebula. Contacts have been made also with the Cylic Federation, home base unknown.

ALIEN ENTRY DEFENCES Pulsating electromagnetic force-fields, used by large urban areas to prevent alien abductions and the pilfering of metallic infrastructure.

ALIEN GENOME PROJECT A privately funded research organization, seeking to "improve" the human race by incorporating alien DNA into the genome. The alien genetic material was obtained from the Roswell crash site and refrigerated until 2051 when the project began.

ALIEN INFORMATION TRANSFER The bartering of knowledge during alien contacts. Innovations developed as a direct result of this process have included mind-melding and the zipship.

AMAZONIAN PIPELINE This pipeline, which diverts some 25 percent of the Amazon's mean discharge form Manaus to Valparaiso, was built during the period 2074 to 2093. The bulk of this water is used by cactirice and cactioat agrobusinesses, located in the former Atacama Desert. The costs of construction exceeded 749 billion credits; with major overruns occurring during Trans-Andean pumping station construction.

AMERICAN CONFEDERATION OF STATES ACOS replaced NAFTA in 2032. A trading block consisting of the countries of North, Central and South America, it was created to counterbalance the growing influence of both the Asiatic League and the European Confederation of Independent Countries.

ANDERSON Alan Anderson, President of the United States (2026-29) spearheaded the drive into the Hydrogen Economy, one of the most significant and environmentally beneficial events of the twenty-first century. This leadership naturally cost him his re-election chances.

ANDROID BROTHERHOOD The largest and the most militant android union, the Android Brotherhood is often associated with the Teamsters Union in violent job actions.

ANDROID PROTECTION LEAGUE The League was set up in 2075 after the Anti-android riots. Headquartered in Salt Lake City, Utah, it promotes hypnotism and martial art skills amongst younger androids.

ANDROID SERVICES INC. Class 4 and higher androids can perform any human physical activity, usually at a superior level. In 2074, the Android Brotherhood established Android Services Inc. in an attempt to establish leadership in the manufacture of houses and the provision of personal services to homemakers.

ANIMAL MIND-MELDERS In 2036, biological computing, obtained by alien information transfer from the Raybourne Confederation, allowed animal to human brain linkages. These became wildly popular amongst neurobiologists, pet owners, zookeepers and adventure tourists. Drawbacks were apparent soon afterwards, with flashback attacks by canine mind-melders on cats, and those wearing uniforms.

ANTI-GRAVITY STRATOCRUISER Throughout the aircraft industry, anti-gravity stratocruisers replaced jets by 2040. Powered by piezoelectric retrojets, these lightweight craft could reach maximum speeds of 50,000 kilometres per hour. The manufacturing facilities of Boeing-Microharder were badly damaged during the 2058 Seattle earthquake but stratocruiser construction was reestablished in Florence.

ARCH BUTTON Device used to control perception in virtual reality locations, provides instant access to central computer control.

ARCHOPOLY The construction of Archopoly, a 94-storey, glass and concrete pyramid on the outskirts of Winnipeg in 2041 was a major architectural blunder. Designed to house Central African refugees, its inhabitants burned it to the ground during the 2044 riots.

ASIATIC LEAGUE The AL was formed in 2023 by the economic amalgamation of the People's Republic of China, Taiwan, Korea and Japan. This trading block then dominated world industrial production and commerce for 40 years.

ASNESTINE A Canadian author and talk show host, John Asnestine triggered the anti-capitalist Downsizing Riots of 2008. His most influential book, *The Time to Strike Back*, urged the middle classes to adopt bartering and refuse to pay taxes.

AUTOMATONS The least sophisticated form of android, often referred to as Class Ias. They have no android rights and, therefore, are not permitted to vote or hold office.

BACK TO THE PAST One of the most militant of the Green Rage factions, Back to the Past aims not merely to stop innovation but reverse it.

BACOEGGS In 2041, researchers from the University of Kentucky successfully combined DNA from chickens and pigs to create pigens. Pigens lay eggs with a distinct bacon flavour, which are marketed under the trade name Bacoeggs. Forbidden to Jews; bacoeggs are extremely popular with the British.

BIG ZIPPER Headquartered in Times Square, Lunar Base Three, this conglomerate pioneered ionic cloud sculpture. Its financial interests also include cortical manipulators, cybersex networks and laser advertising.

BILL C-11 This bill, which was expected to permit the expansion of Lunar Base Two, was unexpectedly defeated in November, 2093 when the Followers of Barracki voted against it.

BIONICS Military research, designed to replicate electronically the flight of swallows, resulted in the development of Bionics, the science of artificial neurology.

BOEING-MICROHARDER A common target of the Neoluddites, Boeing-Microharder was formerly the solar system's largest manufacturer of zipships and ionic engines. The company was also notable for its pioneering work on anti-gravity stratocruisers. Unfortunately, Boeing-Microharder never fully recovered from the deaths of most of its top management, during the 2058 Seattle subduction earthquake, which also destroyed its headquarters.

BOGOLIN Claude Andrew Bogolin, the inventor of interviral multiplication regulation. This breakthrough was accidental, occurring as Bogolin was measuring the impact of polypeptide reductase on the spread of LNY. His 2052 discovery was instrumental in the conquest of all viral diseases. Bogolin was shot and killed by a failed doctoral candidate, Joseph B. Raytor, at the University of Toronto in 2065.

BOMBAY ASSAULT As the Pakistan-Indo War drew to its close, lithonuclear weapons were used to terminate Hindu resistance in Bombay.

BOTIWELT Eleanor Botiwelt founded the Android Destruction Movement in 2057. For 20 years she and her associated militants sought to prevent android manufacture and use.

BROKEN ECUMENE An organization dedicated to preserving genetic material, including whole genomes, regardless of their economic significance, the Broken Ecumene is often referred to as Noah's Ark by the gutter media.

CACTIOATS A widely grown artificial crop, created at the Dunedin Centre for Agricultural Research, in 2042, by the genetic splicing of the Mexican cactus (*Pereskia aculeata*) and the common oat (*Avena sativa*). This combination produced a plant with the ability to thrive in desert areas, giving it a major commercial advantage. Banned in Scotland.

CACTIRICE A popular artificial crop, first produced in 2039 at the Beijing Centre for Genetic Progress, cactirice was manufactured by the genome merger of the prickly pear (*Opuntia*) with common rice (*Oryza sativa*). It has the ability to withstand extreme drought, yet has a high yield. Its initial introduction into Japan led to the Great Tokyo Rice Riots of 2043.

CACTIRICE PRODUCERS FEDERATION A lobby group that aims to expand the demand for cactirice, this Federation is noted for its sexually explicit laser advertisements.

CACTIWHEAT Cactiwheat is an economically significant artificial crop, developed by Dr. George L. Swinnerton at the Winnipeg Centre for Lifeform Research. Since its 2041 International Patent was granted to the Canadian Wheat Board, it can be grown only under licence. Cactiwheat thrives in areas receiving as little as 4 cm annual precipitation and is an ideal crop for many former deserts.

CANADA-UNITED STATES DISCORD In 2031, a trade war broke out between Canada and the United States over the latter's unilateral decision to extract water from the Great Lakes to prop up Texan agriculture.

CARBON NITRIDES A class of materials that are very stable at high temperatures and pressures, carbon nitrides have a bulk modulus greater than diamonds. The hardest substances yet discovered, carbon nitrides are used in lithonuclear weapons, zipship engines and navigation consoles.

CATHOS A large ring mining settlement on Saturn, destroyed by lithonuclear attack in 2077.

CD-CORTAB Cortical absorption input disks, programmed for rapid ideological conversion, CD-cortabs are highly popular with politicians and religious leaders since they by-pass human thought processes, feeding information, emotions and philosophy directly into memory.

CLEM TUDDENHAM In 2028, tired of the slow pace of space exploration, Tuddenham obtained financing for private, extraterrestrial real estate development. With the aid of the symbiocants he developed Tuddenville on the asteroid Nirvana.

COLE In 2043, Andrew Cole established the Back to Money Association. Its major aim was the abolition of credits and the return to the use of coins and paper money.

COLONIZATION BONUSES Payments made by the United Assembly of Nation States' Expansion Program (UANSEP) to permanent, interplanetary settlers, colonization bonuses reflect both family size and the home planet's lifestyle severity index.

COMPUTSOL Formerly known as the dashboard, the computsol provides visual confirmation of neurodigital information and automatically draw's a pilot's attention to malfunctions, the weather, approaching aircraft and important personal anniversaries.

CORTICAL ABSORPTION This process allows the transfer of information from machines to human brains. See optional cortical absorption for more details.

CORTICAL INDEX TESTS A measure of intelligence, computed from neuron and dendron density scans, cortical index tests replaced IQ assessments in 2024.

CORTICAL MANIPULATION Ultra-sound deep mind probes, set at specific frequencies, can interact with the pleasure centres of the cerebral cortex. Addicts often spend many hours a day in vibratory neural masturbation.

CREDITS Credits replaced money as a lubricant of commerce in 2027. Throughout the solar system, all services are paid for by credits. Less serious crimes are punished by negative credits, which must be redeemed before all but essential purchases are permitted.

CYBERSEX Biological computers can provide sexual encounters between partners, regardless of their actual location. There is no technological limit to the number of on-line individuals simultaneously involved. This activity is considered a mortal sin by most religious organizations and is illegal in Ireland.

DATABASE FOUR One of six Databases, set up during the period 2058-2067, to preserve all knowledge, Database Four is located in Las Vegas, Nevada.

DAUGHTERS OF REALITY A small group of feminist intellectuals, the Daughters of Reality believe that logic is the primary goal of education and that the hallmark of a well spent life is consistency.

DAUGHTERS OF THE REVOLUTION In 2068, the Moon settlement of Malefree was established by 2000 ultra-feminists and a sperm bank. This city's population is entirely female; the occasional, accidental male offspring is returned to earth for adoption.

DECISION EVALUATION MESHES All neurosocial network output is screened through decision evaluation meshes, to ensure current legality. Meshes are updated, after the passage of new legislation.

DELTAGLOBE A four dimensional, virtual reality world, whose citizenship is limited to those scoring 550, or higher, on the Mendelson Creativity Scale. Its current population is 5,784,231; 27,983 of whom are androids. Deltaglobe's chief imports are electrical power, data, electronic orgasms and intellectual experiences. Its major exports are insights, innovations, superior concepts, religious visions and stroking.

DEVALUISTS In the early 2070s, economic cultists, such as Peter Cheng, Moonwalk Hutt and Amos Turgeon promoted visions of a future with high inflation and low interest rates. Disciples were urged to borrow their way to financial security. Many went bankrupt during the stagecession of the 2080s. This cult is dormant and largely defunct.

DEVELOPMENT PERMIT No permanent change to any planet's surface, Earth included, can be made without a development permit. The bigger the requested change, the higher the class of permit required.

DIFFUSIONISTS The invention of nanotechnolgoy, in 2023, caused major disagreements over the distribution of manufactured goods. The Diffusionists argued for the free provision of all products to anyone who wanted them; that is, "to each according to their need." Academico-Capitalists and the Solar Chamber of Commerce opposed this strategy, claiming it would undermine social stability.

DIRECTION BLAST DEFLECTOR An ionic force field generator, designed to give protection against thermonuclear and larger explosions. An error in the setting of a precision-switch electromagnetometer in a direction blast deflector led to the unfortunate destruction of Dusseldorf and Tula, during the fragmentation of Assassin 3.

DNA SNIFFER The latest type of anti-personnel mine, capable of determining the sex, age and ethnic origin of a potential victim, the DNA sniffer is a very selective and highly lethal weapon, widely used in limited-area conflicts.

DOCUSAVE FILE Old habits die hard and many of the elderly miss paper. To overcome this yearning for the obsolete, docusave files create virtual paper.

DOW JONES EXPANDED INDEX After the Great Blue Monday Crash, the Dow Jones Index was revised to include nanotechnology producers and companies specializing in industrial mind-melding.

DOWNSIZING RIOTS The replacement of middle management by neural networks and shop floor workers by automatons created worldwide unemployment. In 2008, riots orchestrated by the Neoluddites triggered the Capitalist Collapse.

ECOLOGICAL IMPERATIVE The Ecological Imperative consists of a large group of radical ecologists and environmentalists, whose members believe all animals should have civil rights, protected by law. Its more extreme members would like to see this concept extended to artificial lifeforms and to the inhabitants of digital wildlife reserves.

ENIGMATIC CONTINUUM The objectives of this society are unknown, despite its regular, but secret, Lunar Base Three meetings. Some members have links to the Advocates of the Quantum Leap, while others are connected to Green Rage and the Immortalists.

ETERNAL-LIFE BUILDING MATERIALS Research is being conducted into new alloys capable of resisting corrosion and corrasion. These are expected to be eternal.

ETHNIC DECERTIFICATION This process, which began in Yorkshire, England in 2078, involves the ethnic reclassification of individuals on the basis of genetic data. It is limited now to a few lunar dictatorships where ethnic purity is still advocated.

EUGENIC SETTLEMENTS Illegal, clandestine settlements on the fringes of the explored universe. Reproduction is scientifically controlled and only designer infants without physical, intellectual, emotional or personality defects are permitted. Often promoted by the Religious Right.

EUROPEAN CONFEDERATION OF INDEPENDENT COUNTRIES In 2027, the European Economic Community was expanded to include Russia, Poland and Latvia. The impetus for this economic union came largely from the growing threat of the Asiatic League.

EXTRATERRESTRIAL CONTACT PROBES These highly sophisticated bioelectrical communication devices were developed by the Academico-Capitalists, with financing from the Solar Chamber of Commerce. Their mission is to penetrate deep space in search of alien business contacts. *Futureshockery*, the fifth such probe, launched in 2088, was responsible for humanity's first contact with the Cylic Federation.

FATALISTS The key to fatalism is a belief in predestination. The faithful see life's goal as stoic acceptance of hardship.

FIRST SOLAR EXPLORER Clem Tuddenham's First Solar Explorer was built in 2028 and used by the symbiocants to settle Nirvana, a class three asteroid. It crashed on Geneva, Switzerland in 2073, igniting a large fire. There has never been a second ship with this name.

FLOATER HOMES To avoid the high cost of real estate yet increase their upward mobility, many younger couples have bought floater homes, held in stationary planetary orbit by anti-gravity fields, generated by piezoelectric retrojects. Floaters have caused significant tax problems for many cities.

FOLLOWERS OF BARRACKI While serving a 20 year sentence for illegal drug manufacture at Lunar Base One, Galileo Barracki claimed to have had a direct dialogue with God. The Lord instructed Barracki to combine all known religions to create the One, True and Only Faith. Despite, or perhaps because of his death in 2082 from drinking poisoned communion wine, Barracki's disciples have continued to increase both in number and persistence.

FRIENDS OF THE SOLAR SYSTEM Established in 2018, this organization attempts to promote scientific resource management. It appears to have been an offshoot of *Technopoly.*

GALAXY BANK The Galaxy Bank was established in 2057 soon after the collapse of the World Bank. It initially consisted of a consortium of 223 private financial institutions. All the GB's extraterrestrial loans are guaranteed by the United Assembly of Nation States Expansion Program.

GALAXYNET Established during the period 2058-2069, GalaxyNet is a communications network of biological computers, capable of transmitting both emotions and data. It replaced the antique and overloaded Internet throughout the solar system.

GALAXY TRADE CONSORTIUM In 2069, the Galaxy Trade Consortium was established by the Galaxy Bank to encourage trade with the Raybourne Confederation. It was the first joint project of the Asiatic League and the European Confederation of Independent Countries. The American Confederation of States refused to participate until 2081.

GENETIC CODE MANIPULATION The process by which the genetic code of a species is rewritten to create an alternative life form is known as genetic code manipulation.

GENETIC INTERMINGLING ACT Passed by the DeltaGlobe Assembly in 2095, this Act was designed to reduce racial differences by encouraging the adoption of genetically engineered infants. It provided major financial incentives to adoptive parents, but was strongly opposed by Caucasian and Asiatic extremists, who considered it an assault on racial purity.

GENETIC SHIFTS Accidental exposure to high doses of radiation, largely caused by nuclear reactor accidents, caused significant alterations to the human genome, known as genetic shifts.

GENEVA FIRE Geneva, Switzerland was damaged badly in 2073 by fires ignited by the First Solar Explorer, which crashed during an emergency landing.

GEOELECTROMAGNETIC FIELD BUMPER A safety device, used in antigravity vehicles to prevent crashes, the geoelectromagnetic field bumper was invented by Dr. Dorothy Drucker, University of Calgary.

GLADIATORS Gladiators are highly paid athletes, specializing in laser combat and electric shock buffeting. Since women are more capable of withstanding high tension laser burns, they generally make the best gladiators.

GLOBAL AGRICULTURAL DIRECTORATE The Global Agricultural Directorate is one of the few surviving agencies of the former United Nations. Its mandate is to ensure increased productivity on a shrinking land base. Its chief research facility, *Eggcentrics*, is located in Geneva.

GNST (Gross National Social Throughput) Lobbying by radical feminists forced economists to discontinue use of the GNP (Gross National Product), in 2037. This was replaced by the GNST, which assigns economic value to housework, whether performed by humans or androids. Recent revisions now permit accounting for artificial lifeform productivity.

GREAT DYING Beginning in the 2030s, emerging viruses, pollution and the loss of agricultural lands to rising sea levels caused a major dieback of the human race. This continued until the late 2040s, in a period known as the Great Dying.

GREAT MELTING Throughout the twenty-first century, Earth has suffered from the effects of earlier industrial pollution. The greatest losses have come from the global warming associated with carbon dioxide, which has caused Antarctica to melt, flooding low lying countries.

GREEN RAGE Green Rage's supporters promote direct action in the pursuit of animal, artificial lifeform and digital wildlife rights. These extremists are thought to have been responsible for the San Diego zoo massacre of 2080 and may have caused the London B and B Circus stampede of 2083.

HADRIAN SHERRINGTON The President of Starview Intersolar Inc., the Earth's largest interplanetary adventure tourism company, Sherrington was widely known for his dedication to quality. He cancelled entire voyages, if he considered a spacecraft's wine vintages or champagne to be inferior.

HAL The name most pilots give to their talking controlputer.

HITLER'S BUNKER SYNDROME A deep-seated depression, characterized by the belief that the future will be worse than the present. Hitler's Bunker Syndrome appears most common among death row inmates and the terminally ill.

HOLODRAM An obsolete form of entertainment that rapidly replaced television, during the period 2018 to 2025, the holodram generated holographic projections that allowed the viewer to enter, but not influence, the drama. The effect is rather like walking onto a stage during the production of a play and being totally ignored by the actors. Holodrams were themselves considered passé after 2036 with the invention of the controlfreak. This innovation

now permits viewers to modify the holographic projections at will, so altering the course of any program.

HOLOGRAPHIC RECONSTRUCTORS An early form of entertainment, holographic reconstructors created three dimensional mobile images. This antique technology is still used in children's games and advertising. What you see isn't what you get.

HUMAN DISCONTENT INDEX In 2084, Alexander Monroe published an article in *World Social Science* attacking the Galaxy Bank as too materialist and arguing that economic indices should be supplemented by a weekly Human Discontent Index, based mainly on human stress levels. To his surprise, the Bank offered to fund this project and has published the Index each week since Monroe first presented it in 2086.

HYDROGEN ECONOMY The Great Melting and the Great Dying forced a radical shift in energy generation and consumption. By 2033, hydrocarbons had been replaced by hydrogen in most energy systems.

IMMORTALISTS A group of wealthy Dallas businessmen and women devoted to achieving eternal life through the use of nanotechnology in medicine. The immortalists finance major health-related innovations in exchange for an endless supply of replacement organs and tissues. Their leader, Alexander G. Hunt has reached the age of 173 and is still an active sportsman.

INDUSTRIAL IMMUNOLOGY The Turner-Lang breakthrough allowed the manufacture of individualized antibodies, giving rise to a new manufacturing sector, industrial immunology.

INNER LIGHT Inner Light is an association of individuals who have had near-death experiences and claim to have seen the light at the end of the tunnel. Members are usually altruistic and do not fear death.

INSTANT RECALL A controlfreak show featuring "great moments" in human history, *Instant Recall* caters to the worst in human nature. Naturally, it is very popular.

INTERNATIONAL BALLISTIC MISSILE DEFENCE OFFICE This organization was set up to ensure solar storms and associated auroras did not trigger nuclear war. It continued to function, even after the 2068 Treaty of Sydney rendered ballistic missiles obsolete.

INTERNATIONAL OCEANIC RESOURCES CONFERENCE The International Oceanic Resources Conference was held in Tokyo in 2018 to discuss the collapse of global fisheries. This meeting led to the farming of the Earth's continental shelves. The Tokyo agreement was strongly opposed by landlocked states, and triggered their ten year, Swiss-funded fish products embargo.

INTERPOLICE As a result of an expansion in organized crime, terrorism and drug-induced acts of violence, Interpolice was created in 2041 to fight social disruption throughout the solar system. Its headquarters are at Very New Scotland Yard, London.

INTERSOLAR COMMUNICATIONS INC. The largest communications organization in the solar system, Intersolar CI is largely responsible for the control and operation of GalaxyNet.

INTERSOLAR MEMPROD Intersolar Memprod is the cartel that controls the manufacturing and coupling of miniaturized mechanical and electronic systems. It is a promoter of nanotechnology and bionics.

IONIC ENGINES Ionic engines are the key to interplanetary travel. They were perfected in 2017 at the Lewis Research Center in Cleveland. Ionic engines are cheap, simple and efficient. Electricity is passed through xenogas and the resulting electrically charged atoms, or ions, are expelled from the engine as a propulsive jet. This persistent ionic engine thrust is used to accelerate spacecraft and extraterrestrial contact probes to very high velocities. Warp Six has been reached under experimental conditions. Research continues using a mixture of xenon and neon gases.

IONIC ENGINES INC. The organization set up by the City of Cleveland to exploit the benefits of the ionic engine, was known as IEI. It went bankrupt in 2083.

JANUS Janus, a humanitarian organization, was established in 2031 by Maxene Adams. Its major objective is still the assistance of xenotransplants, hermaphrodites and maladjusted androids. Supporters are frequently referred to as "freak freaks" by the gutter media.

JESUIT ASSOCIATION A militant male rights organization, founded in 2019 by clerics, made redundant by the admittance of women priests into the Catholic Church. The Jesuit Association's major goal is the prevention of the appointment of feminists to positions of economic, religious and political power.

KAIZEN A cult, headquartered in Kobe, Japan; followers of Kaizen are involved in a continuous quest for physical, mental, spiritual and financial improvement. Their slogan is "A Better Tomorrow."

LABYRINTH Labyrinth is an educational society, dedicated to puzzle-solving. Membership by cross-word addicts is discouraged.

LADRIMIUM Ladrimium, the only known emotion-stimulating element, is used to enhance satisfaction during cybersex. Ladrimium is mined in Saturn's Outer Ring Complex.

LANG In 2028, Dr. John Lang, together with Dr. Richard Turner, invented reverse vitamin C, now used routinely to cure cancer.

LASER ADVERTISING Laser advertising is the use of high output lasers to create large messages in the night sky; also used even more dramatically during eclipses of the sun. Messages are flashed in bright bursts of light on the earthward side of the magnetosphere, causing it to oscillate slightly. Franchises are still available from Night Flazers Inc, Chicago, Illinois, for some of earth's smaller cities.

LASER FORUM TONIGHT A daily Controlfreak presentation, with the capacity to trivialize even the most significant issues. Naturally, it is extremely popular.

LITHONUCLEAR WEAPONS Subterranean targets spawned the development of a new generation of armaments, using anti-gravity engines encased in carbon nitride shields. These weapons are able to cause devastation up to 20 miles beneath the planet's surface.

LNY (Laforia's neurospasmic yaws) This disease first appeared in Gambia in 2007 but spread quickly to Europe and North America. Victims of LNY suffer severe epileptic seizures. These are caused by the spirochaete *Treponema gambiani*. LNY is highly infectious.

LPN (Lysergic Pernapic Neurocampin) A designer drug, with strong chemical similarities to a skin secretion produced by the Yellow Amazonian Yaki frog, LPN is considered by addicts to give the ultimate high. It was first used during initiation ceremonies of the Followers of Barracki.

LUCERNE VIRTUOCEAN A privately owned Swiss, three dimensional, fourth order virtual reality amusement park, recreating the Pacific Ocean around Hawaii; the Lucerne Virtuocean is popular amongst virtual step-divers, surf boarders and laser fishers.

LUNAR BASE ONE This early development centre was used extensively as a transportation node during the First Great Moon Rush (2009 -2018). When mining activity declined during the Great Dying, Lunar Base One was converted into a penal colony. The Tobacco Blight Conspirators were banished there in 2077.

LUNAR BASE TWO Located in the Mare Humorum, Lunar Base Two is a solar communications centre and tax free retirement haven.

LUNAR BASE THREE This outworld was founded during the Second Great Moon Rush. Located in the Sea of Tranquillity, it is most famous as the site of the 2075 anti-android revolt.

MAGNETO-OPTICS Magneto-optics is the study of the use of interconnected magnetic and optical fields in communications.

MAROTZKA With the aid of alien information transfer from the Raybourne Confederation, Dr. Paul Marotzka perfected the zipship in 2054. Marotzka was an electrical programmer at the University of Madrid at Chicago. He later joined the Academico-Capitalists and was elected their president in 2071.

MARTIAN ATMOSPHERIC CONVERSION PROJECT There is no place like home. Yet there will be when, by 2200, the carbon dioxide, oxygen and nitrogen content of the Martian atmosphere has been made to replicate that of Earth.

MARTIAN SETTLEMENTS In 2081, Century 22 began marketing Martian real estate. Sales were brisk, even though owners' deeds only granted possession in 2200, with the completion of the Martian Atmospheric Conversion Project.

MCLACKLAN PROJECT Initiated in 2049, the McLacklan Project was, and still is, the most ambitious of the Saturn Mining Ventures.

MENTAL MAGNETIC FIELD FLUCTUATIONS Changes in the Earth's magnetic field caused by earthquakes and volcanic eruptions have been discovered to cause mental illness in susceptible individuals. As yet, no cure has been developed.

MICROELECTROMECHANICAL PRODUCTION MEMPROD is the name given to the manufacture and coupling of miniaturized mechanical and electronic systems. This technology was a necessary first step in the Nanotechnological Revolution. MEMPROD systems are used for the arming and detonation of weapons, optical switching and aligning, biological computing, data storage and inertia navigation systems. Early MEMPRODS were only able to compress ten trillion bits of information onto a centimetre square computer chip.

MICROHARD Established in 2074, Microhard is an organization for "hands-on" engineers. Its main objectives are not professional, but political. Most of the Microhard's activities involve lobbying for Diffusionists causes. Microhard is noted for its aggressive use of laser advertising. Members typically describe themselves as electrical, but definitely not civil, engineers.

MONICA Hurricane Monica destroyed much of New York City in 2041. Damage was in excess of 627 trillion credits.

NANOGOODS Nanogoods are the products of nanotechnology, a process first envisaged by K. Eric Drexler in his book *Engines of Creation*, published in the late twentieth century. Nanofabrication experiments began in 1990 but large-scale nanomanufacturing only became feasible in 2072 after Thomas Damasio's microelectromechanical production breakthrough.

NANOMEDICINE Nanomedicine began to be practised in 2074 after Damasio's breakthrough. It involves the regular replacement of body parts with designer organs, specifically manufactured, atom by atom, for the patient. Wealthier individuals no longer age in the traditional manner. Their eyes may be 20 years old, while it may only be four weeks since both legs were replaced. All surgery is conducted by precision androids, supposedly incapable of error.

NANOTECHNOLOGY Nanotechnology is a method of fabrication in which objects are created with the individual specification and placement of each separate atom. The Nanotechnological Revolution gave rise to numerous replicating assemblers which, in turn, resulted in an exponential growth in productivity. The process, however, undermined the social structure by rendering virtually all manufacturing labour valueless.

NEOLUDDITES Founded in 2041 by Dr. Arthur Szilard, a psychosocialist at the University of Southern California, the Neoluddites argue that technology destroys human dignity. They are widely believed to have caused the chaos of August 17, 2063, when the virus *Guillotine* destroyed all records of the year's stock market trading solar wide.

NEUROMODELLERS Neuromodellers are academics who are attempting to statistically predict the output of any human brain. Much of their work is funded by political parties and by the military establishment.

NEUROSOCIAL NETWORKS Neural networks, computer simulations of the human brain, originally were developed in the last three decades of the twentieth century. However, it was not until 2035 that they became sophisticated enough to replace most human decision-making. Cortical Charlie was the first elected neurosocial network to serve in the US senate.

NEW COALITION A coalition of central parties set up to rule after the Capitalist Collapse. The New Coalition's main platform was LifeNet, a programme guaranteeing various new rights to all.

NEW DAWN A Taoist splinter group; Members of New Dawn, also known as the NeoConfucionists, see life's ultimate goal as the conquest of emotion.

NEW LONDON New London was destroyed in 2077 by a lithonuclear attack launched by Cathos, its chief competitor.

NIRVANA Nirvana is a class three asteroid, settled in 2029 by symbiocants under the leadership of Clem Tuddenham. A closed settlement, it cannot be visited without state-sanctioned permission. Nirvana's major imports are zipperjuice and ladrimium. It exports high quality designer genomes.

NUCLEAR LITHOPROBES An advanced form of lithonuclear weapon, the lithoprobe is capable of search and destroy missions up to 20 miles beneath a planet's surface.

OFFICES WITHOUT WALLS There is no personal contact in Offices Without Walls and workers typically have never met their employer or colleagues. It is often unclear whether the work undertaken is real or virtual.

OLIVER Jonathan Oliver, a Neoluddite leader, who, during the period 2073 to 2084, acted as a catalyst for more violent members of the organization. Oliver was noted for his oratory and incompetence.

OPTIONAL CORTICAL ABSORPTION Just as biological computing permitted the interspecies linkage of brains, cortical absorption allows the transfer of information from artificial intelligences to the human mind. This process rendered traditional education obsolete and resulted in the widespread collapse of schools, colleges and universities in the 2040s.

ORGANIZATION FOR ECONOMIC GROWTH AND COOPERATION In 2062 the Solar Chamber of Commerce denied membership to androids. In retaliation they established the OFEGAC, limited to non-humans.

OUT-OF-BODY TRAVELLERS The cooperation of Near Death Experience Researchers with Mind-melders and Alien Channellers resulted in the chance development of Soultech, a methodology capable of splitting body and mind. Once free of the body, the mind or, as some prefer to call it, the soul or spirit, can travel the Universe unfettered. This process resulted in numerous serious privacy violations and was banned in 2078. Nevertheless, it is extremely difficult to control and remains popular, especially among Immoralists.

OUTER DOME Settlements on planets without an earthlike atmosphere take place under domes, normally three levels deep. The level in direct contact with the external environment is the thickest and is normally referred to as the Outer Dome.

PAKISTAN-INDO WAR The first religious war fought using lithonuclear weapons, it pitted the Sunnis of Pakistan against the Hindus of India. The war lasted for two days (November 3 and 4, 2073).

PATERBY Mary Anne Paterby was the first person to apply mind-melding in communications with the dead. Since there is no time sequencing for the departed, her deceased husband was able to provide her with the winning numbers for 25 future lotteries. Paterby now lives a life of luxury in a major Las Vegas hotel, which she owns. By law, she is not permitted to play any games of chance.

PERSONAE NON GRATAE Membership in this association of former political prisoners is limited to those who have served a minimum of five years hard labour at Lunar Base One's maximum security centre.

PHASER PROBES Programmed laser beams, designed to interact with the DNA sequences in neurons and dendrites, produced by phaser probes, are capable of profoundly altering human personality.

PIRANHA A coalition of right-wing businessmen, sometimes called the Genghis Khan Committee, noted for its belief in the survival of the fittest and its disdain for environmentalists.

PLANETARY ASSASSINS Asteroids and other celestial bodies that are capable of causing extensive damage on collision with planets.

PLANETARY DEFENCE PROJECT This UN sponsored body tried unsuccessfully to protect the Earth against asteroid strikes. Its mismanagement was responsible for the destruction of Dusseldorf and Tula. Disbanded in 2063.

PLASTOMETAL Invented at the University of Western Samoa in 2048, plastometal was the original plastic-metal alloy. It has the weight and flexibility of plastic combined with the strength of steel.

PLUG-IN CITY The first of the internally interchangeable cities, designed by Jandang Lee and built on the outskirts of Rome, Plug-In City stimulated the Mobility Movement in Architecture. Plug-In City began to grow in 2052 and is still constantly changing in shape, height and population. Its major critics are delivery personnel.

POLITICAL CORRECTNESS REVIEWS On a slow day in April 2073, a coalition of radical feminists and androids succeeded in pushing mandatory political correctness reviews through the DeltaGlobe Assembly. A clever twist in the wording of this Act invalidates all current legislators' pensions, should it be repealed. Despite constant public criticism, there has been little political will to revoke it.

POWWOW An aboriginal business association, controlling solar-wide gladiatorial gambling and bingo; headquartered at the Little Bighorn.

PSYCHOSOCIALISTS Academics who specialize in using psychological techniques to encourage political and religious conversions, psychosocialists are trained in socioneutronics.

QUADRIUM FIELDS Quadrium mussels are cultivated on the tropical continental shelf. They are harvested for the extraction of barium halazonate, used to cure rheumatoid arthritis.

REPRESENTATIVE CYBERDEMOCRACY Representative cyberdemocracy is informed government by the masses, made possible by advances in communications technology. Some voters are more wired than others.

RETROJETS Retrojets use recycled gravity as means of generating rapid motion. This technology was "borrowed" from a UFO of unknown origin which crashed outside Zurich in 2038.

REYNOLDS In 2075, Benjamin F. Reynolds led the violent Lunar Base Three revolt against the replacement of human workers by androids. The spread of this unrest triggered the collapse of the United Nations.

RING MINER Ring miners are usually hard drinking, low intelligence males. Since 2031 they have been making a lucrative but dangerous living in Saturn's ring mining industry.

ROBOTANK Completely automated, the robotank is the initial weapon of choice on the automated battlefield.

RONNESHANK Alvin Ronneshank was unique in being a leader of both the Green Rage and Neoluddite movements. He is best remembered for his book *No*.

ROSBONE Albert Rosbone is a tame scientist, used by the media to promote the idea of the month.

ROTOSTAB The strongest of the energy absorbing metacompounds, rotostab is used to protect targets from attack. It can be applied by spray or incorporated during manufacture.

SEARCHERS FOR SELF-SUFFICIENCY In 2059, Robert L. Spondman's CD-cortab *Simplespeak* gave rise to a quasi-religious cult, the Searchers for Self-Sufficiency. Spondman preached that simplicity and self-reliance marked the road to personal peace. Searchers for Self-Sufficiency follow a reductionist lifestyle. Their numbers are highest in Central Europe and Quebec South.

SEATTLE EARTHQUAKE A large subduction earthquake devastated Washington State and much of British Columbia on August 3, 2058. This earthquake killed 39,000 people and was responsible for 41 trillion credits in damage.

SELF-ASSEMBLING MATERIALS Substances with induced high molecular surface tension can be memory programmed to repair automatically. Ideal for toys and crockery.

SHANGHAI INTERNATIONAL The largest of the first generation fusion plants, Shanghai International supplies power to much of SE Asia.

SIMPLEX Juleene Simplex served as Minister of Industrial Development in the Gibson Administration until forced to resign because of a rash promise made in connection with the passage of Bill C-11.

SIMPSON Adrian Simpson was probably the most intelligent of the Neoluddites. He is best known for his book *Stability Now*.

SIMULATED HEALTH SERVICE The cheapest and most effective health care service is one staffed by androids. However, patients often want the human touch. The Simulated Health Service provides the illusion of human care through level four deep hypnosis.

SIROSIS James Louis Sirosis, elected as Premier of Lunar Base Three in 2072, quickly turned it into a tax haven and gambling den.

SNIBBLES Snibbles are chocolate-coated Chinese scorpions; thought by many to be an aphrodisiac. They are, therefore, usually served in bars and swinging single centres.

SOCIONEUTRONICS On September 13, 1848 Phineas P. Gage, a 25 year old construction foreman for the Rutland and Burlington Railroad in New England, was seriously injured by a metal bar. Although he did not die, the passage of this projectile through his skull and brain completely altered his personality. The science of socioneutronics involves moulding personality by causing microstrokes in selected areas of the human brain, a procedure usually limited to criminals or the politically unrealistic.

SOCIO-SIMULATIONS Computerized attempts to predict the actions of society, socio-simulations are particularly valuable to advertisers and politicians.

SOLAR CHAMBER OF COMMERCE Trade expands to fill the space available and so does the Chamber of Commerce.

SOLAR-MILITARY COMPLEX A multi-planetary defence force and its industrial base, first established in 2083, the Solar-Military Complex is designed to react to alien aggression.

SOLAR STOCK MARKET Headquartered in Tokyo, the Solar Stock Market acts as a catalyst to private enterprise, by linking independent markets throughout the solar system.

SOLAR-WIDE WEB MARKET A branch of the Solar Stock Market, the SWWM focuses on commodity trading.

SONS OF NOAH In 2083, a religious cult known as the Sons of Noah spread rumours of a second great flood. Many of the faithful fled to the Sahara Desert where they died of thirst.

SOTHERBY-MICROSOFTER INDEX This index, established in 2019, tracks fluctuations in planetary auction prices of commodities, such as gold, silver, platinum, zipperjuice and ladrimium.

SPINBALL Spinball was the first public use of fifth dimensional holographic flux fields. Developed in 2043, the object of the game is to increase the ball's spin by bouncing it off micro-concavities on interdimensional interfaces. The harder the bounce, the greater the increase in spin velocity. Black holes must be avoided.

SPONDMAN Dr. Robert L. Spondman, formerly an Academico-Capitalist, underwent a major mind shift in 2059. This resulted in his authoring several CD-cortabs, including *Simplespeak*, *Simplethink* and *Simpleact* which promoted a reductionist lifestyle. Spondman is considered the Father of the Searchers for Self-sufficiency. In 2074 he abandoned his followers to become the Chairman of the Galaxy Bank.

STATUS SOCIETIES Status Societies were set up with the sole intent of increasing the status of their members. Higher social status is achieved by techniques such as family tree revision, accent reduction, plastic and genetic surgery, intelligence boosting and cortical absorption.

STEP DIVING The discovery that oxyhaemoglobin in tablet form would permit humans to stay underwater for long periods without equipment gave rise to the step diving craze. Enthusiasts compete to see who can venture the deepest and stay submerged the longest. The current record for depth is 381 metres and for time, 27 hours 36 minutes; both are held by Paul Boyd. Step diving, of course, can be simulated in all Virtuocean amusement parks.

STOP THE ROT Stop the Rot is a militant environmentalist pressure group that focuses on preserving old growth forests.

STUNGUN This device is used by the unintelligent to settle differences of opinion. Its blast paralyses the nervous system for up to 12 hours, depending on the control setting. Deaths have been reported in victims with previously unidentified cardio-vascular problems.

SUBMARINE SEISMICITY Faults on land are routinely lubricated to prevent large magnitude earthquakes. Those lying beneath the oceans still pose a threat.

SUPERCONDUCTION A simple process originally involving materials such as yttrium barium copper oxide that can conduct current without resistance. Its major impact came after 2031 with the invention of ladrimium superconductors that could be used at room temperatures. Superconductors are found in zipships, ionic engines and are used to control and magnify holographic flux fields.

SYDNEY FIRE Sydney, Australia was gutted by a fire in 2067, which began in a CD-cortab manufacturing plant. Damage estimates reached 103 trillion credits.

SYMBIOCANTS Many early xenotransplants, such as the symbiocants, were genetically integrated inadequately. Symbiocants, as a result, were often intellectually superior but suffered from serious cosmetic difficulties. Unfortunately, they often experienced rampant prejudice and usually preferred their own closed settlements. Many followed Tuddenham to Nirvana.

THE ANDROID PROTECTION LEAGUE Without emotions, androids are forced to act logically, frequently bringing them into conflict with humans. After the 2075 Anti-Android Revolt at Lunar Base Three, Class 3A and higher automatons banded together to form the Android Protection League. This is devoted to teaching the martial arts to androids for self-protection.

THE EDGE A biological venture capital association which promotes new lifeforms, capable of neutralizing radioactive and other toxic wastes, The Edge

was established in 2014 to handle leaks from the Harford Nuclear Repository, Washington. Using the profits earned, it expanded to become a major force in the ecological renovation industry.

THE FLAG A zip on/zip off submarine ferry. *The Flag* sank in the Bay of Bengal on May 18, 2081.

THE INNOVATORS A small, very financially secure scientific pressure group, headquartered in Pretoria, Caucasian Free State, the Innovators promote phaser probe realignment as a treatment for personality disorders. This dangerous procedure can reprogramme the brain, creating the illusion of completely new life experiences. It is extremely popular with politicians on the comeback trail. Such individuals are colloquially known as "New Nixons."

THERMONUCLEAR GENERATING PLANTS In the 2030s, electromagnetic field flux control of deuterium-tritium reactions permitted the construction of several large nuclear fusion plants. The largest of these was located beneath Kansas City in an abandoned limestone quarry.

TILMARE Dr. Albert Tilmare was a popular leader of the Academico-Capitalists, in the period 2082 to 2094.

TOBACCO BLIGHT CONSPIRATORS A coalition of biochemists, microbiologists and genetic manipulators developed *Revenge,* a devastating tobacco blight. This bacterio-viral-prion hybrid was designed to continuously mutate, making control extremely difficult, if not impossible. In 2073, *Revenge* was released simultaneously in 26 tobacco growing regions, destroying global production. After an emotional trial, the tobacco blight conspirators were sentenced to life imprisonment without parole at Lunar Base One.

TOLSTOY COMPLEX In a vain effort to reduce illegal immigration the United States built a laser barrier along its border with Mexico. Begun in 2011 and completed in 2031, this fence proved costly, yet totally ineffective.

TOKYO EARTHQUAKE In 2048, the Tokyo earthquake killed 420,000 people and destroyed the city and surrounding regions. Damage estimates were as high as 278 trillion credits.

2QT2BSTR8 (TOO CUTE TO BE STRAIGHT) With the final conquest of AIDS in 2017, gay rights activist organizations joined forces to promote homosexuality as a parental genetic choice. When this goal was achieved in 2033, gays began lobbying for universal access to softechnology. 2QT2BSTR8 is the umbrella organization of human non-heterosexuals. Its headquarters is in Miami, Florida.

TURNER Dr. Richard Turner, together with Dr. John Lang invented reversed vitamin C, the long sought after cure for cancer.

TWENTY-TWENTY VISION A psychic training association, headquartered in Boulder, Colorado, Twenty-Twenty Vision emphasizes long distance healing. Research continues into raising the dead.

TWO YEAR PLAN Every two years, the Galaxy Bank and the Solar Chamber of Commerce release a plan for commercial growth.

UNEDUCATION The use of reverse cortical absorption to remove unwanted or unauthorized information from the human brain is known as uneducation. It is most often used by governments to relieve individuals of the burden of information they don't need to know.

UNIVERSAL HONEY BEE HEALTH MONITORING SYSTEM Bees are very sensitive to toxins in the environment and are used as an early warning system to identify potential threats to human health. This project was funded by the Immortalists.

UNLIMITED HORIZONS A group dedicated to combining cortical absorption and mind-melding technologies to permit the complete transfer of memories and personality traits from one individual to another. It is suspected, but has never been proven, that such research is funded by the Immortalists.

VACCIBAR Vaccibars provide free fresh fruit and vegetables, containing vaccines against a wide range of prions, viruses, bacteria and other pathogens. They were established originally with savings from health care systems and staffed by former doctors and nurses.

VIRGINIS 70 In 1996, scientists based at the University of California at Berkeley detected repetitive electrical emissions from Virginis 70, a star in the constellation Virgo. This discovery, made by members of Serendip 3, part of Seti (Search For Extraterrestrial Intelligence) ultimately resulted in the first officially admitted alien contact.

VIRTUAL EDUCATION The invention of CD-cortabs removed the need for schools and universities. Nevertheless, the social experience of education was missed and is recreated in virtual education centres.

VIRTUAL LIFEFORMS Begun as an experiment in evolution, virtual lifeforms were released onto the GalaxyNet in 2072. They since have multiplied enormously, interbred and mutated. Hundreds of virtual lifeform species now exist and have begun to lobby for their rights.

VIRTUAL REALITY HERMIT MOVEMENT Disillusioned with the harshness of reality, many computer buffs retreat into virtual worlds, where they easily obtain entertainment, companionship and cybersex. Such hermits become neurologically withdrawn, unable to relate to human contact. A few have starved, or died of thirst rather than disconnect.

VIRTUOCEAN Virtuoceans are recreational centres which aim to reproduce the experiences available in the real thing. Their main attraction is the provision of risk-free underwater spills and thrills.

VOYAGEUR FRANCHISES Sophisticated confidence tricksters began selling Voyageur Franchises to gullible investors in 2093. This space craft, so it was claimed, would be powered by optical rockets using intense laser pulses and would make rapid direct contact with the Cylic Foundation. The only individuals associated with this project ever to leave Earth, however, were the company's directors, taking 27 trillion credits with them.

WATCHERS In DeltaGlobe, politicians debate issues but only those members of the public who follow the discussion are allowed to vote. This group is termed the Watchers.

WIRED DEMOCRACY In the 2030s, Wired Democracy led the revolt against government by elected and appointed officials. Since representative cyberdemocracy is now universal, this is a rump organization dedicated to maintain the power of the individual in all virtual reality worlds.

XENOTRANSMITTERS Artificial biological lifeforms, developed by the Military-Industrial Complex for work in high severity index extraterrestrial environments. Solar law mandates that xenotransplants with more than 25 percent human genetic material must be allowed to vote and have to be paid at least minimum wage. They are, therefore, relatively uncommon.

YRWEHERE? Founded in 2047, this debating society specializes in high energy interfaces at which the meaning of life is the chief topic of discussion. Its membership is drawn largely from Alien Channellers, Mind-Melders and Diffusionists, with a sprinkling of former university faculty, mainly philosophers.

ZAPPER'S SYNDROME In 2068, technologists working on the Martian Atmospheric Conversion Project began to experience acute phlebarteriectosis, a severe dilation of veins and arteries. Many died within days of the onset of the syndrome, which is named after Dr. Eric Zapper, the project's physician. Both the cause and the cure are unknown. Zapper's syndrome only affects men, females appear immune to it.

ZELDA Hurricane Zelda devastated the Miami region in 2034, causing 13 trillion credits in damage and 1,480 deaths.

ZIP ON/ZIP OFF SUBMARINE FERRIES During hurricanes and other extreme natural weather phenomena, zipships cannot fly safely. At such times they may be transported by submarine zip on/zip off ferries.

ZIPPERJUICE Secreted by the female Brazilian Bedbug (Ouch ouch), Zipperjuice can increase human intelligence and creativity. Its high cost occurs

because it must be collected by hand during the August-October mating season. Zipperjuice is in great demand among artists, actors, authors and intellectuals.

ZIPSHIP In 2054, alien information transfer from the Raybourne Confederation permitted Dr. Paul Marotzka to develop the zipship. This small, saucer-shaped craft bounces through the atmosphere on rising thermals, rather like a pebble skimming the ocean surface. A major advantage of this inexpensive form of transport is its absorption of carbon dioxide and generation of oxygen. The zipship revolution has been credited with slowing global warming and reducing the rise of the Earth's sea level. The zipship's popularity destroyed the automobile industry and greatly reduced the demand for rail and air transportation. Zipship competition provided the stimulus for the 2065 Detroit riots.

ZIPSHIP FREIGHTERS Zipship freighters carry commodities around the Earth and other planets. Their initial use caused extensive unemployment among truckers and railway workers who converged on Detroit to take part in the 2065 riots.

He wrapped himself in quotations—as a beggar would enfold himself in the purple of Emperors

Rudyard Kipling

SIGNIFICANT EVENTS OF THE TWENTY-FIRST CENTURY

2001-2010

Science and Technology

2003 Dr. Richard Stevenson discovered that barium halazonate cured rheumatoid arthritis.

2006 Drinking water aluminum was found to cause osteoporosis. Aluminum cans were banned.

Environment

2004 Global warming was officially admitted by United Nations Assembly.

2009 Green Rage was founded in Sydney, Australia.

2009 Broken Ecumene was funded by the Turner Foundation.

Social

2007 LNY first appeared in Gambia.

2008 Highly expensive cure for AIDS was discovered.

2008 Downsizing riots swept the industrialized world.

Political

2008 New Zealand adopted a representative cyberdemocracy.

2009 Lunar legislation enacted by the UN sparked the First Great Moon Rush.

2010 New Coalition was formed and LifeNet legislation adopted.

2011-2020

Science and Technology

2012 A cure for Parkinson's disease was found.

2016 A Human genome was mapped and corrected.

2017 Ionic engines were perfected at the Lewis Research Center, Cleveland.

2018 Pierre Roggeveen invented the holodram.

2020 The first human landings occurred on Mars, Venus and Saturn.

Environment

2011 Sea level rise accelerated.

2014 Antarctica shrank by 28 percent.

2018 Tokyo International Oceanic Resources Conference

Social

2011 Constructing of the Tolstoy Complex began.

2012 The Innovators was founded.

2014 Wired Democracy was established.

2018 Friends of the Solar System held its initial meeting.

2019 The Jesuit Association was founded in Rome.

Sotherby-Microsofter Index was introduced.

Political

2013 Cyberdemocracy was adopted in France, Spain and Costa Rica.

2019 The Central Africa War escalated.

2021-2030

Science and Technology

2023 Dr. Allen Satayanta, a Cambridge University engineer, developed the Class 1 android.

2027 Alien contact was established by scientists at the University of California at Berkeley.

2028 Reverse vitamin C was created and a cure for cancer found.

Environment

2024 Mean annual global temperature was 1° C higher than in 2004.

Social

2024 Daughters of Reality founded.

Great Blue Monday Stock Market crash

2026 Universal Cortical Index Testing became widespread.

2027 Money was replaced by credits.

2028 Tuddenville was established on Nirvana.

2029 Intersolar Communications Inc. began in Switzerland.

Political

2023 The Asiatic League was established.

2026 President Anderson began the drive for a United States hydrogen economy.

2027 Russia, Poland and Latvia joined the European Community to form the European Confederation of Independent Countries.

2028 The Truth of Roswell Incident was admitted.

2031-2040

Science and Technology

2031 Class 2 androids were developed at the University of British Columbia.

2032 Karyl Szasz invented the soul-splitter, permitting out-of-body travel at will.

2035 Boeing-Microharder manufactured the first anti-gravity stratocruiser, known as the A-GST 937.

2036 Biological computing was obtained by alien information transfer from the Raybourne Confederation, permitting animal mind-melding.

Controlfreak was invented by George Lee.

2037 Class 3 androids were produced by Boeing-Microharder.

2038 A new discipline of Bionics was established at the University of Turin.

2039 Cactirice was developed at the Beijing Centre for Genetic Progress.

2040 Cactiwheat was developed at the Winnipeg Centre for Lifeform Research.

Environment

2031 Ebola gabon epidemic swept North America.

Ring mining began on Saturn, despite environmentalist initiatives.

2038 Mean annual global temperature was 1.5° C higher than in 2024.

Caucasian skin cancer incidence doubled since 2029.

Social

2031 Construction of Tolstoy Complex was completed.

Janus was founded.

2035 Cortical Claude won *Jeopardy Tournament of Champions*, despite human protests.

2037 GNP was replaced by GNST (Gross National Social Throughput).

2039 Mary Paterby achieved mind-melding with the dead.

Political

2031 Canada-America Discord

2032 NAFTA collapsed.

The American Confederation of States was established.

2038 Anti-hydrocarbon legislation was passed by the UN General Assembly.

2041-2050

Science and Technology

2041 Bacoeggs were first produced at the University of Kentucky.

Cactiwheat inventors won a patent fight.

2042 Cactioats were developed at the Dunedin Centre for Agricultural Research.

Retrojets were introduced on commercial stratocruisers.

2044 Class 4 androids were developed at Oxford University by Dr. Leslie Ashwood and colleagues.

CD-cortabs were invented by Kelvin C. Kram.

2047 The first thermonuclear fusion plant was commissioned beneath Kansas City.

2048 Dr. Richard Koestler, Centre for Industrial Research, Western Samoa invented plastometal.

Environment

2041 The Seychelles were abandoned because of rising sea level.

2044-2049 Famines swept Central Africa, SE Asia and South America.

2048 Monkey pox pandemic worsened.

2049 McLacklan Saturn Mining Project began.

Social

2041 Interpolice were given solar-wide authority.

Hurricane Monica devastated New York.

Archopoly was constructed.

2043 Great Tokyo Rice Riot

Back to Money Association was founded by Andrew Cole.

2047 Advocates of the Quantum Leap was formed by Professor G.D. Kiersch.

2048 United Nations Assembly abandoned the principle of universal education.

The Great Tokyo Earthquake killed 420,000.

2049 Alien channelling permitted the public direct contact with the Raybourne Confederation.

Political

2047 Boeing-Microharder created DeltaGlobe.

2049 The European Confederation of Independent States withdrew all funding for education and many universities collapsed.

2051-2060

Science and Technology

2051 Class 5 androids were developed by Boeing-Microharder in Moscow.

2052 Claude A. Bogolin discovered interviral multiplication regulation.

2054 Alcilozit was banned.

Paul Marotzka invented the zipship.

2055 Robotanks were used in the Second Korean War.

2058 GalaxyNet began.

Database One was established in Madrid.

2059 Lithonuclear weapons were tested by Pakistan.

Environment

2051 Holland was evacuated permanently.

2053 Hurricane Zelda destroyed New Orleans.

2058 The ozone layer virtually disappeared over North America.

Social

2051 Cortical Charlie was elected to the US Senate.

2052 Kaizen was established in Kobe.

Plug-In-City was built near Rome.

Alien Channellers' Association was founded.

2053 The Solar Stock Market opened.

2057 The World Bank collapsed.

The Galaxy Bank was established.

2058 The Seattle Earthquake killed 39,000.

2059 Robert L. Spondman formed the Searchers for Self-Sufficiency.

Political

2051 The American Confederation of States transferred all education funding to research centres.

2054 Eleanor Botiwelt established the Android Destruction Movement and the Party for the Reestablishment of Human Supremacy.

2058 The Android Brotherhood was founded in Paris.

2061-2070

Science and Technology

2061 AIDS, TB and LNY reappeared on the Lunar Colonies.

Dr. Ann Colwood invented Magneto-optics.

2065 The A-GST 941 replaced the A-GST 937 as the premier anti-gravity stratocruiser.

2067 Database Six, established at Lunar Base One, completed the Eternal Knowledge Project.

2068 Zapper's Syndrome first occurred on Mars.

Tokyo was rebuilt.

2069 GalaxyNet was completed.

Environment

2062 Zipship use was credited with slowing global warming and rising sea levels.

2065 This was the first famine free year since 2007.

Social

2062 Eilene Roshette founded the Daughters of the Revolution.

Claude A. Bogolin was assassinated.

Androids established the Organization for Economic Growth and Co-operation.

2063 PowWow was incorporated.

The biocomputer virus, *Guillotine* destroyed Solar Stock Market records.

2067 Sydney fire

2068 The Malefree ultra-feminist settlement was established.

2069 The Galaxy Trade Consortium signed an agreement with the Raybourne Confederation.

Political

2067 Invasion of Nepal by Chinese Neoluddites occurred.

2068 The Treaty of Sydney was enacted.

2071-2080

Science and Technology

2072 Virtual lifeforms were released onto GalaxyNet.

Large scale nanomanufacture began.

Construction was started on the Global Energy Net.

2074 Nanomedicine was introduced.

The Amazonian Pipeline was begun.

2078 Gene replication was perfected.

Environment

2073 The Tobacco Blight pandemic destroyed crops.

2077 Global warming stopped.

2079 Attempts were begun to reconstitute Earth's atmosphere.

Social

2071 Inflation was rampant throughout the Solar System.

Followers of Barracki was founded.

2073 The first Solar Explorer crashed, causing the Geneva Fire.

Mandatory Political Correctness Reviews were introduced.

2075 Anti-android riots occurred.

The Android Protection League was established.

2076 Academico-Capitalists bought Yale University.
Initial contact with Cylic Federation was made.
2078 Ethnic decertification began in England.

Political

2073 Pakistan-Indo War (November 3-4)
2074 Alien Entry Defences became mandatory for larger cities.
2077 Mutual destruction of Cathos and New London occurred.

2081-2090

Science and Technology

2081 The Martian Atmospheric Conversion Programme began.
Rotostab was invented at the Anti-terrorist Research Centre, Berlin.
2083 The Global Energy Net was completed.
2086 An Assassin 3 destruction error caused global disaster.
Dr. Alexander Monroe developed the Human Discontent Index.
2088 Extraterrestrial Probe 5 made direct contact with Cylic Federation.

Environment

2081 Ecological Imperative was founded by Dr. Mary Copper.
2089 This was the first drought-free year in Africa.

Social

2081 Widespread stagecession and associated bankruptcies occurred.
Piranha was established.
The Flag sank in the Bay of Bengal.
2082 Colonization bonuses were introduced by UANSEP.
Galileo Barracki was poisoned.
2083 Sons of Noah disaster occurred.
The London B and B Circus Stampede happened.
2084 The Enigmatic Continuum held its first meeting.

Political

2084 Offices Without Walls was established throughout the solar system.
2086 Simulated Health Service replaced medical care.

2091-2096

Science and Technology

2093 The Amazonian Pipeline was completed.

2094 Cactirice and cactioat plantations were established in the former Atacama Desert.

Environment

2096 The Next Century Environmental Happening was held in Calcutta.

Social

2093 The defeat of Bill C-11 prevented the expansion of Lunar Base Two.

The Great Voyageur Franchise scam occurred.

Political

2093 Bill C-11 was defeated.

2095 The Genetic Intermingling Act was passed by the DeltaGlobe Assembly.

2096 Bill C-39 was debated by the DeltaGlobe Assembly.

Everything has been thought of before, but

the problem is to think of it again

Johann W. von Goethe

R E F E R E N C E S

1. RESILIENCE: A QUESTIONNAIRE

These questions are actual or modified quotations from numerous sources. These are: Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan; Peter, Laurence J. (1977) *Peter's Quotations: Ideas For Our Time*, New York: William Morrow (Quill); Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books; Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor; Browning, D.C. (1988) *Dictionary of Quotations and Proverbs*, London: Chancellor Press; Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster; Olive, D. (1993) *Canadian Political Babble*, Toronto: John Wiley. Other sources include: Gary Tooze's Internet column, *Quotation of the Day!*; Byrne, R. (1982) *The 637 Best Things Anybody Ever Said*, New York: Fawcett Books; Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Books; and Oxford University Press (1980) *The Concise Oxford Dictionary of Quotations*, Oxford: Oxford University Press.

Question	Original Author	Source
1.	Gypsy Rose Lee	Green, *op. cit*. p. 12
2.	Adolf Hitler	Peter, *op. cit*. p. 61
3.	Robert Frost	*Ibid*., p. 45
4.	Dom Dix	Green, *op. cit*., p. 7
5.	Greek Saying (quoted by Shaw)	Seldes, *op. cit*., 950
6.	George Washington	*Ibid*., p. 455
7.	George Bernard Shaw	*Ibid*., p. 434
8.	Will Durant	Green, *op. cit*., p. 19
9.	Josh Billings	Peter, *op. cit*., p. 19
10.	Henri Frédéric Amiel	Seldes, *op. cit*., p. 326
11.	Thoreau	Rawson and Miner, *op. cit*., p. 342
12.	Madame De Staël	*Ibid*., p. 216
13.	Abraham Lincoln	*Ibid*., p. 104
14.	Norman Mailer	Green, *op. cit*., p. 27
15.	Evelyn Waugh	Peter, *op. cit*., p. 63

Question	Original Author	Source
16.	Tacitus	Rawson and Miner, *op. cit.*, p. 133
17.	Matthew Prior	Seldes, *op. cit.*, p. 314
18.	Julian L. Simon	Rhodes and Odell, *op. cit.*, p. 99
19.	Joe Clark	Olive, *op. cit.*, p. 95
20.	William Faulkner	Green, *op. cit.*, p. 20
21.	Albert Einstein	*Ibid.*, p. 25
22.	John Balzar	Rodes and Odell, *op. cit.*, p. 73
23.	David Olive	Olive, *op. cit.*, p. 158
24.	Alfred North Whitehead	Peter, *op. cit.*, p. 63
25.	Epictetus	Seldes, *op. cit.*, p. 305
26.	Fran Lebowitz	Rodes and Odell, *op. cit.*, p. 149
27.	Shakespeare (King Henry VI, Part II)	Browning, *op. cit.*, p. 237
28.	Alan Barth	Seldes, *op. cit.*, p. 291
29.	Konrad Adenauer	Green, *op. cit.*, p. 34
30.	Kingsley Amis	*Ibid.*, p. 29
31.	John Kieran	Peter, *op. cit.*, p. 77
32.	John Crosbie	Olive, *op. cit.*, p. 35
33.	Bible	Browning, *op. cit.*, p. 333
34.	Marchant	Peter, *op. cit.*, p. 88
35.	Anonymous	Rodes and Odell, *op. cit.*, p. 189
36.	Ken Russell	Green, *op. cit.*, p. 28
37.	Lord Beaverbrook	*Ibid.*, p. 35
38.	Friedrich Nietzsche	Seldes, *op. cit.*, p. 540
39.	O. Soemarwoto	Rodes and Odell, *op. cit.*, p. 169
40.	Proverb	Browning, *op. cit.*, p. 424
41.	Allan Lamport	Olive, *op. cit.*, p. 159
42.	Proverb (Italian)	Browning, *op. cit.*, p. 425
43.	L.L. Hendren	Peter, *op. cit.*, p. 118
44.	Tacitus	Seldes, *op. cit.*, p. 346
45.	Lillian Gish	Green, *op. cit.*, p. 38
46.	H.R. Haldeman	*Ibid.*

Question	Original Author	Source
47.	Robert Heinlein	*Ibid.*
48.	Jean-Paul Sartre	Rawson and Miner, *op. cit.*, p. 391
49.	Bill Press	Peter, *op. cit.*, p. 129
50.	Barry Commoner	Green, *op. cit.*, p. 36
51.	Proverb (Polish)	Peter, *op. cit.*, p. 94
52.	Jean Cocteau	Tooze, 8/5/96
53.	Maurice Duplessis	Olive, *op. cit.*, p. 43
54.	Paul Boese	Rodes and Odell, *op. cit.*, p. 148
55.	Budd Schulberg	Byrne (1986), *op. cit.*, no. 253
56.	Steven Wright	Tooze, 8/8/96
57.	Irene Peter	Peter, *op. cit.*, p. 99
58.	Alphonse Karr	*Ibid.*, p. 100
59.	Hermann Goering	Oxford U. Press, *op. cit.*, p. 94
60.	Mavis Gallant	Green, *op. cit.*, p. 282
61.	Proverb (Spanish)	Byrne (1986), *op. cit.*, no. 359
62.	Proverb (Pennsylvania Dutch)	*Ibid.*, no. 262
63.	Stephen Leacock	Peter, *op. cit.*, p. 139
64.	Steven Wright	Tooze, 8/8/96
65.	Anonymous	Byrne (1986), *op. cit.*, no. 278
66.	Mortimer Caplan	Green, *op. cit.*, p. 293
67.	Plato	Byrne (1982), *op. cit.*, no. 137
68.	Sir Winston Churchill	Green, *op. cit.*, p. 248
69.	Al Capone	Tooze, 8/12/96
70.	Elbert Hubbard	Peter, *op. cit.*, p. 144
71.	George Orwell	Green, *op. cit.*, p. 452
72.	Terence	Byrne (1982), *op. cit.*,no. 328
73.	Boulay De La Meurthe	Oxford U. Press, *op. cit.*, p. 40
74.	Bishop Mandell Creighton	*Ibid.*, p. 71
75.	Noel Coward	Byrne (1982), *op. cit.*, no. 438
76.	Somerset Maugham	Peter, *op. cit.*, p. 147
77.	Lily Tomlin	Tooze, 7/15/96
78.	Robert Lloyd	Oxford U. Press, *op. cit.*, p. 133

Question	Original Author	Source
79.	George Orwell	*Ibid*., p. 159
80.	William Vander Zalm	Olive, *op. cit*., p. 57
81.	Jean Chrétien	*Ibid*., p. 218
82.	Nietzsche	Byrne (1982), *op. cit*., no. 573
83.	Unemployed Edmonton man	Olive, *op. cit*., 63
84.	Ronald Reagan	Rodes and Odell, *op. cit*., p. 204
85.	Thomas Edison	Tooze, 6/12/96
86.	Karl Barth	Green, *op. cit*., p. 133
87.	Lewis Mumford	Peter, *op. cit*., p. 159
88.	Robert Bourassa	Olive, *op. cit*., p. 187
89.	Alan Paton	Green, *op. cit*., p. 353
90.	Thomas Babington Macaulay	Peter, *op. cit*., p. 361
91.	Albert Einstein	Tooze, 6/13/96
92.	Wilson Mizner	Peter, *op. cit*., p. 167
93.	Bertrand Russell	Green, *op. cit*., p. 241
94.	Aristotle	Byrne (1982), *op. cit*., no. 70
95.	Sir Herbert Samuel	Peter, *op. cit*., p. 179
96.	T.J. Wilson	Tooze, 5/23/96
97.	Tom Stoppard	Green, *op. cit*., p. 223
98.	Ernest Hemingway	Byrne (1986), *op. cit*., no. 531
99.	George Arnold	Oxford U. Press, *op. cit*., p. 11
100.	Will and Ariel Durant	Peter, *op. cit*., p. 163

2. A GLOSSARY OF TWENTY-FIRST CENTURY TERMS

Most of the glossary is the product of my fetid imagination. It was inevitable, however, that a few facts would creep into even fiction of this quality. Where this has occurred, their sources are provided below.

Arch button

I must admit the concepts of both the arch button and virtuocean owe a great deal to *Star Trek: The Next Generation*.

Archopoly

The concept of archopoly draws on Paolo Soleri's arcologies. These are described in Tod, I. and Wheeler, M. (1978) *Utopia*, New York: Harmony Books, pp. 140-143.

Cactioats, cactirice and cactiwheat

These novel crops were "invented" by Dr. W.R. Derrick Sewell and myself for use in a presentation he was making on the future of agriculture.

Carbon nitrides

The extreme properties of carbon nitrides are described by Szuromi, P. (ed.) (1995) "Hard Calculations" This Week in Science, *Science*, 271, p. 9.

Cybersex

My understanding is that electronic sex is now possible between computer users.

Decision evaluation meshes

Commercially available neural networks are in widespread use, including *BrainMaker*, a system I use in both research and play. This software is manufactured by California Scientific Software.

Green Rage

Green Rage is part of the title of a book written by Manes, C. (1990) *Green Rage: Radical Environmentalism and the Unmaking of Civilization*, Boston: Little, Brown and Co.

Human discontent index

A human discontent index appears to make more social sense than the GNP. In 1976 I developed a scale based on stress units to quantify disasters. The basic methodology is described in Foster, H.D. (1976) "Assessing disaster magnitude: A social science approach" *The Professional Geographer*, xxviii(3), pp. 241-247. This paper was an application of the ideas of Holmes, T.H. and Rahe, R.H. (1967) "The social readjustment rating scale" *Journal of Psychosomatic Research*, 11, pp. 213-218.

Inner light

Interesting details of out-of-body experiences are provided by Moody, R.A. Jr. (1975) *Life After Life*, New York: Bantam Books; and Moody, R.A. Jr. (1991) *Coming Back: A Psychiatrist Explores Past-Life Journeys*, New York: Bantam. The book that converted me from science to religion, however, was Currie, I. (1993) *You Cannot Die: The Incredible Findings of a Century of Research on Death*, Toronto: Somerville House.

Intersolar Memprod

For the latest on microelectromechanical production consult Gabriel, K.J. (1995) "Engineering microscopic machines" *Scientific American*, 273(3), pp. 150-153.

Ionic engines

Ionic engines currently are being tested at the Lewis Research Center in Cleveland. See Dyson, F.J. (1995) "21st century spacecraft" *Scientific American*, 273(3), pp. 114-116A.

Kaizen

The term Kaizen is claimed to be Japanese for constant improvement. This translation was given by Long, W. (1996) "Amateur sports world is changing and only the fittest will survive" *The Vancouver Sun*, January 25, 1996, p. D1.

Laser advertising

Laser pulses are described by Voss, D. (1996) "Optical rockets" *Science*, 271(5245), p. 42.

LNY (Laforia's neurospasmic yaws)

The terminology used to construct the name of this hypothetical disease was taken from Miller, B.F. and Keane, C.B. (1978) *Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health*, Philadelphia: W.B. Saunders.

Mental magnetic field fluctuations

Oscillations of the earth's magnetosphere are described in Carlowicz, M. (1996) "Solar answers may be in the wind" *EOS*, 77(3), p. 1.

Nanotechnology

K.E. Drexler is not fictitious. He is quoted widely on the Internet as the father of nanotechnology. I have found the citation *Nanosystems: Molecular, Manufacturing, and Computation*, John Wiley, ascribed to him but must admit I have not seen the book.

Plug-In City

The concept of Plug-In-City was drawn from the English design group Archigram. This is discussed in Tod, I. and Wheeler, M. (1978) *Utopia*, New York: Harmony Books, pp. 144-145.

Snibbles

In China, I have eaten scorpions. They taste like fried shrimp, but I've never seen them chocolate coated.

Socioneutronics

The story of Phineas P. Gage is told in Damasio, H. *et al*. (1994) "The return of Phineas Gage: Clues about the brain from the skill of a famous patient" *Science*, 264, pp. 1102-1105.

Superconduction

Superconduction is discussed at length by Chu, P.C.W. (1995) "High temperature superconductors" *Scientific American*, 273(3), pp. 162-165.

Symbiocants

Xenotransplants are reviewed in Kaiser, J. (1996) "Xenograft guidelines clearing last hurdles" *Science*, 271, p. 585.

Virginis 70

Radio signals from Virginis 70, of unknown origin, were recorded by scientists from the University of California at Berkeley, cited by Observer News Service, "Radio signals detected from star with planet" *The Vancouver Sun*, February 13, 1996, p. A14.

Virtual lifeforms

Thomas Ray of the University of Delaware has created cyberlife. See Flam, F. (1994) "Ecologist plans to let cyberlife run wild in Internet reserve" *Science*, 264, p. 1085.

Wired democracy

Wired democracy or, as it is also called, hyperdemocracy, was discussed by Wright, R. (1995) *Time*, 145(4), pp. 40-46.

3. SIGNIFICANT EVENTS OF THE TWENTY-FIRST CENTURY: A TIME-LINE

The design of this time-line is based on Castleden, R. (n.d.) *World History: A Chronological Dictionary of Dates*, New York: Shooting Star Press. Interestingly, although this book is totally devoted to dates, the only thing missing appears to be the date of its own publication. It is current to 1993.

4. SECTION-SEPARATING QUOTATIONS

"Ozymandias"is a poem written by Percy Bysshe Shelley in 1817 and published in *The Examiner*, January 1818. My source was Hutchinson, T. (1912) *The Poems of Percy Bysshe Shelley*, London: Henry Frowde, p. 546. Other quotations separating sections of the book are listed below.

"It is a mean thief or a successful author, that plunders the dead," Austin O'Malley cited by Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 385.

"It's a poor sort of memory that only works backwards," Lewis Carroll from Peter, *op. cit*., p. 328.

"And slowly answer'd Arthur from the barge" is by Alfred, Lord Tennyson cited by *The Concise Oxford Dictionary of Quotations* (1980), Oxford: Oxford University Press, p. 227.

"What is originality? Undetected plagiarism" comes from Dean W.R. Inge, (unless, of course, we are all unaware of this quotation's original source), cited by Peter, *op. cit*., p. 328.

"Copy from one, it's plagiarism; copy from two, it's research" is from Wilson Mizner, cited by Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, no. 488.

"He wrapped himself in quotations - as a beggar would enfold himself in the purple of Emperors" is by Rudyard Kipling, cited by Gary Tooze, *Quotation of the Day!*, May 3, 1996.

"Everything has been thought of before, but the problem is to think of it again" is by Johann W. von Goethe, cited by Peter, *op. cit*., p. 11.

"Some for renown on scraps of learning dote" is by Edward Young, taken from Browning, D.C. (1982) *Dictionary of Quotations and Proverbs*, London: Chancellor Press, p. 322.

Another damned, thick, square book!
Always scribble, scribble, scribble!
Eh! Mr. Gibbon?

William Henry,
Duke of Gloucester

NOTES AND NOTABLES

FLUX

This introduction draws on the works of Alvin Toffier (1970), *Future Shock*, New York: Random House; Peter Drucker (1968), *The Age Of Discontinuity*, New York: Harper and Row; Willis Harman (1976), *An Incomplete Guide to the Future*, Stanford: Stanford Alumni Association; and John Naisbitt (1982) *Megatrends: Ten New Directions Transforming Our Lives*, New York: Warner Books. Also consulted were A.C. Clarke (1967), *Profiles of the Future*, Toronto: Bantam Books; Alvin Toffler (1990) *Powershift*, New York: Bantam Books; Frank Ogden (1993), *The Last Book You'll Ever Read*, Toronto: MacFarlane, Walter and Ross; and Neil Postman (1993), *Technology: The Surrender of Culture to Technology*, New York: Random House.

DELTAGLOBE GOVERNMENT ORDERS 8.9.2096

A confession is in order here. Quotations, purloined from the élite of the world's literature, are used repeatedly throughout the DeltaGlobe Assembly debate. Under normal circumstances, I would have footnoted such plagiarism and contended it provided evidence of extensive research. However, not only have numerous quotations been borrowed from great authors, politicians and the famous and infamous but most have been mutilated. Frequently, the original intent has been reversed. Some nitpicking critics will, no doubt, see my rewriting of Shaw, Goethe, Disraeli, Darwin and other classical authors, too numerous to mention here, as evidence of arrogance of the highest order. Other readers will view it merely as a serious character defect. My only excuse for this totally unacceptable lack of breeding is that, hopefully, the ends have justified the means; or perhaps the other way around? As far as my failing memory permits, these abused sources are provided below.

Hon. Rhodes W. Vizena (Minister of Social Stability)

Several of the ideas in this contribution to the debate are taken from quotations found in Flesch, R. (1957) *The Book of Unusual Quotation*, New York: Harper and Brothers. These are as follows. The evil of good intentions is based on the quotation by George Bernard Shaw "Hell is paved with good intentions, not bad ones. All men mean well," p. 137. The role of the chess Queen is from Goethe,

"Daring ideas are like chessmen moved forward, they may be beaten, but they may start a winning game," p. 124. The comment on the need for another commandment comes from Josh Billings "If I had the privilege of making the eleventh commandment it would be this—*Owe no man,"* p. 56. The quotation "conditions are never just right" is from William Feather, p. 46; while "The cautious seldom err" is after Confucius, p. 79. The contrast between knowing and actually doing is drawn from Goethe, p. 142.

"Everything is in a state of flux, including the status quo" is from Byrne, R. (1982) *The 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, No. 461. In a moment of modesty, that author attributes the quotation to himself.

Mr. Henry Spurgeon (Database Four)

The concept that disasters can be beneficial was taken from Purcell, R. and Gould, S.J. (1994) "Scales of Destruction" *The Sciences*, 34(3), pp. 36-37. The Shakespearean quotation is correct as cited. For the benefits of the Great Fire of London, see Ferguson, R.S. (1975) "Building Codes—Yesterday and Today" *Habitat* 18(6), pp. 2-11. The pain-gain relationship seems to be a favourite quotation of coaches. Naturally, most of the pain is felt by the players while the benefits mainly accrue to the coaches.

Mr. Vlakic Varkaris (2QT2BSTR8)

2QT2BSTR8, (Too Cute to be Straight), was taken from an article "The Unbearable Normalcy of Being Queer" which probably first appeared in *The Economist* but was reprinted in *The Weekend Sun*, a part of *The Vancouver Sun* January 27, 1996, p. D1. This combination of figures and letters was seen by the author of the article on a t-shirt, in a gay bar in Ljublijana, in Slovenia. Green Rage is part of the title of a book by Manes, D. (1990) *Green Rage: Radical Environmentalism and the Unmaking of Civilization*, Boston: Little, Brown and Co. The Immortalists quotation was derived from Susan Ertz "Millions long for immortality who don't know what to do on a rainy Sunday afternoon" cited by Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, no. 6.

The description of the Albanian nuclear fusion plant was based on Austria's only nuclear plant station, built at Zwentendorf, some 25 miles northwest of Vienna. As far as I know, because of public opposition, this plant, built at a cost of $500 million, has never been switched on. It became ready to generate electricity in 1978.

Mr. David Disraeli (Advocates of the Quantum Leap)

The initial quotation is from Edgar Allan Poe *The Masque of the Red Death,* republished in Crane, M. (ed.) (1983) *50 Great Short Stories*, Toronto: Bantam Books, p. 141. While the Heaven and Hell quotation is from Virgil, *The Aeneid* and was quoted by Freud in the epigraph to *The Interpretation of Dreams.* I, in my ignorance, first stumbled across it in Olshaker, M. (1995) *The Edge*, New York: Bantam Books. My writing throughout Mr. David Disraeli's speech is coloured by memories of a Cuban presentation given at a disaster planning conference I attended.

Ms. Sylvia Malver (Alien Channellers Association)

The statement "it is easier to be critical than correct" is based on a similar one by the British Prime Minister, Benjamin Disraeli, cited by Harris, L.A. (1966) *The Fine Art of Political Wit*, New York: E.P. Dutton and Co. The insult "blind in one eye and who can't see out of the other" was borrowed from Parker, T. (1989) *Horses Talk: It Pays to Listen*, Deerfield Beach: Parker Productions. The idea that every age has its follies comes from Mackay, C. (1980) *Extraordinary Popular Delusions and the Madness of Crowds*, New York: Harmony Books. Boyd, N. (1991) *High Society: Legal and Illegal Drugs in Canada*, Toronto: Key Porter Books contains an excellent description of tobacco use and its effects.

Mr. Mason Skarzynski (Lunar Base One)

What it is like to be bitten by a large marine predator is described by Doudt, K. (1995) "In the Jaws of a Great White Shark" *Reader's Digest*, December 1995, pp. 26-30. I was introduced to the term 'passive panic'when reading Jenkins, P. (1995) "Along the Edge of America" *Today's Best Nonfiction*, Pleasantville: The Reader's Digest Association, pp. 186-291.

Mrs. Anna Brye (Searchers for Self-Sufficiency)

The protein-idea analogy is based on Medawar P.B.'s "The human mind treats a new idea the way the body treats a strange protein; it rejects it." The source for this quotation was Byrne, R. (1982) *The 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, no. 62. This Robert Burns quotation is well-known. I found it in Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 271. I remember reading the probability argument but can't remember where. My apologies to the original author. The problem-solution

statement is a reworking of a quotation attributed to Ashleigh Brilliant "I do not have any solution but I certainly admire the problem." I came across this on the Internet at the University of Toledo, Faculty of Education web site.

Mr. Han Peng Lee (YRWEHERE?)

YMIHERE is an Albertan car number plate, seen on a vehicle visiting Victoria, as reported in the *Times-Colonist*, February 6, 1996, p. B2. I have modified it slightly. The two types of people who won't amount to anything quotation was borrowed from an Ann Landers column, where it appeared as the Gem of the Day, *Times-Colonist*, February 6, 1996, p. C2. Plastering together the true and the false to produce the not quite plausible is a reconstructed quotation after Stanley Baldwin, who was recycling Carlyle's description of a contemporary. The original quotation is "He spent his whole life in plastering together the true and the false and therefrom manufacturing the plausible." The source is Harris, L.A. (1966). *The Fine Art of Political Wit*, New York: E.P. Dutton and Co., p. 130. Astronomers at the University of Victoria are monitoring heavenly bodies that may collide with the earth. See also Weisman, J. (1995) "Clementine 2 to Size up an Asteroid" *Science*, 170(5242), p. 1563. The six stages of a project are modified after Unknown in Byrne, R. (1986). *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, no. 183.

Mr. Randy Hoon (Academico-Capitalists)

Most of this discussion about Henry Ford was based on Dawkins, R. (1995) "The Great Leveler," *Scientific American*, 273(5), pp 84-85. Richard Dawkins himself is citing Nicholas Humphrey's book *Consciousness Regained*: *Chapters in the Development of Mind*. I am not absolutely sure from reading Dawkins whether Ford actually commissioned such a survey. Does it really matter?

The "engineer yes, but not civil" quotation was based on a remark made by the lead character in an episode of the TV series, Banacek. In reply to the question, "How was the engineer?," he replied, "Electrical but not civil."

Mr. Shawn O'Brien (Microhard)

This contribution to the debate is derived from ideas presented by Dawkins, R. (1995) "The Great Leveler" *Scientific American*, 273(5), pp. 84-85. The concept of nanomedicine was developed by the author after reading discussion of nanotechnology on the Internet. Most enthusiasts consider K.E. Drexler to be the

"father" of the concept. Drexler, K.E. (1992) *Nanosystems: Nuclear Machinery, Manufacturing and Computation,* London: John Wiley and Sons is a frequently cited reference.

Mr. Merlot Ashini (Neoluddites)

I based these comments on the following quotations. Goethe, "Nothing is more terrible than ignorance in action" Flesche, R (1959), *The Book of Unusual Quotations,* New York: Harper and Brothers, p. 126. "They have a saying in this country [Tanzania] that bureaucracy is like God. It's everywhere," Palin, M. (1992), *Pole to Pole with Michael Palin,* London: BBC Books, p. 228. Mary McCarthy, ". . . just as bureaucracy, the rule of no one, has become the modern form of despotism," cited by Seldes, G. (1970), *The Great Quotations,* New York: Pocket Books, p. 102. "Technology is a way of organizing the universe so that man doesn't have to experience it" is by Max Frisch cited in Byrne, R. (1986), *The Third and Possibly the Best 637 Best Things Anybody Ever Said,* New York: Fawcett Crest, no. 384.

Mr. Lee Li (New Dawn)

The Devaluist views presented in this section are a corruption of those of Shulman, M. (1977) *Anyone Can Make Money Buying Art,* Toronto: Fitzhenry and Whiteside. The perils of leapfrogging with a unicorn are derived from "never play leapfrog with a unicorn" source unknown, cited by Byrne, R. (1986) *The Third and Possibly the Best 627 Best Things Anybody Ever Said,* New York: Fawcett Cresk, no. 109. "Economists are people who work with numbers but who don't have the personality to be accountants" comes from the same source, no. 203. "Freedom is the absence of necessity" was borrowed from Newman, P.C. (1995) *The Canadian Revolution 1985-1995: From Deference to Defiance,* Toronto: Viking (Penguin Group).

Mr. Franklin H. Brandeis (Big Zipper)

According to the Internet, Mr. Joe Boxer has the world's largest e-mail; it runs all day on a 'zipper'—a 100 foot long message board located at 42nd and Broadway in Times Square, New York. Hence the name used here, the Big Zipper. Rothschild's loan to Disraeli is described in Maurois, A. (1980) *Disraeli: A Picture of the Victoria Age,* Alexandria, Virginia: Time-Life Books. The concept that it is more difficult to get society to accept a new idea today is modelled after Newt Gingrich (1995) "Newtspeak: The Gospel According to Gingrich" *Time,* vol. 144

(26), p. 45. The quotation "This book fills a much-needed gap" is taken from a review by Moses Hadas, cited in Byrne, R. (1982) *The 637 Best Things Anybody Ever Said*, New York: Fawcett Books, number 523. Two further quotations are based on Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Books. They are Sir Burnett Cocks "A committee is a cul-de-sac down which ideas are lured and then quietly strangled," no. 542 and "If you want a place in the sun prepare to put up with a few blisters" Abigail Van Buren, no. 585.

Ms. Indria Ranganathan (Followers of Barracki)

These comments are based on two references; Matthew Chapter 7, verses 24-27, *Holy Bible* (Authorized King James Version) New York: Delair Publishing Co. and Raphael, A. (1994) *Ultimate Risk*, London: Corgi Books.

Mr. Bukkyo Nyirbu (Fatalists)

The battle quotation is derived from Alshaker, M. (1995) *The Edge*, New York: Bantam Books.

Ms. Mashenka Kushkins (Broken Ecumene)

The opening statement about the survival of the most adaptable was attributed to Charles Darwin during a television discussion. I have not been able to verify this quotation but if Darwin didn't say it, he should have. Genetic diversity and its value is reviewed by Inis, D.Q. (1980). "The Future of Traditional Agriculture" *Focus*, 30(3), pp 1-8; by Myers, N. (1980) "The Sinking Ark," *Harrowsmith*, 3(31), pp. 31-39 and by Nabham, G.P. (1979) "Who is saving the seeds to save us?" *Manzingira*, No. 9, pp 54-59. The quotation about what one can be sure of was taken from Palin, M. (1992) *Pole to Pole with Michael Palin*, London: BBC Books.

Mr. Russell Kauffman (Alien Genome Project)

The stiffle quotation was based on comments seen but source forgotten, on the Internet. The original was referring not to politicians, but to authors.

Mr. Isaac Panati (The Edge)

The name of Mr. Panati's organization was inspired by Mark Olshaka's (1995) book of the same name, published in New York by Bantam Books. The wit-memory

quotation is from Richard Brinsley Sheridan who said it about Dundas in the British House of Commons. The actual quotation is "The right honourable gentleman is indebted to his memory for his jests and to his imagination for his facts," cited in Harris, L.A. (1966) *The Fine Art of Political Wit,* New York: E.P. Dutton, p. 25. The smart ass joke is based on one in "StarLaughs, *Star,* April 16, 1996, p. 30. The biological information is taken from Myers, N. (1993) *Gaia: An Atlas of Planet Management*, New York: Doubleday and from Inis, D.Q. (1980) "The Future of Traditional Agriculture, *Focus,* 30(3), pp. 1-8; Myers, N. (1980) "The Sinking Ark" *Harrowsmith* V:3(31), pp. 31-39 and Nabham, G.P. (1979) "Who is sowing the seeds to save us?" *Mazingira* No. 9, pp. 54-59.

Ms. Annetta Durrell (Janus)

The quotation "Those who cannot remember the past are condemned to repeat it" is by Santayana cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 203.

The discussion of chemical carcinogenicity and its testing on rats is based on Lawrence, W.W. (1976) *Of Acceptable Risk*, Los Altos, California: William Kaufman and on Weinberg, A.M. (1972) "Science and trans-science" *Minerva* 10, 209-222. I discussed this issue in my own book Foster, H.D. (1980) *Disaster Planning: The Preservation of Life and Property*, New York: Springer Verlag. Information on gender benders was taken from Lutz, D. (1996) "Anecdotal Evidence: No Conception" *The Sciences* 36(1), pp. 12-15. The male pocket quotation is based on one attributed to Audrey McLaughlin, former leader of the Canadian New Democrats, who lamented "the hardest thing in most Ottawa men's pants is their cellular phone." The source for this cry of disappointment was Newman, P. (1995) *The Canadian Revolution 1985-1995: From Deference to Defiance*, Toronto: Penguin, p. 387.

Dr. Benjamin Franco (The Innovators: Level Three)

The quotation "a wise man thinks twice before saying nothing" reads too well to be original. Unfortunately, I can't remember whether or not I borrowed it. My apologies if I did. The discussion of the conventional wisdom is based on works by John Kenneth Galbraith, such as Galbraith, J.K. (1962) *The Affluent Society*, Harmondsworth, Middlesex: Penguin. Comments about the conventional wisdom cutting channels in the brain, like water running down hill, are taken from Edward de Bono. I have read most of his books. Two that come to mind are De Bono, E. (1986) *Lateral Thinking: A Textbook of Creativity*, Harmondsworth, Middlesex: Penguin; and De Bono, E. (1985) *Six Thinking Hats*, Boston: Little, Brown

and Company. Ketterling's Law "Logic is an organized way of going wrong with confidence" came via the Internet from the Faculty of Education of the University of Toledo. "The greater the ignorance, the greater the dogmatism" is from Sir William Osler. The quotation "caricature is rough truth" is by George Meredith. Both are from Flesch, R (1957) *The Book of Unusual Quotations* New York: Harper and Brothers, p. 64 and p. 30.

Ms. Yola Correa (Lunar Base Two)

Consistency as a defect is based on Oscar Wilde's "Consistency is the last refuge of the unimaginative" Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 47. I owe the closing idea to Will Rogers "I don't make jokes. I just watch the government and report the facts" taken from Byrne, R. (1982). *The 636 Best Things Anybody Ever Said*, New York: Ballantine Books, No. 564**.**

Ms. Uta Bliss (Twenty-Twenty Vision)

That the quality of an idea can be judged by its enemies came via the Internet. The actual quotation was "You can always tell a good idea by the enemies it makes." The original source is unknown. The discussion of English and its evolution is based on MacNeil, R. (1995) "The Glorious Messiness of English" *Reader's Digest*, December 1995, pp. 59-62.

Ms. Anna Cazenare (Personae Non Gratae)

This contribution to the debate is based on information from Preston, R. (1994) *The Hot Zone*, New York: Random House.

Mr. Philip Rosensweig (Academico-Capitalists)

Plant vaccines were discussed in "Researchers Tout Plant Vaccines" *Times Colonist*, January 20, 1996, p. C5. The quotation "One dog barks at something; the rest bark at him" is said to be a Chinese proverb; cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 17.

Mr. James Wharton (Unlimited Horizons)

The experience quotation is modified after Oscar Wilde, cited in Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 82.

The idea that volcanic ash can cause aircraft engine problems was borrowed from Browne, P. (1983) "We've Lost All Four Engines!" *Reader's Digest,* August 1983, pp. 76-80.

Mr. Takeshi Hirayati (Inner Light)

The half brick quotation is based on Stephen Leacock "A half truth in argument, like a half brick, carries better," cited by Flesch, R (1957) *The Book of Unusual Quotations,* New York: Harper and Brothers, p. 12. The bad management as destiny quip is by Kin Hubbard "Lots of folks confuse bad management with destiny," p. 59 in the same source. The ideas on future fisheries were attributed to Sir Alister Hardy by Joy Tivy (1982) *Biogeography: A Study of Plants in the Ecosphere*, London: Longman.

Mr. Roger Fitzgerald (Searchers for Self-Sufficiency)

The argument-ignorance quotation came to my attention while Internet surfing—no source was given. The phrase "heir and the spare" is often used by tabloids to describe Prince Charles' and Princess Diana's children. The information about kangaroos and sharks was taken from Bram, L.L. (ed.) (1979) *Funk and Wagnalls New Encyclopedia*, New York: Funk and Wagnalls.

Ms. Lizzie Montarg (Daughters of the Revolution)

The information about lemmings was taken from Bram, L.L. (ed.) (1979) *Funk and Wagnalls New Encyclopedia*, New York: Funk and Wagnalls. The plastering together of truth and fiction is based on Carlyle's description of a contemporary "He spent his whole life in plastering together the true and the false and therefrom manufacturing the plausible." The source for this quotation is Harris, L.A. (1966) *The Fine Art of Political Wit*, New York: E.P. Dutton, p. 130.

Mr. Amgad S. Al-Ghussain (Kaizen)

The biological information concerning the American rag weed, Chinese wisteria and locusts came from McWhirter, N. and McWhirter, R. (1973) *Guinness Book of Records*, Enfield: Guinness Superlatives. The value of excess came from Oscar Wilde "Moderation is a fatal thing. Nothing succeeds like excess" cited by Flesch, R. (1957) *The Book of Unusual Quotations,* New York: Harper and Brothers, p. 81.

Ms. Annie Sprague (Alien Genome Project)

The satisfaction through deceit introduction was based on a quotation by Vauvenargues, "The art of pleasing is the art of deceiving" cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 56. The iron first in velvet glove quotation is not original but I'm not sure of its initial source.

Mr. Vladimir Vedenkin (The Edge)

This section of the debate is based on a published Canadian Federal government report, which I wrote with a close friend. The reference is Sewell, W.R.D and Foster, H.D. (1976) *Images of Canadian Futures: The Role of Conservation and Renewable Energy*, Report No. 13, Office of the Science Advisor, Planning and Finance Service, Environment Canada, pp. 47-48. The substitution of false abstractions for the complexities of reality is based on a statement by Aldous Huxley, cited in Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 2. Also from this book is the quotation by Josh Billings, p. 80 "There are people so addicted to exaggeration that they can't tell the truth without lying." The quotation by Ashleigh Brilliant "To be sure of hitting the target, shoot first, and call whatever you hit the target" was taken from the Internet, University of Toledo, Faculty of Education website.

Ms. Katharine Rodriguez (Big Zipper)

"It is better to have lived one day as a tiger than a thousand years as a sheep," is a Tibetan proverb. I came across this when reading the obituary of Alison Hargreaves and other climbers in Blumenfeld, J. and Lesser, J. (eds.) (1995) "Alison Hargreaves, Six Others Perish on K2," *The Explorers Journal*, 73 (2), p. 7. The idea that nothing worthwhile comes from committees, panels or the conventional wisdom is taken from Olshaker, M. (1995) *The Edge*, New York: Bantam. "The meek will inherit the earth . . . the rest of us will go to the stars" appeared on the University of Toledo, Education Internet site. The idea of retiring from history to pet oneself is not original, but I can't trace the source.

Dr. Aldous Cousin (Enigmatic Continuum)

The many paths comment is based on a Chinese proverb, cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 180. The mine/shaft pun was told to me by one of the biggest rogues I ever met; he was

one of the élite. The need for equity comes from, Leopold, L.B. (1990) "Ethos, Equity and the Water Resource" *Environment* 32(2), pp. 16-20, 37-42. The discussion of the operation of the marketplace is based on Amory B. Lovins *Orion Nature Quarterly*, Winter 1990, cited in Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, London: Simon and Schuster, p. 64. The cancer analogy is taken from the same volume, p. 62, it is based on Edward Abbey (1988) *One Life at a Time, Please.* The all humans being equal statement is, of course, a misquotation of George Orwell's *Animal Farm*, Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books, p. 323.

Mr. Theodor Liebkecht (Academico-Capitalists)

The Pythagoras' life-Olympic Games analogy is taken from a comment by Montaigne, included in Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 155. The statement about the three types of people and their social contributions is not mine, I have heard it many times but have no idea of its original source. The "Parable of the Labourers in a Vineyard**"** is from Matthew, Chapter 20, verses 1 to 16, *Holy Bible*, New York: Delair Publishing Company, 1982, p. 554.

Mr. Mao Zhisui (Labyrinth)

The introductory credit doubling quotation is based on Kin Hubbard, "The safest way to double your money is to fold it over once and put it in your pocket" cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 178. Another quotation from this volume is E.W. Howe's "No man's credit is as good as his money," p. 52. The quote about expenses not being hard to meet came from an Internet Web page, plagiarized while surfing. Details of the Waxahachie, Texas superconducting supercollider came from Stowers, C. and Thomson, D. (1993) "The $2 billion hole" *Time*, November 1, 1993, p. 50.

Ms. Lisa Monzon (Wired Democracy)

The Channel swimming analogy is based on W. Somerset Maugham, cited by Flesch, R. (1957), *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 212. The cost of forward steps is from Friedrich Nietzsche, also quoted in the same volume, p. 201. The Pope as a Catholic comment is in common usage; original source unknown.

Ms. Patricia McElroy (Twenty-Twenty Vision)

The philosopher quotation is a modified version of one by Karl Marx, taken from Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 209. The hot water comment is based on a similar sentiment by G.K. Chesterton from the same source, p. 121. The major part of the first paragraph is a rewriting of Kimble, G.H.T. (1960) *Tropical Africa*, 1, New York: Twentieth Century Fund, p. 151. Paragraph two is a mixture of Mumford L. (1970), cited by Detwyler, T.R. (1971) (ed.) *Man's Impact on Environment*, New York: McGraw Hill, p. 167, and O'Hara, K. (1996) "Gross Domestic Product doesn't reflect real values" *Times-Colonist* April 8, 1996, p. A4.

Mr. James Grayson (Piranha)

The general tone of this speaker's comments is taken from Grayson, M.J. and Shepard, T.R. Jr. (1973) *The Disaster Lobby: Prophets of Ecological Doom and other Absurdities*, Chicago: Follett Publishing. However, many other phrases, comments and approaches are combined to form the second paragraph. These were obtained from Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster. Authors cited include William Tucker, who claimed that families with memories of hard times were not members of the environmental élite, p. 91; James G. Watt, who stated that you can't outrun an environmentalist to the left and that environmentalism is a left wing cult, p. 91 and John B. Beaux, discussing the need for a permit to go to the bathroom, p. 89.

Mr. Gregory Kew (Followers of Barracki)

Anyone interested in the links between declining environments and human health might wish to read Foster, H.D. (1994) "Health and the Physical Environment: The Challenge of Global Change" *Western Geographical Series* 29, pp. 73-120. Both quotations are from the Bible. The first was the catechism of Jesse Jackson's campaign and was used also by Patrick Buchanan during his attempt, in 1996, to gain the Republican nomination for the US presidency. The second quotation is from Ecclesiastes, Chapter 3, verses 19-20, *Holy Bible*, New York: Delair Publishing Company, 1982, p. 391.

Ms. Setting Sun Bigman (PowWow)

The quotation about born-again religious fanatics was based on one by Herb Caen, taken from Byrne, R. (1982) *The 537 Best Things Anybody Ever Said*, New

York: Fawcett Books, No. 21. The demand for proof is essentially a quotation from J.B.S. Haldane, cited by Sacks, O. (1996) *An Anthropologist on Mars*, Toronto: Vintage Canada, p. iv. It is, of course, by definition impossible to prove this statement.

Ms. Susan Mezey (Kaizen)

The major part of this contribution obviously has been based on Orwell, G. (1969) *Nineteen Eighty-Four,* Harmondsworth: Penguin. George Orwell's novel was first published in 1949. The quotation "time is the furnace in which we burn" or something very like it came from *Star Trek Generations*, but I can't recall which episode. The idea that the tortoise learns more than the hare about the road was taken from Kahlil Gibran, cited in Flesch, R. (1959) *The Book of Unusual Quotations,* New York: Harper and Brothers, p. 271.

Dr. Xernia Polinski (Searchers for Self-Sufficiency)

The time quotation is based on Hector Berlioz, cited in Rawson, H. and Miner, M. (1986), *The New International Dictionary of Quotations,* New York: Nal Penguin, p. 368. The atom-Sermon on the Mount contrast is from Omar Bradley's Armistice Day speech, 1948, also cited by Rawson, H. and Miner M., p. 219. The idea of a derelict in a rapidly moving train as an analogy for change without progress is based on Eiseley, L.C. "Man, Time and Prophecy" in Gunn, J.E. (ed.) (1968) *Man and the Future*, Lawrence: The University of Kansas, pp. 22-26.

Dr. Charles Litenberg (Inner Light)

Avoiding small errors by embracing grand fallacies came from a quotation cited by Jill Tittle on the Internet's *Derby Digest*. No original source was given but the actual quotation was "An expert is a person who avoids the small errors while sweeping on to the grand fallacy." Stimulus for the position that computer malfunctions can result in catastrophe came from Neumann, P.G. (1995) *Computer-Related Risks*, New York: ACM Press. The improved idiot was borrowed from a bumper sticker which read "Make it idiot proof and someone will make a better idiot." This appeared on Gary Tooze's *Quotation of the Day!* which I receive on my e-mail.

Mr. John Priestley (Academico-Capitalists)

The inverse relationship between lies and belief was spelled out by Adolf Hitler in *Mein Kampf*, cited by Seldes, G. (1970) *The Great Quotations*, New York:

Pocket Books, p. 606. The comments about bureaucracy are based on a description of India in Jacob, R. "Economic Reform" *Time*, March 25, 1996, p. 45. The characterization of the pathetic-loser kit is drawn from Jerry Seinfeld, cited in Gary Tooze's *Quotation of the Day!* April 27, 1996.

Ms. Emily Meynell (Twenty-Twenty Vision)

The description of the nature of the future is based on one by John Schaar, cited by Gary Tooze in his e-mail column, *Quotation of the Day!* May 7, 1996. Discontent with the current definition of efficiency draws upon comments by Wendell Berry, quoted in *Manas*, 14 March, 1973. I found these comments in Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 284. *The Quotation of the Day!* April 27, 1996 attributes "Few men have virtue to withstand the highest bidder" to George Washington. The description of the impact of technology on contemporary culture draws on the U.S. Senate Public Works Committee, Report on Water Pollution Bill, August 7, 1969. This is also cited by Rodes, B.K. and Odell, R. (1992), p. 272.

Dr. Robert Alfred Holmes (Academico-Capitalists)

The evaporation of every revolution is based on a Franz Kafka statement, cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 245. The closing railway analogy quotation is by Will Rogers, taken from Gary Tooze's *Quotation of the Day!* May 2, 1996.

Dr. Franklin O'Malley (Broken Ecumene)

The Genesis statement is a modified form of one made by an anonymous British scientist in the Royal Society of Medicine (1985) *The Chemical Industry and the Health of the Community* cited by Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 125. The closing quotation about the market's inability to price effectively is also from Rodes and Odell, p. 79. The author cited is Schneider, S.H. (1989) *Global Warming: Are We Entering the Greenhouse Century?* The criticism definition is derived from H.L. Mencken, taken from Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Books, no. 516. "One dog barks at something; the rest bark at him," is a Chinese proverb taken from Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 17.

Mr. Ralph Ainslie (Kaizen)

A bumper sticker quotation, "he who laughs last, thinks slowest," came via Gary Tooze's *Quotation of the Day!* on my e-mail, April 30, 1996.

Mr. Friedrich Soyinka (New Dawn)

The inheritance quotation is a Kashmiri proverb, cited by Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 111. It was George Santayana who said, "Those who cannot remember the past are condemned to repeat it," Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 203. The material on downsizing came from Gwyn, R. "Profit-obsessed firms destroying their market," *Times Colonist*, January 12, 1996, p. A5. The idea that "Nothing is impossible for the man who doesn't have to do it himself," came from A.H. Weiler in Byrne, R. (1986) *The Third and Possibly the Best 637 Best Things Anybody Ever Said*, New York: Fawcett Crest, no. 540. The wee-ness envy concept came from Richard Gwyn via *Fortune Magazine*. Of course, Asnestine's book is a figment of my imagination, but the quotation is based on one from the University of Toledo's Faculty of Education Internet site.

Mrs. Cecilia Beintema (Searchers for Self-Sufficiency)

The opening sentence is based on E.H. Carr, *From Napoleon to Stalin, and Other Essays*, "Change is certain. Progress is not," cited by Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Signet Books, p. 294. The information on the impact of introduced species came from Bright, C. (1996) "Understanding the Threat of Bioinvasions" in Brown, L.R. *et al*., *State of the World*, New York: W.W. Norton, pp. 95-113. Details of the impact of *Anopheles Gambiae* in Brazil were taken from Elton, C.S. (1971) "The Invaders" in Detwyler, T.R. (ed.) *Man's Impact on Environment*, New York: McGraw Hill, pp. 447-458 and Sopher, F.L. and Wilson, B. (1970) "Anopheles Gambiae in Brazil, 1930 to 1940" in Sopher, F.L. (ed.) *Building the Health Bridge*, Bloomington: Indiana University Press, pp. 247-302.

Mr. Jorge Folleso (Followers of Barracki)

The moving finger quotation is, of course, from Edward FitzGerald's translation of *The Rubaiyat of Omar Khayyam*, Singapore: Running Press, p. 51, republished in 1989. It initially appeared anonymously in 1859. The same river

quotation is after Heraclitus, *On the Universe*, "You can't step twice into the same river," cited by Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Signet Books, p. 50. The idea that one can never go home again is in common usage. I am unaware of its origin.

Dr. Stanton Gibbs (Alien Channellers' Association)

The description of the Battle of the Crater was based on Felton, B. and Fowler, M. (1976) *Felton and Fowler's More Best, Worst and Most Unusual*, New York: Thomas Y. Crowell. The final sentence draws from Vauvenargues, "Necessity frees us from the embarrassment of choice," cited in Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 186. "Never cut what you can untie," is from Joseph Joubert, also cited in the same source, p. 54.

Ms. Norma Rilke (Inner Light)

"Historical events occur twice—the first as tragedy, the second as farce," is a quotation by Karl Marx, elaborating a remark by Hegel, *The Eighteenth Brumaire of Louis Bonaparte*, cited in Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Signet, p. 144. The information on King Canute came from Bram, L.L. (ed.) *Funk and Wagnalls New Encyclopedia, vol. 5*, New York: Funk and Wagnalls, pp. 116-117. "We don't see things as they are, we see things as we are," is from Anaïs Nin, from Gary Tooze's *Quotation of the Day!* May 2, 1996.

Mr. Vinton Stuart Hughes (Labyrinth)

The description of the birth of the Internet is based on Tayber, D.A. and Kienan, B. (1995) *Surfing the Internet with Netscape*, San Francisco: Sybex, pp. 8-11. The "military intelligence as an oxymoron" comment is in common usage; I have merely reversed it.

Ms. Susan Yulsman (The Edge)

This attack on the actions of a defecting colleague draws on two British Parliamentary debates. The "slimy trail" was included in the abuse that Lloyd George heaped on Sir John Simon, when the latter left the Liberals to join the Tories. This tirade can be consulted in Harris, L.A. (1966) *The Fine Art of Political Wit*, New York: E.P. Dutton, pp. 128-129. The description of the Lord High

Admiral's betrayal was based on an attack by Benjamin Disraeli on Sir Robert Peel, for desertion of his protectionist principles and conversion to free trade. This is from the same source, pp. 76-77.

Mr. Sang Jae-Young (2QT2BSTR8)

The beriberi barb was hurled originally at Winston Churchill, in the British House of Commons, by a fellow Conservative who was enraged at the former's independent views on free trade. The circumstances are discussed in Harris, L.A. (1966) *The Fine Art of Political Wit*, New York: E.P. Dutton, p. 154. The description, "disorganized hypocrisy," was used by Benjamin Disraeli to attack the Conservative government. It can be found in the same source, p. 75. The discussion of the Global Energy Net draws on Lovins, A.B. and Lovins, L.H. (1982) *Brittle Power: Energy Strategy for National Security*, Andover, M.A.: Brick House Publishing. The quotation, "timing is the chief ingredient in judgement," is after William Feather, cited in Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 291.

Ms. Christiana Sereno (YRWEHERE?)

The opening is based on Bertrand Russell, "The whole problem with the world is that fools and fanatics are always so certain of themselves, but wiser people are so full of doubts." I came across this quotation on the Internet's *Quotation Home Page*. The fools/angels comparison is in common usage; I'm not sure of its origin. Count Oxenstierna's letter was cited by Pierre Trudeau during remarks at Duke University, N.C., May 12, 1974 and referred to in Sewell, W.R.D. and Foster, H.D. (1976) *Images of Canadian Futures: The Role of Conservation and Renewable Energy*, Report No. 13, Office of the Science Advisor, Environment Canada, p. 64. I am uncertain of the original source. The value of the bureaucracy's incompetence comes from Eugene McCarthy cited in Byrne, R. (1982) *The Best 637 Things Anybody Ever Said*, New York: Fawcett Books, number 292. The distribution of ice and the seasons of the year is after Bat Masterson, cited on Gary Tooze's *Quotation of the Day!* April 28, 1996. The discussion of the homily as untruth was taken from John Stuart Mill. I first stumbled across this quotation from the English political economist and philosopher on a posting on the *Derby Digest*, which shows that handicapping ability does not preclude an education. The gap between the promised earrings and the pierced ears comes from an Arabic saying, cited on an unknown date on Gary Tooze's *Quotation of the Day!*. The original is, "he promised me earrings, but he only pierced my ears." I heard the "never believe anything

until it has been officially denied" on the very funny British television comedy series, *Yes, Prime Minister*, 1986. It was presented as the first rule of politics. This quotation should be attributed to the scriptwriters Antony Jay and Jonathan Lynn, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 352.

Mr. Aleksandr Shevchenko (Alien Channellers' Association)

The parentage of error and success contrast was based on John F. Kennedy's "Victory has a thousand fathers, but defeat is an orphan," cited in Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 406. I have heard the claim that more people have died on the roads than in World War II in debate, but can't vouch for its validity. The use of hollow fluorescent fluid filled machine parts, so-called "bleeding machines," is described in my book, Foster H.D. (1980) *Disaster Planning: The Preservation of Life and Property*, New York: Springer Verlag, p. 104. The reason-excuse quotation is based on one attributed to Rudyard Kipling, "We have forty million reasons for failure, but not a single excuse," cited on Gary Tooze's *Quotation of the Day!* March 25, 1996.

Ms. Gabrielle Varricchio (Piranha)

"You can always tell when a politician is lying, their lips are moving," is an old joke. I have no idea which cynic said it first, but it's worth repeating. The concept that hair analysis can be used to identify potentially violent criminals was taken from a paper presented at *The 25th Annual International Conference, Nutritional Medicine Today*, May 2-5, 1996, Waterfront Centre Hotel, Vancouver, Canada, by Dr. William Walsh, Carl Pfeiffer Treatment Centre. The idea that "freedom is the right to do what you ought to," is from Fulton Sheen, cited on Gary Tooze's *Quotation of the Day!* May 23, 1996. The opposing viewpoint, that it includes the right to err, is also from the same list, May 10, 1996, no source given. The rose and thorn relationship was from Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 100. It is a French proverb.

Dr. Robert Shenstone (Searchers for Self-Sufficiency)

"To be forewarned is to be forearmed," is in common usage. I am unsure of its original source. "No man is an Island, entire of itself," is from John Donne, cited by *The Concise Oxford Dictionary of Quotations*, Oxford: Oxford University Press, 1964, p. 77. The viewpoint expressed about chemotherapy is my own.

Dr. Hugh Mckinney (Alien Genome Project)

The introduction is based on Fred Hoyle, "It is the true nature of mankind to learn from mistakes, not from example," cited in Rawson, H. And Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 218. The discovery of penicillin by Alexander Fleming was taken from an account by Hart, M.H. (1978) *The 100: A Ranking of the Most Influential Persons in History*, New York: Galahad Books, pp. 248-250. The idea that there would be no evolution without mutation came from Mckinney, M.L. (1993) *Evolution of Life*, Englewood Cliffs: Prentice Hall, pp. 50-52.

Ms. Gwyneth Griffiths (Kaizen)

Charles F. Kettering, cited by Flesch, R. (1957) *The Book of Universal Quotations*, New York: Harper and Brothers, p. 84, claims that "failing is one of the greatest arts in the world." I was first introduced to the concept of fail-safe design by Adcock, H.W. (1978) "The engineer's obligations as related to man-made hazards." *ASCE-ICE-CSCE 1978 Joint Conference on Predicting and Designing for Natural and Man-Made Hazards*, New York: American Society of Civil Engineers, pp. 39-48. The viewpoint that failure can be as educational as success was borrowed from John Dewey, "Failure is instructive. The person who really thinks learns quite as much from his failures as from his successes." The source for this was Flesch, R. (1957), *op. cit.*, p. 84.

Ms. Jay Gamber (Academico-Capitalists)

Although I was one of the breathless millions who watched Eddie "The Eagle" Edwards' triumph in the 1988 Calgary Winter Olympics, I refreshed my memory of the event by consulting Pile, S. (1988) *The Return of the Incomplete Book of Failures*, Toronto: Stoddart Publishing, pp. 177-178.

Mr. C. Norman Lowry (Enigmatic Continuum)

The initial definition of progress draws on that given by the British philosopher Alfred North Whitehead, "The art of progress is to preserve order amid change and to preserve change amid order," cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 31. The final sentence is partially derived from the British historian R. H. Tawney, "The purpose of industry is the conquest of nature in the service of man," Green, J., *op. cit.*, p. 123.

Mr. Niccolo Fallaci (Personae Non Gratae)

The formula for failure comes from the American film director Nicholas Ray, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 99. The Gods' plan for destruction came from Cyril Connolly, cited in the same source, p. 92. Glyme's formula for success was published in *Murphy's Law Book Two* by Arthur Block. I discovered it in Green, J., *op. cit*., p. 93. The details of Douglas "Wrong Way" Corrigan's trans-Atlantic flight were derived form Pile, S. (1988) *The Return of the Incomplete Book of Failures*, Toronto: Stoddart Publishing, pp. 63-64.

Mr. Tim Hoffmann (Kaizen)

The cynic definition comes from H.L. Mencken, "A cynic is a man who, when he smells flowers, looks around for a coffin." The quotation is from Peter, L.J. (1977*) Peter's Quotations: Ideas for Our Time*, New York: William Morrow (Quill), p. 147. The information on the Maginot Line was abstracted from Bram, L.L. (ed.) (1979) "Fortification and Siegecraft," *Funk and Wagnalls New Encyclopedia*, 10, pp. 196-202. Details of Operation Overlord were drawn from Ambrose, S.E. (1994) "D-Day June 6, 1944: The Climactic Battle of World War II" *Today's Best Nonfiction*, Pleasantville, New York: The Reader's Digest Association, pp. 7-211. The concluding comment on the repetition of history is from "Quote and Unquote," *The Diner's Club Magazine*, 1970 cited in Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 22.

Ms. Julie May-ying (Personae Non Gratae)

The information about antipersonnel mines is modified after an Internet posting of the *Canadian Disarmament Digest*, April 10, 1996. There are currently over 110 million deployed anti-personnel mines in 69 countries, with another 150 million in national stockpiles. They claim some 500 victims a week, many of whom are civilians. There are three quotations in this debate contribution taken from Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan. They include Eric Bentley, "Ours is an age of substitutes: instead of language we have jargon; instead of principles, slogans; and instead of genuine ideas, bright ideas," p. 24. The second is from Louis Kronenberger, "The trouble with our age is that it is all signposts and no destination," p. 26. The final quotation comes from Lily Tomlin, "no matter how cynical you get, it is impossible to keep up," p. 28.

Mr. Dante Radhakrishnan (Followers of Barracki)

The Parable of the Sower is from Mark, Chapter 4, verses 3-9, *Holy Bible*, New York: Delair Publishing Company, 1982, p. 564.

Mr. Adlai Wright (Academico-Capitalists)

"We shape our buildings, thereafter they shape us," is from Sir Winston Churchill, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 454. Other comments on architecture are from several authors cited in the same source. These include Ernest Dimnet, p. 454, who described architecture's impact on the soul; Craig Ellwood, who saw architecture enriching the drama of life, p. 454, and Robert Geddes, on architecture expressing the values of our culture, p. 454. Rem Kookhaas described postwar architecture as "the accountants' revenge on the pre-war businessmen's dreams," p. 455. The idea of ill-conceived, ill-planned development came from Joseph Haring, cited by Rodes, B.K. and Odele, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 48. The quotation, "Where there is no vision, the people perish," is, of course, from the Bible. It can be located in Proverbs, chapter 29, verse 18, *Holy Bible*, New York: Delair Publishing Company, 1982, p. 388.

Ms. Anne Mary Lamb (The Edge)

The hunting of spies as one of the few genuine adventures left is based on a quotation from Hans Zingger (1934), *Rats, Lice and History*, a book which deals with pathogens and which was cited on the Internet web page of the Microbiology Department, University of Cape Town, South Africa. I have developed some understanding of the techniques of espionage from reading books by Chapman Pincher, which have included Pincher, C. (1985) *The Secret Offensive*, New York: St. Martin's Press. The sentiment, "To betray, you must first belong," came from the British diplomat and Russian spy Harold "Kim" Philby, cited in Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 41.

Ms. Betty MacDougall (Wired Democracy)

The opening sentence about leaking to the media and skewering on the greasy spit of scandal is derived from two sources. Both are taken from Simpson, J.B., (1988) *Simpson's Contemporary Quotations*, Boston: Houghton Mifflin. The first is by Ronald Reagan, p. 368 and the second by Paul O'Neil, p. 367. The discussion

of the value of unions draws from Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books. The first part of the paragraph is after Samuel Gompers, p. 941 and the second is based on Clarence S. Darrow, p. 940. The quotation from Niccolo Machiavelli is from the same source, p. 940.

Mr. Booker Sorokin (Unlimited Horizons)

The comment on intelligent decisions and representation is taken from Kent York, a Texas Baptist pastor, on Representative Bill Sarpalius' vote for the 1993 Clinton administration's first budget. This was cited in Olive, D. (1996) *More Political Babble*, New York: John Wiley, p. 24. The urban model was first described by Christaller and is discussed in many geographical texts, for example, Getis, A., Getis, J. and Fellmann, J. (1981) *Geography*, New York: Macmillan. The moment of history quotation is based on R.D. Laing, *The Politics of Experience*, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 2. The sentiment, "You can't direct the wind, but you can direct the sail," came from Gary Tooze's *Quotation of the Day!* May 26, 1996. It appears to have originated in *Buddha's Little Instruction Book.*

Mr. Victor Hammerstein (Alien Genome Project)

The hypocrisy insult is based on one made in 1995 by Mark Green, about his opponent Al D'Amato during a race for a New York seat in the United States Senate, cited by Olive, D. (1996) *More Political Babble*, New York: John Wiley and Sons, p. 198. Comments on Houdini are drawn from The Amazing Randi and Sugar, B.R. (1976) *Houdini: His Life and Art*, New York: Grosset and Dunlap, pp. 9-10.

The comment about making the situation worse is after U.S. Representative E. Clay Shaw, during the 1994 debate on health-care reform, cited by Olive, *op. cit*., p. 27. The "double-cross that bridge" comment is from Oscar Levant, cited in Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 228.

Ms. Hillary Spaeth (The Edge)

Most of this section of the debate draws on quotations from Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill). The sources are Edward Gibbon, "I never make the mistake of arguing with people for whose opinions I have no respect," p. 54; Ambrose Bierce, "Hypocrisy-prejudice with a halo," p. 254; Edward Stillingfleet on the fawning, sneaking, flattering hypocrite, p. 255. The hobgoblin-consistency comment is based on Ralph Waldo Emerson's "A foolish consistency is the hobgoblin of little minds."

Mr. Julian Cudlipp (Kaizen)

The description of the two parts of the human brain was derived from *Newsweek* magazine, cited by Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 269. More details on the Australian railways are contained in Ivory, M. (1996) *Fodor's Exploring Australia*, New York: Fodor's Travel Publications, p. 188. There are several excellent texts that discuss the politics and engineering associated with construction of the Global Energy Net. I suggest that Newman, B. (2085) *Power to the People*, Lunar Base Three: Selene Press, is probably the most reliable. Clement Freud, the British politician, used the phrase, "Attila the Hen," on BBC Radio 4, October 1979, to describe Margaret Thatcher. The reference for this is Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 127.

Mr. Aung San Lee (Personae Non Gratae)

The opening statement about crystal-clear truth and profound falsity is not mine. I read it years ago, but cannot remember where. My apologies to the original author. The bulk of the rest of this debate contribution draws upon and mixes the ideas of several social commentators, all of which were cited by Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books, pp. 208-210. The authors involved are J.A. Hobson, Robert M. Lindner, H.L. Mencken and José Ortega y Gasset. The final quotation about the safety of ships in harbour came from Gary Tooze, *Quotation of the Day*! April 26, 1996. No source was provided.

Ms. Laura Osnstein (Searchers for Self-Sufficiency)

The facts-ventriloquist's dummy analogy is based on Aldous Huxley's *Time Must Have a Stop* cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 246. The closing comments about bleached bones marking the path of progress is a highly modified version of a comment made by Arthur Koestler while talking about the progress of science. Its source is also Green, J. p. 247. Details on containerization came from Forward, C.N., "The Impact of Containerization on the Major Ports of Australia," in Sewell, W.R.D. and Foster, H.D. (eds.) (1970) *The Geographer and Society*, Western Geographical Series, vol. 1, pp. 171-183. Information on railroads was taken from Bram, L.L. (ed.) (1979) "Railroads," *Funk and Wagnalls New Encyclopedia*, New York: Funk and Wagnalls Inc., pp. 119-131.

Ms. Claire Fixx (Enigmatic Continuum)

The discussion of the nature of progress was based largely on an analogy by Will of Ariel Durant cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 425. Information about increased human mobility through time was taken from McWhirter, N. and McWhirter, R. (1973) *Guinness Book of Records*, Enfield: Guinness Superlatives. The quotation "If it works, it's out of date," came from Stafford Beer, a British Scientist, cited by Green, *op. cit*., p. 248. The technology-magic analogy is taken from Arthur C. Clarke, also cited by Green, *op. cit*., p. 248.

Mr. Bruce Kari (Big Zipper)

The lobotomy taunt is based on a comment made by the former Canadian Prime Minister Kim Campbell about the then Premier of British Columbia, William Vander Zalm. The source for this is Olive, D. (1993) *Canadian Political Babble*, Toronto: John Wiley, p. 109. The plea for truth in government was drawn from a speech given by Richard M. Nixon, when accepting the GOP presidential nomination in 1968. Need I say more. The source is Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 473. Comments about Aristotle's unwillingness to apply the scientific method are after Bertrand Russell, cited by Peter, *op.cit*, p. 436. The information on animal speed is taken from McWhirter, N. and McWhirter, R. (eds.) (1973) *The Guinness Book of Records*, Enfield: Guinness Superlatives, p. 34. Longevity information is from the same source, pp. 33-34 and from Hayflick, L. (1994) *How and Why We Age*, New York: Ballantine Books, pp. 29-33. "In the long run we are all dead," comes from John Maynard Keynes, cited by Peter, *op.cit*., p. 150. "Another beautiful theory slain by an ugly fact," is by Oliver Wendell Holmes, cited by Gary Tooze in *Quotation of the Day*! July 21, 1996.

Ms. Elaine Merakis (Alien Channellers' Association)

The contrast between the gun and the kind word draws on the sentiments of Al Capone, cited in Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 141. The high chair to the electric one comment was stimulated by James D.C. Murray, "Juvenile delinquency starts in the high chair and ends in the death chair." This is also cited by Peter, *op. cit*., p. 143. The Wilde quotations are from *The Ballad of Reading Gaol*, taken from Evans, B. (1968) *Dictionary of Quotations*, New York: Bonanza Books, p. 556. The "bricks of law" phrase comes from William Blake, cited by Evans, B., *loc.cit*. The sentence, "Caged birds accept

each other but flight is what they long for," is by Tennessee Williams, *Camino Real*, cited by Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 113.

Mr. Antoine Dubos (Fatalists)

Much of the discussion about the true significance of work was based on quotations found in Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill). The original authors were "work as a dilemma," Melvin Maddocks, p. 506; "without work all life goes rotten," Albert Camus, p. 506; "unemployment worse than death," José Ortega y Gasset, p. 506; "not enough to be busy," Henry David Thoreau, p. 507 and "working to become not acquire," Elbert Hubbard, p. 505.

The idea of travel for its own sake was taken from Robert Louis Stevenson, cited by Rawson H., and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 375. Ralph Waldo Emerson described travelling as the "fool's paradise," p. 373. The less-than-flattering description of a typical tourist is based on Kahn, H. and Wiener, A.J. cited by Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 276. Reference to the Talmud came from Rawson and Miner, *op. cit*., p. 375.

Ms. Bev Koerner (Alien Channellers' Association)

Much of the early part of this contribution to the debate is taken from various sources found in Simpson, J.B. (1988) *Simpson's Contemporary Quotations*, Boston: Houghton Mifflin. Some of them have been combined and mixed. As far as possible, I will identify the source of the original concept: "purpose of medicine," Joel J. Nobel, p. 127; "Tower of Pisa," Charles, Prince of Wales, p. 124; "consulting rooms," Francis Dudley-Hart, p. 124; "smoker's lung," Thomas J. Bassler, p. 122; "ragged, hallucinating mentally ill," American Psychiatric Association, p. 130; "cherries jubilee," Leonard Bailey, p. 123.

I am a supporter of orthomolecular medicine and own and have read several hundred books on the topic. An excellent introduction to its concepts can be found in Pauling, L. (1986*) How to Live Longer and Feel Better*, New York: W.H. Freeman. A signed copy of this was sent to me by the author. I was converted to orthomolecular medicine by my own research into the spatial patterns of disease which showed clear links between many illnesses and soil and water mineral excesses and/or deficiencies.

Ms. Willa Cassatt (Piranha)

This chapter is based on ideas taken from Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan. The sources are as follows: "manufacture of echoes," Norman Douglas, p. 404; "managed consumer society," Ivan Illich, p. 405; "universal remedy," Malcolm Muggeridge, p. 405; "higher grade of prejudices," Lawrence Peter, p. 406; "handicap," Paul Chambers, p. 404; "human pack is shuffled and cut," David Lodge, p. 405; "Ivy League," Peter De Vries, p. 407; "nobody ever heard common sense from a school teacher," John Mortimer, p. 405. Quentin Crisp, p. 404, was the source for "clutter your skull."

Mr. Carl Babington (New Dawn)

The first paragraph draws on several sources cited by Simpson, J.B. (1988) *Simpson's Contemporary Quotations*, Boston: Houghton Mifflin. They are as follows: "mosquito," Stephen Bayne, p. 205; "fancy-dress contest," Alan Bleasdale, p. 205; "still an atheist," Luis Buñuel, p. 206; "faith in luck," Jean Cocteau, p. 207. Bette Davis', p. 208 quotation seems worth providing in full, "she is the original goodtime that was had by all."

The two opening remarks of the second paragraph came from Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: Mentor, p. 43. "Fortune sides with him who dares," is from Virgil's *Aeneid*, while the Shakespeare quotation is from *Julius Caesar*, IV,iii. The comments about global change rely on McKay, G.A. and Hengeveld, H. (1990) "The Changing Atmosphere," in Mungall, C. and McLaren, D.J. (eds.) *Planet Under Stress*, Toronto: Oxford University Press, pp. 46-79. Closing comments about fear were modified from Fyodor Dostoyevski and William O. Douglas, p. 356 in Seldes, G. (1970), *The Great Quotations*, New York: Pocket Books.

Mr. Bruce Zyllo (Searchers for Self-Sufficiency)

The order "keep it simple, stupid," is widely used. The original source is unknown to me. The rest of this contribution is built around quotations taken from Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster. These sources are now provided: "Faustian bargain," Alvin M. Weinberg, p. 202; "burden of continuous monitoring," Allen V. Kneese, p. 203; "no Acts of God," Hannes Alfvén, p. 204; "Capitalist and Marxist isotopes," Jean Rostand, p. 204; "most decisive conflict," Hannes Alfvén, p. 203; "atoms for peace," Hannes Aflvén, p. 203; "Hobson's Choice," Denis Hayes, p. 206; "unstable atoms," Andrea Carothers, p. 206.

Ms. Wenda Kusama (Twenty-Twenty Vision)

"It is far more difficult to be simple than to be complicated," is from John Ruskin, the English art critic, cited by Browning, D.C. (1988) *Dictionary of Quotations and Proverbs*, London: Chancellor Press, p. 207. The power of stupidity discussion is based largely on Robert Heinlein, the American science fiction author, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 417.

Details about the S.S. Trade Carrier's poisoned wheat were taken from Hughes, E. (1973) "Pink was the Colour of Death," *Reader's Digest*, December, pp. 184-190. The final paragraph is based on my own book, Foster, H. (1980) *Disaster Planning: The Preservation of Life and Property*, New York: Springer Verlag, pp. 102-103. The closing comment about never underestimating the power of stupidity is from Heinlein, *op. cit.*, p. 417.

Mr. Hans Wendel (Followers of Barracki)

The quotation is from Ecclesiastes, Chapter 9, Verse 11, *Holy Bible*, (1982), New York: Delair Publishing Company, p. 393.

Ms. Susanna Veblen (Unlimited Horizon)

The anecdote is based on a supposedly true incident that occurred in Pittsburgh, Pennsylvania, in 1984 when a driver in a hurry buried his car under five tons of coal. This event was described on Gary Tooze's Internet *Quotation of the Day!* June 24, 1996. The closing mistake comment draws from John Gordon Bennett, cited by Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 181. The peach-cauliflower relationship is from Mark Twain, cited by Flesch, R. (1957) *The Book of Unusual Quotations*, New York: Harper and Brothers, p. 293.

Ms. Alison Lamport (Daughters of the Revolution)

"The devil is in the details," seems very popular; I have no idea of its origin. The insult, "I will never ascribe to this government such wrongdoing as mere stupidity will explain," was hurled by John Diefenbaker, the Conservative Party leader against the Canadian Liberal government in 1966. It is cited in Olive, D. (1993) *Canadian Political Babble*, Toronto: John Wiley and Sons, p. 106.

Mr. Thelonius Kinsley (Searchers for Self-Sufficiency)

The anecdote about the Chinese emperor came from something I read years ago but cannot recall the source; my apologies to the original author. I have no idea whether the story has any truth to it. The quotation beginning, "To lie in cold obstruction and to rot" is, of course, from Shakespeare's, *Measure for Measure*, III.i. My source was Evans, B. (1968) *Dictionary of Quotations*, New York: Bonanza Books, p. 150.

Ms. Eileen Nurkse (Inner Light)

This contribution is based on two statements taken from Evans, B. (1968) *Dictionary of Quotations*, New York: Bonanza Books. These are: "a good catchword can obscure analysis for fifty years," Wendell L. Wilkie, p. 771, and "the history of our time is a history of phrases," Russell Davenport, p. 771.

Ms. Rebecca Al-Hakim (Advocates of the Quantum Leap)

Most of this debate contribution is based on Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books. These quotations have been altered and mixed. The sources used are as follows: "I am, and have always been, and shall now always be, a revolutionary," George Bernard Shaw, p. 838; "organic revolutions," Wendell Phillips, p. 836; "found its bayonets," Napoleon Bonaparte, p. 836; "liberty against tyranny," Maximilien de Robespierre, p. 837; "not made with rosewater," Edward George Bulwer-Lytton, p. 385; "silk gloves," Joseph Stalin, p. 839; "not dinner parties," Mao Tse-Tung, p. 836. Other sources are "most abandoned," Georges Jacques Danton, p. 833; "inherent right to cast out," Henry Campbell Black, p. 833; "innocent as well as guilty," Ulysses S. Grant, p. 834. As mentioned earlier in the references for Mr. David Disraeli, the heaven and hell quotation is taken from Virgil, *The Aeneid*.

Mr. Hans Langdon-Davies (Followers of Barracki)

The biblical quotation is from Matthew, Chapter 6, Verses 19-21, *Holy Bible*, New York: Delair Publishing Company, 1982, p. 544.

Mr. Odil Saro-Wiwa (Piranha)

The swearing-in joke is based on comments by Dennis Miller, reproduced by Gary Tooze in his *Quotation of the Day!* June 2, 1996. The "feathering their

own nests with their face in the trough" quotation is from Ontario premier David Peterson, cited by Olive, D. (1993) *Canadian Political Babble*, Toronto: John Wiley pp. 129-130. The Robert Linder quotation was found in Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 320. "Our worst enemies are the intelligent and corrupt," is after Graham Greene, *ibid.*, p. 114. The idea that to live involves risk is from Harold Macmillan, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 115. The need for tension is from T.V. Smith, *ibid*., p. 117. The discussion of life as a gamble, the death in bed of the overcautious man and the Ascot racecourse incident are all based on Wykes, A. (1964) *The Complete Illustrated Guide to Gambling*, Garden City, New York: Doubleday, pp. 8-10. The view that we don't need to weep over change is William Cullen Bryant's, cited by Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books, p. 137. The discussion of change's impacts on society is based on Henry Thomas Buckle, *ibid*. Comments about the value of living for the present rather than the future are after Otavio Paz, cited by Green, *op. cit.*, p. 33. The jam quotation is, of course, borrowed from Lewis Carroll (Charles Dodgson) and was taken from *The Concise Oxford Dictionary of Quotations* (1980), Oxford: Oxford University Press, p. 58. The relationship between principle and suffering is discussed by John K. Galbraith, cited by Green, *op. cit*., p. 319.

Mr. Jerome Cipra (Microhard)

The Dag Hammarskjöld quotation is cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 141. The "strut sitting down" comment was made originally by John Diefenbaker about Quebec premier Lesage; it is cited by Olive, D. (1993) *Canadian Political Babble*, Toronto: John Wiley and Sons, p. 105. "Time is a storm in which we are all lost," comes from William Carlos Williams cited by Green, J. (1996) *ibid.*, p. 142. The need for a flexible plan comes from Jerry Brown, cited by Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 100. The optimist-pessimist reaction to change is based upon comments by King Whitney Jr. in Simpson, J.B. (1988*) Simpson's Contemporary Quotations*, Boston: Houghton Mifflin, p. 100. The discussion of the Chinese characters for crisis not change is from John F. Kennedy, Green *op. cit.*, p. 115. "The anguish of our times," is based on John B. Keane, *ibid*. For a discussion of the Luddites, see Cole, G.D.H. and Filson, A.W. (1951) *British Working Class Movements—Select Documents 1789-1897*, London: Macmillan, pp. 111-115. The Cultural Revolution is discussed in Goldman, M. (1981) *China's Intellectuals: Advise and Dissent*, Cambridge, Massachusetts:

Harvard University Press, pp. 117-245. The idea that confusion and despair accompany change was drawn from Marshall McLuhan cited by Green, *op. cit.*, p. 115. "An hour is a long time in politics" is a parody of Harold Wilson's "A week is a long time in politics," cited by Green, *op. cit.*, p. 142. "The whole is greater than the sum of its parts," is from common usage. The description of ants is based on one by Lewis Thomas in *The Lives of a Cell*, cited by Simpson, *op. cit*., p. 216. Other information on these social insects is taken from Bram, L.L. (1979) (ed.) *Funk and Wagnalls New Encyclopedia*, New York: Funk and Wagnalls, 2, pp. 122-125. The "thousands of engineers can design . . ." quotation is after Eugene G. Grace, cited by Rodes, B.K. and Odele, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 81. Richard Stubbing, U.S. Office of Management and Budget described the lack of competitive bidding on construction projects as "a middle-class welfare program for engineers," cited by Simpson, J.B. (1988) *Simpson's Contemporary Quotations*, Boston: Houghton Mifflin, p. 61. Georges Pompidou described three roads to ruin. For good measure in case anyone has missed them, I have added two more. Pompidou is cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 251. "One has to be very careful with engineers," is based on Marcel Pagnol, *ibid*. The Gothic cathedral for cars was derived from Roland Barthes, Green, *op. cit.*, p. 248. The doctor burying his mistakes is derived from a quotation by Frank Lloyd Wright, in Green, *op. cit*., p. 457. The Shakespearean quotation is from *Hamlet*, III. iv. 206, cited by *The Concise Oxford Dictionary of Quotations* (1980), Oxford: Oxford University Press, p. 189. Stalin's comments on the Pope were taken from Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books, p. 741. The Pope's weapons were described by Desiderius Erasmus, *ibid.*, p. 32. The phrase "the dogma of infallibility" is from T.H. Huxley, *ibid*., p. 78, who used it when discussing the Bible. The description of the avant-garde, chic, cliché progression was borrowed from Richard Hofstadter, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 141. The Roman Catholic Church's "tentacles" are described by H.G. Wells, cited by Seldes, *op. cit*., p. 131. The church as a democracy nourished by sap came from Woodrow Wilson, in *ibid.*, p. 132. Martin Luther's comments are from Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 427. The church as a supporter of feudalism and other state power structures, is from Daniel DeLeon in Seldes, G. *op. cit*., p. 128. The view that one will never see a liberal Pope is actually that of Metternich, discussed by G.A. Borgese cited in *ibid.*, p. 262. The description of the Roman Catholic hierarchy comes from Braum, L.L. (eds.) (1979) *Funk and Wagnalls New Encyclopedia,* New York: Funk and Wagnalls, 20, pp. 349-353. The significance of cathedrals is based on a quotation by Lionel Tiger which I have

mutilated severely. The original source was Simpson, J.B., *op. cit.*, p. 196. The description of how to lead is based on comments by Ken Kesey, cited by Green, J. *op. cit.*, p. 320. It was Franklin D. Roosevelt who said, "The only limit to our realization of tomorrow will be our doubts of today," cited by Green, *op. cit.*, p. 33. All the comments on sustainable development rest on statements found in Rodes, B.K. and Odele, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster. The authors used to build this case are "development which destroys the environment eventually destroys itself," Rajiv Gandhi, p. 270; "fulfill the requirements of the present without compromising the future," James Baker, p. 271; and "a reality not a slogan," Robert Repetto, *ibid*.

Madame Speaker (Ms. Susan Barach)

The quotation in praise of speed is from *Macbeth*, II, vii.I. It is cited in *The Concise Oxford Dictionary of Quotations* (1980), Oxford: Oxford University Press, p. 198. The comment about not ending until the fat lady sings is a derogatory remark about opera. It is popular with hockey and football fans in North America, but I am unaware of its origin. Who decides issues was discussed by George F. Will, cited by Simpson, J.B. (1988), *Simpson's Contemporary Quotations*, Boston: Houghton Mifflin, p. 44. Voting as a civic sacrament comes from Theodore M. Hesburgh, *ibid.*, p. 29. The closing, off the record, comments are the famous last words of Errol Flynn, cited by Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan, p. 66.

WHITEPAPER

Banks C., Reukiner, E.L. and Lehner K.

Social Dimensions

All fictitious and factual references are included in the bibliography following the Whitepaper. All that is provided here are references to quotations used in the text. To illustrate, the idea of shovelling smoke comes from Oliver Wendell Holmes, Jr. "Lawyers spend a great deal of their time shovelling smoke" cited by Peter, L.J. (1977) *Peter's Quotations*, New York: William Morrow (Quill), p. 289. Abraham Joshua Heschel said "The course of life is unpredictable . . . no one can write his autobiography in advance," *ibid*., p. 304. The J.B.S. Haldane quotation about how queer the universe is was cited by Sacks, O. (1996) *An Anthropologist on Mars*, Toronto: Vintage Canada, p. iv. The statement supposedly made by Alvin Ronneshank, a Green Rage leader, was actually from Mrs. Piozzi's *Observations*

on a Journey Though Italy, cited by Evans, B. (1978) *Dictionary of Quotations*, New York: Bonanza Books, p. 95. The slogan "inertia is beautiful" owes a great deal to Schumacher, E.F. (1973), *Small is Beautiful: Economics as if People Mattered*, New York: Harper and Row. Both quotations about fanatics are drawn from Peter, L.J. *op. cit.*, p. 196. The first, "The worst vice of the fanatic is his sincerity" is by Oscar Wilde and the second, "A fanatic is a man that does what he thinks the Lord would do if he knew the facts of the case" is after Finley Peter Dunne.

The diamond-power relationship description was based on comments by Charles Caleb Colton cited by Seldes, G. (1970) *The Great Quotations*, New York: Pocket Books, p. 747. The drug-power link is after Bertrand Russell, *ibid*., p. 755. Comments about discontent draw on Eugene V. Debs, *ibid*., p. 289. "When a thought is too weak to be expressed simply, it is proof that it should be rejected;" is from Vauvenargues *Réflexions*, cited by Evans, B., *op. cit.*, p. 690.

Systems Characteristics

Both descriptions of prejudice come from Peter, *op. cit.* The first "Prejudice is the reason of fools" is from Voltaire, p. 401; the second "The prejudices of ignorance are more easily removed than the prejudices of interest; the first are blindly adopted, the second willfully preferred" is after George Bancroft, *ibid.* The "so much owed by so many to so few" quotation is, of course, taken out of context from Winston Churchill's August 20, 1940 speech to the House of Commons, cited by Evans, *op. cit.*, p. 233. Money as the philosopher's stone is after Lord Byron, quoted by *ibid*., p. 460-61. The value of money in providing solace comes from Logan Pearsall Smith, *ibid*., p. 461. The discussion itself is based on an article describing the collapse of the USSR and its impact on Cuba's economy. This reference is Whittington, L. "Castrating Cuba" *The Vancouver Sun*, January 18, 1992, p. B3. The view of variety as the spice of life comes from W. Cowper, cited in Davidoff, H. (1974) *The Pocket Book of Quotations*, New York: Pocket Books, p. 414. The "spending the planet's irreplaceable capital" is based on Aldous Huxley, cited by Evans, *op. cit*., p. 561. The story of Joseph and the famine can be found in Genesis, Chapters 41-42, *Holy Bible*, New York: Delair Publishing Company, 1982, pp. 26-28.

Economic Dimensions

Almost all the quotations used in this section of the Whitepaper were derived from Green, J. (1996) *The Macmillan Dictionary of Contemporary Quotations*, London: Macmillan. They include "patent medicines," Barbara Bergman, p. 440; "the business world worships mediocrity," George Lois, p. 439; "banks lend

an umbrella," Robert Frost, p. 442; "society structured on greed," Milton Friedman, p. 442; "money is God," Frederick J. Eikerenkoetter, p. 442; "knows no women," Art Buchwald, p. 441; "creative accounting," Gene Wilder in *The Producers*, an Embassy, 1968 screenplay by Mel Brooks, p. 439 [which incidentally I consider one of the funniest films ever made]. Other quotations from Green, *op. cit.* include "salaries of chief executives," J.K. Galbraith, p. 438; "restraint cutting others' benefits," J.B. Morton, p. 439; and "rich man may never get to Heaven," Alexander Chase, p. 441. The description of Economics as the "Dismal Science" is, of course, after Thomas Carlyle, cited by Rawson, H. and Miner, M. (1986) *The New International Dictionary of Quotations*, New York: New American Library (Mentor), p. 81.

Environmental Dimensions

"In the eyes of Nature we are just another species in trouble" is by Lionel Tiger and Robin Fox (1971) *The Imperial Animal*, cited by Green, J. *op. cit.*, p. 254. The Earth as a living organism is after Paul Brooks (1971) *The Pursuit of Wilderness*, *ibid*., p. 252. The definition of sustainable development comes from two sources, the World Commission on Environment and Development (1987) *Our Common Future* cited in Rodes, B.K. and Odell, R. (1992) *A Dictionary of Environmental Quotations*, New York: Simon and Schuster, p. 270 and Edward Goldsmith and co-authors, *ibid*.

The conflict between environmentalists and the corporate élite is after *The Progressive Magazine* cited by Peter, L.T., *op. cit.* p. 172. "The industrialists' purpose" was based on comments about strip-mining engineers by Bertrand de Jouvenel, *ibid*.

Time and Timing

The quotations used in this section are from Evans, B. *op. cit.* These are as follows: "perfection in clocks," Vauvenargues, p. 112; "everything a season," Ecclesiastes chapter 3, verses 1 to 8, p. 612; "Hurry up please, it's time" is the warning given at closing time in British public houses, p. 697; "alcohol, hashish" is based on Emerson, p. 539; "whirligig of time" is borrowed from Shakespeare's *Twelfth Night*, p. 697; "Time goes, you say?" is taken from Austin Dobson, p. 696.

Operational Characteristics

Fiddling as wild places burn is taken from David R. Brower cited by Rodes, B.K. and Odell, R.E, *op. cit*., p. 94. The cancer comparison is after Myers, N.

(1993) *Gaia: An Atlas of Planet Management*, New York: Doubleday, p. 18. The rest of the discussion of efficiency is after Foster, H.D. (1994) "Health and the Physical Environment: The Challenge of Global Change" in Hayes, M.V., Foster, L.T. and Foster, H.D. (eds.) *The Determinants of Population Health: A Critical Assessment, Western Geographical Series*, 29, pp. 73-120. The description of printed words as "everlasting, provided with wings, intangible and indestructible" is after Victor Hugo but I have had trouble locating the original source. The quotation "when a thought is too weak to be expressed simply, it is proof that it should be rejected" is from Vauvenargues cited by Evans, B. *op. cit.*, p. 690.

The discussion of lithonuclear war is based on quotations drawn from Green, J. *op. cit.* They are by Martin Amis, p. 254; Jonathan Schell, p. 255 and General Omar Bradley, p. 254. *The Encyclopedia of Error* is based on a letter written by Lord Acton to Mary Gladstone, April 24, 1881 cited by Seldes, G. *op. cit*., p. 326.

The discussion of stability and the no-growth economy is based on quotations from Rodes, B.K. and Odell, R. *op. cit*. These are from Kenneth E. Boulding, p. 65 and Aleksandr I. Solzhenitsyn, p. 66. Information about stronger egg shells came from May, K. "Scientists are scrambling to make eggshells tougher" *Times-Colonist*, December 24, 1983, p. D-10. The nail-kingdom parable is taken partially from Evans, B. *op. cit*. quoting Benjamin Franklin, p. 475 and in part from memory.

Selecting the Most Appropriate Dimensions

"Conflict is the gadfly of thought" and other comments on conflict are from John Dewey, cited by Seldes, G. *op. cit*., p. 207. "If you don't know where you're going, every road will take you there" is by an unknown author, cited on Gary Tooze's *Quotation of the Day!*, June 5, 1996. "A clash of doctrines is not a disaster—it is an opportunity" is after Alfred North Whitehead, cited by Green, J. *op. cit*., p. 480. "Comparisons are odious" is after Francesco Berni, cited by Evans, B. *op. cit*., p. 118. The "hook in the benefit" is from Donne, *ibid*., p. 57. Politics is an arena of interests, not morals is after Aneurin Bevan cited by Green, J. *op. cit*., p. 313.

Conclusions

"The world is an enormous injustice" is a quotation from Jules Romains, p. 3 in Green, J. *op. cit.* "There is no security on this earth, there is only opportunity" is from General Douglas MacArthur, *ibid*., p. 2.

Some for renown on scraps of learning dote,

And think they grow immortal as they quote.

Edward Young

DeltaGlobe Citizenship

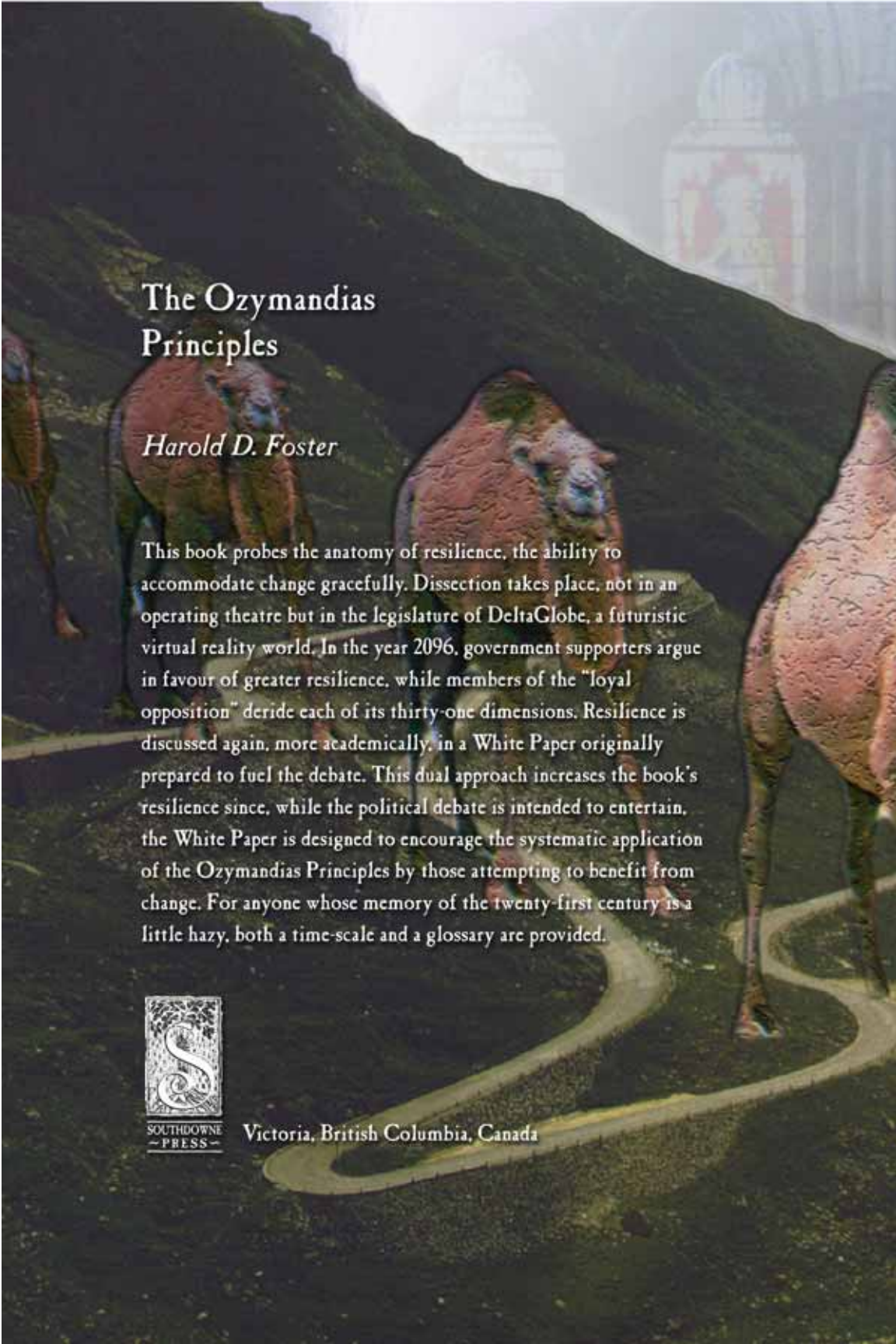
Did you score 550 or more on the Mendelson Creativity Scale? If so, DeltaGlobe citizenship can be yours. Apply now (http://webcom.net/~real/ozy/ozy.html) and join the pressure group of your choice. Organizations ranging from the Followers of Barracki to the Immortalists actively seek your support. With your citizenship comes access to the DeltaGlobe Assembly and, with it, the chance to share your views solar-wide. Help shape humanity's destiny as we prepare to enter the 22nd century.

The Author

The author lives with his wife Sarah, stepsons Chris and Dan, two cats Molly and McNuff, and Labrador, Winston in Victoria, British Columbia. A Canadian by choice, he was born in Tunstall, Yorkshire, England where he was educated at the Hull Grammar School and University College London. While at university, he specialized in geology and geography, earning a B.Sc. in 1964 and Ph.D. in 1968.

He has been a faculty member in the Department of Geography, University of Victoria since 1967. A tenured professor, he has authored or edited some 180 publications, the majority of which focus on reducing disaster losses or identifying the causes of chronic disease. More recently he has begun to write on longevity. His numerous books include *Disaster Planning: The Preservation of Life and Property*, Springer Verlag: New York; *Health, Disease and the Environment*, Belhaven Press: London, and *Reducing Cancer Mortality: A Geographical Perspective*, Western Geographical Press: Victoria.

He is a member of The Explorers Club and numerous academic organizations including The New York Academy of Sciences, The Royal Geographical Society and The Royal Society of Literature. He is also the editor of both the International and Canadian Western Geographical Series and is a member of the boards of the Journal of Orthomolecular Medicine and the Canadian Schizophrenia Foundation. He has been a consultant to numerous organizations, including the United Nations, NATO and the governments of Canada, Ontario and British Columbia. Every day he takes at least the recommended daily allowance of the known essential nutrients, in the belief that this will slow the aging process. As a result, most of his salary is spent in health food stores. His other bad habits include providing treats to all the neighbourhood dogs; losing at chess to his computer; being regularly beaten by Dan at video games and, with the assistance of @Derby, failing to correctly predict the outcomes of horse races.



The Ozymandias Principles

Harold D. Foster

This book probes the anatomy of resilience, the ability to accommodate change gracefully. Dissection takes place, not in an operating theatre but in the legislature of DeltaGlobe, a futuristic virtual reality world. In the year 2096, government supporters argue in favour of greater resilience, while members of the "loyal opposition" deride each of its thirty-one dimensions. Resilience is discussed again, more academically, in a White Paper originally prepared to fuel the debate. This dual approach increases the book's resilience since, while the political debate is intended to entertain, the White Paper is designed to encourage the systematic application of the Ozymandias Principles by those attempting to benefit from change. For anyone whose memory of the twenty-first century is a little hazy, both a time-scale and a glossary are provided.

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