Strategic Opportunities and Challenges
Facing Canada and the World
In the Early 21st Century
and
The Science and Technologies
Required to Sustain Success

For Discussion Only
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Prepared by
Ruben Nelson
Executive Director
&
Dr. David Harries
Senior Fellow

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Preface

This Paper
The ultimate purpose of this paper is to lay out and explore the nature of the science and technologies that will be required in order to sustain success in the face of the strategic (history-altering) opportunities and challenges that can now be foreseen as emerging by 2020 for Canada and the world. The secondary purpose is to identify the major trends and uncertainties that will be driving change in the early decades of the 21st Century.

Our client is aware that this paper is being sent to selected persons for review. They realize that it is their interest to get a feel for how the content of the paper is seen and judged by others. Feel free to ignore the Appendices.

As you read this paper, keep in mind that we were asked to write as if we are standing in 2020 looking back at 2005. Our intent is neither to shock nor to comfort, but to do as we have been asked – explore the implications for 2020 of the forces now shaping our future. Accordingly, we have made our best efforts to get into the full range of possibilities that 2020 represents. This means that some of the assertions and conclusions of this paper may not be credible to you; that some of what is written here may well jar your sensibility of the world as you know it. In our view, such responses to profound changes are normal. Consider the incredulity that greeted Einstein’s ideas in 1905, Mahler’s music in 1911 or, more recently, the events of 9/11. In all these cases, the fundamentally new shook taken-for-granted sensibilities and world-views. Such experiences, in effect, are experiences of culture shock – experiences that are all the more shocking because they happened at home. It is slowly dawning on us that in the world of profound change that is the 21st Century the assumption that culture shock is not supposed to happen to us in our own country no longer holds. This being our new condition, it becomes imperative that we notice and explore the new realities that are occurring within and around us. The essential reason was stated by Paul Kennedy when he said, “If we can at least understand the transformations bearing down on the planet, we might be able to consider how best to prepare for them.”

The Introduction begins with a vision of Canada in 2020. In a world in which we can do almost anything to which we set our hearts and minds, the overriding question becomes, “How, then, shall we live?” In the view offered here, as Canadians, it is vital that we learn to see ourselves as a nation that by our pioneering

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Efforts is creating a new future for ourselves and all humankind. We must aspire again to becoming a country that is not only prosperous, but influential – one that is sought out by others because we are carrying our weight, and more, in the new project of creating societies and economies that are deeply aligned with the emerging character of the 21st Century.

We then turn to consider the critical characteristics that persons and organizations must demonstrate if we are to be able to see, think through and respond creatively to emerging strategic issues. It is not enough to claim that we are thinking about and shaping the future; we must actually be able to do so. Recently, the distinction between intending and actually performing has too often escaped Canadians. Besides, for those who are willing to pay attention, to be forewarned is to be forearmed.

Section I identifies the major trends that will shape Canada to 2020. Particular attention is paid to trends that, while they have gone critical, will greatly intensify by 2020, and to trends, that while they have not yet gone critical, may well move past the tipping point by 2020.

Section II sets out the three overarching meta-uncertainties that, depending on how they turn out, will determine the actual shape and content of the early decades of the 21st Century.

Section III explores one focus of the paper – the major strategic opportunities and challenges that will emerge for Canada and the world as we journey to 2020.

Section IV explores the heart of the paper – the nature of the science and technologies that will be required by 2020 if Canada is to sustain success in the world of 2020.

Appendix A sets out definitions of some of the key terms – ‘strategic,’ ‘strategy,’ ‘forecasting,’ ‘foresight’ ‘strategic foresight.’

Appendix B is a more complete statement than is found in the Introduction of what is entailed in the work of understanding change, shaping the future and doing so strategically.

Appendix C seeks to illuminate Canada’s future by exploring four possible scenarios of our development to 2020. The logic of the scenarios arises from two of the three meta-uncertainties identified in Section II.

Finally, please note that this paper has been written in light of other papers prepared for our client. Knowing that these papers exist has freed us to write without having to duplicate the content available in the others. This may account for the absence of some expected drivers of change. Of course, the views expressed in this paper are entirely the views of the authors.

Comments
Your comments will be welcomed and appreciated. Please send them directly to either of us:
RubenNelson@shaw.ca Jdsharries@aol.com

Ruben Nelson
Executive Director
Foresight Canada
Lac Des Arcs, Canada
July 28, 2005

Dr. David Harries
Senior Fellow
Foresight Canada
Kingston, Canada
July 28, 2005
Executive Summary

There are two essential messages of this paper. One is good news, the other is not.

First the bad news: The global changes now washing over us and all persons are far more profound than is commonly understood. Ours is one of the few periods of history during which a truly history-altering cultural mutation and deviation is slowly taking place. Therefore, it is increasingly likely that the future for which Canada and other OECD nations are planning – a future that extends Industrial Culture and consciousness to the ends of the earth – is not the actual future we will get.

Now the Good News: It is possible for Canada to become the most influential mid-sized nation in the world by committing itself to the new work of understanding and capitalizing on long-term societal change, evolution and transformation in ways that no nation now advocates or practices. Canada can become the world’s first 21st Century nation – the leading country that is committed to aligning all that we are and do with the best that we are coming to know about persons, communities, wealth creation and reality itself.

It follows that the most pressing strategic question that emerges from this paper is this: “Is the official reading of history that underlies and informs virtually all intention, action and planning in every sector of Canadian society grounded and sound or is it an understandable, but future-threatening, case of overshoot – continuing to believe and behave as we have in the past long after the conditions that justified such behaviour have changed?”

The threat of this question is deepened by the fact that, as of now, we in Canada have no basis for deciding – other than our cultural biases and personal convictions. The reason is that it is no one’s ongoing responsibility to ask or answer this question with authority. In fact, we know of no research centre anywhere in the world that is charged with answering this question. Nowhere is there a government that takes this question with the seriousness that it deserves. As a result the depths and powers of societal change in the 21st Century will surprise us. Yehezkel Dror described our situation in his 1994 Report to the Club of Rome – The Capacity to Govern – “The situation of humanity in the face of global change is ominous. We are not prepared for the existential questions that face us. We cannot easily饲 from the past to think about the future.”

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transformations can be summarized in two sentences: Societies are unprepared. Governance is ill-equipped... In the main, contemporary governance is obsolete and unable to deal fittingly with rapidly mutating problems and opportunities.”

The essential argument on which the above messages rest has these key points:

- Relative to the world, Canada has a fine, possibly even a great, 20th Century Industrial culture.

- However, we are still in the grip of a 20th Century dream of our future. We aspire to meet the requirements of the 21st Century by becoming an even better version of what we already are – a 20th Century Industrial Culture. Given that the aspiration to be a successful Industrial society and economy is the only national dream we have ever known, this is understandable.

- However, it is increasingly apparent that the 21st Century will not be a replay of the 20th; that present societal changes are driving us off our inherited mental maps and Industrial business models into quite new and uncharted post-Industrial territory.

- A variety of global crises are looming that net out to a major crisis of leadership and governance. The forces that are driving change are creating rapidly mutating complex conditions for which we, as a people and as governments, are almost wholly unprepared – conditions with which we do not know how to cope. All six billion of us are being driven off our mental maps into terra incognita – an unfamiliar space that presents unrecognizable threats and opportunities.

- So, we need to explore and learn the drivers, dynamics, depths and drift of long-term cultural change, evolution and transformation. Such an understanding provides the only reliable foundation for a new and powerful vision of what we can become in the 21st Century – the world’s first society and economy that is truly aligned with the unique characteristics of the emerging post-Industrial world.

- 21st Century Science and technology is a sine qua non of success. However, the required science and technologies are not exempt from the demands made by cultural transformation. They, too, must come to reflect and reinforce the emerging characteristics of the 21st Century.

Considerations:
First, as it stands today, no culture, including our own, has the capacity to see, think through and act coherently as a culture in the face of the conditions that are emerging within and around us. Rather, every country is still trying to force the new wine of its emerging situation into the old wineskins of its existing culture. No country, as yet, is led by persons who grasp, have digested and welcome the fact that ours is one of those few times in human history during which a truly profound deviation from the established societal norm is taking place. This cross-threading between the future our leaders envision and the one actually emerging among us is, in our view, the source of much of the distrust, distress and dissatisfaction that is becoming a world-wide phenomenon. While many can and do achieve brave things in small pieces, such accomplishments do not and cannot add up to an adequate response to our times.

As the reality of the mismatch between shared expectations and daily realities sinks in we can expect a global epidemic of culture shock and the disorientation that goes with it. Today, most are not yet aware of
our new condition; some who see it are in denial and some in active revolt; and a small but growing number embrace this moment as a new hope for humankind.

In saying this, we are accusing no one of bad faith. Canadians and others have not acted badly or with ill intent. Rather, ours is an error of omission. If we can be criticized, it is for not attending with greater care, perceptiveness, humility and intentionality to our changing environment and our changing selves.

Even as we say this, we recognize that this is asking a lot; that it would have been somewhat miraculous for our leaders to respond in other ways than in fact they have. Consider:

- No culture in human history has, as yet, developed a reflexive culture – a self-aware, self-critical corporate capacity to notice, explore and think through the implications for action of its own long-term societal change, evolution and transformation.

- No generation of leaders, anywhere, has been raised with this instruction, “Remember, when you are in mid-life, at the height of your capabilities, you will have to learn to do something no generation has ever done before – see the whole set of cultural presuppositions on the basis of which your achievements rest and evaluate their adequacy to your future in light of the changes that are taking place both within and around you.”

- Until virtually yesterday, the pace of societal change has been slower than generational change. This means that it has occurred unconsciously and unseen, by a process akin to cultural osmosis. As sons replaced fathers and daughters their mothers, the unconscious adaptive capacity of each new generation has been sufficient to ensure that the culture changed enough to continue to succeed. On those rare occasions in which the context of a culture changed dramatically and rapidly, the culture simply died out. Given this, we should expect that the first generation to become aware of this dynamic – namely our own – will necessarily face this reality unprepared. To expect otherwise is unrealistic.

- Until yesterday, the scale of change has been manageable – a new process was introduced here, a new technology there. Now we face change that is global and relentlessly culture-eroding. Worse, we must come to terms with two assertions that would have been laughable only fifty years ago, let alone five hundred. First, human beings actually bear significant responsibility for the ongoing condition of what we have thought of as the outdoors. It is not nearly enough to keep it clean; we must care about the amount of sulphur, carbon dioxide and ozone in the atmosphere. Second, we also bear responsibility for the ongoing evolution of our culture. These twin assertions entail the fact that for good and ill the future lies in our hands, hearts and minds.

- As experienced, most change throughout history has been both gradual and linear. Reasonably, the experience of such change has shaped our sense of what to expect next. It follows, at least up to now, that human cultures have not expected, indeed cannot be expected to have expected, non-linear or emergent change. Therefore, when confronted with a rare case of non-linear change, the common response throughout history has not been to try to understand it, but to accept whatever fate is being dealt us by the gods. In short, to date no culture has been, or is, 5.
prepared for change that is non-linear or emergent. To the extent that ours is a time of such change, we, too, are unprepared.

Nevertheless, if ours is a rare time of profound societal change and we are becoming aware of this fact, then this knowledge creates obligations – as knowledge has always done.

Second, Canada is facing a crucial choice: Now that we are beginning to understand our situation, shall we continue to utilize and work within the frames of reference that are familiar and comfortable – those of Industrial consciousness and culture? Or, shall we become the first nation to explore, map, define and learn to utilize the emerging metaphors, logics and frames that will transform us, and ultimately all people, into truly post-Industrial societies and economies?

This question is the crux of the matter for Canadians. Both what we try to achieve over the next generation and how we go about it hang on the answer that our opinion leaders give to it. That this should be the case is not surprising. In medicine, prescriptions follow from diagnoses. Or as the authors of Probing Human Origins put it, “Our perspective on the world determines how we behave in the world.” The corollary is clear – a fundamentally new perspective requires equally new behaviours.

Since the collapse of Industrial consciousness is not imminent, what we face is a real choice. However, only the post-Industrial alternative has legs beyond a generation; only it provides the opportunity for Canada to earn a new place of honour in the eyes of the world – the opportunity to become the world’s leading, living, learning laboratory for the development of an adaptable society and economy that is truly aligned with the emerging character and requirements of the 21st Century – one that is wise, courageous, secure, prosperous, inclusive, innovative, sustainable and deeply humane.

Third, much hangs on the choice we make. In its 2004 review of The Challenge of Long Term Policy Analysis, the Rand Corporation said:

> Our world confronts rapid and potentially profound transitions... It is increasingly clear that today's decisions could play a decisive role in determining whether the 21st Century offers peace and prosperity or crisis and collapse.

While this language may seem overblown, in our view it is appropriate. We invite you to come to your own conclusion, after you have considered the trends and meta-uncertainties now shaping Canada and

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6. Industrial cultures rest on, reflect and reinforce two deep insights into the nature of reality. First, reality is static – the truly true does not change. This insight is in continuity with pre-Industrial cultures – both Aristotle and Newton shared it. Second, reality can be grasped one piece at a time – as with a jigsaw puzzle, wholeness is not primary, but additive. Not surprisingly, this insight was also shared by empirical science. It is this second insight that creates the distinctive features of Industrial cultures – the separation of silos, disciplines, rooms within houses, sectors of society; the “freedom-loving” ego-filled individuals who are competitive at heart; the empirical bias and the measurement of every quality by its cash value. See The Homeless Mind: Modernization and Consciousness, Peter Berger, Brigitte Berger and Hansfried Kellner. Random House, New York, 1973.

7. Post-Industrial cultures will also rest on, reflect and reinforce two deep insights into the nature of reality. Both break with those of Industrial cultures. First, reality is dynamic. Truth is not timeless, but time-dependent. Second, reality is relational/ecological. Individual things may appear to be wholly separate, but if you want to understand the bit on which you are focussed, you must understand its context; its relationships. To date no culture has learned to live with any degree of consistency with both of these insights. Given that it took us almost 1,000 years to work out the implications of the insights underlying Industrial culture, this should not distress us. However, we should also learn to trust the fact that, in time, the implications of our experience do dawn on us and they are slowly woven into the practice of our lives. The new insights can already be seen in a good deal of the family practice, spirituality and science of Canada in 2005.
the world. Happily, human consciousness is among the things that are changing. What we as persons, families, communities, companies and a whole society decide about our situation and its possibilities is not irrelevant to the shape and quality of our future.

Fourth, after exploring a wide variety of trends, we identify three major uncertainties on which the actual shape and success of Canadian society hang in the early decades of the 21st Century. Asked as questions, they are: (1) Will the core project that informs and animates whole societies remain as it is now or will a new cultural project emerge? (2) How generous will the physical environment of the planet be to humankind? (3) Will the quality of leadership offered by powerful and influential nations be informed by 20th or 21st Century realities?

Fifth, the key to a truly humane future is our resilience, adaptability and transformability – as persons, families, communities, organizations and a whole society. These are the key requirements for sustained success. About these requirements, complexity science is clear and Darwin was blunt, “It is not the strongest of the species that survives, nor the most intelligent, but the ones most responsive to change.” The Rand Corporation, in the study cited above, put it this way:

The best response to deep uncertainty is often a strategy that, rather than being optimized for a particular predicted future, is both well-hedged against a variety of different futures and is capable of evolving over time as new information becomes available.

Sixth, we are faced with and able to chose among a wide variety of possible initiatives. Several initiatives that will help us to face, cope with and even thrive in the emerging conditions of the 21st Century are set out.

Finally, the characteristics of the science and technologies that will be required in the 21st Century are set out, as are four discipline-bursting issues as examples of what needs to be done.
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The hope that informs this paper is that Canada will grasp the opportunity to become the world’s leading 21st Century country – the country that most deeply and completely is reorganizing itself, inside and out, to meet the unique characteristics and requirements that are emerging in and will define the 21st Century. The fear that runs through the paper is that Canada will ultimately fail to grasp this prize. We fear that Canada’s leaders may be unwilling to engage the data of profound change deeply enough to see just how different the 21st Century will be from the world that we now know and just how poorly prepared we now are to comprehend, let alone meet, the changes that are washing over and through us. But we are committed to hope. The vision of what Canada can become flows from this hope.

A. A Vision of Canada in 2020

In 2020, Canada is acknowledged as the world’s leading pioneer of 21st Century ways of living. We are admired around the world for our courageous and explicit commitment to enabling our citizens to become and live as active and responsible co-creators of their lives, families, communities, economies and country. We are known for our resilience, adaptiveness, capacity for transformation and our deep commitment to the new national project of creating the first society and economy that are truly aligned with the emerging character of the 21st Century.

We make this work easy for ourselves because we have created formal, open-source organizations, networks and infrastructures to facilitate the history-altering work of socializing and supporting all Canadians to be co-creators of our future – capacities that simply did not exist in 2005. Such organizations span and integrate the efforts of separate sectors, disciplines, jurisdictions and countries. They make it easy for all who are interested to (a) explore and understand the profoundly changing conditions of the 21st Century; (b) gain access to the reliable knowledge, persons, resources and tools that this work requires; and (c) become reflexive citizen-learners who are committed to the strategic utilization of knowledge in every area of our lives as we conceive and create the new and wise ways of living that truly fit with and capitalize on the changing conditions – ways that allow us to sustain success regardless of the conditions we face; ways that are leading to the creation of a global civilization that works for all.

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Just as every Industrial society grows more produce than any Agricultural society, so our emerging Post-Industrial economy manufactures more than we did as an Industrial economy. But ‘value-added’ is no longer limited to manufacturing. It is a feature of every endeavour, because we now know that what adds value is the utilization of high-quality information in all that we do. This is why some call our still-emerging culture a “culture of knowledge in strategic use.”

At last, we have a meta-story and cultural project that grips and unites the hearts and minds of Canadians. For the first time in our history, all Canadians – Aboriginals, Francophones, Anglophones and more recent immigrants – are committed to a widely-shared and strategically-important national project.

We have become a source of hope and encouragement to hundred of millions of people around the world – persons, communities, companies and governments that are coming to terms with the gravity, precariousness and hopefulness of the human situation in the early 21st Century.

By design, our networks and value ecologies extend around the world. Canadians get it that in a globalizing world our interest is to work with and through others to co-create a world that works for all. Accordingly, we are the partners of choice for companies and organizations in every sector that share our commitment to creating a world that is truly wise, secure, prosperous, innovative, inclusive, integrated, sustainable and humane. Ironically, we now realize that the path we are on is actually Canada’s best possible long-term economic development strategy. We are laying a foundation that will create knowledge work for many generations, both here and abroad.

We are again punching far above our weight internationally. We are seen as the most future-savvy and influential mid-sized jurisdiction in the world. The best of the world’s best willingly come to live and invest here in order to participate in the work of pioneering a great 21st Century culture – a culture so exciting that our children and great-grandchildren have reasons to stay!

Can this happen? Of course it can.

Will this happen? There is no guarantee. Making it unlikely is the fact that no recognized national body or political party advocates such a vision for Canada. On the other hand, in 2005, there are indications that a significant percentage of Canadians is more ready than we now know to be called to and supported in such an apparently radical venture. Besides, it may well be the best shot we have at sustaining our place in the emerging world of the 21st Century. Further, the major case against taking this step is its unfamiliarity and novelty. This paper is intended to help with the former source of hesitation. Comfort regarding the latter can be found by reflecting on the fact that all successful grand schemes, including the formation of Canada, begin as novel ideas on the margins of the society.

Should it happen? In our view, yes. As we will see below, there is a good deal of evidence that such a project is both required and possible.

We readily recognize that the credibility of our visions of both 2005 and 2020 depends on how the data of our experience is framed, noticed and interpreted. For this reason, much of the rest of this Introduction will explore what has been learned by experienced practitioners of strategic foresight about seeing, thinking through and responding appropriately to the signals of change and the strategic issues that are hidden within them.
B. Seeing, Thinking Through and Responding to Emerging Issues

Challenge and Response is a dominant metaphor in our culture for capturing the precariousness of the human condition. This image – that we must meet the challenges of our time or be swept away by historical forces – informs academic research, professional programs and strategic thinking about the future. The core point is that personal, organizational or cultural death are not merely possibilities – they are always options that are far more likely than we care to acknowledge. While there are many ways to fail, success requires the execution of multiple steps in an appropriate and timely manner. To succeed, one must notice, explore, think through and respond appropriately to the challenges one faces before they have become significant crises that swamp one’s capacity to act.

Meeting these challenges is made more difficult when we factor in the plasticity of human consciousness and cultures. We now know that it is not a straightforward process, but one that is culture-laden and time-bound, to notice the relevant factors of our environment, our situation within it, and even our own capacity to notice what is relevant. The phenomena of culture shock and the difficulty of communication across sub-cultures, be they those of physics and philosophy, or urban and rural formation, reveal this feature of human experience.

The key thought is this – we must become reflexive learners. We must learn to become self-critically aware of the eyes with which we see the world – the patterns of seeing, thinking and acting that we inherit and utilize – in order to ensure that by using them we are actually able to notice and capture those features of our environment and ourselves on which our future hangs. Put simply, when our patterns of consciousness, thinking and behaviour do not adequately map onto and capture reality, we lose; reality wins.

What then are the critical characteristics of perception, thought and action that are required in order for a person and community to notice and mitigate emerging threats and see and grasp emerging opportunities while there is still time to do so? These can also be thought of as the characteristics of the receptor capacity of individuals, organizations and whole cultures that is required to sustain success in the 21st Century. Note that these are requirements, not “nice-to-haves.” Consistent seeing, thinking and acting in the ways specified here is required. Note also that notional familiarity with these concepts is not nearly enough to stave off failure. Success requires that our seeing, thinking and acting actually reflect and reinforce these characteristics as a set, in ways that inform, challenge and reinforce one another.

1. See, Think and Act Contextually: The first rule of serious thinking about the future is that context is king. Put bluntly, this means that the object of our attention – be it our own lives, our family, our organization, or our whole country – is wholly intertwined in and dependent on its context. If the context dies, we go with it. If the context changes in important ways, we must adapt to those changes or diminish. This reality is caught in this comment by Charles Darwin, “It is not the strongest of the species that survives, nor the most intelligent, but the ones most responsive to change.” A reminder of the survival value of this orientation is found in the Army saying, “Time spent on recce is never wasted.” Recce is reconnaissance.

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9. Will and Ariel Durant’s multi-volume The History of Civilization, published between 1935 and 1985, exemplifies research organized around this theme as does Jared Diamond’s more recent Collapse; the slogan of the Banff School of Advanced Management – adapt or die – is an example of a professional organization with this focus; our client’s Renewal process is a close-to-home example of thinking into the future that is shot through with this image.

10. One way to tell whether we really know something or are only notionally familiar with it is to put what we think we know to this test, “Do we know enough to deliver a spontaneous twelve minute mini-lecture or write a decent five page essay without further research on the topic?” With knowledge, but not notional acquaintance, the answer is “yes”.

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Given our utter dependency on our context, we can never know too much about our situation or be too ready to adapt to changes in it.

A second reason for taking context seriously is that it now appears that reality itself can best be understood as a complex web of interrelatedness. Put simply, if we want to understand a specific thing, be it a person, protein or process, we must explore and understand its history and its relationships. Put more formally, the metaphors and logic of networks, systems and ecologies allows us to make more sense of more reality than do the metaphors and logic of Newtonian mechanics.

Lest a contextual orientation sound easy, we must remember that the root assumption of Industrial consciousness and culture is that the various aspects of reality can be treated without harm as wholly separate from one another. Put abstractly, our bias is to see, think about and deal with X without Y. We do chemistry without physics and both without history or spirituality. We do men without women, the economy without community, economics with externalities, and all without the environment or delight for the senses. In short, analysis – pulling things apart and dealing with things alone – has been the overarching project of Industrial culture. The default move of Industrial consciousness and culture is to isolate, separate and fragment; not to relate and contextualize. Therefore, it is no accident that ours is a culture of silos and stove pipes – smaller and smaller bounded domains each of which is assigned to a separate bureau. Not surprisingly, while hierarchies have been with us for millennia, bureaucracies are an invention of Industrial culture. The combination defines the way we organize our consciousness, our lives and our world.

Given that the analytical perspective has been developing for almost a thousand years and that it has enabled a huge increase in our control over natural forces, it is not surprising that it is now deeply entrenched in the laws, organizations, aspirations and norms of all Industrial cultures, including Canada. All of this, of course, is in sharp contrast to the holistic orientation of all pre-Industrial cultures and the living systems bias that will come to mark post-Industrial cultures.\[1\]

A third reason to take context seriously is that every culture is, in effect, a bet that its way of seeing reality, thinking about it and acting in relationship to it actually reflects the way reality truly is. The implicit promise every culture makes to its young is that the bet it has made can be trusted. The fact that some cultures collapse is evidence that not all such bets are sound. In these terms the overarching question for us and all cultures, organizations, families and persons\[2\] in the early 21st Century can be put this way, “Do the patterns of consciousness and culture that we have inherited still reflect the best that we are coming to know about the nature of reality and the role of human persons within it?” The implication is that if the answer is “Yes” we can relax, while if it is“No” we must commit ourselves to adapting and transforming our own lives, our family patterns, work places and whole countries until we are aligned with the emerging character of the 21st Century.

One measure of the precariousness of our situation is that no existing culture, including our own, has a formal capacity to ask, let alone answer, the above question. Rather, all cultures assume that their past success is sufficient proof of the adequacy of their grasp on reality. The simple statement of this

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[1] Understanding the formative predispositions of the major forms of human culture, how and why they are what they are and under what conditions they evolve is central to sustaining success throughout the 21st Century. In our view, a new science focused on long-term cultural change, evolution and transformation is required. More is said about this in Section IV.

[2] It is the universality of this challenge – that fact that no person, gender, age or culture is exempt for this demand – that levels the playing field and makes genuine global cooperation possible. For the first time in history, the conditions of history are judging all existing forms of consciousness and culture to be wanting. Whether we like it or not, we all must learn and become learners.
assumption is enough to reveal it as psychologically understandable, but nevertheless naive and invalid. This means, contrary to the brave claims of President Bush and so many other leaders, that there are many good reasons to suggest that our way of life is in fact negotiable. But we are not negotiating with Islamic terrorists, but with reality itself. To date the record is that when a culture gets seriously out of step with reality, it dies. There is no reason to think that Western Industrial cultures are exempt from the implied demand in this pattern. If it is the case, as many now argue, that Industrial cultures no longer reflect the most current and grounded understanding of the nature of reality and the nature of human persons, then there is every likelihood that Industrial cultures will either die out or evolve into new forms that come to be aligned with the best that we are coming to know about ourselves and our situation. In our view, the latter route is clearly preferable.

The final comment about a contextual approach is that we must take our whole context into account. The rule of thumb is that we must take into account any dimension that is actually changing during the time under consideration. We find the Four Quadrants of Ken Wilber\(^\text{13}\) to be a useful reminder of the many dimensions that must be included in any thorough-going contextual view. He sets out two axes: (I) Interior – Exterior, and (ii) Individual – Common to All. They result in the four quadrants set out in Figure 1. A moment’s thought reveals that we put ourselves at risk if we only pay attention to those aspects of our existence with which we are most familiar or that are easiest to measure. Yet, that is what every culture is predisposed to do, although they ignore different aspects of our reality. Since ours is an Industrial culture it is useful to consider how our inherent biases now mislead us and set us up for failure.

We begin with the fact that futures research was invented in the Industrial West. It is not surprising, therefore, that it would reveal both the strengths and weaknesses of Industrial forms of consciousness and culture. So, for example, even today, futures research – from scanning exercises to trend analysis to issue identification – tends to be limited to the bottom right-hand quadrant – those features that are so obvious that they coerce our attention. Consider the much-used STEEP – Social, Technological, Economic, Environmental and Political. However, with this model for scanning there is no chance that we will learn anything that is useful to interpret, much less prevent, events such as 9/11. In order to do this, the changes to which we must pay attention before they get acted out in behaviour are those occurring in human consciousness and culture. STEEP ignores them. But then so does the list of the top ten problems facing humanity developed by Dr. R.E. Smalley of Rice University\(^\text{14}\), the list of the fifteen human challenges developed by the Millennium Project\(^\text{15}\) or the list of the major drivers of change set out in The Report of The National Intelligence Council’s 2020 Project\(^\text{16}\) and a host of other futures reports. That this would be expected in an Industrial culture is cool, if not cold, comfort.\(^\text{17}\)


\(^{15}\) The list can be found in the MP’s State of the Future, 2004 Report or on its website: www.acunu.org/


\(^{17}\) For exceptions see the work of Peter L. Berger, Marc Luyckx, Oliver Markely, Richard Slaughter and Wilfred Cantwell Smith.
2. See, Think and Act Developmentally: That the truly true is timelessly true was known to be true by both Aristotle and Newton, indeed by all who founded the Royal Society with him in 1661. As an intellectually justified perspective, the view that reality is static, not dynamic, was undermined by Kant, hugely damaged by Marx and Darwin and destroyed by Einstein. We now know that time matters; that how things are today is not how they were yesterday or how they will be tomorrow. In short, we must pay attention to how things have developed, do develop and are developing. In other words, while snapshots are useful for many purposes at hand, we must never forget that they are frames in the ongoing movie that we call the universe.

The upside of taking the passage of time seriously is that trend need not be destiny; our future is more open than any people has ever dared to believe. Human persons and cultures have degrees of freedom which we have hardly begun to see, explore and grasp. The downside of this is that in the 21st Century we have to learn to see, think through and act on this new-found freedom. To do so we must deliberately break many deeply ingrained habits of seeing, thinking and acting that have been inherited from pre-Industrial settled cultures; habits that came to mark Industrial consciousness and culture and still bedevil us today. For example, thinking in terms of unchanging essences and changing appearances is still common, as is our general neglect of the dynamics of change. The fact is that even today, when thinking about change, most people still think in terms of switches rather than rheostats. When George Bush talks of “freedom-loving people” he is thinking of those who act without restraint, not those who know how to cooperate with the dynamics of change.

The dynamics of change focus on the conditions under which things happen in order to understand roughly when things will happen. Without an understanding of when things will happen it is not possible to think and act coherently in the present. Consider these examples: If you know the date of a meeting has been changed, but not the new date, then you have no idea when to prepare or show up. It matters to Canada’s energy policy whether we will pass Hubbert’s Peak – the point at which half of the world’s extractable oil will have been produced – by 2010 as Exxon now suggests or not until 2035. In principle, these examples are easy to deal with because the change being considered can be readily modelled. This is not true of expected non-linear change and not at all true of emergent change. Taken together, these facts make forecasting of the mid-to-long-term future impossible and strategic foresight necessary.

Those who underestimate the pace of change will always be running to catch up to realities that have already changed, even when they talk bravely about “getting ahead of the curve.” This condition is called overshoot – continuing forms of organization and behaviour that once were justified by conditions long after the circumstances that made them reasonable in the past have changed into fundamentally new conditions. By the time those in a overshoot condition realize their true situation they are in crisis; it is way too late for opportunistic and creative action. Consider the fifteen years it took GM to get it that Japanese auto makers were a genuine threat. By 1972, the date of GM’s first car designated as an import killer, the Japanese had secured a beachhead in the minds of young Americans. Consider the decades it took Kodak to get it that the future belonged to digital, not chemical, processing of information. It took fifteen years of dedicated work to transform Kodak’s culture enough to ensure its survival. Even then, as it recently admitted, film declined far faster than had been anticipated. Finally, consider the 20 years that it took Canadians to get it that ongoing government debts were foreclosing our future. The opportunity costs of our inattention have been huge.

In our view, overshoot is the single most threatening behaviour facing organizations, countries and whole cultures today. Consider that in most cases even our boldest plans are seldom enough to catch up with
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reality and get us into the current game as it is actually playing out. That most leaders should fail to assess the actual timing of important changes is not surprising, given that few have undertaken any formal study of the subject and that the biases of Industrial culture predispose us to get it wrong when it comes to the dynamics of change. History is littered with programs of change that promised a new future while delivering yet another version of yesterday. Renewal in the federal public service offers several such examples, as does much of the current brave talk about innovation and Canada’s future as a world-leading innovative nation. In this light, Canada’s present inability to see, think through and act creatively and prophylactically in relationship to tomorrow’s strategic crises is truly alarming.

Beyond overshoot, the major source of failure is the failure to take two insights into account as if our future hangs on them – that things evolve towards greater complexity and that the control processes of a system must be more complex than the system being controlled. The wide-spread sense in our society that “things are not working; they are increasingly out of control” stems from our failure to adapt and update our institutions – they are simply not complex enough to manage the complexity they face. The facts are that both Canadians and Canadian society are more complex today then they were a hundred years ago, and that this new level of complexity can no longer be managed by hierarchical bureaucracies. A CEO of a major public institution acknowledged this reality when he said, “Hierarchical bureaucracies are a rotten way to organize knowledge work.” Given the growing intensification of knowledge in our society, it follows that fundamentally new forms of organization will emerge in the 21st Century, or civilization as we know it will collapse. Unfortunately, this item is not on the agenda of any federal or provincial government in Canada.

3. See, Think and Act Deeply: Sustained success requires both penetrating insight into the depths of human life and culture and the capacity to think through what is seen. However, Industrial consciousness and culture is marked by a systemic superficiality – literally a bias to value surface over depth. Our widespread inclination to gloss over the depths of every matter can be seen in the following:

- We readily confuse perceptions with realities – a confusion which has led us to focus on manipulating perceptions, not exploring and understanding changing realities. Advertising, politics and the requirement for formal credentials all reveal this bias.

- We confuse being notionally familiar with information with actually knowing something about the subject at hand – a confusion which has led to a climate in which fast talkers and those with detailed memories tend to rise while many with substantial knowledge are marginalized.

- We confuse correlation with causation – a confusion that legitimizes otherwise outrageous beliefs and biases and undermines the value of grounded and considered judgement.

- We confuse quantification with insight – a confusion that reduces the process of noticing and understanding reality to measuring those external features that are so obvious anyone can see them. Insights and intuitions that are sparked by weak signals are systematically ignored.

- We confuse the authority of structural status with that which comes from actually knowing something – a confusion that reinforces all of the above confusions and the general bias to superficiality.

18. This is known as the strong version of Ashby’s Law of Requisite Variety – “the variety in the control system must be equal to or larger than the variety of the perturbations in order to achieve control”.

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Given the bias to the surface, it is not surprising that Industrial cultures develop systemic patterns of inattention and moral weakness that at the time are not seen for what they are – patterns that threaten the long-term well-being of the organization and the culture. This phenomenon can be seen in the intelligence failure of 9/11 and the Enron and Sponsorships scandals. Tragically, it can also be seen in our inclination in response to such phenomena – our instinct is to resurrect old laws, tighten the rules and lay out yet more explicit procedures, rather than to develop our capacity to see, think and act at depth. It will take conscious efforts to ensure that this type of failure does not mark our responses to the major strategic issues that will come to define the 21st Century.

Regarding the distinction between memorizing information and truly knowing, the essential points are:
(1) There are significant differences between information we have committed to memory and what we actually know. Merely possessing information is a largely impersonal act, while to digest new information into one’s prior knowledge-base to the point that it is an integral and reliable part of one’s own knowing is a deeply personal act. Think of it this way – to understand is literally to stand under. When we memorize we possess, rather than submit ourselves to, that which we are memorizing. Further, one is responsible for one’s knowledge in a way that one is not responsible for information. It is also the case that it takes time to digest information into knowledge, since a myriad of connections must be made between one’s prior ecology of knowledge and that which is now being integrated into it. (2) In our increasingly speedy society, such time is hard to find and seldom valued. Therefore, memorized information is all too often mistaken for deeply digested and tested knowledge. (3) Humility is called for. It is one thing to encounter and begin to understand new information. It is quite another to become knowledgeable about a new subject matter. Learning a new discipline is also learning to be in the world, including one’s own skin, in a new way. (4) We ignore these differences at our peril. History is littered with the remains of projects, armies and organizations who did not do so. (5) The bias of Industrial culture and consciousness is to ignore the need to deeply digest and integrate new information into our own lives and knowledge-base.

Regarding the depths of our lives and cultures, we at Foresight Canada have developed a Change Gauge – a model of the depths of change that has three major levels – seeing, thinking and doing.

- **Seeing** is the level at which cultures and human consciousness are most fundamentally shaped and, therefore, reveals our most basic sense of the cosmic and historic situation we are in. Attending to change at this level is the cognitive work of **Leadership**.19

- **Thinking** is the level at which our fundamental responses to our cosmic and historic situation are revealed and articulated. Attending to change at this level is the cognitive work of **Management**.

- **Doing** is the level of physical activity; the level at which we take the physical actions that embody our cosmic and historic sense of our situation and our response to it. Attending to change at this level is the cognitive work of **Operations** or **Administration**.

The relative depths of these familiar distinctions are revealed in the following thought experiment. If you are asked for your response to this paper you might answer in one of four general ways. They reveal that seeing trumps thinking and thinking trumps doing.

19. We find it helpful to distinguish ‘leaders’ from ‘leadership.’ The former refers to those at the top of an organization – its leaders. The latter refers to a new function that must be performed within an organization in the 21st Century. At least in principle, leadership can be practiced by every person in an organization, regardless of his/her level in the organization. The case we are making is that in the conditions of the 21st Century, our leaders must learn to practice leadership.
• “I see the point, like the way they think, and agree with the directions they set out for action.”

• “I see the point, like the way they think, but I would advise other actions than the ones they suggest.”

• “I see the point, but don’t like the way they think about it.”

• “I don’t even see what they are talking about.”

The general rule is that we must be critically conscious of any level of depth in a culture that is changing when we are alive. Since ours is one of the rare times in history in which all levels of our consciousness and culture are in play and up for grabs, competence at all levels is now required. This is true not only for us but for all people on the planet, given that their cultures are being eroded by the acids of modernity, since globalization is primarily Westernization. This means that the levels at which all of us are being challenged is much deeper that it was even fifty years ago, let alone one hundred years ago. In 1900, the challenges and changes were largely operational. Neither the ways of thinking nor the fundamental cultural identity of any culture was seriously at risk. By 1975, new ways of thinking were emerging at street level, but the core identity of virtually all cultures were still not challenged. In contrast, today virtually every aspect of every culture is being eroded and called into question.

Given these conditions, both nationalism and fundamentalism of all kinds are a natural and to-be-expected response of those who find their world and identities being torn asunder, their culture trivialized and their future put in doubt. Given the bias to the surface of Industrial cultures it is not surprising that we would not understand what is happening and our own roles in it; that we would brand those who resist the disintegration of their cultures as criminals and make war on them.

Given the superficial biases of Industrial societies, it is not surprising that we privilege doing over thinking, and thinking over seeing. If, as we argue, the work of giving conscious and intentional shape to the future hangs on privileging seeing over thinking, and thinking over doing, then Canada, among others, is not well positioned to undertake and succeed with the new work of the 21st Century. For example, we take comfort in the fact that the Report of the 9/11 Commission identifies “the failure of imagination” as a root source of the failure of intelligence. However, we are disheartened by the fact that neither the press nor most politicians have responded to this insight as if it matters. While it is not surprising that this would be the case, it is tragic. The general rule is that if we do not understand what we are up against, the chances of sustaining success in changing our world are virtually zero.

4. See, Think and Act Reflexively as a Learner: While continuous learning has much support in our culture, the future belongs to those who have become reflexive learners. The differences are these: continuous learning is about learning under direction, while reflexive learners have taken responsibility for their learning. The former requires formal settings; the latter utilizes every and any observation and experience. Those who are learning may or may not be motivated to grow as persons; reflexive learners are hungry to learn in every dimension of their lives. Typically, those who are learning are not reflective – they have not seen or thought deeply about the eyes with which they see the world – the many biases and inclinations that affect their learning, e.g. their gender, culture, economic status, learning style, Meyer-Briggs type or Enneagram number.

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In a world that is ecological, profoundly changing and with subtle depths – a world in which social realities are socially constructed – reflexivity (self-critical, self-governing, self-awareness) is a requirement. It is also a capacity that is rare in our culture. Few persons, virtually no institutions and no cultures have a well-developed reflexive capacity. It simply has not yet dawned on us as an operating principle that the quality of our knowing is a direct function of our capacity as persons and organizations to see, think and act reflexively. If we are to sustain success throughout the 21st Century, it must.

Until now, human history has been driven by the largely unconscious interplay of the physical environment and our physical characteristics, including our brain structure and hormones. That this has been largely an unconscious process is seen in the fact that no culture, including our own, has even formed the thought, let alone acted on it, that it needs to develop human capacities and institutions that are devoted to the conscious evolution of their own culture. No culture socializes its newborns to grow into persons who are willing and able to see themselves as governors of evolution.21

Worse, most of the six billion persons with whom we now share the planet would see this argument to be blasphemous. They would say that only God can define the future and that we must never play God. A minority, mostly in OECD countries, would say that the market shapes the future. Within our inherited cultural frames of reference such judgements are reasonable, even required. But we now know that both of them are wrong-headed. For the first time in human experience, the ongoing success of the human adventure requires that we become conscious, intentional and reflexive. Under the conditions that are emerging in the 21st Century, unconscious evolution leads to a dead end.

Consider the opening of To Govern Evolution by Walter Truett Anderson:

"Evolution no longer follows the Darwinian rules that provided, for over a century, our best understanding of it. It is no longer an impersonal and mechanistic process obeying the remorseless logic of natural selection. That vision is as obsolete as its first cousin, Newton's clockwork cosmos. Today the driving force in evolution is human intelligence. Species survive or perish because of what people do to them and to their environments. The land and air and water systems are massively altered by humankind which has become, as one scientist put it, 'a new geological force.' Even our own genetic future is in our hands, guided not by Darwinian abstractions but by science and medical technology and public policy. The world has changed; and the human species, which has wrought the change, is now being required to change in response to the conditions we have created."

"I am not here to argue that the human species ought to take responsibility for evolution on the planet, and begin through public and private institutions to make collective decisions about such matters. If that were the question to be decided I would advocate that we put it off for a few centuries or more – let things run themselves while we get accustomed to the idea of evolutionary governance, develop the appropriate ethics and myths and political structures, and perhaps mature a bit. However, that is not the question before us, since we are already governing evolution. This is the great paradox about the threshold: It is not out there ahead of us somewhere, a line from which we might conceivably draw back. We are well across it. To say that we are not ready for evolutionary governance is equivalent to saying that a teenage child is not ready for puberty; the statement may be true, but it is not much help."

"We have made the transition into acts of evolutionary governance, but we have not yet developed a concept of evolutionary governance. ... This is the project of the coming era: to create a social and

political order— a global one – commensurate to human power in nature. The project requires a shift from evolutionary meddling to evolutionary governance, informed by an ethic of responsibility – an evolutionary ethic, not merely an environmental ethic – and it requires appropriate ways of thinking about new issues and making decisions. It involves public policy: matters of survival and extinctions are already being legislated everywhere. ... It involves a general recognition, one that will have to be articulated throughout human society, that the human species has developed a specialized role in the global ecosystem...”

C. From Stand-Alone Action to Value-Chains to Value-Ecologies – An Exploration

In order to make clear the nature and magnitude of the change that is now being asked of us, we will explore the shifting mind-set and practice that is reflected in the shift from going it alone to being part of a value chain to contributing to a value ecology. We note that these shifts represent a fundamental evolution at first within, and then beyond Industrial consciousness and culture.

1. Stand-Alone: Within Industrial cultures we would expect that most companies would see themselves to be stand-alone units. Each is seen, thought about and treated as separate and independent from the others. It is the business and responsibility of each to set its own course and determine its own fate. Other companies in the same business are competitors who must be kept in the dark about one’s plans and products and beaten in the marketplace. Cooperation with them is unthinkable.

That this was the normal practice of business in Industrial countries in the early to mid-20th Century is not in the least surprising. It is just the way things were done. That this model extended to the other sectors of our society is also unremarkable. Departments of governments and universities worked in water-tight silos. Even the existence of the other was seldom recognized. It was almost never capitalized on.

However, it is to be expected that this stand-alone orientation and practice would be challenged for companies as it slowly dawned on us in the middle of the 20th Century that ecologies and systems are real and must be understood.22

2. Value Chains: In 1985, Michael Porter postulated the nature of and need for value chains in his work on competitive analysis.23 The essential idea is that for any one firm to prosper, it must see and think of itself as a key part of a larger value-chain and act in ways that value is added at every step along the chain. The inputs to one’s own processes are someone else’s outputs and one’s outputs are inputs to someone else. Therefore, each organization must learn to care for the whole value chain as an act of intelligent self-interest. With this analysis the external boundaries begin to shift from the individual firm to one’s value chain. Competitors are now other value chains; not merely other firms.

A moment’s reflection will reveal that as a phenomenon the emergence of value chains reflects the recognition that reality is not best described as made up of individual stand-alone units, but as nodes in networks, systems and ecologies. The reality of interdependence is recognized, even if in limited ways. But note also the lingering Industrial biases. Normally a chain is a linear, not an ecological, device. Those firms outside one’s value chain are competitors to be kept out and beaten, not potential allies. Those interests that do not add value to one’s value chain are still externalities to be ignored. In short, much as value chain analysis is a step in the right direction it is small and inadequate when judged by 21st Century

22. Developments that contributed to and mark this growing realization include the emergence of systems research during WWII, systems science in the 1950s, the first inter-corporate research centre in 1971 and the International Institute for Applied Systems Analysis in 1972.

standards. This thought bring us to value ecologies – the next step in the direction of a post-Industrial society and economy.

3. **Value Ecologies:** Value ecologies can be seen as an answer to this question: “How would we organize ourselves if we truly possessed the capacities to see, think and act that are outlined above, if we understood the major trends that are now shaping our future, and if we were committed to noticing and mitigating emerging strategic threats and seeing and grasping new strategic opportunities for the sake of the whole inhabited earth and not just “us”? Value ecologies are only beginning to come into being. One way they start is as a network of value chains. As yet few exist. But even now they can be seen to be a new and powerful pattern for organizing human energy in the 21st Century. Open source software and the Wikipedia are two examples of value ecologies. While these examples are drawn from IT, value ecologies apply to every area of living.

Consider the emerging features of the world to which value ecologies are a response. They recognize that:

- The reality of which we are a part is a dynamic, developmental, multi-layered and multi-dimensional reality that is best approached as an increasingly complex network of networks – a system of systems.

- The systems of which we are a part are easily perturbed and it is often not obvious that they are perturbed until it is too late to respond; therefore conscious care is warranted.

- System success is not merely an additive function of the success of its parts. The system can fail even though many of its parts succeed. The system can succeed even if some of its parts fail.

- Human systems should be designed and operated in order to nurture the emergence of a maturity that leads to conscious, reflexive, responsible and uncoerced behaviour by individual persons, groups of persons and whole communities.

- Human beings are tool makers. Therefore, there is no inherent tension between persons and technologies. However, the unconscious creation and use of new technologies can create tensions.\(^{24}\)

- In a globalizing world, fences that exclude are seldom justified. The bias is towards inclusion.

- In a profoundly changing world the whole system must be resilient, adaptable and transformable. Our fundamental work today is not the protection of yesterday’s identities, but nurturing new identities that grow out of those we have inherited.

- There is a profound difference between possessing information and utilizing knowledge. The bias is that access to information should be essentially free, while one should pay a teacher or coach in order to more adequately utilize knowledge. The bias is also that if one improves the information received from others at no cost, then that information should be passed on to others at no cost to them. These insights are the basis of open-source practices.

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\(^{24}\) For a provocative view of the transforming power of new technologies, See Michel Bauwens, P2P and Human Evolution: Peer to peer as the premise of a new mode of civilization. Version 3/05. michelsub2003@yahoo.com
• For many purposes the whole Earth is the smallest scope of our concern. In an increasingly globally-interconnected world it is foolish to think that one can “win” while the earth, or some good portion of it, “loses.” This is the point that Gorbachev understood before any other world leader.

• Our identities are multiple. For example, for some purposes another organization may be a partner, for others a competitor. The simple-minded singular identities of Industrial cultures get in the way of success in a value ecology, rather than facilitate it.

• The division of the world into tidy sectors – private, public and voluntary – no longer makes much sense and should be abandoned. The relevant question is not “What sector are you in?” or “Whose payroll are you on?,” but “Do you understand and can you contribute to the project at hand?”

• Culture matters. Focussing on “doing” and “thinking about doing” are no longer enough to guarantee sustained success. We must also focus on the eyes with which we see the world and the metaphors that guide them. For example, George Fisher’s instinct, when he was President and CEO, to tackle and transform Kodak’s culture in order to allow it to be profitable with a new technology was unusually insightful. In contrast, the fetish of efficiency with its systemic insensitivity to culture that is now so common with chambers of commerce and governments reflects yesterday’s Industrial mentality, not tomorrow’s post-Industrial understanding.

• Few, if any, bodies have enough power to make something happen all by themselves, but many can stop good things from happening. Therefore, as the frame of the games we are playing widens, influence is more effective than power, and cooperation more effective than competition.
I

Major Trends Shaping Our World

A. Preliminary Comments

1. Why ‘Major Trends’? This paper is about big picture sense-making. It reflects our conviction that we are awash in data and seriously short of insightful and courageous interpretations of what it all means. The paralysis of analysis is a fate we wish to escape. For this reason we begin by setting out and exploring the major trends that will shape the early decades of the 21st Century, rather than on the mountains of data that underlie them. In the next section, we push even further into what it all means by aggregating the major trends into three fundamental uncertainties that, depending on how they turn out, will define the 21st Century.

We take this tack because it is our experience that in order to commit to and sustain substantial actions, such as setting new strategic directions for a major organization, we must be confident that we understand our situation deeply enough that our judgements about it and its future are sound. We readily acknowledge that reliable information, grounded in sound and tested data, is required. But it is not sufficient as a basis for substantial action. Rather, we need to have made sense of the information; to internalize it; to chew on it; to not only grasp it, but be grasped by it. In short, the data and information need to be digested and transformed into meaningful patterns of knowing.

2. Can Real Change Happen in Only Fifteen Years?

A fifteen year window into the future is not very long. However, if the conditions are right, dramatic and even history-altering changes can take place in this relatively short period of time. The right conditions for producing such change include the following: (1) At the beginning of the period there are significant trends that have been developing slowly and quietly, but they have not yet gone critical. Typically, they are virtually unnoticed because they give off such weak signals that they do not yet demand our attention. (2) Over the fifteen years, several such mutually reinforcing trends go critical at roughly the same time. (3) Since, as a culture the weak signals will have been ignored, trends that go critical will appear to come fully developed out of nowhere. The society will feel blind-sided and unprepared. 25 It will not occur to its inhabitants that they are experiencing overshoot.

Consider in this light the significant changes in Quebec from 1955 to 1970 – the years of the Quiet Revolution; in the auto industry from 1958 to 1973 – the first years of imported Japanese autos; in Canada from 1960 to 1975 – the years of the Youth Revolution; in ICT from 1975 to 1990 – the years of the microchip revolution; in our attitude to government deficits from 1985 to 2000 – the years of the Fiscal Conservative Revolution; and in our attention to “the other” from 1995 to 2010 – the years of the Terrorist/Counter-Terrorist Revolution. All offered signals to be read. All were surprises.

25. This kind of predictable surprise is the basis of several new books, one of which is Inevitable Surprises: Thinking Ahead in a Time of Turbulence, by Peter Schwartz. 2003. Gotham Books, New York.
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It follows that we should be looking for trends that are at either the bottom or top of an “S” curve. These are the trends that are about to go critical – to dramatically change in intensity and to become a legitimate part of the public debate. Prior to the bottom curve or after the top curve, not much changes. While the changes that occur between the curves can be dramatic, they are changes of intensity in an already established direction. As such, they are less significant for our purposes than the changes that occur at the curves. However, when a trend goes critical fundamental changes occur.

3. The Drivers of Societal Change: A driver of change is any factor that, when it changes, causes some significant degree of change in the human future. The drivers of societal change are either hard or semi-hard. The former have historically been and still largely are seen as wholly outside of human influence and intervention. The latter have historically been somewhat more amenable to human intervention, even if this fact is not acknowledged and owned by the culture.

Hard Drivers:
- The structure, character and dynamics of our universe and solar system
- The structure, character and dynamics of the geology of the planet
- The structure, character and dynamics of life on this planet
- The structure, character and dynamics of the basic biology of men and women
- The structure, character, condition and dynamics of the physical environment

All of these drivers are on the right side of Wilber’s four quadrants. For most of human history, these hard drivers have been taken as the invariant conditions of life and not as drivers of change. The deep default position of virtually every culture regarding these matters is that they do not change, because they cannot change. They are what God made them. If a momentary change does occur – an earthquake, tsunami or volcanic eruption – it is seen, by most as an “act of God” and not as an expected consequence of dynamics we can understand. A good argument can be made that these factors have been and still remain the essential drivers of evolution – geological, biological and cultural. Where would humans be without the physical environment, our hormones, our body structure and the triune structure of our brains?

Semi-Hard Drivers:
- The built environments of cultures
- The technologies that extend the reach and power of the people in the culture
- The behaviour of persons and groups, both inside and outside the culture
- The number and demographic profile of the people in the culture
- The character and values of the people who make up the culture
- The content, logic and metaphors of the language of the culture
- The dominant consciousness of the culture – a consciousness that is both revealed in and reinforced by both hard and semi-hard factors
- Those things that we call the software of a culture

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26. Historically, virtually all but Industrial cultures have lived within the limits of their environments. However, as Jared Diamond argues in his new book Collapse: How Societies Choose to Fail or Succeed, there were exceptions. On several occasions, a pre-Industrial culture has inadvertently altered its physical environment to such a degree that the only choice was to move on or to die. Given the propensity of Industrial societies to alter, rather than adapt to, their physical environments, this is a sobering thought.

27. This phrase refers to the content and structure of the metaphors and logic of our mother tongues and the myths by which a culture lives. A vital and robust structure of myths and metaphors is as required for human life as are water and food. Metaphors provide orientation. Myths allow us to make sense of the world, our society, our work and our lives; to make cosmos out of chaos.
To date, most persons have been, and still largely are, unconscious of many of the semi-hard factors as drivers of change. For example, virtually all city planners still do not factor into their urban design the impacts of that design on human community, much less our consciousness. Our point is that we must give up the Industrial dream of developing a culture with the characteristics we desire by only working with the realities in the bottom right quadrant. For good and ill, culture change involves all four quadrants.

4. The Interplay of Trends: In order to ferret out the range of meanings of a set of trends, one must both explore and understand them as if they were separate phenomena – which of course they are not – and explore the dynamics and possible outcomes of their interaction. The most fundamental payoffs come from exploring the interactions. Consider, for example, the June rainfall and flooding in Alberta. What Marx would have called the objective conditions of the rainfall and the flooding must be considered and responded to. However, they must also be considered in light of the logging of the Eastern Slopes of the Rocky Mountains (logged land absorbs less water); extreme weather events driven by global warming; sections of towns built on flood-plains before we were conscious of the dangers of doing so, etc. Second and third order connections must also be identified and explored, e.g. the bias of Industrial consciousness and cultures to allow wealth creation to trump all other concerns. The general rule is that the more connections that can be made to an event, the more completely one understands it.

5. Why Bring Up Cultural Frame Change? The primary reason that we include reference to cultural frame change – the evolution of pre-Industrial cultures into Industrial cultures and of Industrial cultures into post-Industrial cultures – is that as we read the evidence the former has happened and the latter is now happening. If this is where the data takes us, we must follow it, regardless of the social, psychological and intellectual discomfort involved in the journey. As we know from the history of science, it is particularly important that we find the courage to explore new paths in the early days of novel interpretation of the data – the time during which most folks would just as soon ignore the whole matter. The reason is that if the new interpretation is not grounded, early serious examination will help remove it from the board; if it is grounded, the sooner we acknowledge it and wrestle with its meaning and implications the better off we will be. This latter comment is based on the observation that later, if not sooner, societies actually gravitate to those understandings that, as with a good hypothesis, account for more data, more fully, more suggestively and more elegantly.

Based on our research, ours is such a time of cultural transformation. We are convinced by our explorations of the data that there is much evidence that the Industrial Age is drawing to a close and a truly new stage of human development is opening before us. The fact that this is not widely recognized does not mean that it is not happening, only that we are utterly unprepared to avoid the dangers of such an evolution and to capitalize on the opportunities presented. One of the truly remarkable characteristics of virtually all of the scans and trend analysis that is undertaken by large and established organizations – be they governments, private corporations or think tanks – is their utter silence on the topic of long-term cultural change, evolution and transformation. This topic is simply neither raised nor explored. The unconscious commitment of such organizations is to extend Industrial consciousness and culture. As we shall see below, this unconscious commitment will play an important roles in the dynamics of the 21st Century. In contrast, there is a growing literature focussed on cultural frame change and several lively discussions among dedicated individuals and a few voluntary organizations. There are even several websites dedicated to this conversation.28

B. Major Invariant Conditions to 2020

While the primary focus of this paper is on the uncertain and changing aspects of Canada’s future, some features of our future can safely be taken now as known, especially when our time frame is less than a generation. These must not be forgotten, for they too will have an influence on the shape of our future.

- The characteristics of the structure and functioning of the universe and the earth’s geology will continue as they are, e.g. gravity, the second law of thermodynamics, the speed of light and the boiling point of fresh water at sea level. If these features do not characterize the earth in 2020, then struggling to determine future-shaping trends will be the least of our troubles.

- The inconvenient fact for human beings is that it will still matter little to the earth whether or not *homo sapiens* is along for the ride over the next few million years. The chances that the earth will outlive humans will still be a sure thing.

- Societies that are able to sustain success must still possess multiple capacities and meet multiple success criteria – the capacity to create wealth, to create community, to prepare for whatever changes the future will bring, to appropriately educate the young, to become healthy and be able to restore people to health, to attenuate variety, create consensus, value differences, to protect themselves against attacks by others.

- The primary influence on the formation of the identities of the vast majority of human persons will still be their tradition-bound cultures and local geographies. However, as we will explore below, such influence will be noticeably weaker as all cultures disintegrate to some noticeable degree under the twin pressures of globalization and Westernization.

- The primary identity of most persons will continue to arise from and be centred in their ethnicity. The direct correlation of nationality, ethnicity and their form of spirituality will continue to be the norm, although these connections will also be weakening. Canada will continue to be an exception. The fact that we have developed a sense of citizenship that is not defined by or even connected with ethnicity, will set us apart even more than it does today.

- Canada will be a country of 35 million that includes Quebec and is a constitutional monarchy. We say this not as a political conviction or idiosyncratic view. Rather, we ground the first of these judgements in the fact that when push comes to shove Quebeckers have consistently shown little stomach for the only deal they will be offered – separation without special status. The second judgement is based on the fact that it is virtually impossible to change the core elements of the 1982 Canadian Constitution Act.

- The majority of the seven billion persons on the planet will live in urban centres in developing countries.

- The vast majority of persons in every country will still live without much capacity for a reflexive, self-critical self-awareness. Second-order, reflexive thinking will still be an art practiced by a very small minority.

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29. In this and the following sub-sections of Section I, no claim for completeness is made, i.e. we do not claim to have identified every trend that can be said to be a major trend. We readily acknowledge that a case can be made for including trends that we have omitted. However, we do make the claim that no strategically important trends have been omitted and that if our client wrestles with the trends we have included, it will be well-served.
Persons who are charismatic communicators will continue to be able to attract and sway large numbers of followers. In this sense they will be powerful leaders, whether or not they have any ability to exercise what we define as the cognitive work of leadership.

C. Major Trends that have Gone Critical that will Intensify Further by 2020

The trends set out in sub-sections C and D are, in Langdon Gilkey’s phrase, the “the fundamental trends of an epoch” – the trends that cannot be avoided and will direct the course of history. Whether a trend is included in sub-section C depends on our view of this question, “Have the objective conditions of the trend already gone critical?” If the answer is, “yes” then the trend is included in this sub-section. If, “no”, it is included in the next. However, we recognize that public awareness of many of the major trends in this sub-section has not yet gone critical; that they are not yet securely established on our societal radar screens as strategically important trends with which we must deal. It follows that the implications of most of these trends have not been thought through, digested and understood. To this extent, we are at risk and in danger.

Globalization: We find it helpful to distinguish between two different senses of ‘globalization.’ The first refers to what might be called the raw phenomenon of globalization. The second, to the human project that is advocated in light of the fact of globalization.

First, the phenomenon of globalization. This sense does not judge, it merely points to the fact that, for good and for ill, all six point four billion of us are increasingly living in each other’s faces. For example, one billion people are now connected via the internet. In a globalizing, distance-independent world there is no place to hide. Even if you live in Lanark, someone in India may be plotting to take away your customers. If you live in Vancouver, even the Pacific Ocean is not large enough to keep the dust from the deserts of China from polluting your air. This still-emerging and intensifying reality is undeniable and unstoppable.

Globalization as a phenomenon is far more profound than is normally given credence. This is the trend that touches all others and transforms many. For 200,000 years all homo sapiens have lived in what were essentially provincial cultures – cultures that assumed the effectiveness of the protection provided by oceans, mountains, deserts and boundaries. In 2005, our attitudes and behaviours still reflect this experience. However, in our globalizing world, this way of seeing and thinking about ourselves no longer reflects our actual condition – a condition that is making our present habits and expectations increasingly irrelevant. Ironically, the well-organized efforts of those who resist globalization actually reinforce it as a phenomenological and experiential reality.

For good and ill, we have entered a new stage of human existence. From this day forward, for many human purposes the whole earth is the smallest unit for consideration, if not action. We must face, understand and come to terms with the reality of globalization as a phenomenon. We are not going back to the ignorance of one another or the lack of immediate contact with each other that marked earlier decades, let alone earlier centuries and millennia.

Consider that with every passing day more and more of us know that we share the planet with some six billion others; and that eventually we will all know it (of course, by then the number of us will be higher). Consider also that as recently as 1900, not .01% of folks on the planet would have had any idea of how many others were on the planet with them.30 Further, in 1900, this ignorance did not

30. About 1.4 billion.
The 1903 Encyclopaedia Britannica had no articles on Hinduism, Buddhism or Islam. These did not appear even as paragraphs until the 1908 version. Now however, for the first time in history, we now think we know where everyone is. We no longer expect to find folks about whose existence we did not now know. This puts an end to a human experience of “discovering” people we had not known about.

In sum, whatever ‘globalization’ meant in 1900 it did NOT mean billions of people living with an undeniable awareness that they do share, will share, must share the planet with folks who are ever so different. Friedman’s distinction among three phases of globalization is helpful. Globalization 1, from 1492 to 1800, was an experience of governments and very selected persons on their payroll; Globalization 2, from 1800 to 2000, was also an experience of large companies and selected persons on their payroll; while Globalization 3, from 2000, is an experience of hundreds of millions of quite ordinary individuals.

The second sense of ‘globalization’ is the human project that is advocated in response to the mere fact of globalization. We find it useful to distinguish three such projects:

A. As it is most frequently used, ‘Globalization’ is the code word for the project to make the world of the 21st Century safe for corporations as they existed in the late 20th Century and for the trade on which they depend. It is this project of globalization that is supported by the WTO, cheered in Davos and resisted in the streets because, at least as practiced at present, it is so unconscionably destructive of much that stands in its way, including the environment and local ways of knowing and living. This globalization project has been an implicit dream of a significant sub-set of Western Culture for several hundred years – especially those with money and access to power. In our view, this project will ultimately fail. The essential reason is that we now know that no 20th Century vision is adequate to the emerging realities of the 21st Century. The only question is how much damage is done before this fact is faced and how irreparable the damage will be.

B. ‘Anti-Globalization’ is the code word for those who resist the above project of globalization and seek to replace it with a globalization project of their own – the project to make the world of the 21st Century safe for the cultures and consciousness that they discovered in the late 20th Century. In our view, the anti-globalization project is often accurate in its assessment of the damage done by the commercially-driven globalization project. However, its grasp on the realities of societal, cultural and personal change is flimsy. Those who protest invest far too much energy in trying to hold on to local ways of living – as if that were possible, when it is not. While much energy goes into expressing indignation at the destructive character of commercial ‘globalization,’ the empirical issue of how whole cultures actually change, evolve and transform is never addressed by the protesters. Since long-term cultural change, evolution and transformation is a reality, there is no chance this project will succeed.

C. The sense of ‘globalization’ as project that we support is the new human project of openly, intentionally and reflexively co-creating ways of living that reflect and reinforce the best that we are coming to know about reality and the place of human persons in it – ways of living that are wise, secure, prosperous, sustainable, inclusive, innovative, humane – ways that work for all. In our judgement it is this project that is the new work of the next two centuries. For the first time in history, we must come to terms with developing ways of living that are truly global and sustainable. We find it an

intriguing thought that this new project is evenhanded when it comes to existing cultures. All are found to be wanting. None meet the new conditions. All must transform. Yet, all can contribute to the new project. There is serious work to do together.

- **Education Levels:** Levels of formal education in Canada and virtually all countries will continue to rise. This is important because at its heart, education is a process of stretching human consciousness into new shapes. It opens new possibilities for perception, thought, aspiration and action. Accordingly, it may be the single most powerful driver of change of human consciousness. For example, no culture that has educated its girls has been able to long remain a tradition-bound culture. It is also clear that birth rates correlate inversely with the education of girls. More particularly, sustained education in the late high school and early college years nurtures a sense of psychological individuation and independence, the willingness to question authority and a capacity for 2nd order thinking – thinking reflexively about our seeing, thinking and doing. For example, it is now recognized that by valuing education as highly as it did the Soviet Union unconsciously helped to create the conditions of its downfall – the withdrawal of commitment from the regime by psychologically independent people. This same dynamic is in play in all OECD countries. It is no accident that the obedience to the Roman Catholic church has declined most in the countries with the highest general levels of education.  

- **The Big Generation:** The societal influence of the Big Generation – those born between 1952 and 1966 – will greatly increase as it becomes Canada’s psychologically dominant generation. By 2020, they will range in age from 54 to 68. Many will be retired, but most will still be working. At last, they will have become the psychologically dominant generation in Canada – those with the most assets, power and influence. For this reason their unique characteristics, now much neglected, need to be understood. The most important fact is that they are the first generation in history to have a majority of its cohort graduate from high school. This percentage contrasts with only 35% of those who were born during WWII and fewer than 20% of those born during WWI. The reason this is important is set out above – high school completion correlates directly with increased psychological independence, increased willingness to resist the power of cultural traditions and figures of authority and an increased capacity for self-authorization. For example, the Big Generation is much less likely to vote than their parents or to adhere to their parent’s religion than earlier generations, the majority of which are not high school graduates. In addition, the Big Generation is the first unisex generation and the first generation that has been targeted by marketers since they were teenagers.

Further, as they were growing up, they infected some of their parents with many of their attitudes and made it easier for the kind of psychological assertiveness to develop that twenty year olds now routinely demonstrate and take for granted. In short, the new status of the Big Generation will be

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32. Given that Quebec did not have a Ministry of Education until 1960, Quebec has lagged behind the rest of Canada by one to two generations. However, Quebeckers under thirty are now more like their counterparts in the rest of Canada than at any time in our history. This suggests that if we can get through another generation without separating; it will not happen. This does not mean that the rest of Canada will have won. Rather, if Canada still exists by 2050, all of Canada will have committed itself to the new work of becoming aligned with the emerging character of the 21st Century.

33. By this term John Kettle refers to the 400,000 persons born in Canada in each year from 1952 to 1966. It is much more precise than the more common term ‘baby boomers’. See his The Big Generation, 1980. McClelland and Stewart Limited, Toronto.

34. In our view, the emergence of the Big Generation as the dominant generation in Canada is far and away the most significant demographic fact for Canada in the next 20 to 30 years. The fact that few analysts even have this on their list; that most focus on aging is, to us, evidence that Canada needs a serious national capacity to undertake strategic foresight.
critical to the legitimization of the project that Canadian culture transform into a truly post-Industrial form. They will be more inclined to let go of the past in ways that older generations find impossible.

Resource Constraints: The facts suggest that the 21st Century will be the very first resource-constrained century for Industrial societies. For understandable reasons this new reality has not yet sunk in, but it will. Since the Black Death in the 14th Century, the fundamental experience of Industrializing countries has been one of open vistas that provide sufficient resources for the purposes at hand. If the required resources could not be supplied locally, horizons were expanded, supply lines lengthened and new settlements founded to secure their far end. It is no accident then, that in Industrial societies expansion and growth have come to be seen as the normal state of things. Growth is a requirement, a right and virtually a religious obligation.

It is not surprising, then, that in Industrial societies there is still little public recognition of the actual state of the earth and how the human situation has changed in the last generation. Virtually all of the official rhetoric and plans still call for never-ending growth and greater ingenuity to achieve it. Sustainable development is seen by most executives as a way to keep the present Industrial game going, not to change it. Should the thought cross our minds that our most pressing need is to transform ourselves, our societies and our economies in order to adapt to fundamentally new conditions, we quickly shake our heads and get back to our consensus reality.

Since it is our view that we will awaken to new realities eventually, we are confident that the least likely long-term future we face is the one that is commonly expected – continued growth for all. The data simply will not support our current orientation, policies and expectations over long periods of time. The general point is that the concern that drove Thomas Malthus is not wrong-headed – at some point the demands we make on the earth may well surpass the capacity of the earth to supply resources. At that point, we either change or die. Consider the following in this light:35

• Regarding the production of oil, Marion King Hubbert did us the service of asking in the 1950s, “When will half of the available oil have been produced?” While most in the oil patch still neglect the question and its implications, at least it has been openly asked. We note that the analogous question has yet to be publicly asked regarding other finite resources.

• Exxon now believes that Hubbert’s Peak will arrive by 2010. Yet the proposed US Energy Policy is primarily designed to assure supply, not reduce consumption. However, few careful observers believe that Saudi Arabia will ever pump enough oil to meet its share of rising global demand. Some believe it will never produce more than it is now and that it will soon be in decline.36

• Superficially, this situation seems to favour Canada, given our capacity to expand oil exports to the USA. But we really do not know either the costs or the benefits of the path to which we have set our feet. To our knowledge, Canadians have yet to attempt to assess our energy future with the kind of eyes and patterns of thought advocated here. To date, all calculations of our energy future and its implications have been partial, not systemic, and undertaken from a limited and interested point of view, not that of the whole future of all Canadians and our descendants.

35. We are indebted to the work of Lester R Brown, The World Watch Institute and The Earth Policy Institute for a good deal of this information. See www.worldwatch.org and www.earth-policy.org

• The folks who calculate the Ecological Footprint\(^\text{37}\) estimate that five earths would be required for all persons to live at a North American level. While breakthroughs in physics may greatly increase our capacity to create the materials we need, they are not imminent.

• World food production tripled between 1950 and 1996. It has been essentially flat since. Surplus grain stocks are virtually exhausted. Consider that the global shortfall of 100 million tons that was experienced in 2002 and 2003 is 35% more than Canada’s annual production.

• From 1950 to 1984, world grain production grew faster than population – from 250 kg per person to 329 kg per person. By 2004, grain production has fallen to 309 kg per person. From 1950 to 1990, productivity of grain production world-wide grew by an average of 2% a year. In the 1990s, this has fallen to 1% a year.

• It takes 100 tons of water to produce a ton of grain AND water table levels are falling in many of the world’s grain belts – China’s Great Northern Plain (1-3 metres a year), most states in India, and the Great Plains and Southwest of the USA. Again, Canada is not well-positioned to resist the demands for our water from the USA, should it insist. Over 50% of the water in China is polluted to the point that it is unfit for human consumption.

Our points are few and simple. By 2020, it will be blindingly obvious that we face a resource-constrained future and that sustained success requires degrees of resilience, adaptability and transformability about which we do not yet dream, let alone possess. Yet publicly we are still in denial about this fact and wholly unprepared for the realities that lie ahead of us. The meta-message of every political party is still, “Elect us and we will make the Industrial Age work for you.” Even the Green Party does not challenge the myth of the never-ending Industrial Age. In short, in 2005, we are much less well-positioned for the future than we in Canada or folks in the Industrial West think we are. Since, as noted earlier, the longer we wait to seriously change our minds, our patterns of living and behaviour and the technologies that support us, the deeper the trouble we will be in, best we awaken from our dogmatic slumbers soon.

Human Security: In the 21st Century, human security will become a 24/7, 360 degree civilian, as well as military, concern. This represents a huge shift in our seeing, thinking and acting; a shift that runs parallel to the evolution of Friedman’s phases of globalization – from states, to corporations to persons. In 1970, when I arrived in Ottawa to do a job for our still newly-minted Prime Minister, ‘security,’ meant state security – protecting us from the various threats posed by Communism. It was solely the responsibility of the military and the police. At that time, we were still tracking Canadians and visitors who had visited Eastern Europe. In 1991, when the Berlin Wall came down, many mused about a peace dividend, since they assumed, wrongly as it turns out, that the main threat to our security had just collapsed. This expectation was in line with our superficial and outdated view of what threatens us.

In the 1990s, some academics and bureaucrats were expanding their understanding, but it took 9/11, SARS and BSE to begin to shake a critical mass of Canadians from our remarkably narrow view of security. We are still on the road of deepening our understanding that human security underpins human dignity and of learning to see human security as a multi-faceted ecology of risk, rather than as

\(^37\) See http://www.ecologicalfootprint.com/
a single-source threat. 38 Our list of risks about which we must be prepared and vigilant even now includes:

- Pandemics that originate half-way around the world.
- Acts of terrorism, both abroad and within Canada.
- The safety of our food supplies and continued access to them.
- The lack of a reliable sense of community in our communities.
- Extreme weather events.
- Major acts of corruption by executives in the private or public sector.
- Politicians of all stripes and executives in major organizations who are clearly not up to the work that actually needs to be done.
- The need to engage in military actions in other countries to establish or keep peace.

In the future we will add such items as the following to this list:

- Urban design that nurtures a sense of community and, therefore, safety.
- The range of normal risks must be tolerated in any society in order to create the conditions that are required to nurture and deepen truly human experiences.
- Developing strategies to deal with the crisis of crises.

We speak of securing many different things. For example, the state, a place, a person, a package, a date, a way of life, hope, freedom, privacy and knowledge. However, caution is warranted. Reflection reveals that it is one thing to secure a package, another to secure a date and yet another to secure one’s privacy. The security of a package is not a zero sum game, while that of a person is. A package can be secured by an individual acting alone, whereas securing a date and one’s person requires the cooperation of others. In short, the simplicity of the language of security masks great complexity. Care must be taken to ensure that in any given case we actually understand what is required in order to secure the object at hand.

The sovereign state, with its military and security organizations and processes, remains one of the biggest, and arguably still the most important, security actor. But there are also non-state nations with major security structures, for example the Palestinians, Kurds, and Papuans. There is also a host of private security actors. In fact, it has been estimated that between 1/12 and 1/8 of all full-time and part-time employed people on earth are in the business of security. Even if the estimate is high, there is no escaping the fact that hundreds of millions of individuals all over the world are engaged in “security.” Given that Human Security is seen to be a “Good Thing” and not to be questioned. There is no estimate regarding how much of this activity is effective, wasted or, while well-intended, is ill-conceived. There is also no estimate of how much risk there is to the society in the scale, strength and influence of the security business. By and large, we have ignored the 1961 warning of President Eisenhower about the growing power of the military-industrial complex (MIC). We do not know what it means that the MIC has sufficient funds to track every development in society, science and technology, while the society has no analogous capacity to monitor the MIC. Even fifteen years after the end of the Cold War, much of the science and technology developed in the security sector is not openly available to the civilian sector.
because the state has determined that it is not in the interests of “national security” to do so. The costs of such limitations to either our efforts to secure our society or to increase our prosperity are unknown.

- **Inappropriate Organizational Forms:** In the 21st Century, huge investments will be made in transforming the essential culture, structure and functioning of our organizations in every sector. The shift will be from our present hierarchical bureaucracies – forms that fit the conditions of earlier centuries – to new global value ecologies – forms that fit and can cope with the emerging conditions of the 21st Century. The boundaries between sectors will blur to the point of being irrelevant. We will seek organizations that are capable of relevant leadership, effective management and efficient operations. Collectively, the price tag for this transformation will be in the hundreds of billions of dollars.

The force that will push this transformation will be the recognition that efficient organizations that are neither effective nor relevant are a cost we can no longer afford. We will come to recognize that virtually all major institutions – private, public and voluntary – no longer serve us well. They are simply too narrowly focussed, linear, costly, time-consuming (unable to make timely decisions or take timely actions), unwieldy, hostile to high-quality knowledge and truth, insensitive to the communities and environments on which they depend, and inelegant.

The force that will pull us towards new ways of organizing large-scale human endeavours is the simple realization that fundamentally new organizational forms are a big win for virtually everyone. An extended value ecology actually fits the character of the work to be done. We will get it that virtually all work that adds value is knowledge-based, multi-faceted and requires boundary-crossing of interests and jurisdictions; that for the first time in history we have the ICT capacity to support such work; that customers who are increasingly multi-faceted require a multi-faceted capacity to engage with them; and that a critical mass of workers are looking for organizations that have adapted themselves to fit the emerging identities of post-Industrial well-educated people. As Homer Simpson would put it, “Duh! Why wouldn’t we do it!”

- **Canada’s Place in the World:** Historically, trade has anchored Canada’s prosperity. Our internal market has never been large enough to consume what we can produce. The percentage of our GDP that is dependent on trade is higher than any other OECD nation. Therefore, our place in the world is central to our future. However, the reality is that without a major new commitment to re-earn this reputation, we will continue to slip from being an influential mid-sized nation – how we see ourselves – towards just another of the world’s many mid-sized states. There are many reasons why new investments by Canadians are required to re-secure our place in the world. Consider:

  - Historically, Canada has punched above its weight internationally; we have had more influence than our size alone would indicate. Until recently, we have successfully practiced a “blowfish” strategy. However, if the world ever comes to see us as a country with only ½ of 1% of the world’s population, we are toast.

  - Our influence has been a function of our “family” connections and our capabilities – human, institutional, technological and financial. Our “family” connections have withered to the point that they no longer give us much of a leg up with either the UK or the USA. We are in danger of becoming an international orphan. In the ‘70s, we allowed our priority place in the hearts of Indians to wither. Neither China nor the EU has a serious interest in us. However, Canada is still...
recognized as having both human and institutional heft. Both are still sought by others. But over the last several decades our technological and financial heft has diminished. The latter capacity is declining at a time when we need to be making more international investments just to keep from slipping further off the international radar screen.

• The number of effective international players – governments, ethnic nations, agencies, corporations and NGOs – is growing. For example, contrary to the Canadian experience, most states are still defined as the home of a single ethnic nation. Since the number of states today pales in comparison to the number of ethnic nations, it is inevitable that the number of states will grow. Without offsetting action, as time passes our voice will be more and more muted and our influence will wane.

• Canada is earning a reputation in some circles as a country of talk, but little follow-through. Most of us will give a friend some leeway in order to allow them to get his/her house in order. However, those who refuse to shape up eventually get more severe treatment. Our reputation matters because in much of the world, it is still one’s reputation that closes and opens doors for trade.

• Canada is already being treated as an incubator for both high-quality people and effective corporations; a place from which both can be plucked when they are needed by the larger players. If this trend intensifies, Canada will suffer a dearth of effective leaders in both the public and private sectors. NAFTA has already hollowed out many foreign-owned firms. Since Canada no longer has an over-riding national project, there is little reason for the best to stay if they get a better offer from elsewhere.

• Asia’s primary interest in Canada is as a source of raw materials, energy and aid, and as a market for its goods. As a long-term pattern this is unsustainable. Canada needs new roles in the lives of Asians. Further, while we claim to be an “Asia/Pacific” nation, we do not act as if we are or as if this identity is important to our future. At present, we are seen by many as not pulling our weight in Asia.

• Canada is ill-positioned for a serious struggle between China and the USA. We have made China our Asian partner of choice, while the USA has a new alliance with India, in part, many think, in order to hem in China. Our understanding of human cultures, religions and identities tends to be so superficial that we will be taken aback by the divisiveness of these issues in the 21st Century and the ways they will play out within Canada.

• Relative to much of the world, Canada will continue to be seen to be a desirable place for individuals and their families to escape to. There are and will be far more such persons than we can accommodate. We will not lack for potential immigrants. But this is cool, if not cold, comfort that does nothing to reverse our slide out of the global mainstream.

• It follows that we must make new concerted efforts to re-earn our reputation as a mid-sized country of exceptional capabilities; as a reliable partner that can be counted on to keep its commitments. Fiscal realities of the Government of Canada dictate that we must reinvent Canada’s external involvements by learning to draw on the capacities of all Canadians and not

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40. There are now 191 states in the United Nations and more than 200 in the world. However, there are 2400 “significant nations” according to an unpublished 1985 Austrian study, including many who already claim the right to their own state.
Strategic Opportunities, Challenges and S&T of the Early 21st Century

just federal public servants. Our need should be grasped as an opportunity to align this aspect of Canada with the emerging character of the 21st Century and not as a poor second choice forced on us by fiscal realities.

- **Courageous and Insightful Leadership:** The need for courageous and insightful leaders who are able, competently, to exercise the new function of leadership has already gone critical. We are already suffering from the fact that few of our leaders could give a sound, worthwhile and spontaneous briefing on the forces that are changing our world and their implications for future strategic directions, core roles and goals of their organization, much less the whole society. This condition will only get worse until we develop a critical mass of persons who are deeply and intuitively able to see, think and act contextually, developmentally, deeply and reflexively. In our view, the widespread fascination with leadership that is revealed in so much personal conversation and in the titles of conferences, articles and talks is a signal that large numbers of people in many countries know that while they may or may not be adequately managed, they are badly led. In our view, this intuition is sound. Most of those who would lead us today have little more sense of what really needs to be done than do Canadians in general. Further, they show little sense that their ignorance is dangerous, even potentially tragic.

**D. Major Trends that may well Go Critical by 2020**

The major trends that may well go critical by 2020 are set out in this sub-section. All are notionally familiar. However, since none have yet gone critical, they do not press on our awareness with the force they deserve. But, given time, they will. Even when they do, as is the case with the trends that have already gone critical, it is likely that our awareness of these trends will lag behind changes in their objective conditions.

- **A Return to Domination by Big Powers:** The trend is back to the future – a world that is dominated by a few truly large Superpowers. But the line-up is changing. The USA, UK, USSR lineup is giving way to a new group – the USA, China and India. This development will disappoint both the USA and Canada – the USA because it prefers to be the only superpower; Canada because we prefer a truly multi-lateral world in which the voice of mid-sized nations is heard and respected. But Asia is not to be denied. It has always been clear that in time Asia would become a major locus of global power and influence. The question has been, “When?” Apparently the answer is, “Soon.” By 2020, given present trends, China will have an economy that rivals that of the USA in size. India will achieve this mark sometime in the 2040s.

The potential for serious conflict between China and the USA, should a bidding war emerge over Canadian energy and resources, is probably greatly underestimated. On the one hand, the USA takes it for granted that Canada has an obligation to meet its needs, even when we are offered better prices from others. It also shows no signs of being willing to voluntarily abandon its new role of sole Superpower. On the other, China has long been an Empire. For 5,000 years, it has conquered its conquerors by transforming them into advocates for Chinese culture. To date, neither the security of its identity nor its capacity to play out very long strategies have been challenged. The extent to which the new influences on its life can over longer period of time erode these characteristics is not yet clear. The Internet, education, Western science, technology and consumer goods are powerful carriers of individuating consciousness. However, in only fifteen years magic will not happen. The Middle Kingdom will expect to be treated as such. Given this, there is no chance that China will accept the

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41. This new function was introduced above. See the discussion of the “Change Gauge” in Appendix B for a more complete exploration of the new cognitive work of the function of leadership and why it must be undertaken in the 21st Century.
role of second fiddle in an essentially American symphony. Therefore, it is reasonable to expect a new Superpower struggle, if not yet a new cold war. At best, we could see some very bad moments and a long-term resolution that establishes a new era of equilibrium. At worst, the world could be plunged into a very serious cold war. In this case, Europe will likely take over Canada’s traditional role of intermediary and peace-maker. Should this happen, our room for independent action will be very small indeed. Clearly, we need to develop long-term strategies that increase our degrees of freedom and room for independent action – action that is not offered by our present fixation on the USA as our economic salvation. A serious re-discovery of both India and Europe seems to be called for. In the mid-term, there is much to say for having both as allies. In this context, another strategy is that of deliberately becoming the world’s champion of a post-Industrial future.

- **Further Decline of the US Dollar**: The status of the US dollar will likely become even more precarious in the next fifteen years. On the one hand, it is in the interest of Europeans, OECD and OPEC nations and the holders of USA dollars to nurture the status of the Euro as an alternative global currency. Such an achievement would greatly increase their leverage on the USA, which cannot afford a currency meltdown. On the other hand, the inclination of the present US Administration to ignore the size of its deficits and accumulative debt is further reason for these same nations to slowly and carefully distance themselves from the US dollar. One scenario is that by 2020 the required distancing will have happened slowly enough to avoid the collapse of the dollar, and the world economy with it. In this case the Canadian dollar might again be worth more than its US counterpart. Since this result would collapse much of Canada’s manufacturing capacity, destabilize federal-provincial relations and tie us even more closely to a Superpower under stress, it is imperative that Canadians get serious about increasing our resilience, adaptability and transformability.

- **An Emerging Culture of Knowledge-in-Strategic-Use**[^42]: In one sense, of course, every culture and economy has been knowledge-driven, i.e. dependent on and driven by the knowledge then existing in the culture. However, this new phrase adds a new perspective – sustained success now requires the reflexive capacity to determine whether or not the knowledge that one is routinely putting to use is (a) adequate to the task at hand when compared to the best knowledge that is available to others and (b) being used strategically. This is worth thinking through.

What images first come to your mind when you hear these phrases: ‘information society,’ ‘knowledge economy’ or ‘new economy’? Chances are, your first thoughts are about a new stage that is driven by technology – computers, chips, modems, e-mail, e-business, the Web and the bandwidth to access it. The equation is simple – a ‘knowledge economy’ is a high-tech economy. The more high technology one uses, the more one is a part of the emerging knowledge economy.

This way of thinking is now common. Business pages/programs are full of headlines and easy talk about ‘new economy firms’ (Nortel, Intel, Microsoft and the dot coms) and ‘old economy firms’ (Shell, CPR, GM, Agrium and most manufacturers). Whole sectors of the economy are breezily assigned to the future or the past. So... electronics, software, web-based enterprise are said to be new; while education, public service, agriculture, petroleum and steel are said to be old economy. The implication is clear. Old is yesterday; new is tomorrow. Get out of the old and into the new. Transform your business into a web-based business or die!

Canadians have been fed these lines from books and public platforms for two decades. Accordingly, it became official doctrine to feel guilty that we were still a resource-based economy. We failed to see that it is our resources that give us an edge in the 21st Century. Many commentators express regret that the present lift to the Canadian economy is based on the interest of others in our resources. As things stand today, far too many Canadians have come to now fear for the future of their business, their towns and even their country.

In our view, there are good reasons to fear for Canada’s future, but our reliance on resources is not one of them. It is true that we are in the midst of a profound, society-wide transformation. The old order is dying. We do have to change. In the words of the Premier’s Commission on Future Health Care for Albertans, “It is no longer good enough for Albertans to learn to do better those things which Albertans already do well.” All our work and research points to this conclusion.

The lesson is that the still-common way of thinking about the old and the new economies is unreliable – it is trapped in Industrial ways of thinking. It is not to be trusted!

Industrial societies divide the economy into four sections. As with print, the movement is from left to right. If this were a map, the left end would be the West and the right end the East.

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<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
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<td>Resource Extraction</td>
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<td>Agriculture</td>
<td>Autos</td>
<td>Government</td>
<td>High Tech</td>
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The Spectrum of Industrial Economies

Figure #2

When the common equation of the new economy with high technology is laid over this way of thinking, the message is clear, “Go EAST young man, young woman!” “Move left to right!” “Get into high tech. It is the future!”

But... what if the transformation we are in is also changing how we think of the economy and what is actually involved in creating wealth? What if the common Industrial understanding is, itself, yesterday and not tomorrow? What if the heart of the new knowledge economy is not technology, but the people who do the knowing?

If knowledgeable people are key, then any business or sector can be either old or new. What distinguishes past from future is the degree to which high-quality information is routinely and strategically accessed and utilized. This is good news. Our future is primarily in our heads, hearts and hands, and only secondarily in the technologies we utilize. Consider the following:

As we have noted, knowledge is inherently a personal, social and cultural creation, because knowledge is only information that has been internalized and validated by actual persons. It follows that a knowledge-based economy will ultimately be more, not less, personal than any Industrial society. This, too, is good news. For example, the content of this paper is what I think we know – it is our knowledge. But, to you as reader, it is only information. It will remain as such until you have internalized it into your own

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knowing, believing and behaving. Reliable knowing, then, is shared knowing – knowing that has been tested, agreed-upon and trusted-in-living within an actual self-critical community of persons.

One implication is that high-quality people are even more important in the 21st Century than they have been in the past. Another is that people – whether citizens or employees – must be actively engaged in the knowing on which our society and companies depend. You can no more know for other persons than you can digest food or love their children for them.

Knowledge-in-strategic-use, not the possession of information, is the key to sustained success in every area of life. The new message, in Hugh Wynne-Edwards' phrase, is, "Go north!" (See figure #3.) His point, which we happily echo, is that regardless of the sector of the economy in which one is active – the “X” axis – the new challenge as persons, families, organizations or a whole society is not merely to possess high-quality information, but to digest it into each one's own knowing and to know strategically. His advice is to focus on moving up the “Y” axis – to “Go North.” The implication is clear: any business can be a knowledge-based business. Every sector can be a knowledge-based sector. The question is not, “Which part of an Industrial economy are you in?”, but “How good are you and your people at routinely accessing or creating high-quality information and digesting it effectively and strategically into your everyday knowing, believing and behaving?” In time this new reality will erode the large and increasingly ideological distinctions among the public, private and voluntary sectors.

The human experience of creating, testing and using knowledge is slowly taking centre stage in current thinking. This is revealed in the growing preoccupation with the formation and transformation of cultures, whether in families, organizations or whole societies. The talk of “learning organizations,” of “markets as conversations,” and of “knowledge management” is finally focussing on human knowing as a central and inherently social process.

One implication of our growing dependence on the quality of our knowing maps onto the need for new organizational forms – regardless of the business you are in, your people must have enough
“elbow” room to test and revise what they think they know. “Going North” means that the days of controlling your people are over. Now you must learn with them. Mutual respect and common work, not external, structural authority, are the glue of the future. This will be as hard a lesson to learn for the private sector as it is for governments or the Roman Catholic Church.

The deepest question is this: "In a world in which many citizens are well-educated, widely-travelled and have easy access to high-quality information, how can we arrive at sound judgements which are respected, and thus accepted as binding throughout the whole community?" It is increasingly evident that social cohesion can no longer be achieved by either the assertion of one's authority – technical or structural – or by the use of majority votes. Unconvinced minorities now undercut virtually every majority decision. Any community will disintegrate and become ungovernable if it does not develop the capacity to create, trust and act on knowledge that is both reliable and widely accepted. If we are to survive as free persons and societies, we must develop a much deeper capacity than is now possessed by the citizens of any industrial society, to democratically co-create and agree upon that which, for us as persons, organizations and a society, will be true and binding knowledge.

This challenge maps onto the growing trend that we explore below – the new focus on being co-creators of our future with others in deeply democratic relationships. It is time to grow into a full adult maturity and to use this as the only standard by which we will judge our knowing, believing and behaving. This is the deep work which underlies every task of the 21st Century.

- **Climate Change:** In our view, it is entirely likely that the 21st Century will be marked by dramatic changes in the earth’s climate. We make no attempt to predict what the combination of heating, cooling and extreme events will be. But that the climate will be experienced as extreme we have no doubt. The implication for us is that, compared to the present focus on efforts to slow global warming, much more energy and effort needs to devoted to anticipating and mitigating the effects of these changes. We must prepare adaptive strategies to cope with possible outcomes now. For example, what would be the impact on Canada of a world awash in environmental refugees? Whatever we can learn from our experience with BSE, it is that it is way too late to begin to think these things through after they have happened.

- **Societal Change and the Disintegration of Identity and Community:** The reality is that profound societal changes are taking place everywhere. In large part, this is a result of globalization. All cultures already show significant signs of stress and dysfunction in the face of relentless pressures from late Industrial persons, institutions and markets – pressures to abandon the myths and values of Traditional cultures and begin to measure the value and quality of life primarily by dollars per quarter. These pressures will intensify. Even now it is clear that the 21st Century will be even more different from the 20th than the 20th Century was from the 19th. The new realities are slowly moving us off our inherited and taken-for-granted mental maps and models for every aspect of our lives, from government, to business, to communities, to religion. For example, no child born in the early years of the 21st Century will be able to die in the same world as that into which he/she was born. We are in for a substantial increase of people who live between dreams – unable to reconnect with their inherited identity and equally unable to define a new, stable identity.

The significance of this trend is that no society is prepared for such change. Most don’t even expect it, let alone know how to see it, think it through and handle it. A few moments’ reflection will reveal that the much-talked-of capacity of Industrial societies to adapt is hugely overblown. If Canada’s
capacity to adapt is revealed in the way we are handling the gay marriage debate, we are in deep trouble. This debate is marked by hatred, bitterness, accusations of bad faith and types of behaviour few of us would tolerate in our own living rooms. If this relatively trivial case is beyond our capacity for graceful and rational action, and it does appear to be such, then how much worse will our behaviour be if we are faced with a truly hard case? Even the Canadian gene for niceness may not be strong enough to deal with the frustration of people who fear that their world is being taken away from them by the willful acts of others.

As this trend intensifies, it should not surprise us if more of our leaders resort to fear as the basis of their appeal to actual and potential followers and to the projection of fear onto those who are vulnerable and easily demonized. By 2020, many Canadians may be leaving our largest cities, where these tensions will be most readily manifest, for the welcoming yesteryear feel of small towns. If these responses are to be avoided, we will require leaders the likes of whom we have seldom seen.

The Centrality of Societal Issues: The realization that the question is not, “What can we do?” but, “What do we want to do?” will have dawned on large numbers of us and gone critical. Ironically, our new S&T capacities will have shifted the fundamental issues raised by science and technology from technical issues to those that are human and societal – “What kinds of people do we want to be, in what kind of society and what kind of world?” To date, few who are scientifically literate are also knowledgeable about the ongoing social evolution of whole societies; fewer still are wise about such matters. The reverse, of course, is also true. This state of affairs reflects the fact that modern science is an invention of Industrial consciousness and the bias of that consciousness to use the ready excuse provided by the normal organizational structures of our culture – “This is not my responsibility. In my specialty, such concerns are externalities.” “The question is above my pay grade.” In short, we are utterly unprepared to cope with the conditions we are creating.

Consider the following: While it is true that Queen’s has an MBA focussed on the management of technology, the motivation and focus is on using these skills to commercialize technology, not on the wider questions of the interplay of science and society. While Canada now has a “Chief Science Advisor to the Prime Minister,” note that he is a science advisor, not an advisor on the mutual interpenetrations of science and society. Finally, while there is an academic society for the History of Science, there is no formal network or society of those who are knowledgeable about the interplay of science, consciousness and society.

Struggle Over Late Industrial Market Capitalism: Defence of late Industrial market capitalism by many who benefit most from it will increase in sophistication and volume. It will be argued, following Margaret Thatcher in 1982, that there is no alternative; that market capitalism is a necessary feature of any conceivable future. We are just beginning to see the serious societal struggle to defend market capitalism. This is not surprising, given that after the collapse of Communism it was widely thought by Capitalists that, “We have won.” “We own the field.” “There is no longer any serious competition.” It is also not surprising that supporters of market capitalism do not see it as a normal expression of Industrial consciousness, or see that it does not fit well with the new ideas that are now challenging those that provide the foundation of Industrial culture. In short, they will be blind-sided by the nature of the emerging opposition with no more capacity to understand it than they do the resistance of those who follow bin Laden. Resistance to market capitalism has not yet gone critical, but will do so by 2020. By 2020, the defence of market capitalism against those who would move beyond it may well be the next “war” sponsored by the Government of the USA. This struggle could
be very destructive. It could come to divide and fracture families, companies, political parties and
domestic institutions. The struggle over Intellectual Property – privatize it VS make it widely available through
open-source everywhere – should be seen in this light. It will be one of the bellwether battlegrounds
of this struggle. If the worst is to be avoided, it will take a quality of leadership that we have seldom
known.

- Struggle over a Closed View of Reality: Defence of a closed view of reality with absolute (invariant)
values will greatly intensify as those whose personal and organizational identity is now tied to this view
feel themselves to be losing the culture war, e.g. Roman Catholics and fundamentalists of all kinds –
Christian, Jewish, Islamic, Hindu and ethnic nationalists from pre-Industrial cultures. The potential
power and ferocity of this struggle is now greatly underestimated. Handled badly, it has the potential
to do the same kind of damage to Canada that the Reformation did to Europe. Lest this sound trivial,
we need to remember that hundreds of thousands were killed in the name of invariant truth. In 1648,
the Treaty of Westphalia established nation states in law in order to provide a way to put an end to
the killing. By 2020, the most divisive fault lines in the world may no longer be the rich West against
the rest, but the pre-modern majority against an increasingly post-modern minority. This new alliance
may even subsume the Islam against the West debate, as the West divides yet again along these same
lines. Lest this seem fanciful, this tension is already alive and well in mainline reformed churches. To
date it has been a destructive experience. Again, to avoid the worst, a rare quality of leadership is
called for.

- The Use of Fear as a Motivator: The use of fear as a motivator to gain support from potential
followers for both political and civic causes will greatly increase in Canada, as it already has in the
USA. The struggle between fear and love as our primary motivation is as old as humanity. At times
truly secure and civil societies have arisen because, among other things, they have found ways to
encapsulate fear so that its potential for virulent destruction is kept in check. It is instructive that
both the Hard Right and Hard Left now show no restraint in playing the fear card. They seem not to
understand that some form of totalitarianism is the only logical result of a society that comes to be
driven by fear and that such a society cannot be the civil society they claim to desire. This trend, of
course, interweaves with the three set out above. Only a historically rare quality of leadership will
allow us to escape serious damage to the democratic character of Canadian society.

- The Hunger for a Coherent, Convincing and Grounded Story of Our Society: The above trends
can be read as signs that many societies are already having trouble setting and keeping to a clear
societal course in the midst of times that are as confusing and conflicted as our own. Without a clear
and convincing course, it is too easy to get distracted. Big Picture Goals are forgotten and small wins
are settled for. One trouble is that a series of small and often incoherent wins do not add up to achieving
a Big Goal. In such situations goal displacement abounds and culture wars can erupt. In time, a
society that once hung together can become so deeply riven that daily civility is lost. At worst,
families that lived peacefully as neighbours can turn on each other. At best, a new story of what it is
we are doing living together in this same space will emerge – one that is coherent, convincing,
inclusive and grounded.44

In this light, consider the following countries and the different strategies they have chosen to provide
a focus for the multitude of individual efforts that make up their societies:

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44. The four adjectives are vital. In an interdependent world not every story will do.
• **Singapore** – a 650 square kilometre island-state whose very focussed leaders brook no opposition to the country’s motto: *Society over Self*. The imposed national commitment, bordering on a religion, is that priority shall go to growing human and material capital on a foundation of leadership in science and technology. This focus is not without cost to the social aspects of national life.

The tiny state occupies a hugely challenging location at the fulcrum of the world’s busiest sea-strait and between two internally-challenged countries many times its size and population – Indonesia and Malaysia. Nevertheless, Singapore continues to successfully attract investments, often to the cost of much less challenged countries, including Canada.45

The state is only a city, fixed in size, strategically located, academically and financially strong, and led in ways that are not challenged by a tradition of democracy and dissent. Therefore, its high ratings for innovation and competitiveness are not really surprising.

The next twenty years are not without storm clouds. Globalization is forcing Singapore to adapt to changing conditions whose highlights are a resurgent China, security of its water and energy supply and a slowly growing desire among some citizens to deepen its sense of democracy. However, Singapore can adapt quickly because it is small and cohesive.

• **The USA** – the world’s only global superpower. It began life as a Protestant enterprise. Therefore, there was an effective and widely-supported basis for holding the most assertive aspects of acquisitive individuating persons in check. Early on, American history was marked by strong individuals who put themselves at the service of others. Over time, especially in the 20th Century, acquisition won and the power of internalized restraint diminished. Today, the law fulfils this role. The question that is asked is less likely to be, “What is true and good for all of us?”, but “What can I get away with?” Accordingly, for public purposes the USA is increasingly legalistic, litigious, and amoral. In short, without the same clear intentionality of Singapore, the USA seems to have set its foot to the path of being a living experiment to see how far a society can get under the banner of “Self over Society.”

The jury is still out on the likely longer-term success of this venture. In the short run, the capacity of the USA to engage in and survive creative destruction in its economy is awesome to behold, especially for those of us whose tolerance for such dynamics is substantially lower. At least in the 20th Century, it is clear that the United States was able to out-think, out-produce, out-consume, out-acquire and out-gun everyone else in the world. Most are willing to grant that it will continue to be strong throughout the 21st Century. The question is its influence. It is not at all clear to us that the USA will be sufficiently resilient, adaptable and transformable to retain its overriding influence. Given how tied we are to US fortunes, the opportunities for Canada in this situation are probably fewer than the headaches.

• **The European Union** – a growing agglomeration of nations that started with a post-war passion for peace in Europe. Fundamentally, the EU is an adaptive response to changed circumstances – two World Wars in Europe in less than two generations. It is not, and has never been, marked by a capacity for rapid adaptation to further changes in its context. It is not only that, unlike

45. “Canada stands to lose a cutting edge scientific project….The Blueprint Initiative….to Singapore….” Globe & Mail, May 17, 2005, p.
Singapore, it is large, diverse and unwieldy. Rather, the story of the EU is that it is an adaptation, to be protected at all costs. The focus has been on this end, not on fostering further adaptation.

However, the EU has strengths that must be understood, and even emulated by Canada. First, given the complexity and ethic diversity of the EU, discussion of a new European meta-story is intensifying. Singapore they cannot mimic. The USA they reject as a model. So the question becomes, “What could we become when we grow up?” Canada could do worse than link into such conversations, both for the sake of the continuing success of the EU and our own. Second, the EU has made a more significant commitment to the practice of Foresight, particularly S & T Foresight, than any other large jurisdiction. Its infrastructure includes the European Science & Technology Observatory (ESTO) – a network of organisations that operates under the leadership of the Institute of Prospective Technological Studies (IPTS). IPTS, in turn, is an arm of the Joint Research Center of the European Commission. In addition, a new EU Foresight Academy is being formed and a good deal of funding is earmarked explicitly for foresight research, projects and conferences. The recommendation has been made that in the future all graduate students, regardless of discipline, must take at least one course in foresight.

• Canada. For over two hundred years, Canada’s official story was that we were British North America – the carriers in the New World of the best of the British tradition. It is no accident that the British Law establishing Canada in 1867 was called the British North America Act. By the mid-20th Century, it was dawning on us that this story gave short shrift to Francophones, Aboriginals and non-British immigrants. During the years of Pierre Trudeau we put to bed the story that Canada was most fundamentally about being British in the New World.

However, the story we replaced it with was the anti-story that Canada was a country without a story; that anyone could come here and live out whatever story they thought to be appropriate, as long as it was legal. In 1972, when visible minorities were small, this sounded reasonable. Besides, then our main preoccupation was to sell Bilingualism and Multiculturalism to Canadians as the official law of the land.

In our view, the absence of a common story is one of the factors that has led to the present fractiousness of Canadians. Many tie their identify as Canadians to a government program – Health Care. Others fight for a new “Republican light” identity – smaller governments, more deferential courts, lower taxes and more individual freedom. Some Francophones opt for a faux form of sovereignty. Our point is that, with no shared story to form a shared identity, this will be about as good as it gets. Not a good start on creating a culture that is agile, focussed, resilient, adaptable and transformable.

• The Crisis of Crises: The trend to multiple crises happening at the same time. The phrase to capture and warn us of the danger in this trend was coined by Willis Harman in the early 1970s. He argued that most of us, whether as persons or organizations, can handle one crisis, because we are able to invest our full energy in it; that a very few of us can handle two crises at a time; and that none of us can handle three at once. However, the chances that several places on the planet will face triple crises in the next fifteen years are high – virtually certain.
To make things worse, our capacity to cope is eroding. In virtually every culture, including our own, anxiety about the future is growing, as are mental and emotional breakdowns. In many places this is a silent epidemic that now affects almost 20% of the population. One of the many things that we do not know is at what point a societal collapse takes place. The intuition that it is much less than 25% is probably sound. The point is that at the very time at which pressures of global change are increasing and demanding more of us, many of us are calling in sick. This trend is the kind that may well lay us low when it blindsides us. Remember how the SARS crisis exhausted Toronto, the one-front war in Iraq exhausted the USA military and how little it takes to bring all creative work in Ottawa to a halt.

- **Clash of Culture and Religions:** Increased inter-cultural tensions, and even tragedies, can be expected in every country, including Canada. The first reason is that in a globalizing world the protective barriers of space, limited travel, costly communication and hard-to-cross boundaries no longer exist. We are stuck with each other. The second reason that inter-cultural clashes will increase is that no country has, as yet, developed its policy and practice on the basis of a sound understanding of what cultures are and how they actually change, evolve and transform. Our ignorance has made and will make things much worse than, in principle, they need to be. We in the West have been naive about cultural tolerance. We have developed our policy and practice as if profound differences among people regarding those things we officially deem to be private will have no effect on public behaviours, simply because we have deemed them to be private matters. Finally, in a growing number of countries, including Canada, there is now a legal basis for the privatization of cultural assumptions. It is called a Bill of Rights.

Unfortunately, we are as unprepared to think about and deal publicly with religion as we are with culture. The reasons are much the same. We do not understand religion mostly because it is officially deemed to be a private matter. It follows that ignorance of this matter does not hinder success in government or in business. Public policy regarding religion is even more likely to be formed by those who are almost wholly ignorant of it than is the case with ethnicity and culture.

Many understandings of religion are not helpful; they fuel misunderstanding, rather than dampen it. To start, it is helpful to treat religion like any other phenomenon – it will take on somewhat different forms in different places and at different times of its development. It is also useful to recall that we are also struggling to see ‘science’ in this way. It used to be thought that science was a single and invariant attitude and practice. Today, no one who knows about the evolution of science would talk about it in this way. Rather, they would understand that while both Aristotle and Newton talked of science, they were talking about perceptions and practices *vis a vis* the world that were very different from one another, and that to conflate them is a grave mistake that causes confusion, not clarity. Further, we know that to ask who got it right is to ask a flatfooted and ill-formed question. So it is with religion. We must learn to see its evolution and stop seeing it as if it is marked by a timeless, unchanging essence or cognitive content.

For most of human history, what may be called the ‘faith stance’ of a people was so deeply tied up with the practices as lived in daily life that it was not a separate activity. Their worship and their food gathering were both parts of the total work that they needed to do to live well. For such people there was no religion that could be separated out from the rest of their lives. To them the concept of religious freedom would make no more sense than the concept of food-growing freedom. While we talk as if one’s nationality, ethnicity and religion are all separate matters, for most of history and for most still today, these are simply major dimensions of one’s identity. To attack one is to attack all.
This sensibility can still be seen among many aboriginal people. It also predominated in the 7th Century in the West. Given that Islam was born into this world at that time, it is not surprising that Muslims would experience life as sufficiently whole that the later divisions between church and state that now mark the Modern West still are not found in Islam. When this is understood, we can begin to grasp why our demands for such a separation in Islamic countries is heard as a declaration of war on their culture, one that they would reasonably resist. Of course it is also the case that their capacity to re-frame our demands in analogous ways is no greater than their capacity to comprehend them. However, it matters. We have gone to war based on such mutual ignorance. And we think it’s their fault.

It follows that the widely-shared view – that we are facing a clash of cultures; that it is “Islam against the West” – is understandable, but wrong-headed. The culture clash is not us VS them. Rather the clash is one of a time shift. The struggle is between an unconscious understanding of how things are and should be that developed in the past and an equally unconscious understanding of how things are and should be that is taken for granted in the West today. If we knew our history, we would recognize that Islam and Christianity have nothing to do with our present struggles. Rather, we would see that our 7th Century selves are at war with our 20th Century selves; that 7th Century Christians would be as appalled at the ways of living that mark the present as any 7th Century Muslim. In this frame, the response of bin Laden to the discovery that modernity is leaking into every valley of the planet; that soon there will be no space for a good 7th Century Muslim to live faithfully, is fully rational, accurate and understandable. None of this is meant to justify terrorist actions. It is to show that a 2nd order reading of a situation at depth opens space for insights and strategies that are not available to us by any 1st order superficial reading.

Changing Human Consciousness: In our view, the 21st Century will be marked by changes in the patterns of human consciousness that are more dramatic than any in history. Of course, the pace and scope of such change will vary with location, education, and situation. However, the drift is unmistakable – it is slowly dawning on us that social realities are and always have been socially constructed; that we are now required to become conscious architects of our future; and that the quality of our actual future hangs on the quality of the work we undertake over the next very few generations. In short, we had better learn to live as co-creators of our lives and societies.

It is also the case that we are utterly unprepared to even see, let alone think through and cope with the phenomenon of consciousness change. We are ill-equipped to guard against its dangers or take advantage of its opportunities. The reason this is so is found in three undeniable facts. First, human consciousness actually changes. Second, even today most cultures treat such change as failure. Third, while we in Industrial culture acknowledge the reality of consciousness change, we have stripped it of its public significance by privatizing it. As noted above, we do not monitor consciousness change or take it into account for public purposes. This self-inflicted blindness keeps us from understanding many of the threats that face us, from terrorism to the fatal flaw in our doctrine and practice of multiculturalism. It is also keeping us from seeing and capitalizing on our drift to a post-Industrial society and economy.

These are the changes that are slowly and silently changing the ways we see, think about and act in our world.
• **From Piecemeal to Systems/Ecologies:** The default position of Industrial consciousness and cultures is to deal with things one at a time, in a serial order. Even when we recognize a set of relationships, we tend to reinforce this orientation by our use of such metaphors as “value chains.” It is slowly dawning on us that the reality of which we are a part is better caught in the metaphors of networks, ecologies and systems. For example, while economists provide us comfort with the notion of ‘externalities,’ it is now clear that living by them is both destructive and misleading. While we are not through this evolution, its drift is unmistakable.

• **From Community-defined Persons, to Individuals with Choices, to Interdependent Co-Creators:** As long as our roles and behaviours were tied to unchallengeable traditions, we had little choice in how we behaved. This was true at work, in our marriages and even in our voluntary roles. However, for the first time in history, the drift for the majority of people is to greater and greater participation in the definition of their roles and identities. This drift, if sustained, will spell the end to every traditionally-defined culture. But contrary to the established beliefs of Industrial cultures, free individuals are not the end of the story. It is now well established among researchers that individuation is a necessary step on the long journey of becoming a person who is able to take on the responsibility of working with and through others as a co-creator of one’s life, family, community, company and society. It is instructive that this next step is widely recognized and embraced by individuals in our society and yet it plays no role in our public discourse.

• **From Static to Dynamic:** That the truly true is timelessly true was a sensibility shared by both Aristotle and Newton, indeed by all who founded the Royal Society with him in 1661. This view was somewhat undermined by Kant, hugely damaged by Darwin and destroyed by Einstein. The downside is that something may not be essentially the same at two different times. The upside is that trend need not be destiny; our future is more open than we have ever dared to believe.

• **From Linear to non-Linear Change:** Linear change means that we can figure out just where we are and what to expect next. Non-linear change means that we have to give up the illusion of control; that we must anticipate what will happen when we can, but not know exactly when it will happen. We must also learn to anticipate the fact that new and wholly unpredictable things will emerge from chaotic environments.

• **From Mechanisms to Complexity:** Mechanistic metaphors both arise from and reinforce our need for control. It is not an accident that they flourish in command and control institutions. Thoughtful observers have always known that human persons are not machine-like, but this fact alone has not been enough to get us to abandon our fantasy. The metaphors and logic of chaos theory and complexity science, with its focus on unanticipated emergent entities with unique properties, is beginning to allow us to see, think and act to new music.

• **From Single Truths to Multiple Perspectives:** The timelessly true was once seen to be sufficiently independent of human experience that it could be described without reference to human perception. The truth could be told again and again in different places and even in different languages without nuance. However, the epistemology – theory of knowledge – that has come to underlie science has embraced a view of reality that makes central the perspective of

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46. George W. Bush declared that he stands in this now discredited tradition when he said, “I am not a President of nuance.”
the one who knows. The practical implication is that, if our knowing is to be at all reliable, we who are the knowers must view that which is known from as many perspectives as possible.

- **From Unconscious to Reflexive Living:** It follows from the above shifts that reflexive self-awareness has become a requirement for sustained success in the 21st Century. This demand adds a huge burden, but, short of death, it is inescapable.

- **From Surface to Multiple Depths:** Einstein’s much-quoted statement to the effect that we must solve problems at a different level of understanding from that which caused them is an invitation to develop multi-layered views of the world. While we have made significant headway in teasing out new layers of depth over the last fifty years, we have not yet completed the job. The new layers set out in our Change Gauge must be added to our repertoire. Major institutions need to develop a line of sight from their operations, not only to their multi-year Goals and vision of themselves in the future, but to their explicit understanding of the drivers, dynamics and drifts of this moment of history, including the changing shape of human consciousness. Otherwise, they are flying blind.

If, as argued here, changing human consciousness is a key to achieving a deeply satisfying future, then we must develop the capacity among Canadians to perceive, think through and act in relationship to our changing human consciousness. Far too many persons in senior positions are unfamiliar with this work; worse, they tend to conclude that because they do not understand it, it holds no value for them or their institutions.
II
The Deep Uncertainties of the Early 21st Century

A. Our Approach to Making Sense of the Information in Section I
One problem with the kind of information that is laid out in Section I is that, while illuminating, it is not actionable. As it stands, it is far from clear what it all means and in what directions we should move, let alone just what we should actually do. Which of the courses of action that are consistent with the foregoing should we choose? What to do?

Our response is to aggregate the information under three powerful and inclusive high-level categories that express a fundamental uncertainty about the 21st Century. Our intention is to identify the truly large, and at this point uncertain, issues on which, depending on how they are resolved, the essential shape of the 21st Century will hang. Our intent is to boil the information in Section I down to issues and choices that are more strategic and more easily understood. The strategic issues that fall out of Sections I and II are set out in Section III.

B. Three Critical Uncertainties of the 21st Century
We have chosen the following three aggregated uncertainties carefully and after a good deal of thought. However, we recognize that these are not the only aggregated uncertainties that might be chosen. Asked as questions, the three uncertainties on which we have chosen to focus are: (1) Will the core project that informs and animates whole societies remain as it is now or will a new cultural project emerge? (2) How generous will the physical environment of the planet be to humankind? (3) Will the quality of leadership offered by powerful and influential nations be informed by 20th or 21st Century realities? A word about each of our chosen aggregate uncertainties.

1. The Core Cultural Project that Informs and Animates Whole Societies: By ‘cultural project’ we mean the largely-unconscious aspirations which focus and sum up the human energy that drives a society. The core cultural project provides an answer to questions such as these: “What is it all about?”, “What’s the story we are in?”, “What finally makes life worthwhile?” “Why should I make an extra effort?” “What goals should we pursue?” “How should we organize to achieve them?” We do not suggest that the project of a culture is explicitly taught or memorized, for it is not. However, the sensibility of a people will be profoundly shaped by it, as will their own lives, their economy and society. All that they are and do will reflect, reinforce and reveal the core project of the culture. The great Canadian intellectual, Northrop Frye, made the point this way, “In what our culture produces, whether it is art, philosophy, military strategy or political and economic development, there are no accidents: everything a culture produces is equally a symbol of that culture.”

47. In appendix C we use two of these uncertainties to create four scenarios of the future in which Canada may find itself. These are included as a way to aid the digestion of the material in this paper and stimulate thought and insight.
The reason a culture’s core project is important is that, as we pointed out in the Introduction, every culture can be seen as making a cosmic bet that the way it sees, thinks about and acts towards reality is in fact reliable enough, given the conditions it is in, to be sustainable. This means that every existing culture in 2005 has met this criteria. However, the qualification – given the conditions it is in – is critical. If the conditions that have allowed a society to succeed up until now change and the culture does not adapt to them, the culture will die out.

Upon reflection, this contextual reality – that new contexts may require new behaviours if success is to be sustained – is not really news. We know that, once married, one’s identity as a single person must be transformed into that of a truly married person; that once one has become CEO, that behaving as one who is still advising the CEO will not cut it. To think that whole cultures would be immune from the influences of their contexts makes little sense. It follows that the core project of cultures that will thrive in the 21st Century must be projects that the actual context of the earth will support.

To date, the record of achieving such cultural change is, at best, mixed. Many cultures have expired because they have finally been unable to adapt to the changes they faced. While the adventure of being human in some society or other has continued, it is not clear whether we and others who are living in the emerging conditions of the 21st Century will be wise enough to continue the human adventure, preferably with some reasonable degrees of grace and prosperity. In short, our core cultural project is of utmost importance.

This is not good news for two reasons. First, we have no precedent for a culture to consciously evolve a new core cultural project. No society on earth, including our own, has consciously chosen its core cultural project. To this point, all have been inherited and unconsciously affirmed and continued. Even those that have adapted have done so unconsciously. Ten to twelve thousand years ago, it is indisputable that the shepherds of what is now Iraq fundamentally changed their ways of living by developing a settled way of life. But they did not decide to “do settlement” consciously. A new way of living, with a new core cultural project, just evolved. This is equally true of the evolution of Industrial consciousness and culture in the West over the last thousand years. Second, as we have noted, we know so little about the evolution of whole cultures that few people on the planet are in a position to offer advice that is grounded and wise.

But, according to Paul Kennedy, we have no choice. We must face both “the difficulty of changing entrenched structures and ideas and the danger of remaining culturally blind, given the transformation of global society” that we are now experiencing. Towards the end of his book he says, “If my analysis is roughly correct, the forces for change facing the world could be so far-reaching, complex and interactive that they call for nothing less than the re-education of mankind.” No small task.

We can also talk of a culture’s core project as a vital dimension of the story it is in. This is in distinction from the story of a people. The latter is set, most often unconsciously, within the frame of the story it is in. The story we are in tells a people what life is most deeply and truly about, including what kind of place the earth is, who we are as human persons, how we relate to others, the other, the earth and the divine, what is think-able and unthinkable, what is to be done, and what is error, evil, success and failure. As Thomas Berry put it:

49. Kennedy, op cit, p 344.
50. Kennedy, op cit, p 339.
It's all a question of story... The Old Story sustained us... It shaped our emotional attitudes, provided us with life purpose, energized action, consecrated suffering, integrated knowledge, and guided education. We awoke in the morning and knew where we were. We could answer the questions of our children. We could identify crime, punish criminals. Everything was taken care of because the story was there. It did not make men good. It did not take away the pains and stupidities of life, or make for unfailing warmth in human association, but it did provide a context in which life could function in a meaningful manner.\textsuperscript{51}

It follows that one way to classify societies is by the fundamentally different stories that they see themselves to be in. To show the difference, we will contrast the essential story of Tradition-bound tribal cultures and that of Industrial cultures.\textsuperscript{52} Of course, there are noticeable differences between Canada and the USA or France and Germany. However, these are differences between societies that are both versions of the same type of culture – Industrial. The differences between societies of a similar cultural type, real as they are, pale into insignificance when they are compared to the differences that exist between societies of different cultural types.

First, the story of Tradition-bound tribal peoples. The core project that is revealed in the story is in \textit{bold}.

In the beginning, the gods created. All that is here, including us – "the people," – was created by the gods for us. They gave us the earth as our home. We do not own it, but can live with it. It can be a place of bounty, harmony and prosperity, as long as we live according to the unchanging ways the gods have determined for us. Fortunately, the gods have revealed the ways they require us to live to our forefathers. "Our ways", then, are the ways of the gods. \textit{Fundamentally, what life is about is learning, and living by, the ways of the people as taught to us by the gods. Freedom, therefore, is only found in submitting to our traditions and accepting life as defined by them.} If this is understood, all else follows. Life will be good. But, if we choose to go our own ways; if we assert ourselves against the gods or the ways of the people, we, like lost sheep, will be led astray... even unto death. For this reason, we will deal with those who put us at risk decisively. They cannot be allowed to jeopardize the future of the people. This is the will of the gods.

In contrast, the story that Industrial societies know themselves to be in runs along the following lines. Again the core project is in \textit{bold}.

\textit{Not too long ago, our forefathers were bound and ground down by the shackles of poverty, superstition, ignorance and the illegitimate use of authority – both political and religious. But, over the last few hundred years, through education and science on the one hand, and democracy on the other, we have become free men. We have created the conditions within which each one of us is free to pursue the best life that we know.} Freedom – the absence of external restraints – is the fundamental value. All else must be subject to it. Those who wish to worship, may do so. \textit{It is their choice. But fact and value, church and state, society and economy are in separate domains. The good life is attained when each of us pursues his or her self-interest, because all things work together for good when we do so. The good life is measured by possession and consumption of (or as economists say, "command over") goods and services. The}


\textsuperscript{52} It would not add to this paper to offer a complete typology of cultures. However, this work must be undertaken and soon if the 21\textsuperscript{st} Century is not to become the greatest killing field of history.
heart of life, therefore, is in transforming undeveloped resources into goods and services which can be produced, possessed and consumed. While life involves many compromises, if we work hard and protect our ability to choose freely, life can be satisfying.

This latter is the only story that Europeans in Canada have seen themselves to be in. Becoming an accepted, successful and influential player in the Industrial world is the old core project Canada has known for at least five hundred years. Consider that by the time John Cabot was fishing for the British off Newfoundland, the early technologies and structures of consciousness that would become central to the emergence of Industrial culture were well established. We may not see ourselves this way, but Canada is one of the world’s first Industrial societies and economies. The question before us now, but only dimly seen, is will we become the world’s first truly post-Industrial society?

The great uncertainty to 2020, regarding the core cultural project of all nations, is this: “Will the core cultural projects that now dominate the various cultures of the world continue to dominate in 2020, or will a new and potentially global cultural project have arisen?” Since the answer to this question is one of the great uncertainties of the 21st Century, it is represented here as a spectrum of uncertainty.53

A word about each end of this spectrum.

Inherited Cultural Projects: In 2020, the situation regarding the core cultural projects of all cultures will be much as they are today. Several fundamentally core cultural projects will still exist and compete for the hearts and minds of men and women. No cultural project will have won – will have bound all seven billion people on earth in a common agreement regarding what life is most deeply about. In this world, the potential for significant cultural conflict still reigns and, given other factors, has probably increased greatly. Those in Industrial cultures still see life as a production/possession/consumption function, measured by dollars per quarter, and best pursued in spaces unfettered by external constraints. Many in more Traditional cultures will still seek to ward off what they see as the corrupting influences of Industrial cultures in order to sustain a space for lives that are faithful to the tradition. In such cultures, those who have embraced the Industrial story will rejoice in their new-found freedom, but be seen by the tradition-minded in their society as heretics – those who have betrayed all that is true. Given increasing globalization, no society will be internally coherent in 2020; all will be riven by increasingly bitter differences. Internal culture wars are now a reality, globally.

All cultures will still be essentially provincial at heart; rooted in a particular time and space in the past. None will be truly global or deeply aligned with the 21st Century. Although all will continue to believe that their truth and ways of living can be extended to all peoples, everywhere, this is simply not the case. The fact is, no existing culture can be scaled to the whole. None provides a basis for seven billion people to live in the ways it prescribes. Second order thinking, while slowly spreading, is not valued, developed or utilized to any critical degree in any existing culture. It is simply too disruptive.

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53. We fully grant that most of today’s opinion leaders do not see this as an open question; that they are as committed to the continuation of the Industrial project as was Sir John A or Pierre Elliot Trudeau. We trust that readers of this paper will also see, given the major trends of the early 21st Century, that a naive confidence in the continuation and sustainability of today’s core cultural project is no longer well-grounded; that ours is a far more precarious situation that we now know.
Ideal cultures will still be seen as more faithful versions of a known model, whether Traditional or Industrial. The relationships among cultures will still be governed by the logic of contradiction – if I am right, to the extent that you differ, you must be wrong. Therefore, cultural characteristics will still be at the heart of national identities. Newly asserted nationalities can boil over at any time, given enough provocation. Therefore, all people will know that regarding all things political and economic, “We must compete with them.” “We cannot afford to let them win.” In short, life is still seen as a zero-sum game.

In all cultures, science will be honoured in public, but actually paid attention to only when it is convenient. Everywhere, the protection of known truths will continue to trump the emerging truths of science. In short, there is agreement that science is a means to an end – that of cultural success. The thought that we can learn important things from it, in and of itself, will not have taken hold.

In the end, the whole point of both Industrial and Traditional cultures is to secure a future that is guided and shaped by the dream of achieving more of what is already known in the present. In both cases, if the world works as it should, the future will be essentially familiar to those who are alive today. The emergence of an essentially unfamiliar world is not expected, nor would it be tolerated. In spite of the rhetoric to the contrary, if we scratch under the surface, both sustainability and innovation are advocated to serve the project of extending the known present into the future.

The New Cultural Project of Co-Creation: By 2020, a critical mass of people in Canada, and possibly other OECD countries, are well into the process of learning to live by a new core cultural story and have embraced the new core cultural project that flows from it. The new project is that of adapting and transforming every dimension of the culture until it reflects and is aligned with the emerging character and requirements of the 21st Century. The project is to develop a truly sustainable global civilization by socializing every child and adult into seeing, thinking and living as if the future is a co-creation that emerges out of our hearts, minds and hands.

It is recognized that the new core cultural project is a several hundred year venture; that while much can be learned from the past, it must be judged by the following standard: Does it enable us to co-create a culture that can be scaled to the whole – one that is wise, secure, prosperous, innovative, inclusive, integrated and humane? However, for the first time in history, many are explicitly aware that they live at a time during which the foundations of a new civilization are being formed and that it is important for them to understand this dynamic, cooperate with it and contribute to the new project.

The thought that we must re-conceive and think through afresh every major institution from universities, to schools, to hospitals, to corporations, to governments, to communities, to families, to churches is taking hold. New regional, national and global research centres and networks of excellence and action are developed to undertake this work.

Reflexive learning is at the heart of the society, not just for children, but for all. Because we can only learn our way into such a society and because our future hangs on what we take as known, science is central and understood to be central. However, ‘science’ is understood as the most reliable way of establishing large communities of persons who know reliably. It is no longer restricted to the hard sciences, nor primarily valued as the source of new technologies. There is a major accent on the development of what Foresight Canada calls a culture-of-knowledge-in-strategic-use – one that routinely puts high-quality knowledge to strategic use in every area of its life. Second order perception and thought is valued and nurtured routinely. Wisdom is cherished.
In the end, in spite of whatever rhetoric is used, the whole point of such a society is the transformation of all that we have inherited into a society that nurtures the co-creative human capacity to learn to live in ways that shape the future and are continuously adaptable to it.

2. The Generosity of the Physical Environment of the Planet: By the generosity of the physical environment of the planet we refer to the degree to which the planet continues to provide plentiful resources and absorb the results of human actions without inflicting commensurate hardships on us. So a generous planet, to 2020, will provide more resources than are now expected and continue to be sufficiently robust to be hospitable to human life in spite of what we do to her. An ungenerous planet, by 2020, will be seriously resource-constrained and make us pay for both present and past harm that we have done.

It is important to note that the degree of generosity of the planet is somewhat plastic. Within limits of human behaviour and technologies, we either increase or decrease the amount of resources that are available to us and the resilience of the planet. For example, new irrigation technologies that never expose the water to the air can irrigate up to twenty times as much soil as can the technologies that spray water through the air. In short, as is the case with so many things, what is there is not only discovered but created. This thought is critical to any sustainable future.

The degree to which the planet will be generous towards us is the second great uncertainty to 2020.

A word about each end of this spectrum:

Ungenerous Earth: To 2020, an ungenerous earth will be marked by some combination of the following:

- Serious diminution of the Gulf Stream to the point that Northern Europe and North Eastern North America become noticeably colder. This will result in both increased energy use, increased demand for building materials, decreased crops from agriculture and environmental refugees.

- Serious increase in the pollution of the oceans. Dead spots grow, combine and expand. Fish stocks continue to drop as does the world-wide harvest of fish. The ocean’s capacity to generate oxygen is diminished.

- World-wide food production, and not just its distribution, is a matter of serious concern. It turns out that Lester Brown was closer to the mark than government and private sector forecasters. It is clear that the damage done within China to its environment is far worse than was understood in 2005. Two hundred million Chinese are at risk of starving to death. Canada is asked to absorb 5% of them – ten million – as our share of their environmental refugees. Canadians are on the horns of a dilemma – we are unwilling to watch millions of Chinese die before our eyes while we do nothing and we are unwilling to risk the future of Canada by flooding the country with the number of refugees that must be accepted, if this disaster is to be avoided.
In spite of the essential stability of the amount of water on the planet, clean water is in short supply in many places. Because of the careless use of water in Southern Alberta, its needs are now being met by inter-basin transfers. This opens the door both to increased pressure from the USA to export water and a decrease in the salt levels of the Arctic Ocean. The former causes Federal-Provincial stress within Canada; the latter contributes to the slowing of the Gulf Stream. Environmental migrants strain resources and human tolerance.

The energy crisis predicted by some, but ignored by virtually all governments, is upon us. There simply is not enough oil and gas to meet demand. Neither Saudi Arabia nor the new fields East of the Caspian Sea can make up the required differences. While new pools of oil are found, they are smaller than anticipated. It turned out that Exxon was right, we passed Hubbert's Peak in 2010. All of this is exacerbated by social instability and political turmoil in many oil producing states. The results are all unpleasant. The world economy becomes unstable. While this helps with the demand side of the energy situation, it also greatly increases political tensions between China and the USA. Alberta discovers the downside of being a major energy supplier with close ties to the USA. Its room to seek out other buyers, as if there was a free market, has vanished.

The global flu pandemic, feared in 2005, occurs and is much worse than anticipated. 20% of all of people on the planet caught the flu and 25% of those died. As with the Black Death, the long-term effect may be new beginnings for many. But by 2020 we are still too close to the tragedy to give this much thought.

A major volcanic eruption occurs in Yellowstone Park. The Plains States and the Southern Canadian prairies receive a foot of ash. This is far from the record, but enough to cause society-wide turmoil. It also reinforces global cooling, decreased food production increases the number of environmental refugees.

Concern with the possible strike of a newly-found asteroid increases the efforts to deflect it from its present path. This soaks up huge amounts of government and private cash.

Efforts to mitigate these trends by developing new technologies increase; long-term results are promising; but immediate breakthroughs are few.

Through all of this the human population grows to over seven billion.

All of the above trends will contribute to governments being financially strained and less robust. The same condition applies to the social and psychological state of our selves, our families, our communities and our organizations.

Could each of these things happen? Yes. Will all of them happen? Not likely. Will some of them happen? Very likely. Do we have the capacity in Canada to make a grounded and integrated estimate of the likelihood and the potential damage that might be done? No.

Generous Earth: To 2020, a generous earth will be marked by a combination of the following features:

The worst cases of environmental degradation do not occur, e.g. the Gulf Stream does not diminish noticeably, the flu pandemic is much less destructive than predicted, China suffers less environmental
collapse than is now feared by those who watch it closely, extreme weather events do not increase in either scale of frequency, major volcanos do not erupt and major earthquakes do not occur. In short, we dodge several bullets and are much less severely tested than we could have been. Nature cuts us some slack.

- The number of environmental refugees is well within historical ranges. No existing society is overwhelmed.

- New large pools of oil are found and new technologies are developed for extracting more of the residual oil in existing reservoirs. Hubbert’s Peak will not occur until well after 2020. This provides time for new nuclear plants to be built, alternative technologies to be refined and demand reduced.

- The generosity of the earth mutes political tensions and creates world economic conditions that are reasonably stable.

- We discover the demand side and take action on it. There is time and money to develop new technologies and adapt to new ways of living. The amount of water used for all purposes in Canada is cut by 50% by 2020, in spite of a growing economy. The amount of energy used is cut by 20%.

- Governments have the resources, both financial and psychological, to cope with the crises at hand.

Could each of these things happen? Yes. Is it likely that none of these things will happen? No. Is it likely that all of these things will happen? No. Is it likely that some of these things will happen? Yes. Do we know which ones and how important they might be? No.

3. The Quality of Leadership that is Offered: By the quality of the leadership that is offered we refer to the degree to which those in formal positions of leadership, in every sector of the society, offer their leadership in a manner that reflects 20th or 21st Century understandings of the nature and work of leadership.

Discussions of leadership often end, and sometimes even begin, in confusion. Therefore, definitions are in order. The key distinction is between ‘structural leadership’ and ‘the capacities of leadership.’ The former – ‘leadership,’ – refers to those at the top of an organization’s hierarchy and their formal status in the organization. In this sense, leadership is limited to those at the top. The latter – ‘leadership,’ – refers to the three types of capacities that an effective leader must demonstrate: emotional attractiveness, sound character and intellectual depth. In this latter sense, anyone can exercise these capacities. Our focus is here on this capacity for leadership and the intellectual depth that it requires. There are two reasons for this choice. First, there is a huge literature on the emotional and character dimensions of leadership. The former is a response to the changing sensibility of our society, driven by the Big Generation and those that follow it. Fresh interest in the latter has been stimulated by such events as the Enron and Sponsorship scandals. Second, the cognitive work of leadership has been neglected. There is virtually no literature with this focus. Given the biases of Industrial culture, this situation is not surprising. Given the changes now occurring in our society and others, it is unacceptable.

Our analysis suggests that every culture rests on, reveals and reinforces a non-trivial sense of the depths of human life. We distinguish three primary levels of depth. Moving from the surface to deeper levels they
Strategic Opportunities, Challenges and S&T of the Early 21st Century

The cognitive work of Administration is *know-how* – knowing how to do the physical tasks at hand, with the assigned resources, on time and within budget and how to pay appropriate attention to what one is actually doing. The objective is a job done well and efficiently.

The cognitive work of Management is thinking about doing – thinking through the line of sight that must extend from one's goals, to one's policies, objectives, work plans and budgets to the work itself. Note that the overwhelming focus of Administration is on the work of the organization and that the primary focus of Management is still on the organization and its work. The objective is to ensure that the work of the organization is also effective; that the goals and objectives are reached.

The cognitive work of Leadership\(^{55}\) has two foci.

- First, the work of sensing and seeing one's historical situation with fresh eyes. Those who do the cognitive work of Leadership turn away from their organization and look beyond it to the historical situation in which it exists. The intent is to explore and understand the fundamental trends and dynamics of the world well enough that the organization is always well-positioned for success. The objective is to ensure the continuing relevance of the organization – to understand emerging strategic conditions while there is still time to act to mitigate the threats before they have become crises and to capitalize on opportunities before they have dissipated.

- Second, leadership also focusses reflexively on the consciousness of those who are doing this work – the eyes with which they see the world. This second focus reflects the understanding that what is seen is not merely a function of what is “out there,” but also a function of the consciousness that is doing the seeing. In short, leadership is deeply personal work. The street-level intuition – that when judging leaders we are judging what they do, what and how they think, and how they see the world and its possibilities – is justified. This second aspect of the fundamental work of leadership – that of becoming aware of the fundamental metaphors and their logic by which the consciousness of the people in a culture is shaped – is relatively new work for which there are not yet agreed-upon standards. However, the work must proceed because of the character of our time. We live in one of the few times in history in which the path forward requires a new imagination of the nature and destiny of humanity – an imagination informed by metaphors that take us beyond those on which Industrial culture has been built.

The distinctions between the work of Administration, Management and Leadership imply that the mind doing the work of leadership differs as much from the mind doing the work of management as the latter does from the mind doing administrative work. The point is not that one level is more important or virtuous than another, for it is not. Success requires that the work of all three levels must be done. However, it is also clear that, as better administration does not create good management, so better management cannot create good leadership. If the times call for leadership\(^{55}\), as times of profound societal change do, then leadership must be exercised. In such times, structural leaders who cannot undertake the cognitive work of leadership are dangerous to their organizations and societies.

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54. See Appendix B for a more complete statement.

55. The name we in Foresight Canada prefer for the cognitive work of leadership is ‘strategic foresight.’
In 2005, virtually all organizations have some degree of comfort with the work of both Administration and Management. This is not to say that they have a perfect line of sight from their Core Roles and Goals to their daily activities; most do not. But, at least, they are working on it. However, in spite of common talk of ‘societal change’, ‘leadership’ and ‘vision’, most leaders in most organizations are still not undertaking the new cognitive work of leadership. Not understanding the times, most are still trying to ensure the future by working more intensely to improve their management practices. But as we have seen, the medicine of better management never gets anywhere near where the trouble is.

Consider President George W. Bush in this light. Whatever one may think of him, he is one of the few persons in a position of formal leadership who has a line of sight from a strategic reading of this moment of history, through the strategic directions in which the world must move and the values to guide action, to specific long-term Goals, Strategies and Objectives. This penetrating view is the source of much of his attractiveness. It is also worth noting that those who rail against him and his projects seldom offer an equally powerful reading of history and what it demands from us. Rather, because they are managers claiming to be leaders; they offer programs without Goals, and criticism without insight.

We can now see that one of the great questions of the early decades of the 21st Century can be put this way, “Will the quality of leadership offered by powerful and influential nations be informed by a 20th or 21st Century sense of the work of leadership?”

A word about each end of this spectrum.

20th Century Management: To 2020, a world led by leaders who are capable only of undertaking the cognitive work of management will have these features:

- At best, both organizations and the whole society will become more efficient and effective. Both are worthy achievements. Our performance, measured by either of these criteria, is still far from the optimum level.

- The growing number of people who focus on the quality of living, and not just access to goods and services, will ignore these achievements and complain. Leaders whose efforts led to these achievements will feel slighted and become defensive.

- The importance and reality of the achievements will tend to hold back the recognition of the need for the exercise of leadership. This will reinforce the phenomenon of overshoot with its short-term gains and long-term failure.

- Because 20th Century management is still informed by the metaphors of Industrial culture and held in thrall to the core Industrial cultural project, we can expect that the core Industrial cultural project will be pursued single-mindedly. This will result in:
  - An increase in the divides that separate those with power from those without power, those with wealth from those without wealth, those with security from those without security, those who are
well-educated from those who are not well-educated; and those who are technologically-savvy from those who are not. These divisions will be railed against by the increasing number of those who are left out and justified by the minority who benefit. To the latter, nothing will be seen to be wrong with the rise of gated communities, private security services, multiple tier health care and wars on terrorism.

- Increasing churn in employee turnovers as employees look in vain for organizations to which they can give their full commitment. The existing trend will grow to more small companies run by those who have fled the world of large organizations in the hope that they can regain control and integrate their lives and work.

- Our large institutions will slowly become even more control-oriented than they now are. In part this is because the default view of Industrial culture is to regain control by imposing more control; to ignore the reality of Ashby’s Law. In part, the kind of employees who are attracted to large organizations will be those who seek to exercise control. In the short run, this psychological self-selection will appear to work. Ultimately it will fail as the conditions for resilience, adaptability and transformability will not have been created. Innovation consultants will flourish. The societal impact will be negligible.

- Public institutions will flounder as they are at one and the same time told to be expansive and innovative and to restrict their spending and impose even greater internal control. As with health care today, those who understand that a fundamental transformation is called for will not be heard as the society is divided over choices among essentially superficial solutions. There will be much talk of systemic solutions, but little truly systemic analysis will be undertaken or acted on. To do so is simply too high a hurdle. All the while the relevance, effectiveness and efficiency of our institutions will decline.

- All of the above will contribute to overshoot. Canada will continue to decline, since its leaders are incapable of understanding or addressing the more subtle reasons why we are failing.

Could each of these things happen? Yes. Will all of them happen? Not likely. Will some of them happen? Very likely. Do we have the capacity in Canada to make a grounded and integrated estimate of the likelihood and the potential damage that might be done? No.

**21st Century Leadership:** To 2020, a world led by leaders who are increasingly capable of undertaking the cognitive work of leadership will have these features:

- Because those who exercise leadership understand that they must have a line of sight from their historical analysis through management to operations, the work of greatly improving the efficiency and effectiveness of our organizations will be undertaken. The difference is that the new conceptual foundations of this work will also be understood and valued, so that efficiency no longer sacrifices effectiveness, and effectiveness no longer sacrifices relevance. For example, there will not only be an institute in Fort McMurray for nurturing the capacity to manage truly large-scale projects, such as the oil sands, there will be an institute for understanding long-term cultural change, evolution and transformation in order to consciously nurture the evolution of consciousness and whole cultures.
Strategic Opportunities, Challenges and S&T of the Early 21st Century

- Sector-spanning, society-wide, globally-connected networks and organizations to undertake the new cognitive work of leadership will be developed at regional, national and international levels. At last there is a formal capacity to see and think through the multitude of trends and factors that must be encompassed in order to undertake serious and sound strategic foresight. Canada becomes the first nation to make this kind of work easily accessible to all organizations and citizens.

- Truly systemic understandings of our present historical condition, including its threats and opportunities, are not only developed but utilized to formulate truly new visions of our future and new strategic directions, core roles, goals and strategies for all our public institutions. There is reality to the promise that they can again become relevant, effective and efficient.

- A critical mass of Canadians is comfortable with and committed to the view that ours is truly a time of profound societal change and that the only adequate response to it is for Canada to become a living learning laboratory for the work that must ultimately engage all people on the planet – that of aligning all existing cultures with the new realities that are coming to characterize the 21st Century. This idea is central to both our new commitment to community development and to wealth creation. We get it that by breaking new ground regarding the evolution of whole cultures we are creating knowledge work for several generations of Canadians, and making Canada a Mecca for those from all over the world who are willing to invest their lives and funds in this work. The power of this new vision and the seriousness of the commitment to it does not solve all our problems, but it provides a basis to hang together rather than pull apart into warring camps. For the first time in our history, Canadians have a common and inclusive project to which all can contribute.

Could each of these things happen? Yes. Will all of them happen? Not likely. Will some of them happen? Very likely. Do we have the capacity in Canada today to make a grounded and integrated estimate of the likelihood and the potential benefits that might be achieved? This is unclear, but we are hopeful.
III
Strategic Opportunities and Challenges in the Early 21st Century

A. Our Approach
Our approach to exploring the strategic opportunities and challenges of the early 21st Century has the following features:

- We treat the opportunities and the challenges as one. They are different angles of perception on a strategic (history-altering) issue.

- We order the issues into the three levels of generality that correspond to our earlier distinctions among Leadership, Management and Administration.

- We assume that if cultures, organizations and persons are able to sustain success in the early 21st Century, they must have a reasonably coherent line of sight that extends from the physical activities that are undertaken each day through to work plans, strategies, goals, core roles, corporate culture, strategic directions, future vision, a grounded and comprehensive reading of history, to the ontological and epistemological assumptions on which all else rests. We acknowledge that this will be increasingly difficult, since one of the impacts of globalization is to cross-breed cultures. All are becoming mongrels. This fact, however, also makes this work even more urgent as cross-cultural organizations and communities can fail due to the fundamentally different assumptions and expectations that are in play – assumptions and expectations that are virtually invisible to those who hold them.

- We note that the three levels of consciousness and culture are levels of generality in a system. This means that the levels are nested into each other as levels of influence. More specifically, in a grounded and democratic culture, those who do the work of Leadership will shape the world and work of those who undertake the work of Management, just as the latter will shape the world and work of those who operate. In other words, organizations that are only able to function at the level of operations should expect that they will have little influence on Policy, let alone the serious work of Leadership. In effect, they will be owned and used as those who undertake this work see fit. In short, it is better to be able to play at multiple levels.

- Since Canada has no established infrastructures and organizations with the mandate to identify and undertake the new work of Leadership, there are serious choices to be made regarding how such work will be pursued. The questions are, “Will we assign it to an existing body in the hope that it can grow into this new work?” or “Will we create new bodies to do this new work?” The fact of this choice means that existing bodies that become aware of the need for the new order of work may be able to lobby for the assignment on the grounds that, while they are not entirely suited to the work, this is also true of every other existing body, and they have as many of the features that the new work requires as any.
In all that is done, we need to think as global citizens who happen to live in Canada, rather than as Canadian citizens whose interests and concerns stop at our national boundaries. This means that we will develop our responses with and through those who live outside of Canada, as well as with Canadians. We will share the investments we are making in our future with all those who are willing to cooperate with us. No Canadian network of excellence or influence will stop at our borders. Capacities that are in Canada but off limits to others will no longer do. None will be wholly owned by the Government of Canada or staffed wholly by civil servants, as would be normal today. All will be established in ways that serve all persons in the society who have an interest in the work. Open source will be the order of the day.

We proceed in this way for several reasons. First, it is in our deepest interest that the human journey continue and continue to succeed. Second, we grasp the lesson Gorbachev taught in the late 1980s – in a globalizing world we will either lose together or win together, but all thoughts of successfully playing a limited win/lose game must be abandoned. Third, we get it that in a globalizing world our reputation in the rest of the world is our most precious asset. It opens and closes the doors of opportunity. Fourth, we recognize that by limiting our concern to ourselves we miss all of the advantages of drawing on the full power of an Internet-connected world. Finally, the point is to create Canadian capacities that enable all of us to meet the challenges of the early-to-mid 21st Century.

B. Strategic Issues at the Level of Leadership

Three overriding strategic issues are identified – one for each of the aggregated driving forces that were identified in Section II. These three issues are truly strategic. If we fail with them, it is likely our culture will fail. Further, these issues are interwoven. If we tackle any one of them strategically, we will inevitably run into the others. Success with any of these issues entails success with all of them. Therefore, if the divisions among the three issues that are set out below feel somewhat artificial, we readily acknowledge that they are.

Canadians need several things from the work at this level: A grounded and widely-shared sensibility of where we are in history – the essential contours and challenges of this moment. A powerful vision of what we can become by working together in a dedicated and sacrificial way over a generation. Articulation of the strategic directions in which Canadians must move and the character we must exhibit as we travel. Taken together these will articulate the core cultural project to which we are committed. If we do not articulate these things anew, it is almost certain that our the current core cultural project – expanding our economy as an Industrial economy – will swamp every proposed alternative.

1. The Co-Creative Culture Project: The first overarching strategic issue of the early 21st Century is this: to develop a plurality of citizens who understand and are committed to nurturing the evolution and transformation of Canada into a truly 21st Century society and economy. There are two reasons. First, the path we are on is unsustainable. In this, of course, Canada is not unique. No culture, as it now exists, is well-suited to thrive in the emerging conditions of the 21st Century. Second, without the political will that is expressed by a plurality of citizens there is no chance that Canada will take a new path into the future.

The project, then, has two main elements: (1) Getting a plurality to recognize and understand that sustained success of the human journey requires that we embrace the work of becoming conscious architects and intentional creators of the new ways of living that truly fit the unique conditions that are emerging in the 21st Century. (2) Developing and then successfully executing a relevant and effective path forward that will enable us to become the world’s leading, learning laboratory for this work.
Our opportunity is that by committing to this journey we can, over a generation, re-position Canada as the most influential mid-sized country on the planet. This apparently high-risk strategy will, ironically, turn out to be the most effective long-term economic development strategy available to us. With Wayne Gretzky, we will be “skating to where the puck will be.”

One dimension of the challenge is that neither we nor any other country have already developed the infrastructures, organizations or human capacities that success in this work requires. Clearly, most of the work lies ahead of us. We need to develop appropriate understandings, relationships, networks, institutions and technologies. Nevertheless, several indicators suggest that Canadians are better suited and prepared for this work than virtually anyone else. Among these are our reputation for fair and effective action, size (small enough not to be threatening and large enough to have some heft), economy, connections to the world, post-ethnic definition of citizenship, high levels of education, and relative youth.

Jim Dinning, Treasurer of Alberta during the deficit wars of the 1990s, is fond of saying, “Politicians do not start parades, they follow them.” The question, then, becomes, “What actions might be taken by Canadians to start this particular parade?”

We offer a parade-starting option and several ancillary pieces of work. The list begins with the most general and moves to more particular responses. All, however, are responses at the level of leadership. All, therefore, require integrated, developmental and reflexive approaches. All would be networked with the others. None would belong to a particular field or discipline. All would make contributions to the development of intentional, reflexive future-informed design – whether of our cities, organizations, landscapes or curricula. Each would also work to develop appropriate tools and technologies that make this work easier and more accessible.

- A Royal Commission on Enabling Canadians to Shape Their Future:56 This expensive, multi-year effort is not about getting the commission’s answers to a question. Rather, it is a way of creating a legitimate context within which the critical mass of Canadians who are now ready to respond to this challenge can find one another, engage in strategic dialogue and get organized into a parade worth following. The parallel is to Lester Pearson establishing the Bi and Bi Commission. He did so long before there was groundswell of support for such action. Rather, it was a strategy to educate English Canadians about realities in their midst they were then overlooking at their peril. We argue that the case for a Royal Commission to enable Canadians to explore the case for and nature of a new core cultural project is analogous. Some of the initiatives that follow could well be developed by the Commission and launched in response to its recommendations.

- A Networked Research Centre of Excellence for Advanced Study of Long-Term Cultural Change, Evolution and Transformation: This initiative will create a unique, world-class research centre that is the focal point of a new integrative science that will provide powerful and integrated understandings of the phenomena of societal transformation. This will provide a basis to explore in a new light such phenomena as globalization, secularization, the emergence of new understandings and practices – for example, empirical science and the Internet – and the continuing evolution of same. It will develop the evidence that ours is a time of truly profound societal change, evolution and transformation, the drivers and dynamics of such change and the emerging shape of a post-Industrial society and economy.

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56. This idea is set out in greater detail in one of the scenarios in Appendix C – Pioneering Again.
A Substantial Networked Research Project to Assess the Case for a New Core Cultural Project: If the above steps seem too steep a hill to climb, one way to start would be to undertake a substantial research project to assess the evidence for a new Core Cultural Project. In addition to creating an assessment that today does not exist, the project would achieve these objectives:

• Identify and network together the Canadian scholars, practitioners and community leaders who have an interest in this view.
• Connect such Canadians to the global networks of researchers who share this interest.
• Create a website with this focus to make it easy for other Canadians to express their interest and learn.

2. The Project to Increase the Generosity of the Earth: The second overriding strategic issue is that of the generosity of the earth. Two things are clear to us. First, the earth's generosity has been critical to the success of the human adventure. Given the limited levels of consciousness that we have developed to date, we could not have survived had not the earth been so bountiful. Second, unless we change our consciousness we will be entering a period of a less generous earth. Even with a change of consciousness, it is not clear that we shall be able to avoid this fate. Nevertheless, she now needs our cooperation. It behooves us to do all we can to increase the earth's generosity. Finally, we must remember that this issue is part of a three issue set that must be tackled together. If it is tackled alone, as is our Industrial inclination, the reality of overshoot will almost certainly swamp us.

This project, too, has two elements: (1) Developing ways of seeing, thinking and acting that tend to increase the generosity of the planet; to make what she offers now stretch further. Included, for example, would be ways to burn coal cleanly and efficiently, ways to extract a higher percentage of the oil and gas now left as inaccessible in reservoirs, ways to routinize the practice of industrial ecology so a zero waste society becomes feasible, and ways to return water to streams in a fully potable state after their use by some industry or household. (2) Developing ways to reduce our need for the resources the earth offers us; ways that reduce our ecological footprint. Most of the responses included would entail new designs for human processes, e.g. urban designs that increase walking and decrease our need to drive short distances, ITC designs that replace travel with virtual work, house designs that use both energy and materials more efficiently. Sadly, many technologies that fit this second dimension are available, indeed many have been available for some time. What is lacking is the political will to act when markets alone are insufficient to induce action. This makes our point that this project is intimately linked to the emergence of 2nd order leadership and the energy that will be released by the 21st Century cultural project.

We offer the following as an addition to the infrastructure that dealing with this issue requires. As was the case above, the list is not exhaustive. Again, we assume that all of these initiatives will be networked together and web-enabled, with major data-bases that are accessible to all who are interested. All will also find and promote success stories – examples of exceptional achievement.

A Networked Centre of Excellence for the Science and Technologies that Support the Continuation of the Human Journey: This initiative is central to the re-invention of science in Canada; its evolution into 21st Century science. The new body will create a science-based, sector-spanning and trans-disciplinary body with a mandate to develop an ongoing comprehensive, integrated and far-reaching overview of just how well we are doing as a species. It will also have a mandate to nurture the development among Canadians of an adequate understanding of our status and condition and of appropriate technologies to mitigate it. To achieve these ends it will work with and through others. No such capacity now exists. Such a body would best emerge from the Royal
Commission. If this body is created without the supportive sensibility that will be created by a Royal Commission, it will have a much harder time operating at the appropriate level.

3. **The Project of Developing the Leadership Capacity of Canadians:** The third strategic issue is this: *as of today, Canadians do not have a developed capacity to exercise leadership, and without such a capacity we will almost certainly fail.* Our prospects are that stark and simple. We may still fail even if we learn to practice the new cognitive skills of leadership. With them, at least we have a chance. The following initiatives are among those that would assist in this work.

- **A Networked Centre of Excellence for the Development of Persons and Communities that Exercise Leadership and Self-Governance:** It is clear that there is little hope of our being able to notice, understand and cope creatively with the truly swampy and complex issues of the 21st Century unless we have a growing number of people who can chase after the world when it moves off their mental maps and then adjust their own mental maps and their behaviours. Today there are probably well over a million Canadians who care about this work and several dozen centres that are devoted to it. One thing that is lacking is the capacity to allow such folks to find, encourage and learn from one another. Another lack is the capacity to define and undertake serious research in this field. The proposed network would remedy the situation.

- **A Networked Centre of Excellence for Strategic Foresight:** This centre would nurture the practice of strategic foresight at a high professional level. It would also make it easy for Canadians to explore, understand and respond creatively to the many ways our society is being shaped by many forces. A national, cross-sector network is needed. It makes no more sense for each serious foresight exercise to start from scratch than it would for each chemist to have to start by re-creating the periodic table of elements. Yet, regarding strategic foresight, that is what we in Canada are reduced to.

C. **Strategic Issues at the Level of Management**

As set out above, Management is a level of generality that is primarily concerned with thinking about the effectiveness of human action. “Are we achieving the goals we set out to achieve and are we well structured to continue to do so?”, are the core questions.

Management inherits and works within the logically prior work of Leadership. If such work is not explicitly done, institutional leaders would be wise to engage their owners in strategic conversations about the logically-prior leadership issues, “Are we clear about the historical situation we are in, the vision to which we are contributing, the strategic directions in which we must move and the corporate culture we must nurture and manifest?” Managers who try to work without such clarity will inevitably work within the unconscious assumptions they inherit, whether or not they are adequate.

The major strategic issues at the level of Management are: (a) Re-thinking the Core Roles that are to be played by various organizations and players. (b) Establishing society-shaping Goals to be pursued over the next five to fifteen years. (c) Articulating the fundamental Policies that will always be used to guide our decisions about how we will approach the achievement of our Goals. Among the projects that need to be undertaken at the Management level are the following. Again the list is not exhaustive.

- **A Networked Centre of Excellence for Industrial Ecology:** This initiative will legitimize and lead the work of Canada becoming a zero waste society and economy. The point is to make it easy and routine for Canadians to think and practice Industrial Ecology. Today, it is far from easy, and,
therefore, far from routine. No one is seriously championing the work, developing a research agenda for it or telling of the successes of its practitioners.

- **A Networked Centre of Excellence for 21st Century Urban Design:** This initiative will legitimize and lead the work of transforming Canada’s cities into models of urban design that are consistent with the best that we know about reducing travel, reducing the use of energy and water, increasing a sense of community and security, increasing access to and utilization of high-quality information, and increasing the sense of citizens as actual owners of their lives and communities and not merely taxpayers who turn their lives over to others. As Canadians we have no idea how rigid and unsustainable our present cities are, and how much trouble we will be in if today’s cash flows are seriously diminished. The fact is that, even today, in our larger cities the quality of living – as measured by the quality of our whole experience as human persons, families and communities – is slowly being degraded. With this initiative, as with the others, we have no idea how big a difference we can make once we begin to believe that new paths to the future are required, possible and our best shot at living as co-creators.

- **A Networked Centre of Excellence for 21st Century Energy Practices:** This initiative will legitimize and lead the work of transforming the patterns of Canada’s energy use. Contrary to today’s bias, which is to increase supply, the primary focus will be in the development of designs, tools, technologies, towns and transportation that greatly reduce our total energy consumption. The recently launched Energy INet is a good beginning.57

- **A Networked Centre of Excellence for Increasing the Generosity of Oceans:** This initiative will legitimize and lead the work of transforming our understanding and practices in relationship to the oceans. Along with the rain forests, the oceans are the lungs of the planet, a major source of the oxygen on which we depend. Since Canada is an oxygen-importing country – we use more oxygen each day than our land mass creates – we have a vested interest in their well-being. For far too long Canadians have talked of our country as extending from “sea to shining sea” and doing so as if we stop at the ocean’s shore, rather than far out at sea. This perception must change.

- **A Networked Centre of Excellence for the Utilization of High-Quality Information:** This centre will be at the heart of the development of Canada into a non-trivial learning society and knowledge-driven economy – a model culture of the strategic utilization of information. As with all of the centres noted here, this centre will be trans-disciplinary, cross-sectoral and will run from the creation of the most fundamental understandings to the development of the institutions, tools and technologies that are needed to embed new insights in daily living.

- **A Networked Centre of Excellence for Applied Demographics:** As it stands today, we have no integrated capacity to see and think through the fact and implications of demographic change in Canada and the world. This means that most institutions go without good information and serious thinking in this foundational area. Worse, there is no capacity to hold together the many strands of demographics – the numbers; the patterns of consciousness of the various cohorts of age, education and culture; immigration patterns; literacy and re-education issues; aboriginal education; the status and function of the institutions through which work is done and the certification of those educated outside of Canada. The absence of this centre is already costing Canadians several billions of dollars each year, not to speak of the human costs.

A Networked Centre of Excellence for the Re-Conception of Major Institutions: As it stands today, any people who wish to seriously reinvent a major institution find that they are pretty much on their own. They have to start from scratch. The upshot is that most folks just don’t start and the work does not get done. We have no body that has developed an integrated understanding of how to go about evolving an inherited Industrial institution into one that is aligned with the emerging future. It is for this reason that new versions of institutions in such fields as health care, education, governments, churches and corporations look, feel and function pretty much like the old versions. Little sustained thought is given to fresh thinking about the forces that are driving change or to the core roles our major institutions might best play in the future. This initiative would enable us to do what we often claim we want to do – adapt our institutions to fit the new conditions, including the new persons we are becoming. It would also think afresh about the need for new organizations to release enterprising energy for the public good – organizations that are neither public nor private, as these are currently understood.

A Networked Centre of Excellence to Re-conceive Human Security: This centre will undertake the hard work of learning to see, re-conceive and think through the whole matter of human security. That we stand in need of a new understanding of human security that reflects a holistic approach taken from a leadership perspective is glaringly obvious to us. Too many of the operational actions now being taken in the name of security, although well-intended, are ill-directed. They will come to have serious, if not tragic, consequences for democratic societies. While such actions create limited spaces that are more secure, e.g. aeroplanes, offices and gated-communities, they do little to create a secure social and economic order for persons living their daily lives.

A Networked Centre of Excellence to Re-conceive Our Use of Resources: This network will undertake the work of legitimizing and leading the work of re-perceiving our access to resources, extraction of them and their use and re-use. As it stands now, little is being done to move us as a whole society away from the likelihood of overshoot and prepare us to live successfully in a resource-constrained world. While the need to re-perceive and revalue energy and water is slowly edging its way into our consciousness, land use is not. We are almost wholly unprepared for a world in which access to food, not energy or even water, is the overriding concern.

Intellectual Property: As noted above, how we see, think about and treat intellectual property is a major strategic issue. Will IP be essentially seen and treated, in Canada and around the world, as private property or as a shared good? Will we commit to the intellectual equivalent of the enclosure movement or will it be open source everywhere? Far more hangs on the outcome of this struggle than is commonly understood. Our bias is clear, it is to open source everywhere.58

Community: This issue is hardly on our radar screen; few see it as strategic. Yet the fact is that, for the first time in our history, proximity no longer creates community. This is a huge change in the human condition. Because community has always just emerged as reliably as the sun each morning, no culture has formal processes that ensure that a sense of community is developed among its citizens. Up until yesterday, a sense of community formed whether you liked it or not. This condition has led us to be naive regarding community. We have not designed our cities as if it mattered; our common life or our institutions as if it mattered. So today, parents drive their kids to school because it is seen to be unsafe for them to walk; women fear dark streets and children are taught to never speak to strangers. All speak of spaces without communities.

58. The phrase is the title of an article by Thomas Goetz in Wired, November 2003.
Further, Canada has been remarkably naive regarding cultural and ethnic differences. Our policy of multiculturalism took it on faith that people who lived beside one another would overcome their major differences and bond in a common community. After all, this had been the experience of folks on the prairies in the early days. But we neglected to factor in the changes in the conditions of daily life between 1920 and 1972. We thought that since folks in the recent past knew their enemies and could recognize strangers that this would always be so. However, the reality is that few folks today know their friends as well as our grandparents knew their enemies.59

We need to recognize both that humans require community as much as we require food and that every community has a boundary that excludes “them”. It follows that we need to both design for community and work at explicitly including “them” as belonging in our communities. To date no country has got this one right. To the Japanese it is still unthinkable that “they” could ever be included in “our” community. The European practice of guest workers was not far behind that of the Japanese. The USA thought in terms of totally new beginnings as it baptized strangers American. Canada invented the well-intended but incoherent doctrine of Multiculturalism. On the one hand, you are welcome to come from anywhere, live here and contribute. On the other hand, in the name of respecting your culture, we encourage you to pretend that you are still at home, to live as you always have. Accordingly, after a very short period of time, we ignore you. You are essentially on your own. We need to be far more active in order to ensure that those who come to live in Canada from quite different cultures are not only tolerated, but actively integrated. These efforts will be a very practical way in which the fault lines of various cultures can be greased so that their tensions are released slowly, not suddenly and destructively.

Stress and the Relief of Stress: The fact that this issue is defined by most as a private, not public affair, is telling. However, the levels of stress have increased as has our prosperity over the last five decades. While we have paid huge amounts of attention to our prosperity, we have almost wholly neglected stress as a public and shared concern. So we neglect this issue when we design neighbourhoods, buildings, visual sight lines, curricula and work schedules. For example, Calgary now has a downtown that is visually and spiritually oppressive. Rather than delight the eye and make the soul sing, its soulless functionality depresses. Today, the drive on highway 2 from Calgary to Edmonton is mostly a joy as it is a drive through the open countryside. But, given present trends, it will look more and more like southern Florida with every passing decade. This will be our future if we are as inattentive and careless over the next few decades as we have been over the last five.

Science and Society: Seen from a distance, Canada seems to be doing well with the way we think about, organize and practice science. However, as with so many areas of our life today, the closer one gets, the worse things look. Consider: If we talk of ‘science’ at all, it is as if nothing important happened in science in the 20th Century. We still talk of science as if the concept is not only defined, but virtually owned, by the hard sciences. Cross-border conversation between the hard and soft sciences is still in its infancy. This is in spite of the fact that 2005 is 200 years after the acknowledgement that biological growth entails real, not just apparent change, 150 years after Marx and Darwin burst on the scene, 125 years after serious biblical scholarship, 100 years after Einstein and Freud, 70 years after the Frankfurt School, 50 years after systems thinking and 40 years after complexity science. In short, our path has been strewn with clues that we might need to adjust our

59. As measured by such things as knowledge of the whole family, the family tree, and the history of illness, employment and faith of the key members.
ment. But we have not done so. As if this were not enough, we are in the process of devaluing curiosity-driven research and shifting our focus to commercialization. The tragedy is not our recent, and historically un-Canadian, focus on the market value of science-based technology, but our utter inability to place this activity in any other context than that of growing an Industrial economy as an end in itself. We have virtually no capacity to assign funds according to the strategic value to the whole society, as opposed to the contribution to an economic project. It is clear to us that we in Canada need to think long, hard and afresh about the nature, evolution, interpenetrations and ultimately the value of both science and society. That this crucial work is not now assigned to anyone, is telling.

- Degree of Consciousness: Today, it is typically the case that there is no reward for being reflexively conscious of what one is doing and what we are doing together. Quite the reverse, sensitivity to the many levels at which we act is often punished and almost always ignored. This self-inflicted blindness will be fatal. Canadians need to think this situation through and to develop a variety of tools and technologies that reduce the time it takes for reflexive self-critical insight and thought to emerge.

D. Strategic Issues at the Level of Operations

It is our view that there are no truly strategic issues at the level of Operations/Administration. This is not to deny that we may run out of water or energy. However, if we do, the failure is properly seen as a failure of Leadership and Management. This is not to say that significant contributions will not be made at the level of operations. Clearly, operations are crucial. However, none will be truly history-altering as we understand that phrase. For example, even a cure for cancer will not simply be an operational achievement. Rather, it will involve Leadership and Management because new ways of seeing and thinking through what cells are and how they function will be involved.

In saying this we do not in any way denigrate operational work. After all, most of life is at this level. However, we note again that those who can only operate at this level will be directed in their work by those who can handle the higher levels of generality on which our future increasingly depends.

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60. The Science Council of Canada was an exception. But then, it was abandoned as adding little value.
Section IV
The Science and Technologies Canada Requires by 2020

A. Preliminary Comments
We now turn to the question that is of most interest to our client, “What kind of science and technologies does Canada require in 2020, if we are to sustain success regardless of the conditions we must face?” While the run up has been long, we make no apology for the lengthy approach to this central question. It reflects our conviction that truly fruitful and courageous responses to this question hang on a deep and well-digested appreciation of the forces that are re-shaping our selves and our world, the strategic directions in which they are driving us, and the swampy and complex issues with which we will be faced.

Our view implies that science is not now and has never been a stand-alone, self-contained activity that can be understood or undertaken without reference to the culture and times of its scientists – those who practice science, and its citizens – those who tolerate it, fund it and benefit from it. In saying this, we understand that our Industrial culture has a thoroughly reified understanding of science as well-bounded activity. However, it has always been the case that thoughtful historians of science have rejected this view and have seen science as part and parcel of the culture and times in question – from Aristotle’s Greece to Newton’s England to Banting and Best’s Canada.

The history of science and the relationship of science to its societal setting are not the only aspects of science that are often mis-perceived within an Industrial culture. The relationship of science and technology often suffer a similar fate. Commonly in our culture “science and technology” are run together as a single phrase, almost as if they are a single and seamless activity. This conflation has two sources. First, it stems from the fact that science and technology are in fact thoroughly interwoven with one another. While science requires both seeing and thinking things through, it is a hands-on activity that depends, and has always depended, on some technologies for its practice. Today, for example, science as it is now practiced would simply not be possible without information and communications technologies. Of course, the reverse is also true. Second, science and technology are run together in our society because, if truth be told, in our increasingly functional society we are really not all that interested in science per se. For most, it is but a means to an end, not an end in itself. The end we seek so avidly is to turn a dollar while we manipulate our world with the technologies that science makes possible.

However, in spite of their interpenetrations and interdependencies the difference between science and technology must be distinguished. We share the view that science is a way of knowing – the most reliable way of intentionally knowing our world and ourselves that has yet to be devised. Technology, on the other hand, is any device or routine that makes the achievement of some human purposes easier.

As we suggested in the Sections above, the core science issue is not “What can we do by 2020?”, but “What is worth doing?” Given the scope of science and the pace of technology’s growth, if a new human condition, solution, tool or technology can be clearly imagined in 2005, it can almost certainly be achieved by 2020, or at least well started, provided that a decision is made soon to bring it about and resources are
committed. We find this conclusion to be both liberating and intimidating. It means that the critical resource Canada requires in order to understand the place of science in shaping a truly human future is, in Northrop Frye’s phrase, “an educated imagination.”

We have identified ten characteristics of the science and technology Canada will require by 2020. In spite of the linear nature of a page, all ten characteristics are to be seen and understood as interwoven in a systemic understanding of the evolution of the universe, the earth, consciousness and human cultures. In our view, the following characteristics flow from and are necessitated by the trends, changes and uncertainties that have been explored in the previous Sections. We are not suggesting that all of the following characteristics will be fully-formed by 2020, However, by then it will be widely understood that they are new requirements. Accordingly, the commitment to them will be thorough and deep.

B. Characteristics of Science and Technology in 2020

1. Set in a Societal Context: By 2020, it will be taken for granted that the very best practitioners are able to locate their work, their disciplines, their fields and the issues on which they are working in both global and historical contexts. The co-evolution of science and society will be taken for granted and seen to be vitally important. In effect, science will have morphed into the unbreakable bond of science/society. This means that practitioners of science will understand the long evolution of their science and its practice, including why a new and truly post-Industrial view of the nature and place of both science and society is emerging now. It is this understanding of the evolution of science and its interplay with society and human persons that will be taught routinely to everyone who wishes to be considered to be an educated person.

This understanding also means that leaders, managers and practitioners in every sector of the society will get it that their seeing, thinking and acting must be grounded in science – in the most reliable knowing that is currently available.

When these two understandings are held together, a new definition of what it means to be a ‘scientific’ society emerges. The ideal will no longer be a society in which everyone understands the practice of a science. Rather, the goal will be a society in which there is a widely-shared passion to access, digest and utilize the best that is known in every area of our lives. This view, of course, obliterates the existing line between the hard and soft sciences. As noted below, it also fundamentally shifts today’s focus on commercialization. In our view, this still-emerging understanding will come to be at the heart of the work of providing leadership to both science and society. It follows that Canada will no longer have a National Science Advisor or even a National Science Policy. Rather, we will have various national policies – all of which are informed by the insight and advice of those who have mastered the new understandings of science/society and the necessity of becoming a culture of knowledge-in-strategic-use.

2. Reflexive: By 2020, it will be accepted that the practitioners of science/society must be reflexive – sufficiently self-critical and self-aware that they are able to monitor their own knowing, intending and acting and make mid-course corrections to their behaviour and that of the institutions for which they are accountable, without having to be told to do so. This skill is a requirement for those who seek the freedom to be self-governing. Such freedom is a requirement for those who would be truly resilient, adaptable and transformable. This skill is also required if ‘science’ is to come to be understood and valued

61. The title of his 1963 Massey Lectures, broadcast on the CBC.
as the most reliable way of coming to know – a way that is disciplined, open, tested by others and critically self-aware.

3. Variegated in Size and Scope: By 2020, it will be accepted that coming to know scientifically is a far more extensive and more variegated activity than we had thought – an activity that includes many different scales, scopes, intentions, tools, techniques and locations. It is critical that we develop a coherent way of seeing, thinking through, identifying, supporting, managing, undertaking and evaluating the full range of the different types of activities. Ad hoc and accidental achievements are no longer sufficient. It is clear to us that current concepts and current practices do not do justice to the full range of scientific activities. The following are among the distinctions we see to be necessary:

- **Curiosity-driven science**: This is the foundational work. It is work that is akin to that of exploring and mapping new and unchartered territory. Some advocates of science talk as if they would have us believe that all science can be reduced to curiosity-driven science. We strongly disagree. However, curiosity-driven science is far more fundamental to our long-term well-being than is now understood by those who currently fund science. It opens the new vistas and avenues of approach that come to define a field. Note first that success with this type of science is almost entirely a function of the training and imagination of particular scientists, provided they have reasonable access to the equipment they require. This means that far more attention should be paid to identifying and supporting that small percentage of scientists who are truly exceptional at this type of work. They should be seen and treated as scientific superstars. Second, this is high-risk work that requires high-risk, largely unconstrained funding. It must not be judged or funded on a project basis. If private sector funds are provided, they must be given in a way that is as unconstrained as government funds. Corporations that are unwilling to meet this requirement should be barred from participation in funding this type of work. Finally, governments must insist that all of the IP that results from such work is treated as open-source IP. The current trend to corporate ownership of the IP from curiosity-driven science is wholly unacceptable. Finally, far more support for this type of work needs to be provided as a counter-weight to the current fetish of “commercialization.”

- **Project-based science**: This category covers the vast bulk of the work. It can be organized, judged and funded on project basis, as long as there is some sense of how each project fits with some overall scheme that meets appropriate multiple criteria. Our bias is that the IP that results for any project that receives public funding should be treated on an open-source basis.

- **Today's Big science**: This category now denotes major, long-term capital-intensive projects. Criteria need to be developed to ensure that future investments in such science are aligned with Canada's strategic goals.

- **“Manhattan Project” type science**: This new class of science has the following features: It will be discipline-spanning and discipline-bursting, of great societal importance, and it will focus on making serious headway over several years with a large, complex, swampy and strategic issue. For example, we particularly see the need for a new discipline-bursting science that is focussed on the development of a holistic understanding of long-term cultural change, evolution and transformation. See the list of networked centres of excellence set out in Section III for other examples.

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62. The reference is to the size and strategic importance of the Manhattan Project, not to its destructive capabilities.
4. Focused on Human Development: By 2020, it will be recognized that the societal requirement that overarches all others is that of continuing the human game in ways that enable human persons and cultures to continue to develop and evolve. In our view, this card trumps all others. This need also opens the door to learning to assess competing projects against the criteria of their potential contribution to ongoing human development. Certainly, this has more legitimacy and dignity than today's practice of funding those projects that can attract private-sector funding. A further dimension of this focus will be the need to increase the resilience, adaptability and transformability of Canadians and Canadian organizations.

5. Integrated Around New Sector-Bursting Meta-Issues: By 2020, it will be clear that the historic disciplines of what are now the sciences and social-sciences are still useful for training purposes. However, when used individually, none offers a useful approach that can make headway with strategic issues – issues that by their nature cannot be contained within a discipline. In addition, ‘science’ can no longer mean only the “hard” sciences. In our view, this means that Canada must either transform existing institutions or develop new institutions that focus on such new sector-bursting meta-issues. We would not consider universities as candidates for this work. This judgement is based on the fact that the discipline-bias of our universities will not change soon. In part, this stems from the wide-spread and un-reflexive acceptance by those who make them up of their own mythology. In part, it stems from the their core role as centres of serious training of young adults – training that is served well by today’s disciplines at both an undergraduate level and for the formation of the next generation of scholars.

The need for an institutional base takes into account the fact that work that no institution owns, no matter how appealing, in time falls by the wayside. A further consideration is the fact that it can take years for a groups of scholars from divergent backgrounds to learn to work together effectively. In Canada and in much of the world, this is unplowed ground. If we are thoughtful about the franchises we pick up, we can soon earn a global reputation. Four examples of discipline-bursting issues are set out below.

6. Global: By 2020, it will be clear that it makes no sense to draw a meaningful boundary around provinces or even Canada. In short, such bodies as the Alberta Research Council and the National Research Council reflect yesterday, not tomorrow. Rather, Canadians who are capable of undertaking the work must learn to join hands with the best in the world regardless of where they live. For major issues, only global networks make sense. We offer several reasons. Increased efficiency is one. A second is the fact that we in the West need to test what it is we take as known against the experience and judgement of colleagues in other cultures. Finally, we need to reflect and reinforce the substantial history and commitment of Canadians to serve the wider world.

7. Transparent: By 2020, it will be clear that Canadians are demanding greater transparency and accountability from all institutions in all sectors of our society and economy. Whatever we now think of the idea, we must learn to perform in a fish bowl.

8. Committed to Knowledge-in-Use: By 2020, there will be a substantial commitment that is acted on as a matter of course to get high-quality information into routine use within our society and economy, and to do so as quickly as possible. This new focus will have encompassed and replaced today’s narrower interest in commercializing the results of the hard sciences. Bluntly, there is no chance that a science-based economy can survive in a non-scientific culture. This commitment will be seen as a one aspect of a still-growing idea of Canada developing into a culture of knowledge-in-use.
9. **Foresighted:** By 2020, it will be accepted that the practice of strategic foresight is an inherent dimension of leading every organization in all sectors of our society. The institutions that are required to nurture its practice at a high professional level will be in place.

10. **Selectively Focussed:** By 2020, Canadians will have a sharper sense of what needs to be done at home and in the world and of the importance of the Canadian tradition of striving to make unique contributions to the world. This will allow us to focus our energy, to not try to do everything. Rather, we can intelligently cooperate with, learn from and build on the work of others.

C. **Four Examples of Discipline-Bursting Issues that Require 21st Century Science and Technology**

We offer four important discipline-bursting issues that require the commitment of science and technology. These are examples of the kind of work that must be undertaken in the coming decades. Obviously, they do not exhaust the work before us.

1. **Organizational Science and Technology:** It is already clear to us that there is no chance that the essential form of virtually all organizations in all sectors of our society – hierarchical bureaucracies – is good for another hundred years. Too much has already changed for this to be the case. This means that we must conceive and invent another equally powerful way to organize large scale human endeavours – a form of organizing that is relevant, effective, efficient, resilient, adaptable and transformable. The new form must be one that is more aligned with highly individuated and integrated human consciousness, the internalization of externalities and the nature of networks in a dynamic and global world.

   Clearly, the evolution of such a form will not happen overnight. It is also clearly that it will not evolve without the reliable and integrated knowledge of 21st Century science and the new technologies it will spawn. While small steps in these directions have been taken by some organizations, the franchise for developing, testing and rolling out such organizations has yet to be taken up by any community or nation. Why not a discipline-bursting networked centre focussed on conceiving, testing and developing the new organizational forms we require – a centre that is itself a testbed and living laboratory of the new organizational forms that we seek?

   Among other technologies, such a centre would require/explore:
   - Sector-spanning networked structures to enable serious work to be accomplished by virtual teams, whether temporary or permanent.
   - IT semantic webs.
   - AI “smart search.”
   - Flex-Infrastructure, an advanced generation of modular working structures, each worker’s space supported, and enriched, with “infotainment” software.

2. **Interoperability Science and Technology:** Interoperability is an increasingly critical requirement. It is the ability of a person, group or whole organization to work effectively and efficiently with a wide variety of others, without the mismatches, hesitations, cross-purposes and misunderstandings that are common when two quite different systems try to align themselves in a common cause. While true interoperability includes issues of technical standards and regulations, it is ever so much more. It includes human, cultural and not just technical compatibility. The range of knowledge and technologies that must be understood and brought to bear on this issue is huge. At the present time, no such capability exists in Canada.
Interoperability, and the science and technologies that make it possible, guarantees that no strength is overlooked; that all are capitalized on. This is easy to agree to notionally but hard to execute, since every person has strengths to be drawn on and weaknesses to be avoided. The hard part is that some are known; some unknown. Some may only manifest themselves in the company of others or under certain conditions.

This example makes it clear that all of the discipline-bursting issues require new ways of seeing, thinking and acting. It should also be clear that imagination is particularly important to successful interoperability. For example, “Know your enemy” is no longer just a military principle, especially since one who is an enemy (competitor) in one role, may well be a friend (client, customer or colleague) in another. The claim that “One man’s freedom fighter is another man’s terrorist” should be met with reflection and dialogue, not as an easy out or as a way to identify those we deem to be evil. The reason, President Bush to the contrary, is that a nuanced world requires the capacity appropriately to mine valuable insights and lessons from apparent contradictions and ambiguities. Finally, we must recognize that “Oil and water do not mix” is a prejudice of old science. A moment’s reflection reveals that with the addition of the right ingredients and under the right conditions, almost anything can be “mixed,” if we but have the wit and courage to do so.

Among other technologies, the work of increasing interoperability requires software that:

- Mine vast numbers of weak signals for the connectivity that turns data into information.
- Compares actual findings with existing and foresighted contexts.
- Measures interoperability in useful units. For space, it will be in terms of size, shape, dynamics and proximity. For place, it will be in terms of context and the evolution of context. For pace, it will be in terms of timeliness, responsiveness and speed of effectiveness.
- Measures compatibility of risks and spells out the consequences of mis-managing them.  

We also require these technologies:

- Interactive data banks of lessons learned. The interactivity would be designed to offer a measure of the applicability of a given lesson for a given circumstance, as well as the adaptability-value of a combinations of lessons.
- Ecotecture systems – systems that allow us to design physical space in light of the best that we know about human beings and the environment.
- Third generation Protean Media – computer-based genetic algorithms under development for the Proteus Consortium for rule-free gaming of multi-faction, complex settings to promote better option development and decisions. The Proteus Consortium is the outcome of the Proteus Project.
- Interactive virtual simulations that allow us to conceive, create and crash proposed processes, buildings, organizational forms and strategies.
- Globally standardized Radio Frequency Identification Data to uniquely and permanently identify anything, anywhere.

3. **Effective City Science and Technology:** In 2020, since four billion people will live in them, cities will be where “it is at”. Rural issues still receive attention in 2020, but often in the context of their connections with and utility for urban dwellers. By then, if huge crises are to be avoided, cities must be on...
the road to becoming noticeably more efficient and more livable. Space will be used more intelligently. While many cities will increase in density, there will be a greater sense of spaciousness. Neighbourhoods will be designed for walking. Unproductive travel will be costly and in decline. The home will again become central to wealth creation, learning, community development and recreation.

The suburbs and shanty-towns of 2005 that “sprawled” cities into inefficiency, waste and unrest are finally being adapted as support-systems for prosperity and as “spaces” for densification. Steps are being taken to transform today’s citizen tax-payers into citizen-owners – persons with not only a serious psychological stake in their communities, but an expectation that they can play effective roles within them as ongoing co-creators.

Among other technologies, the emergence of Efficient Cities requires:

- Cost effective ways to make the very best that is known about urban design readily available to all who are interested. The current pattern that excludes even many of the relatively prosperous from this information – each one having to start from scratch and pay for it themselves – will no longer exist. Cities will be designed and re-designed for the emergence of security, community, efficiency and low-levels of stress.
- Embedded, universal, self-healing broadband that is routinely in use for every human purpose, not just commerce.
- Distributed energy, including direct waste-to-energy in the household.
- Ecology-mobility – forms of personal and shared mobility fuelled by waste that otherwise would have to be disposed of at a cost.
- Ecologically sound construction materials and processes.
- Very Short Take Off and Landing “buses” for medium to long intra-city trips.
- Virtual public administration that extends the locus of governing from the Council Chambers to homes and communities.
- An emergency response system that is timely and effective.
- Waterless urban agriculture.

4. Protection Science and Technology: By 2020, it is understood that protection is a way of life. One lesson from the tsunami in the Indian Ocean in December 2004 was that major disasters must be dealt with far more effectively. Education in the chemical and physical sciences is now being framed more in terms of opportunity (to empower improvement in the human condition, particularly in times of extreme shock and need) than, as in 2005, in terms of threat (by empowering extremists committed to violence). The relationship between science and technology communities of practice and civil society is greatly improved, not least because the latter saw the former as a key to meeting the basic human need to be protected from extreme conditions.

It is recognized that:

- Mother Nature has no less of a sting than in 2005.
- “The evil that is in all men” continues to threaten civil society.
- The “technology imperative” provokes unexpected and surprisingly destructive disruptions.
- Due to corruption, many of the structures (buildings and dams) and infrastructures of some

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66. See Hernando De Soto, The Mystery of Capital. Basic Books, New York, 2000. He writes, “...the world’s poor have accumulated all the assets needed for successful capitalism. The value of their savings is immense; many times all the foreign aid and investment received since 1945.” The message is that the poor – most of whom are and will be in cities – have enormous unrealized, unexploited assets that have not been mobilized for no real reason other than it has not been done.
developing societies are ill-built and on the verge of collapsing.

- The proliferation of “weapons” in the hands of individuals continues to grow, as does the stock of potential targets for such weapons.

Protection, then, is not the “protectionism” of 2005, e.g. protecting a state’s employment and industries. Rather, it is a proactive and standardized regime of best practices. Prevention of, Defence against, Containment of and Recovery (PreDefConRec) deals with threats to and attacks on people’s quality of life, locally, regionally and globally. In 2020, this Protection system delivered better and more satisfying results than could have been hoped for in 2005.

Among other technologies that Protection requires are these:

- Super-sensors, to warn of and “picture” physical threats.
- Air fences, to quickly mark and contain a geographic space.
- Clothing that, automatically and on remote order, cools, heats, shields, inoculates and heals the wearer and communicates findings to support persons and their systems.
- Faux food, prepared from waste that cannot be used as energy.
- Instant individual shelter, to shield against heat, cold, wet, light, sound, and health threats.
- Air cranes, to guarantee a “first-responder” all-condition capability.
- Open-source, real-time interactive global geography databanks.
- Open-source, real-time interactive global buildings databanks.
- Continuous virtual geographic reconnaissance, with 24/7 control.

D. Concluding Comment
Words that Gil Winstanley wrote for the Department of the Environment in 1975 are appropriate as we close this paper. These words still ring true. That this information has been available in Ottawa for thirty years and that it has made no noticeable difference is deeply worrying. However, we live in hope.

Our future lies neither in doom – depletion of environmental resources, nor in salvation by technology. While we may run up against resource limits and while technology may solve some of our environmental problems, the solution to the “world problematique” lies in the social, economic and political areas. The limits that constrain our future are political and social rather than physical, and survival may require more than we are prepared to give.\(^67\)

Appendices

A. Definitions of Key Terms

B. Anticipating and Influencing the Shape to Our Future

C. Scenarios that Illuminate Possible Futures for Canada
Appendix A
Definitions of Key Terms

There is an old Confucian saying, “The first task of governance is the rectification of names.” We agree. Relevant and effective action is not possible when we are confused conceptually. Therefore, we will define the key concepts – ‘foresight,’ ‘forecasting,’ ‘strategy,’ ‘strategic’ and ‘strategic foresight.’

‘Foresight’
Examples: Foresight is a familiar activity. You are about to go on a holiday, so you stop your mail and arrange for someone to feed your cat and water the plants. You are five months pregnant, so you paint and furnish the nursery. You want a comfortable retirement, so you set aside funds in a retirement account throughout your working life.

Foresight, then, has these features: it is intentional action, undertaken in the present, in a timely manner, with anticipations of the future, by those who intend a better future and who influence the future for good or ill.

Foresight, can be defined as “the integrated capacity to consciously see, think through and do what needs to be done now, in light of what we anticipate our future will or could be, while there is still time to act pro-actively and creatively.”

‘Forecast’
It is clear from the above definition of foresight that a forecast is a sub-set of the wider activity of foresight. A forecast is a narrow and reasonably precise form of forecasting.

Examples: The Ottawa Senators are planning for the 2005-’06 hockey season. One of the details is to determine how many pucks they should order. Their decision will consider such factors as the breakpoint in the price, the number of pucks used in the past few years and a forecast of how many pucks will be used in the coming year. The Ross family is planning a reunion. A number of hotel rooms must be set aside. A forecast must be made of roughly how many people, and in what combinations – single, married, children, wealthy and not-so-wealthy – in order to know how much food to order and how many motel rooms to reserve.

A forecast, then, has these features: It is intentional action, undertaken in the present, in a timely manner, that attempts to specify certain conditions at a future time in order to increase the chances that actions taken today actually map onto and are consistent with the conditions that will present themselves in the future.

It is clear that forecasts require reasonable certainty regarding the aspects of the future that are being forecast. Note that in our society many things are called forecasts that do not meet this condition, e.g. population forecasts for Saskatchewan in 2050. These are more properly projections, not forecasts.
Forecast, can be defined as, “the integrated capacity to foresee what certain features of the future will actually be at a given time.”

‘Strategy’
‘Strategy,’ is often confused with ‘strategic.’ However, these two similar sounding words are not the same. Both are important, but the differences between them must be understood and honoured.

Examples: You want a raise. The question is, “How should you approach your boss?” “What might a successful strategy be?” You are hiking in the mountains and come across a grizzly bear. While the immediate question is, “What should you do?”, the underlying question is, “Do you know enough about grizzly bears to know what strategy in these circumstances will let you survive the experience?” You are thinking of opening a business. A critical question is, “How will I approach the marketplace?” “What will my business strategy be?”

Strategy, then, has these features: It an action taken at a specific level of generality, in a situation about which the actor has knowledge, with the intention of achieving a specified end state that can be reached by more than one route.

‘Strategy’ can be defined as a chosen way of approaching the attainment of a desired and specified end state.

‘Strategic’
Examples: The invention of the printing press was a strategic development in Western history. Gwynne Dyer points out that the decision of the Pearson Government to shape Canada’s immigration decisions by a point system was a strategic move – one that fundamentally and positively altered our position vis a vis the world. Strategic weapons are those that are so powerful that they alone can determine the outcome of a war. The decision by the GM Board to buy EDS from Ross Perot was a strategic decision since the dividend stream from EDS kept the company alive during the 1980s.

Strategic, then, has these features: It is a human judgement or view that some thing or action is of vital – history-altering – importance.

‘Strategic,’ can be defined as “any thing that truly has great consequence in the future; anything that is life-transforming or history-altering.”

‘Strategic Foresight’
Examples: SETI – the program to determine if we are alone in the universe. NEAT – the NASA program to identify, track and take prophylactic action vis a vis meteors that are large enough to cause large-scale damage to the earth should they collide with it. The Hon. Lorne Taylor, in 2002, put the issue of water – its use and conservation – on the agenda of Albertans. In 1975, Premier Peter Lougheed created the Heritage Fund for Medical Research.

Strategic Foresight, then, has these features: It is a somewhat intuitive judgement that combines the conscious intentionality of foresight with the recognition that there are good reasons to focus your energies and full attention on those few things in your life that are truly important. It assumes human potency in an open, complex and dynamic world.
Strategic Foresight can be defined as “the integrated capacity to consciously see, think through and do what needs to be done now, in light of the history-altering implications of the subtle signals of change, while there is still time to act pro-actively and creatively – before hidden opportunities are lost and unseen threats have become crises.”

**Observation**

Because of the discontinuities of the 21st Century, the routine and effective practice of strategic foresight has become a requirement for any person, community or organization that is serious about sustaining success. It is even becoming fashionable to say so. However, very few organizations have any developed capacity to practice strategic foresight in a sustained and routine way at a high professional level. Few understand the work. Fewer still fund it appropriately. Most still confuse ‘strategy’ with ‘strategic’ and ‘forecasting’ with ‘foresight.’ Mistakenly, most still assign foresight work to their corporate and strategic planners – ignoring the fact that strategic foresight breaks with, rather than extends, the mentality of planning.
Appendix B
Anticipating & Influencing the Shape of Our Future

The future is not some place we are going, but one we are creating. The paths to it are not found but made, and the activity of making them changes both the maker and the destination.

Dr. John Scharr
White House Science Advisor to
President Richard Nixon

Overview
The above quote captures our essential understanding of the work of shaping a human future. It is our view that the future is not a matter of fate. It is neither fixed nor pre-ordained by either natural or divine forces. While our world is not so open that any conceivable future can in fact be created, it is open to some significant degree to human influence. The limits to such influence are still being explored. Both the present and any actual human future have this much in common: both largely result from specific human actions undertaken at particular times by specifiable persons in, and limited by, specific geological, biological and historical contexts. It follows that this paper is not a forecasting exercise. Rather, it is written to encourage Canadians to learn to become conscious and responsible co-creators of our future.

In other words, when we hear ‘future’ we should think of yet another human artifact. True, the future cannot be made as can a violin or a pair of socks, but, as we shall see, it is a human construct. Therefore, the question is NOT, “What will the future be for us, then?” as if the future is akin to gravity – something that just is and will be regardless of what we do or how we think of it. Rather, the question is, “What would we be doing now, in the present, if we truly had our wits about us and were committed to creating a truly desirable future by acting together?” Note that this shift of orientation has the strange result that in the end our focus is directed, not on the future, but on how our work illuminates today’s actions. As Peter Drucker once put it, “Strategic Planning does not deal with the future, but with the futurity of present decisions.”

Lest this sound either simple or easy, it is not. It is sobering to think about the fact that no culture that now exists is able, routinely, to socialize its citizens into believing and acting as if they hold the future in their heads, hearts and hands. Rather, cultural success, to date, has been a function not only of human understanding and ingenuity but a generous earth and a not-fatally-challenging moment of history. More bluntly, to date the record is one of consistent human failure in the face of truly challenging biological, geological and historic conditions. Whether we can now change this record will be the central drama of

52. The slow expansion of human freedom to act in history by the dawning awareness of the actual results of human behaviours is the theme of Against the Gods: The Remarkable Story of Risk, Peter L. Bernstein. John Wiley and Sons, 1996. It is also at the heart of the understanding of the place and significance of human persons in the Hebrew/Christian tradition.

53. If this were not true, our client’s Renewal process would necessarily be a waste of time and effort.
the 21st Century. Whether or not the year 2020 turns out to be a great year or an annus horribilus, we will argue, is largely up to us and others.

1. **Required Competencies if We are to Shape Our Future Successfully:** The essential condition that must be met if Canadians are to learn to take open and conscious responsibility for shaping our future is that we understand and live by a new understanding of how cultures are actually shaped and the role of human persons in the process – an understanding that has emerged slowly and incoherently over the last two centuries.

We need a fresh understanding of the actual processes of long-term societal change, evolution and transformation because our inherited understandings block, rather than facilitate, the insight that human beings are now, and always have been, co-creators of their futures. No culture socializes its newborns to grow into persons who are willing and able to see themselves as governors of evolution. Most of the six billion persons with whom we now share the planet will see this argument to be blasphemous. They would say that only God can define the future and that we must never play God. A minority, mostly in OECD countries, would say that the market shapes the future. Within our inherited cultural frames of reference such judgements are reasonable, even required. But we now know that both of them are wrong-headed.

Consider the opening of *To Govern Evolution* by Walter Truett Anderson:

"Evolution no longer follows the Darwinian rules that provided, for over a century, our best understanding of it. It is no longer an impersonal and mechanistic process obeying the remorseless logic of natural selection. That vision is as obsolete as its first cousin, Newton's clockwork cosmos. Today the driving force in evolution is human intelligence. Species survive or perish because of what people do to them and to their environments. The land and air and water system are massively altered by humankind which has become, as one scientist put it, 'a new geological force.' Even our own genetic future is in our hands, guided not by Darwinian abstractions but by science and medical technology and public policy. The world has changed; and the human species, which has wrought the change, is now being required to change in response to the conditions we have created."

"I am not here to argue that the human species ought to take responsibility for evolution on the planet, and begin through public and private institutions to make collective decisions about such matters. If that were the question to be decided I would advocate that we put it off for a few centuries or more – let things run themselves while we get accustomed to the idea of evolutionary governance, develop the appropriate ethics and myths and political structures, and perhaps mature a bit. However, that is not the question before us, since we are already governing evolution. This is the great paradox about the threshold: It is not out there ahead of us somewhere, a line from which we might conceivably draw back. We are well across it. To say that we are not ready for evolutionary governance is equivalent to saying that a teenage child is not ready for puberty; the statement may be true, but it is not much help."

"We have made the transition into acts of evolutionary governance, but we have not yet developed a concept of evolutionary governance. ... This is the project of the coming era: to create a social and political order--a global one--commensurate to human power in nature. The project requires a shift from evolutionary meddling to evolutionary governance, informed by an ethic of responsibility--an evolutionary ethic, not merely an environmental ethic--and it requires appropriate ways of thinking about new issues and making decisions. It involves public policy: matters of survival and extinctions are already being

legislated everywhere. ... It involves a general recognition, one that will have to be articulated throughout human society, that the human species has developed a specialized role in the global ecosystem...."

The remainder of this Introduction will be devoted to exploring the major concepts and sets of ideas that must be understood, if we are to learn to take responsibility for shaping our future. We shall argue below that we have little choice about learning to do so; that if hope for humanity is to be warranted in the 21st Century, we must learn to do so; and that this is the root challenge of the 21st Century. Of course, death is always an option. But it is not the choice we would make nor the one for which we would argue.

A. The Transformation of Data to Information to Knowing to Being Wise

The first set of concepts are the those of ‘data,’ ‘information,’ ‘knowing,’ and being wise.’ The transformations that take place as we move along this line from one level to another are crucial because it forces us to face up to the fact that knowing and being wise are deeply personal activities and communal achievements. This means that we can no longer be protected from the reality of our responsibility for what we claim to know by either the myth of scientific objectivity or the myth of divinely revealed tradition.

From a meta-perspective, the difference between one level and the next is that each new level is more inclusive and integrated than the previous one. We shall also argue that data and information have a somewhat impersonal status as things in the world, whereas knowledge and wisdom are inherently personal. Regarding the former pair, it is now widely recognized that data and information have the strange characteristic that if given away, the originator still has them. Regarding the latter pair, we prefer the verb forms of ‘knowing’ and ‘being wise.

Data: Data are tested observations that have not as yet been included in a patterned web of information. If you give me an unfamiliar object I may be able to say such things as “it appears manmade,” “it is hard,” “it weighs about half a pound.” It is clear from my comments that I do not know what it is you have given me. In short, I have data, but no information about the object. Note that data has an objective existence in the world. It can be shared, improved, traded, sold, given away as can any other thing.

Information: One does not obtain information from data by adding more data. Rather, information emerges from the human act of connecting data into a patterned web of meaning that integrates and holds it together at a higher level of simplicity. So a tingling of the left elbow, a tightening of the jaw and a feeling of weight on one’s chest are just that, until these are recognized as three key symptoms of a heart attack.

This means that the same datum may be seen and treated differently by two different persons. To someone who is ignorant of the symptoms of a heart attack, a tightening of the chest is just that. To someone who knows about heart attacks, this datum is a potentially important piece of information that suggests that action be taken. Data does not impel action; information may.

Claude Shannon, the father of information theory, said, “information is a difference that makes a difference.” He was thinking of electric signals tripping switches. Nevertheless, his insight is useful in this context. First, information must be a difference. This means, for example, that if the content of this paper is wholly familiar to you, that there is no difference here, then for you this paper is not information. Second, information must make a difference. Mechanisms have no choice about whether information will or will not make a difference since the response is designed into the mechanism. However, as persons we
have some degree of choice regarding what information is and is not allowed to make a difference in our lives. To return to this paper, if it contains new information for you, but you decide that because you think it is wrong-headed you will not allow it to make any difference in your life, then for you there is no information here. This feature of information brings us to the core difference between information and knowledge. In these terms, knowledge is information that has been internalized by a person in a way that, however small, makes a difference to the person.

**Knowing:** I am suggesting that it is fruitful as well as accurate to think that for humans information is just information until it is digested and integrated into a person’s knowledge-base – connected to at least some of the other things that one already knows. The use of ‘digest’ is deliberate. The process of transforming information into knowledge is necessarily a personal process of internalizing the information. It is this process that literally *in-forms* us – shapes us from within.

Note that the phrase of self-condemnation, “I should have known better,” is used to point precisely to those situations in which we had access to all of the information we required in order to act properly, but had not yet integrated it into a coherent and usable body of knowledge and, therefore, failed to act appropriately.

The shift from information to knowledge has features that distinguish it from the shift from data to information. As noted, data and information are human artifacts that can be treated like any other artifact. They are things in the world that can be traded, hidden, conserved, managed, shared, sold or given away. We can, then, speak properly of ‘information management’ and the tools and processes by which information is managed. However, in our view, the current talk of ‘knowledge management’ is language-inflated foolishness. Knowledge cannot be managed because it is not a “thing” in the world. Knowledge is created when a particular person internalizes new information into his or her existing knowledge-base by a process called knowing or understanding, or coming to know. Data and information that have not yet been digested into reliable knowing are just memorized but unused raw materials. Of course, such raw materials are essential to knowing reliably. Knowing that is not grounded in verifiable data and information is dangerous.

The distinction between external information and internalized knowledge means that when I share what I think I know with you – as in this paper – to me, from the inside, what I am sharing is my knowledge, but to you, outside of my skin, it can only be received as information. Such information becomes knowledge for you if and only if you digest it into your existing knowledge-base. Further, you may digest it in ways that lead you in quite different directions from the ones in which I am trying to point. This explains the well-known fact that two different people can internalize the same information in ways that they learn quite different things from it, know different things because of it, use it in quite different ways, and react to its implications in quite different ways. This understanding is also consistent with the experience that a person who claims to know a particular field can be judged by those who are truly knowledgeable of it to be a person who is not knowledgeable, but as a person who has merely memorized a large and impressive number of facts about it. Such persons have not yet internalized the facts into a coherent knowledge-base and made it their own. As an old professor used to say, such persons “know the notes, but they do not know the tune.”

This view implies that all knowledge is necessarily personal; that the quality of the knowledge cannot be separated from the character of both the person who knows and the knower’s community. An hour spent
watching the Gomery Inquiry or thinking about the actual dynamics of establishing a view in a scientific community will demonstrate this reality in spades.

It follows that knowing is a human activity that, if it is to be done reliably, must be done in groups. This is because we now know that we live in a dynamic, time-determined reality. In such a world, objectivity cannot mean that what I know is valid forever because it is timelessly true. In such a world, knowledge can not be marked by certainty. Rather, objectivity means openly tested inter-subjective agreement. When what I claim to know to be true is tested and approved by others, then we can say that it is true. By this judgement we do not mean that it is timelessly true. Rather, we mean that this is the most reliable judgement that can be made about the matter at this time by a reliable person who is rooted in a reliable community, on the basis of the information that is available.

It is this characteristic of reliable knowing that entails that we must now pay far more attention than we have in the past to the character of persons who claim to know and the communities of which they are a part, whether as citizens, scientists, workers or politicians. This insight, rather than a concern to meet legal requirements, must be the source of a new and powerful concern with the formation and transformation of our corporate cultures.

Note that the vast majority of the information that we internalize is digested unconsciously by processes of cultural socialization. It is tacit, not explicit, knowledge. It is a part of what we know, but until we stop to think about it – to bring it to consciousness – we do not know that we know it; we just live by it. One of the marks of a culture or sub-culture is that its tacit knowledge is widely, if unconsciously, accepted by its members as the basis for their action. For example, in Canada of the 1950s, men automatically paid the cost incurred on a date. However, once we become conscious of some dimension of our tacit knowledge, we can consciously decide to either conform or alter our tacit knowledge and the behaviours that flow from it. The process is commonly called consciousness-raising. It is at the heart of every liberation movement. The downside is that one must work hard to become aware of and openly evaluate large areas of tacit knowledge. The upside is that we get to make conscious choices about matters that heretofore were unconscious automatic.

Finally, we note that this view of knowing is now widely acknowledged by philosophers of science to be at the heart of science. In short, science is coming to be understood as the most reliable way of knowing that human beings have yet invented to arrive at knowing that is reliable enough to stake our lives and future on it.

**Being Wise:** Only those who are truly knowledgeable in several areas of life can become wise. Note that those who are hugely knowledgeable in a single field are never considered to be wise, regardless of how much they know. The reason is that the transformation of someone who knows into a person who is deemed to be wise is accomplished by a deep integration of all that one knows into a single body of knowledge. Unlike those who are merely knowledgeable, a wise person brings every dimension of his or her life to bear on the question at hand, regardless of its presenting issue. Given the Industrial bias to consider things one at a time, without reference to the others, it should not surprise us that we in Industrial cultures have neglected the knowledge-to-wisdom transformation. As we will see, to continue to neglect the nurture of wisdom is to put our future in peril.

55. For an exploration of the nature of tacit and explicit knowing see Personal Knowledge, Michael Polanyi. 1958.
In this light, while the late Industrial adoration of science – as the best route to new and commercializable technologies – can be seen to be understandable, it can also be seen to be wrong-headed because it ignores the most important role of science in the 21st Century – to offer the possibility that large numbers of culturally diverse persons can come to a common mind about difficult, but essential issues. As we shall see, in a world with the kind of strategic challenges that we will face in the 21st Century, there is little chance for sustainable success without widely-shared ways of establishing reliable and widely-respected agreements among us. In our view, science – understood as a way of increasing the reliability of shared knowing – offers the best path forward. To the extent that this is not understood and acted on, we jeopardize the human future.

B. The Fact of Societal Change

The second concept that must be understood is that of ‘societal change.’ We begin by noting that the history of modern empirical science can be read as the slow and painful extension to all reality of the words that Galileo Galilei reputedly muttered to himself in 1632 after his recantation of the fact that the earth moved around the sun, *Eppur si muove* – “but it does move.”

In 2005, it is generally accepted by philosophers of science that the reality of which we are a part is dynamic; that the historic search for unchanging truths that describe unchanging realities must be abandoned; and that the object of our attention – be it an atomic particle, a mountain range or a person – will take a somewhat different form at appropriately different times.

This understanding that societal change is real must now come to inform our view of human cultures.

We accept the fact that all of the many dimensions of a culture actually change, evolve and transform over longish periods of time. We include not only a culture’s dress, street patterns and technology, but its dominant forms of consciousness – its mythic structure, identity, self-understanding, aspirations and the hierarchy of what it values. In short, much that has historically been seen to be given and invariant, we now know to be historically conditioned and variable, including the nature of human cultures. Ours, then, is a precarious vision.

We acknowledge that this view – that cultures change, evolve and transform – has never been dominant in any culture and that, even today, it is not the statistically common view of the 6.2 billion persons now alive on the planet. To the contrary, the politically correct view of human cultures, as defined by UNESCO and Heritage Canada is that cultures do not change. Both assert, against the facts, that those who have a given cultural identity today have a right to keep that identity forever.

Nevertheless, the recognition of the reality of long-term cultural change is slowly gaining ground among thoughtful observers. Given that in the long run, cultures gravitate away from *a priori* views to those that are empirically grounded, we expect this trend to continue. We also acknowledge how psychologically painful and difficult it is to learn to let go of truths one has hitherto seen to be utterly reliable, certain and unchanging. Therefore, we empathize with those who are finding that they cannot, and must not, let go of the certainties that now underlie their lives, organizations and culture. The resistance to acknowledging both the reality of global climate change and the legitimacy of gay marriage should be seen in this light. It is an easy prediction that the emerging notion that human persons must come to accept and exercise responsibility for the overall shape and future of their cultures will experience even more resistance.

But we also know how liberating it is to embrace reality as dynamic and human beings as co-creators. Among other things it opens a huge new space for human action. Our view – that human beings can be agents of change in the service of a future that will be more deeply satisfying – hangs on it. If the future is determined, then futures research and Renewal processes, in all but the most trivial senses, are a waste of time. In this latter case, sanity requires that we determine what the future will be and plan to conform to it, and all intentions of shaping a more humane future must be abandoned. Happily, this is not the case. However, there are some not-so-happy aspects to the new project of digesting and learning to live by the fact that humans participate in the on-going evolution of both our cultures and the planet. We will have to re-learn who and where we are and what it means to act in ways that influence the shape of our future.

C. The 5Ds of Societal Change
The third set of ideas that must be understood in order to influence the future are what we in Foresight Canada have come to call the 5Ds of Change – its dimensions, drivers, dynamics, depths and drift.

1. The Dimensions of Societal Change: We find the Four Quadrants of Ken Wilber\(^{57}\) to be a useful reminder of the many dimensions that must included in any thorough-going view. He sets out two axes: (i) Interior – Exterior, and (ii) Individual – Collective. They result in the four quadrants set out in Figure 7.

   - **Bottom Right – Exterior and Common-to-All:** This quadrant, which includes the shared physical universe, the economy, the environment, technology and social affairs, receives virtually all public attention. When most people talk about innovation they have this quadrant in mind – creating new technologies and bringing them to market in a way that creates fiscal capital. While science is undertaken in all four quadrants, it tends to become of interest to the corporate and political world only when it can be commercialized. When innovation is reduced to commercialization, it is not surprising that innovation that is appropriate to the other quadrants is almost wholly ignored. Most scanning systems unconsciously restrict themselves to this quadrant.

   Consider the much used STEEP – Society, Technology, Economy, Environment and Politics. Since the biases of Industrial culture are not found in this quadrant, they are little understood by those who live comfortably within the cultural constructs which they inherited and by which they were informed. Consider 9/11 in this light. The physical act of taking down the twin towers falls in this quadrant. The explanation that would satisfy the cry, “Why do they hate us?”, does not.

   - **Top Right – Exterior and Individual:** This quadrant includes both biology and behaviour. A *behaviourist* is someone who attempts to deal with human behaviour by only considering those factors that are found in the two right-hand quadrants. Likewise, a *positivist* restricts his attention to these same two quadrants, because he limits his definition of reality to the physically measurable. In common usage, both at street level and at that of official policy, ‘science’ is limited to the same two quadrants – the so-called *hard* sciences. This understanding can be seen in our client’s mandate and

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work. There is no problem here as long as the complex and swampy issues with which humankind must deal successfully in the 21st Century respect these tidy borders.

- **Bottom Left – Interior and Common-to-all:** This is the quadrant of culture – the shared meanings that are embodied, revealed and reinforced in the patterns of language, relationships, organizations, streets, art, architecture. The great Canadian intellectual, Northrop Frye, put it this way, “In what our culture produces, whether it is art, philosophy, military strategy or political and economic development, there are no accidents: everything a culture produces is equally a symbol of that culture.” In 2005, the reality of culture shock is widely understood – the deep disorientation that is experienced when a person lives in a distinctly different culture, especially for the first time. As any who know this phenomenon can attest, the shock does not stem from the fact that the curb heights, the dress, the food and the architecture are different. Rather, it is the deep, but dim, realization that “these people do ‘human’ in fundamentally different ways.” In short, the reality of which we are a part is construable, and different cultures construe it in quite different ways. The sense that 9/11 has something to do with this fact is widely shared in policy circles. However, no department of foreign affairs has a developed capacity to make non-trivial sense of it in these terms. Worse still, the present state of the social sciences is such that it offers little in the way of helpful insight.

- **Top Left – Individual and Interior:** This is the quadrant of consciousness – that which shapes the fact and manner of our awareness of reality. While realities in the two right-hand quadrants are physical and, therefore, can coerce our attention, those on the left are not. The realities on the left are “blindingly obvious” – a phrase we only use for those things that cannot coerce our attention, but once seen, are as real and coercive as any physical reality. This phenomenon is often at the heart of human dramas. “I neglected my children, because I just did not see that they needed me. Now, they are the centre of my life.” When we consider the depths of change, we will say more about the relationship of these four quadrants.

2. **The Drivers of Societal Change:** We can categorize the drivers of societal change as either hard or semi-hard. The former have historically been and still largely are seen as wholly outside of human influence and intervention. The latter have historically been somewhat more amenable to human intervention. If any of the factors noted here change, then to some significant degree the human future changes.

**Hard Drivers:**
- The structure, character and dynamics of our universe and solar system
- The structure, character and dynamics of the geology of the planet
- The structure, character and dynamics of life on this planet
- The structure, character and dynamics of the basic biology of men and women
- The structure, character, condition and dynamics of the physical environment
- The particular character and fundamental trends in play during the epoch of history of interest to us

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59. Historically, virtually all but Industrial cultures have lived within the limits of their environments. However, as Jared Diamond argues in his new book *Collapse: How Societies Choose to Fail or Succeed*, there were exceptions. On several occasions, a pre-Industrial culture has inadvertently altered its physical environment to such a degree that the only choice was to move on or to die. Given the propensity of Industrial societies to alter, rather than adapt to, their physical environments, this is a sobering thought.
Note first that all but the last of these drivers are on the two right sides of Wilber’s quadrants. For most of human history, these hard drivers have been taken as the invariant conditions of life and not as drivers of change. The deep default position of virtually every culture regarding these matters is that they do not change, because they cannot change. They are what they are. If a momentary change does occur – an earthquake, tsunami or volcanic eruption – it was seen, and is still seen by most as an “act of God” and not as an expected consequence of dynamics we can even understand and maybe even alter. A good argument can be made that these factors have been and still remain the essentially drivers of evolution – geological, biological and cultural. Where would we be without our hormones, triune brain structure and unconscious responses to the land and the metaphors of our mother tongues?

In this light, it is no wonder that after millennia of believing that these “conditions” could not change, we are still having a hard time coming to believe that they do. Consider in this light, Tuzo Wilson’s struggle in the 1920s to have his ideas of the earth’s shifting tectonic plates taken as more than the ravings of an interesting, but wholly misguided, graduate student.

Given the widespread cultural bias to see and treat the earth as a static reality, we should be even less surprised that we are having trouble coming to accept the notion that some of the hard conditions of life might actually be altered irrevocably by human action. It seems unthinkable that we might be in any way responsible for enlarging holes in the ozone layer, melting ice in the Arctic or diminishing the power of the Gulf Stream. As we shall see below, a major trend of the 21st Century is the emerging consciousness that the bottom four hard drivers are far more open to human intervention than any culture, including our own, has ever thought.

If a crisis is having to learn to see, think through and act in relationship to some massive change or event all at the same time, then we are facing a crisis regarding our place and importance in the evolution of the planet we call home. As things now stand, neither we nor any other people know how to see this phenomenon, think it through and act according to our newly-formed beliefs. The notion that we have done and are doing physical damage to the planet is hard enough to grasp. The idea that we must set it right is even harder. Hardest of all is the work of developing a culture that can come to terms with what is happening and utilize the information in ways that will allow us to deal with it. These thoughts are literally off our mental maps and normal business models. It is clear that we do not know what to believe or do in response to them.

**Semi-Hard Drivers:**
- The built environments of the culture
- The technologies that extend the reach and power of the people in the culture
- The behaviour of persons and groups, both inside and outside the culture
- The number and demographic profile of the people in the culture
- The character and values of the people who make up the culture
- The content, logic and metaphors of the language of the culture
- The dominant consciousness of the culture – a consciousness that is both revealed in and reinforced by both hard and semi-hard factors
- Those things that we call the software of a culture

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60. This phrase refers to the content and structure of the myths by which a culture lives. A vital and robust mythic structure is as required for human life as are water and food. Myths allow us to make cosmos out of chaos; to make sense of the world, our society, our work and our lives.
Note that the price of consciously influencing these factors is a robust consciousness of them as malleable drivers of change and the future. To date, most persons have been, and still largely are, unconscious of many of these factors as drivers of change. The fact is that virtually all city planners do not factor into their urban design the impacts of that design on human consciousness. The reason in almost all cases is that they have not yet developed the capacity to see, think through and act on the inter-penetration of these two aspects of human life.

However, much is slowly changing. It is dawning on us, at least regarding semi-hard realities, that “the way things are is not the way they have to be. We can change them.” We are also learning that the price we must pay for conscious influence on the future is that we, ourselves, must become conscious of the ways in which the drivers of change interact in order to create, change and even transform human consciousness and cultures. This understanding, in turn, entails that we must be open to participating in changes we seek. The great Canadian historian of religion, Dr. Wilfred Cantwell Smith, put it this way to me in a letter:

I have spent much of the last forty years endeavouring to understand world views other than those we in the West have inherited; and in the last several years I have been particularly concerned with the question of what is involved in the endeavour to understand, and to help others understand, an outlook different from the one that one already has. One of the conclusions to which I have come is that in order to understand a different view, especially if it be radically different and/or profound, comprehensive, is that one must oneself become a different sort of person.

In terms of the four quadrants, the point is that we must give up the Industrial dream of developing a culture with the characteristics we desire by only working with the realities in the bottom right quadrant. For good and ill, culture change involves all four quadrants.

This means that the degree to which we can come to influence the semi-hard factors that are shaping our lives will be measured by the extent to which we become reflexively and self-critically aware of the fact and nature of such factors and of the ways they influence our lives and culture. This reflexive dynamic can be seen in the struggles over the last two centuries to abolish slavery, sexism and racism and to establish universal human rights. In these terms, it is noteworthy that a capacity for reflexive, self-critical awareness is slowly developing in several areas – from science, to our relationships, to our own lives.

Finally, in terms of the data to wisdom spectrum, it is worth noting that this understanding entails that if we are to succeed with the emerging human project of taking responsibility for shaping a truly human future, then we must not only be knowledgeable, but wise.

3. The Dynamics of Societal Change: The third “D” is the dynamics of change. If we are to have any hope of acting with relevance and effectiveness to shape the future, we must understand the conditions and timing of the kinds of change that are of interest to us. We begin by setting out some of the concepts that have been helpful in the work of thinking about shaping the future.

61. This revolutionary thought is central to the consciousness that is driving humanity beyond all forms of Industrial and pre-Industrial ways of living. In spite of the fact that most who participate in either the World Economic Forum or the World Social Forum see the other as enemy, they both share a commitment to the meta-project of consciously shaping the future.
Switches and Rheostats: The temptation of persons who live in Industrial cultures is to think of change through the mechanical metaphors of switches. As with a switch, things are either on or off. Further, if things are not in the state that we desire, we can simply change them. Instantly. This phenomenon can be seen in virtually all culture change exercises. The assumption is that we who are in charge of the process are bringing change to people and places that are not changing. Of course, this assumption is a major source of resistance. The reason is that we know intuitively, if not explicitly, that the appropriate metaphor for human and societal changes is not to do with switches, but rheostats. A rheostat allows us to control what might be characterized as the degree of on-ness. This image allows us to ask not only, “Is it on?”, but “What degree of on-ness is required for the purposes at hand?” So the question is not merely, “Are you in love?”, but “Is your love deep enough to commit to sustaining the relationship for a lifetime?”, not simply, “Are there reasons to renew our client?”, but “Are there sufficient reasons in 2005 to disrupt the life of our client with a serious Renewal process?”, and not “How can we change them?”, but “In what ways are they already changing and can we nurture such change in ways that serve the evolution of our client?”

How long does it take? If we know, given appropriate time frames, that all things change, the question becomes, “What are the rhythms of the change that interests us and how long does it take?” The short answer is, “It depends.” While change can be an abstract idea, actual changes always involve specific phenomena that are changing under specific conditions. We know that ice melts faster on hot days than cool ones. We know that at a sub-atomic level change is measured in nano-seconds, while at the scale of the universe the measure can be billions of years. As it stands in 2005, we know little about long-term cultural change, evolution and transformation. As far as we know there is no place on the planet that has a developed program in this new and critically important field. However, some things are known.

First, when considering significant changes in human cultures, we need to think in terms of decades, generations, centuries and even millennia. Typically, non-trivial unconscious changes in the dominant consciousness of a culture have taken generations and centuries. However, given today’s capacity to communicate, some large scale changes in human consciousness can be achieved in as little time as a decade or two.

One implication, for a culture to intentionally shape its future, is that it must be able to sustain the required conscious intentionality over the required period of time. Lest this sound trivial, we should recall that the timeframe at which we express impatience is getting shorter, not longer, in our “I want it done NOW” society. Clearly, technologies that would allow us to notice, track, enhance or dampen subtle changes of our consciousness and culture would be helpful.

“S” Curves: Much that changes in a society, changes according to a dynamic that can be graphed by a “S” curve. See the left-hand image of Figure 7 on the next page. We note several things. First, the intensity of change and, therefore, the strength of the signals of change, differ substantially at different times. At first, both the intensity and the strength of the signals is small. This does not change until the growth “goes critical.” Second, the weak signals of change to which practitioners of foresight pay so much attention occur before the first curve. Third, Industrial cultures, because of their bias to easily measurable realities, tend to ignore such weak signals when it comes to societal change. The tendency is to wait until the signals have strengthened to the point that it is evident that they really will be significant and should be attended to. The blue dotted lines in right-hand “S” curve of Figure 7 marks the point at which we in Industrial culture tend to begin to pay serious attention to societal change.
These images make clear why it is that Industrial societies are constantly being surprised by societal change – we have unconsciously blinded ourselves to the early (weak) signals of change. In short, the dominant consciousness and institutional practice of Industrial cultures is biased towards overshoot – continuing practices that were justified given the conditions of the past, long after those conditions have begun to change to a new state that requires new patterns of perception and behaviour. If one enters a curve at a speed that is too fast to make the corner in a vehicle that has no brakes, then overshoot is to be expected. However, in a world of profoundly changing societal conditions, overshoot is often fatal. By the time we get organized to react, it is far too late to avoid disaster. Strategic foresight pays serious attention to the weak signals of change, because it offers some chance that by the time we must act we have our sea legs with the emerging change. Given that Canada has no serious institutionalized capacity to practice foresight, it should not surprise us that we are always running to catch up to reality.

It is for this reason that a host of models that map on to “S” curves have been developed in the business world, e.g. the business cycle, the stages of growth of a firm. It is interesting to note that there are few analogous models regarding the overall dynamics of long-term societal change, evolution and transformation to guide the decisions and actions of those who lead our major institutions.

Finally, we note that not all significant changes can be mapped onto an “S” curve. Some change, especially geological changes, are simply too abrupt. e.g. landslides, volcanoes and earthquakes. Even these, of course, offer weak signals of coming changes, which is why investments in the science of such changes are warranted.

**Nested “S” Curves:** Nested “S” curves allow us to think more clearly about fundamental phase transitions from one stage to another. See Figure 8 in the next page. The hardest judgement call that confronts senior executives and other leaders is this – deciding whether the state of change that is being experienced is properly read as the normal state of turmoil that can be experienced as one moves through an “S” curve, or whether a truly new and unprecedented state of affairs is actually emerging. This judgement is made even harder because of the bias of cultural inertia – the bias of every culture to assume its own continuity without essential change and to resist the judgement that fundamental change is required. This is why almost all organizational culture change exercises, regardless of their rhetorical halos, finally commit to paths that enhance, rather than transform, the present state of their organization. Their leaders simply cannot bring themselves to believe that they face a future for which they are not now well-positioned. In short, expect overshoot even during those rare times of truly transformative societal
change. If, as we shall argue below, ours is one of those times, then we will require more than a normal dose of both acuity and courage to adapt to the emerging conditions.

4. The Depths of Societal Change: We are all used to metaphors that allow us to direct our attention to a new level of depth. We say such things as, “Dig down to another level; you will get quite a new perspective.” The acknowledgement of different levels allow us to account for the fact that at one and the same time both of these statements are true: “We live at a time of cultural change that is quite rare,” and “Change has been a feature of virtually all societies, always and everywhere.” The apparent contradiction confuses only those who do not realize that these statements refer to quite different levels of depth of human cultures. Conversely, those who comfort themselves with this thought, “Since change has been a constant, and human beings have always adapted to change, therefore we can assume we shall always do so” can be seen to be both naive and, if influential in times of profound change, dangerous.

Einstein’s much quoted comment to the effect that we cannot solve our problems at the same level at which they were created reflects this sensibility. The fact that it is now much quoted in Western societies today suggests that we have an intuition that we need to stretch our eyes and minds enough to see and think life through from a deeper or higher perspective. At the very least, it would assist us greatly if we had access to a model of depth that would allow us to specify the various levels at which change can take place in our culture and consciousness. The Foresight Canada model of cultural depth has been explicitly developed to meet this need.

Preliminary comments:
- There are several similarities between moving from data to information to knowledge to wisdom, and moving to new levels of the depth of human consciousness and culture. In both cases, each new level:
  - Presupposes and encompasses those before it
  - Is more inclusive and integrated than the previous one
  - Requires new perceptual and cognitive skills
  - Is more personal, since the development of reflexive self-critical self-awareness is required to deal with the deepest levels.

62. Metaphors of height are used in identical ways. Only the directionality has changed. Overarching principles serve just as well as underlying principles. While the heading is The Depths of Change, we will also use metaphors of height.
The rule of history seems to be that those who sustain success have to be competent at every level at which fundamental change is taking place during their lifetime.

Given that the signals that a new level of seeing, thinking and acting is required are weak and subtle, persons, organizations and whole cultures will almost certainly be caught in the dynamic of overshoot; they will continue past practices long after it is wise to do so.

It follows that times at which a new level of competence is required will be times of turmoil and stress. Further, the deeper the change; the deeper the turmoil.

The price of becoming competent at any new level is that we must learn to become consciously and explicitly aware of each level as a new level of perception, thought and action. It can no longer be unconsciously taken for granted as part of our cultural inheritance. As noted above, the hard part is that we must learn to see, evaluate and challenge that which up to now has been deeply and unconsciously a part of our identity; and the upside is that for the first time we get to make explicit choices about dimensions of our lives that hitherto have been off-limits.

The deeper one moves, the harder it is to do the work, the easier it is to distort it, the easier it is to deceive oneself and the longer it takes to do it. Consider in this light, changing your socks, your job, your vocation, your fundamental beliefs and your ontological assumptions. Clearly, these are not at all the same kind or level of change. They do not take the same effort, kind of work or time to achieve.

Change occurs at any level at which one or more drivers of change are eroding the taken-for-granted confidence of the people in their inherited patterns of perception, thought and behaviour. “Confidence” is from the Latin con fide – with faith. Change at any level can only occur when a people are no longer deeply comfortable with their lives as inherited from and shaped by their culture; when they begin to feel uncomfortable in their own skins doing what they have always done. The fact that few today feel such comfort, is prima facia evidence that ours is a time of profound societal change.

In principle, every level of a culture may be up for grabs at any given time. In practice, however, it is fatal when all levels are called into question at the same time. For cultures, as for persons, one must possess at least some degree of stability to engage successfully in the work of identity change. Some aspects of life must be stable, if the others are in a tizzy. The alternative, for cultures, as for persons, is system collapse and possibly death.

The rule of history seems to be that the longer a culture is stable, the greater the likelihood that the deeper dimensions of life will be unseen. They will be absorbed unconsciously by the socialization processes of the culture. It follows that truly stable cultures are handicapped by their stability in a time of profound change.

The fact that the deeper levels of a stable culture are unseen and unchanging does not mean that they have no cognitive content. To the contrary, every culture at every time has its own distinctive cognitive content at all levels. However, as noted, any level that is essentially unchanging will be invisible to the citizens of the culture. In such a situation, there is no information as there is no “difference to make a difference.” In addition, we know that the human brain is designed to notice differences more than similarities. Therefore, it is to be expected that those who live in a stable culture will not be able to tell themselves, let alone a stranger, about the cognitive content of the
levels of their lives and cultures that are invariant. Once we get past the surface levels of a culture, few people in the culture have any grounded idea of the cognitive content assumed by their culture. By and large the deeper levels of a stable culture are so transparent that they are hardly seen at all by those who live comfortably within it.

The rule of history seems to be that the cognitive content of the various levels of any culture is judged by two criteria: (1) Is the cognitive content self-consistent? Is there a line of sight from the depths to the surface of the culture – from its ontological and epistemic assumptions, through its driving sense of purpose, to its character, goals, strategies and the routines of its daily life? (2) Does the cognitive content reflect and reinforce reliable knowledge about the reality of which we are a part and how it works? To the extent the first criteria is met, a culture, if left alone, will function reasonably well. To the extent the second is met, a culture will be sustainable over long periods of time.

The Foresight Canada Model of the Depths of Conscious and Culture: For the sake of simplicity, our model has three fundamental levels. Moving from surface to depth they can be characterized as Administration, Management and Leadership. We use each of these three terms, including that of ‘leadership’, to denote a particular kind of cognitive work. In Canada in 2005, these labels are familiar to most of us. In fact, as we shall see, the distinction that we make between Administration and Management is widely understood among us. Virtually all randomly-chosen groups of adults in our society could make lists which distinguish between them. What is more, the responses of such groups would be isometric.

However, our use of ‘leadership’ breaks with the most common uses of this word in our culture, so caution is in order. We are aware that those who are most often called the leaders of an organizations are the top five to ten percent of the senior people in the organization, and that many definitions of leadership flow from surveys of what such persons actually do. However, we take a different approach. First, we start with the widely-accepted view that the root difference between Management and Administration is found in the difference in the type of cognitive work that they do. Put simply, administrators do while managers think about better ways of doing. Second, we extend this logic and ask, "What is the distinctive cognitive work of leaders?" and "Is this work now emerging as a historical requirement for sustained success in the 21st Century?" In effect, we are arguing that the mind of a person doing the work of leadership differs as much from the mind of a person doing the work of management as the latter does from the mind of a person doing administrative work.

We grant, at least in principle, that the same person may engage in all three levels of work. Our point is that each requires a distinctive set of cognitive capacities. Just as better administration does not create good management, so better management does not create good leadership. Our point is not that one level is more important or virtuous than another, for it is not. Sustained success in the 21st Century now requires that all must be done, done explicitly and done well. It follows that is no longer good enough to call the top seven percent of the management of an organization its leaders, especially if they are not doing the cognitive work of leadership. If leadership is required, then leadership must be exercised. The short answer as to why the work of leadership must be done afresh in the 21st Century is that ours is one of the few times in history at which change is occurring at every level of our cultures and our lives.

A Metaphor: We invite you to think of a rather unusual three storey house:-- while everyone can see the ground floor, the top two storeys each require a unique set of glasses in order to see that it is there. It follows that those who do not possess the glasses required for the second or third floor will think that they
live in a one-storey house. They will have no inclination to visit or use the upper floors. Similarly, those who have the glasses for the second, but not the third floor, will treat it as a two-storey house with no inclination to use the third floor. Only those who have glasses for both the second and third floors will explicitly live in a three-storey house.

We shall explore the view that most Canadians now live in a two-storey world, that this was not the case as recently as 1900 and that, if we are to sustain success in the 21st Century, we must learn to live in all three storeys.

A visual form of the Foresight Canada model of the levels of depth appears in Figure 9. We will explore each level, working from the bottom to the top.

**Change Gauge – 2000 to 2050**

**Administration (Brown):** This is the level at which we actually do physical work. It is the level of *operations*, of *doing*. Since tangible realities can coerce our attention – they are literally “bloody obvious” – every culture has both language and routines to deal with the physical realities in their part of the world. Everyone in the culture explicitly knows the physical features of their world. At this level, success is judged by efficiency. The question is, “Did we get the most work from the fewest resources?”

If you want to know whether or not something is at the operational level, the quickest way is to determine whether or not it can be photographed by an ordinary camera. If it can, then you are dealing with a operational matter. So, for example, data and information are operational matters; knowledge and wisdom are not. Turning a valve is operational; planning to turn a valve is not. While it is true that carrying or
storing the paper on which a plan is written is an operational matter, the plan *per se* only exists in the minds of those who know it.

Operations can be improved in two quite different ways. First, we can invent a new way to work with physical matter at the operational level, e.g. laying out a new path for an assembly line. The work of Operational Planning – the outside edge of Administrative space – is also an example. However, if enough change takes place in or around our operational world then even increasing efficiency will no longer ensure success. A new level of questions come into play – questions that if asked at an earlier time would have been seen to be impertinent, rather than legitimate. We now inquire why something is being done at all, rather than how it can be done better. When this happens, we need to step outside of the field of action and think not only about what we are doing, but why. This move, the second way to improve operations, takes us to the next level – Management.

Before moving to the next level, it will serve us well to recall that only a century ago we administered organizations; we did not manage them. Senior executives were then the senior administrators of the organization, not its managers. In 1900, there was virtually no planning, only operations. The central focus was on efficiency – the cost-effective use of resources. During the early decades of the 20th Century, both financial and operational planning were invented. The first organization of planners – The Planning Executives Institute – was created in 1915 and made up of people who performed these roles. Then, these activities were the outer reach of administrators. By the 1930s, a university degree for organizational operations was invented – the MBA – Master of Business Administration. Note the focus. It was on operations, since management had not yet been conceived as a separate perspective and practice. This early 20th Century conception of the work is still seen in the language associated with governments, e.g. a new government is characterized as a new administration. The fact that the degree in public management, invented in the 1960s, is called an MPA – Master of Public Administration – reflects this historical legacy. As provincial premiers, neither Tommy Douglas nor Earnest Manning were served by policy advisors; as policy has not yet been invented.

During WWII, two things happened. Operations were systematized by the invention of operations research, and the strategic perspective was teased out of the taken-for-granted tactical, operational perspective. Both these moves contributed to the development in the 1950s of a new and distinct view of organizations and their work – the management perspective.

**Management (Blue):** At this level the primary activity is reflecting on and thinking about doing physical work. Managers do not do physical work, they think about physical realities, different ways of dealing with it and what they are trying to accomplish through having it done. Here questions such as these are asked: “What Core Roles are we willing to play?” “What Goals are we trying to achieve over time in order to play out our roles?” “What strategies will we use to achieve them?” “Are some of these strategies our policies, i.e. strategies that will always be used regardless of circumstance?” “What objectives are we trying to achieve this season?”

The central concern at this new level of understanding is effectiveness – the achievement of the goals and objectives that had been set earlier. During the 1960s this concern was formalized in Planning, Performance, Budgeting Systems (PPBS) and Management by Objectives (MBO). Also, policy then emerged as a distinct level of analysis and as a possible university degree. In the 1970s, Strategic Planning became fashionable. In the 1980s, it was Total Quality Management (TQM) with a Japanese flavour. For most, Strategic Planning is the outer edge of Management.
Note, that the primary focus of attention at the levels of both Administration and Management is with the organization itself. While the world around the organization is given a cursory look, even this is for the sake of improving the future of the organization. The thought that as a senior manager I might not understand the world in which I manage is just not credible to virtually all senior and successful males in an Industrial culture. But even overshoot can only go on so long. The thought that our world is becoming quite foreign to those of us who were born in it will slowly emerge as a credible thought in the late 20th Century.

We have noted that in a stable, tradition-bound culture this level of its life is invisible to its inhabitants; it is not recognized as a level at which humans can act. Rather, in such cultures one absorbs the content of this level by a process of cultural osmosis as one learns to handle the physical tasks one is assigned. Because the knowing is tacit and not explicit, it is not normally available for either examination or alteration. If one asks why, the response is that we do things here in a certain way and that it is not open to debate. If one pushes the matter, one is not seen as bright and precocious, but as dull and difficult.

However, a new level of discourse and action can become credible when the deep and unstated agreements of a society are eroded by societal change. In such situations, ideas and intentions that were previously accepted unthinkingly become open questions to be debated anew. This was the case within Canada during the mid-to-late 20th Century. Previously we just administered our organizations. In the last five decades we have learned to manage them. The core roles, goals, strategies and objectives that were implicit in our society were no longer matters above debate but items truly up for grabs.

By 2005, virtually all organizations have some degree of comfort with the work at the levels of both Administration and Management. This is not to say that they have a perfect line of sight from their Core Roles and Goals to their daily activities; most do not. But, at least, they are working on it.

Should the changes in a society continue to intensify and deepen, then, in time, Leadership will arise to supplement Management, just as Management has now emerged to supplement Administration. However, while management has already been clearly distinguished from administration, there is now only an intuitive and fuzzy understanding of how management differs from leadership. Nevertheless, there is a substantial consensus that we are over-managed and under-led; that what we need is not merely quantifiable goals but clear-eyed, far-sighted, and broad-minded leaders who have a depth of judgement.

It is our view that in the next few decades, the cognitive work of leadership will be teased from the cognitive work of management; just as the latter was teased from administration in the mid-to-late 20th Century. As we do so, we will clearly distinguish strategic planning (looking outward with a management mind) from strategic foresight (looking outward with a leadership perspective). Leaders, when looking outward from their organizations, will practice strategic foresight, and when looking inward, will practice strategic planning.

In this light, it is useful to re-consider the emergence of the practice of strategic planning. Today, strategic planning is understood to be a required practice of good management that is quite separate from operational planning. 'Strategic Planning' routinely appears in the titles of Vice Presidents and Assistant Deputy Ministers. But this was not always so. In 1965, almost no one had heard of strategic planning, much less of the Boston Consulting Group. In the early days, strategic planning was routinely confused with and reduced to operational planning. However, over the last forty years the practice and methods of strategic planning have slowly been refined and defined. Between 1970 and 1973, for example, the number of titles in the Canadian Public Service tripled that included these words or some combination of
them, ‘policy,’ ‘strategic,’ and ‘planning.’ Bit by bit we got it that while operational planning was required, it was not enough; that something more was needed to ensure operations were sound and sustainable over long periods of time. Strategic planning emerged as the “something” we required. Today, it has a secure place in the management universe.

In spite of now-common talk of ‘societal change’, ‘leadership’ and ‘vision’, most organizations are not yet seriously committed to the new cognitive work of leadership; rather they are still trying to ensure their future by working more intensely to improve their management practices. Given the reality of overshoot, this is to be expected. But, if ours is a time of truly profound cultural change, then, to quote Adelaide’s Lament, the medicine of better management will “never get anywhere near where the trouble is.” The old management wine skins cannot hold the new leadership issues. We are confident that a new level of awareness will slowly emerge as a new white-space for conscious human action. As the need for Leadership transcends Management, we are slowly shifting our focus from “What should we achieve?” to “What kind of world do we live in?”, “What can we make of a world like this?”, “What is possible for us in such a world?”, “What opportunities face us?” and “In what strategic directions do we need to move over long periods of time in order to bring our vision to reality?” Questions such as these move us to the next level – Leadership.

Leadership (Yellow and Green): At this level, the primary activity is that of sensing and seeing one’s historical situation with fresh eyes. The intention is to understand one’s historical setting so deeply that one can strategically reposition one’s culture and one’s organization in order to ensure their continuing success over at least a generation. This means that the orientation of Leadership is to pick up and interpret the weak signals of the changing world within which one’s organization lives. Those who do the cognitive work of Leadership turn their backs on their organization and look beyond it to the historical situation in which they exist. Strategic Foresight, then, is at the heart of Leadership. The objective is to see, explore and understand the emerging strategic conditions while there is still time to act – to mitigate the threats before they have become crises and to capitalize on opportunities before they have dissipated.

In 2005, we know of only one organization that has a formal system to support this work as a continuous, rather than episodic, activity – IBM. We know of many organizations that claim to be doing the work of leadership. By our standards, most are not.

Leadership work must also focus on the consciousness of those who are doing this work – the eyes with which they see the world. This focus reflects the understanding that what is seen is not merely a function of what is “out there,” but also a function of the consciousness that is doing the seeing. In short, leadership is deeply personal work. The street-level intuition – that when judging leaders we are really judging their character and their sensibility – is justified.

Consider President George W. Bush in this light. Whatever one may think of him, he is one of the few persons in a position of formal leadership who has a line of sight from a non-trivial strategic reading of this moment of history, through the strategic directions in which the world must move and the values to guide action, to specific long-term Goals, Strategies and Objectives. This penetrating view is the source of much of his attractiveness. It is also worth noting that those who rail against him and his projects seldom offer an equally powerful reading of history and what it demands from us. Rather, because they are managers claiming to be leaders, they offer programs without consistent strategic directions and criticism without insight. Of course, neither are powerful enough to touch, let alone heal, the deep aches in our psyche.

63. From Adelaide’s Lament, a song in the Broadway version of Damon Runyon’s “Guys and Dolls.”
64. A one page comparison of conventional Strategic Planning and Strategic Foresight is found at the end of this appendix. Our point is not that one is good and the other bad, but that both are necessary and that they require quite different mental sets and sensibilities.
Strategic Opportunities, Challenges and S&T of the Early 21st Century

As the diagram of our “change gauge” shows (the Green), the most fundamental work at the level of Leadership is the work of becoming aware of the fundamental metaphors and their logic by which the consciousness of the people in a culture is shaped. This is relatively new work for which there are not yet even agreed-upon standards. However the work must proceed because it appears to be the case that in and beyond the 21st Century the only cultures that have any chance of becoming truly sustainable are those that have developed the consciousness, character and ways of living (conduct) that are aligned with the best insights that are emerging into the nature of the universe, the earth and human persons.65

Finally, we note that as one moves to greater depths, the work itself requires a more integrated and self-reflexive view. By the time one gets to Leadership, all four quadrants must routinely be in play as must the self-integration that enables wisdom to emerge.

Before we turn to consider the major trends that are now shaping our future, it is useful to summarize the exploration of the depths of change in a table. See Table 1 on the next page. It compares the new work of Leadership with the well established work of Administration and Management.

5. The Drift of Societal Change: By this phrase, we point to the fact that as we “read” history, its fundamental shape is neither static nor circular, rather it evolves over hundreds and even thousands of years. If one were graphing the human journey on a single X/Y chart, and if the X axis is time, the question is, “What does the Y axis measure?”

Our response is that it measures increasing complexity and an increasing capacity to come to terms with and accept responsibility as participating co-creators of the future, both our own and that of the planet.

<table>
<thead>
<tr>
<th>The Level</th>
<th>ADMINISTRATION</th>
<th>MANAGEMENT</th>
<th>LEADERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Work</td>
<td>DOING physical things</td>
<td>THINKING hard about doing things</td>
<td>SENSING one’s changing historic situation/context</td>
</tr>
<tr>
<td>The Focus</td>
<td>Operations, Tactics, Logistics, Work Plans</td>
<td>One’s Own Goals, Policies, Objectives</td>
<td>One’s Historic Situation, Vision/Intentions of What We can Become, Strategic Directions</td>
</tr>
<tr>
<td>Success Measured By</td>
<td>Efficiency: Ratio of Results to Resources</td>
<td>Effectiveness: Degree Goals Achieved</td>
<td>Relevance: Degree of Fit between One’s Situation and One’s Intentions/Directions</td>
</tr>
<tr>
<td>Key Tools</td>
<td>Operational Planning</td>
<td>Strategic Planning</td>
<td>Strategic Foresight</td>
</tr>
<tr>
<td>When Systematized</td>
<td>1900 - 1950s</td>
<td>1950s to 1990s</td>
<td>1990s - 2030</td>
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<tr>
<td>Now How Widespread?</td>
<td>Very, virtually universal</td>
<td>Very, becoming universal</td>
<td>Early networks now emerging</td>
</tr>
<tr>
<td>Support Systems</td>
<td>Elaborate: laws, regulations, books, courses, associations, research, degrees, websites</td>
<td>Elaborate: laws, regulations, books, courses, associations, research, degrees, websites</td>
<td>Scattered efforts to create new support systems – books, websites, conferences, training.</td>
</tr>
</tbody>
</table>

Comparing the Three Levels at which We Must Now Work

Table 1

65. See my paper prepared for the Scientific Seminar on New Methods of Science and Technology Foresight, in the Methods section of the Agora site for a discussion of the metaphors that underlie Industrial culture, including Industrial science. Also available on request.
This does not mean that all peoples at any given time are at the same stage of the process, for it is obvious that they are not. However, it does mean that we know of no instances in which a people has consciously chosen to move from a higher to a lower state. As noted above, the root danger facing the human species in the 21st Century is that we will choose this fate unconsciously. The difference is that this time it may be a global catastrophe.

D. The Social Construction of Societal Realities

Given the above, we can now consider the view that societal realities are social constructs – a view that is inherent in all serious futures research and strategic foresight. The core elements of the view:

Human cultures are, and always have been, social creations. They are literally the work of the minds, hearts and hands of the particular persons who live in and by the culture over time. This implies that the emerging shape of any human future is always influenced, for good and ill, by what persons do or do not do with their heads, hearts and hands at any given moment. Given the general lack of consciousness of this fact, we can see that human cultures, at least to this point in history, have evolved largely by unconscious processes. However, as noted above, we can learn to influence the shape of our future by becoming conscious of the fact and dynamics of the social construction of societal realities. This does not mean that we can create just any future we want. Rather, as set out above, the shape of every culture, including its future, is always influenced by both hard and semi-hard limiting factors.

Within limits that are still being explored, human beings can learn to influence the shape and content of their future, their whole culture and even that of the whole inhabited earth. A new human project is slowly emerging as an aspiration in human consciousness – to learn to organize our lives and institutions around the work of enabling all newborn children to grow into citizens who are motivated and able to consciously and responsibly participate with others in the ongoing work of conceiving and co-creating the evolving content of their culture.

At present, no culture – including our own – has embraced this aspiration as central to its mythology, let alone developed the capacities, infrastructures and institutions that would allow it successfully to carry out such a vision. In 2005, all cultures, as cultures, are still living out inherited mythologies of their culture and doing so almost wholly unconsciously. Happily, there are early signs that the desire to become conscious architects of our future is slowly gaining ground as a minority voice in virtually every culture on the planet.

We shall argue that the most fundamental overarching project of the 21st Century is to develop at least one culture that is openly committed to the new human project of the conscious co-creation of the ways of living that are truly sustainable under the conditions of the 21st Century.

66. For a good statement of this view see The Social Construction of Reality, Peter L. Berger and Thomas Luckmann. Doubleday, Garden City, 1966. We acknowledge that most of the 6.2 billion persons on the planet today will be offended by this assertion; that they can only hear it as heresy. To such persons the author of their culture is the Creator. The ways they are to live have been captured in their tradition – which is to be conformed to. Humans should not even think of altering any of the essential features of their culture, much less actually alter them.

67. For an exploration of this point of view see To Govern Evolution, Walter T Anderson. Cited above.
## Contrasting Conventional ‘Strategic Planning’ with ‘Strategic Foresight’

<table>
<thead>
<tr>
<th>Conventional Strategic Planning</th>
<th>Strategic Foresight</th>
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<tr>
<td>• Internally Focused – essentially on the organization and its future</td>
<td>• Externally Focused – essentially on the fundamental changes of one’s circumstances</td>
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<tr>
<td>• Practiced episodically</td>
<td>• Ongoing observations and reflections</td>
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<tr>
<td>• Point: to increase confidence in the path that has been chosen to the future</td>
<td>• Point: to increase our capacity to face and handle ambiguity and fundamental societal change, and thus navigate the rapids of change</td>
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<tr>
<td>• Once set and committed to, it sets limits on what one can think and do</td>
<td>• Never finally set; all conclusions are “for now” and open to challenge. New insights are sought and welcomed</td>
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<tr>
<td>• Still within the “Industrial” assumptions of a mechanistic world that can be controlled and commanded, e.g. ambiguity, when found, should be overcome and dissolved</td>
<td>• Within a post-Newtonian world that assumes the complexity of dynamic systems and the possibility of influence, but not ultimate control, e.g. ambiguity is a necessary dimension of this world and must be faced</td>
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<td>• Ultimately reinforces familiar and well-known perceptions, attitudes, ways of organizing and behaviours, e.g. hierarchical bureaucracies are seldom seriously challenged</td>
<td>• Presupposes that we are at a moment of history that requires new perceptions, mental maps, logics, ways of organizing and behaviours, e.g. learning communities are embraced as a new requirement</td>
</tr>
<tr>
<td>• Little sense of psychological spaciousness and abundance</td>
<td>• Great sense of psychological spaciousness and abundance</td>
</tr>
<tr>
<td>• Tends to see strategic planning as the outermost edge of the cognitive world; there is nothing beyond it that better strategic planning cannot cope with</td>
<td>• Sees strategic planning as an important activity that we now need to affirm and include as we move beyond it to learn the new practice of strategic foresight</td>
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Appendix C
Scenarios that Illuminate Possible Futures for Canada

A. The Axes of the Scenario Worlds
We have chosen two of the great uncertainties that were set out in Section II as our axes. The horizontal axis is that of the Core Cultural Project of the future. Will we continue to assume and pursue those that we have inherited? Will we commit to the Co-Creating Cultural Project? The vertical axis is that of the generosity of the earth. Just how generous will she be to us? The third uncertainty – issue of the quality of leadership – is worked into each of the four scenarios.

B. The Four Scenario Worlds
The four scenario worlds are set out in Figure 10. None is a prediction of our future. However, each is a plausible description of one way our world may evolve to 2020. The question for us is not, “Is this world likely?”, but “Assuming that such a world has emerged, what strategic issues will it present to Canada and the world?”

What kind of opportunities and challenges does each scenario world present? Of course it is not possible to outline every dimension of each scenario world. We invite you to tease out some of the features that interest you, about which we are silent. We will start with Overshoot and work counter-clockwise.

1. Overshoot: Generous earth and Inherited Cultural Projects. This scenario world is the most familiar of the four to persons who know and have some degree of comfort in the taken-for-granted world of Canada in 2005. Overshoot is the business-as-usual scenario world. There are no clear and sharp signals or system shocks that indicate anything else is needed. Within this world, the other scenario worlds are not taken as serious options. It is taken for granted that such worlds cannot really happen to us.
This means there is no serious challenge to the familiar biases of Industrial culture:

- The operational orientation with a gloss of management continues. The new level of work – Leadership – is ignored because it is unseen. The crises that will emerge from this neglect are far enough in the future that thus far we have escaped serious consequences.

- The win/lose zero sum game is the order of the day. Therefore, competition, and increasing Canada’s capacity to compete in a globalizing world is the overwhelming concern. Jobs and cash are the only measures that really count.

- Innovation continues to be valued as a route to more jobs and cash. It is still seen as a stand-alone value, not as an element in value ecologies. It is most frequently reduced to the commercialization of technology.

- ‘Science’ still means the hard sciences in separate silos. It is not valued as a way of achieving reliable knowledge, but as that which gives birth to commercializable technologies. Curiosity-driven research is bureaucratized.

- Both power and work are still assigned to the usual divisions in familiar sectors – public, private and voluntary. Huge amounts of human energy are used in all too familiar turf battles, but it is assumed that this is “just how things are.”

- No serious and sustained energy is devoted to re-conceiving any important institution – health care, universities, schools, corporations or government bureaucracies. However, there is much time and energy devoted to finding money to keep present institutions afloat. To most, ‘sustainability’ means ensuring an adequate on-going cash flow. The cost of healthcare and advanced education are bankrupting governments.

- Just enough experimental projects are undertaken where sectors meet and silos overlap to allow us to assure ourselves that “we are making progress.”

- The urgent continues to take virtually all of our energy. However, we continue to talk a good line about the important of being strategic, getting ahead of the curve and acting pro-actively at major events and during election campaigns.

- The signals that “something has gone wrong”, to use the phrase of the great Principal of Queen’s University, Dr. Alex Corry, are responded to at an operational level. Systemic understandings are neglected, in part because virtually no one lobbies for them.

- Overall, there is a wide-spread private sense that the society is slowly disintegrating around us, but there is little sense of urgency because the officially optimistic climate does not welcome such sentiments.

68. The opening line of Dr. Corry’s lecture in the early 1970s as the first recipient of the Royal Bank of Canada award for significant and sustained public service. Considering the year, he was indeed far sighted.
• There is no greater capacity than there is today to sort among conflicting claims for attention and order them in some kind of rational priority. Politics and political pressures continue to rule the day. The justification continues to be that "giving the people what they ask for is the heart of democracy."

• The market is touted by many as the universal solution for every ill. Those who disagree are credible in social but not economic space, so nothing changes.

• As long as one looks short-term and measures by dollars per quarter, then, “Things are going pretty well. We have challenges, but we are meeting them.”

• Globalization continues to mean increasing Industrialization. The global world is one of competition. Canada continues to slowly slip out of the focus of those who are the richest and most powerful. We are no longer in the G8, although we chair the G20 when our turn comes around.

• Terrorism continues as a serious and substantial concern. Neither we nor they have made much progress in re-framing and understanding the other. Rather, each is more deeply entrenched in self-righteousness and prone to project fear and anger onto the other as the source of all evil.

• In short, this is a world of “inevitable surprises.” We are little better prepared to deal with them in any systemic way than we were in 2005.

• Signs that this world may not be sustainable in face of global and Canadian trends are there if we would but look, however, as noted we are disinclined to do so. For example, the gap between the rich and poor is noted but neglected.

• In short, there are no substantial reasons for the best Canadian young people to stay and invest their lives here when they get a better offer, as they inevitably do.

2. Dog Eat Dog: Ungenerous earth and Inherited Cultural Projects. This scenario world occurs when the business-as-usual world of *Overshoot* fails. Since the failure arises in the first instance from what are seen as external sources – the physical environment and our enemies – it is not seen in any way as our fault by most of those for whom *Overshoot* has worked. However, this is a deeply divided world, not only because of physical scarcity, but because a substantial minority of the now-poor, middle class blame those who held positions of power and influences in *Overshoot* for the emergence of the *Dog Eat Dog* world. The accusation, “We warned you and you did nothing,” is met by “That is easy to say in hindsight, but how were we to know?”

Strangely, a major dimension of this world – the economic deprivation – is also familiar to us. For most, it is the world we feared that we would slip into if Canada could not compete, if jobs were not created and if investments in Canada were not made. For others, a small minority, deprivation has been their life for decades. The stories we live by can make some sense of the suffering. The downside is that the stories we are in offer little support for finding a new way out of this world. In *Dog Eat Dog*, the option of moving to a new cultural project is as unthinkabl e as it is in *Overshoot*.

This world did not emerge rapidly. There was no single crisis that tipped *Overshoot* into *Dog Eat Dog*. Rather, bit by bit, it became clear that the issues of the physical environment were going to be much tougher to face and handle than we had been promised by our leaders in *Overshoot*. Just as it took Kodak
almost a generation to get it that digital technologies were a real alternative to chemicals for processing visual information, so it took a generation for Canadians and virtually all others to get it that Canada was unable to compete with Asian manufacturing; that by trying to do so by “carrying on regardless” was a recipe for an extended death watch. While these thoughts are taking hold in 2020, little has actually been done by then, other than increasing the talk about the need to pioneer a new future. New substantial responses, if they are to occur, will develop after 2020.

Canada is under huge stress in Dog Eat Dog. Our resources are our lifeline, but we have two major difficulties. First, our Industrial selves have learned that ‘value-added’ means moving away from resources into manufacturing and high-tech. Consequently, other than energy, our resources have been neglected. Second, energy resources are unevenly distributed in Canada. As Ontario fails and Alberta prospers, we find ourselves in unfamiliar economic and political territory that we have trouble handling.

The Dog Eat Dog world is made substantially worse by two major factors.

First, since the present and future are still understood within inherited categories and capabilities, there is virtually no capacity to see and think through the situation in fresh terms. Just as 9/11 was filed under wholly familiar categories – ‘criminality’ and ‘war’ – so the stresses of Dog Eat Dog are played out in wholly familiar terms. Because neither Industrial or Traditional cultures encourage a second order reflexive inquiry, this avenue is blocked. Since both encourage projection onto others, this solution is encouraged. In short, as with 9/11, the actual responses that are made exacerbate, rather than relieve, the situation both within Canada and globally. Short-term psychological comfort is bought at the price of long-term distress, economic, social and psychological.

These propensities feed the second difficulty – old identities are reinforced and old suspicions are turned into new hatreds. Each group seeks to survive by protecting itself against the others. So China decides not to revalue the Yuan and to stop supporting the American dollar. This not only creates a new cold war, but a global depression. The upside is that the weakened economy does less harm to the environment; the downside is that there is little cash to deal with the emerging conditions of multiple and simultaneous systems breakdowns. Many technologies that would be helpful are abandoned due to lack of capital to develop them. Every form of conflict that is imaginable appears somewhere – science VS religion, rich VS poor, labour VS management, city VS the country-side, old VS young, North VS South, and white VS coloured. This is not a world filled with hope.

What is not clear is how long people in Dog Eat Dog must suffer before the thought that fresh ways of seeing, thinking through and acting within our situation are called for. It could be only decades, or it could be centuries. The upside is that the thought in the Foster/Kristofferson song that “freedom’s just another word for nothing left to lose” slowly becomes credible in Dog Eat Dog, but only after it has hit rock bottom. Before then, those who talk of new avenues to the future are seen to be enemies of the state. There simply is not enough psychological and intellectual energy to deal with present realities and undertake the additional work of pioneering a new future.

3. Severely Tested: Ungenerous earth and Co-Creative Cultural Project. This scenario world can emerge in one of three quite different ways, depending on the timing of an un-generous earth and the legitimacy of the 21st Century Culture project. First, this space may open up after some substantial period of time from within Dog Eat Dog. Since this would be well after 2020, it is of little interest to us here. Second, if the earth does not turn ungenerous until 2010 and, in the meantime, some serious progress has
been made with the project of co-creating a 21st Century culture, then _Severely Tested_ can begin to emerge from _Dog Eat Dog_ after 2010. Third, _Severely Tested_ can emerge from _Pioneering Again_, if sometime closer to 2020 that society is faced with fairly sudden and catastrophic environmental conditions.

It would be too complex to trace out all three journeys. We note, however, the path that is taken to get into this world will make significant differences to the actual world of _Severely Tested_. The difficulty of the path, and therefore the severity of the test, will be highest for the first path noted, second highest for the second path and least stressful, relatively speaking, for the third path. The reason, of course, is that those on each successive path are relatively better equipped to deal with the objective conditions of _Severely Tested_. The later the test, the more likely that the society would have in place more of the understandings, practices, institutions and infrastructures that would increase the chances for successfully meeting the test. Conversely, the earlier the test, the greater the likelihood that those being tested would revert to old cultural patterns which would tend to slide them into a _Dog Eat Dog_ world.

_Severely Tested_ requires reflexive learners – strong and able persons who can handle all three levels of Administration, Management and Leadership in order to sustain success in _Severely Tested_. This is the scenario world that will require the strongest Leadership – as it is defined in this paper.

We were tempted to call this scenario world _New Wilderness_ because it will be so disorienting. This world is off the mental maps of those who are comfortable in _Overshoot_ in two different ways, each of which is equally disturbing. First, the earth has become obviously less generous in ways that are both surprising and alarming to _Overshoot_ inhabitants. If this is not unthinkable enough, _Severely Tested_ is also a world that is exploring ways of living that are truly post-Industrial. The fact that these new ways of living are also post-Traditional will be too subtle a point to give comfort to the Industrial inhabitants of _Overshoot_.

On the other hand, _Severely Tested_ will be a world of growing hope. Its inhabitants will be seeing, thinking through and learning to live in quite new ways. They will be reinforced on this journey by all of the drivers of change we outlined in the paper. This will strengthen their conviction, their understanding and their success. Since a new and robust version of _the story we are in_ will slowly be emerging, we can expect that many of the signs of stress – mental illness, suicide, relationship breakdown, community breakdown – will begin to turn around and move in more positive directions by 2020.

The words of Robert Grave’s poem _In Broken Images_ seems to have been written for _Severely Tested_.

He is quick, thinking in clear images;  
I am slow, thinking in broken images.  
He becomes dull, trusting to his clear images;  
I become sharp, mistrusting my broken images.  
Trusting his images, he assumes their relevance;  
Mistrusting my images, I question their relevance.  
Assuming their relevance, he assumes the fact;  
Questioning their relevance, I question the fact.  
When the fact fails him he questions his senses;  
When the fact fails me I approve my sense.  
He continues quick and dull in his clear images;  
I continue slow and sharp in my broken images.
He in a new confusion of his understanding;
I in a new understanding of my confusion.\textsuperscript{35}

In much that happens in \textit{Severely Tested}, necessity is the mother of invention. The impulse to re-conceive and not merely re-organize the major institutions of the society – political, economic, educational – will be alive and well. The illusion will have been abandoned that any Industrial or Traditional culture, without substantial transformation, can meet the new requirements of the 21st Century. This opens the possibility that Canada can embrace the new challenge of becoming adaptable sooner and more creatively than others; that Canada can begin to earn a reputation as a happening place that should be sought out as a partner. Since the primary currency of \textit{Severely Tested} will be influence, rather than power, in this world Canada has the possibility of becoming the most influential mid-sized nation on earth. Enabling others to understand the need for and nature of this journey will not only create knowledge jobs for Canadians for generations, but also become a new and more robust form of peacekeeping – bringing peace through long-term societal and personal transformation.

One of the truly hopeful dimensions of \textit{Severely Tested} will be the fact that new coalitions of persons will be formed that cut across lines seldom breached in \textit{Overshoot}. A powerful hunger for a society that is meaningful and that actually works will bring together labourers and management, poets and professors, politicians and bureaucrats, old and young, idealists and the practically-minded. Beyond discipline-based, curiosity-driven research the practice of science is reinvented. Cross-disciplinary and cross-sectoral groups come together to understand and deal with a major issue that is complex, swampy and strategic. The distinctions between the sectors is eroding. By 2020, all major political parties are dedicated to some version of “elect us and work with us and we will make a truly post-Industrial society and economy work for you.”

One of the major sources of stress in \textit{Severely Tested} will be the fact that by 2020 the majority of people on the planet will still not be able to understand the 21st Culture project, let alone support it. The fact of the project will divide existing groups as did the Reformation and the rise of science in earlier centuries. We can expect new divisions in families, communities, corporations, universities, political parties, churches, synagogues, mosques and temples. A hopeful difference is that those who are pursing the 21st Century Culture project will have developed enough of a 2nd order capacity that they are able to comprehend, empathize with and strategize fruitfully regarding the resistance they meet.

4. Pioneering Again: This scenario world can only emerge from \textit{Overshoot}, since it is marked by a generous earth. As we have seen, when considering \textit{Overshoot}, such an emergence is unlikely. How might it be possible?

The short answer is that \textbf{Pioneering Again} requires insightful, courageous and reflexive Leadership. How might this play out? First, it requires that a long-term societal transformation is already taking place, albeit as a largely personal activity. The insight on which Pioneering Again rests is not that “a new world is possible,”\textsuperscript{36} but that unbeknownst to us, a \textit{new world is already being formed within and around us}. The point is not that we can start something if enough of us get together and try really hard to do it. Rather, the point is that we are awakening to the reality that we are, so to speak, already pregnant with a fundamentally new future. \textbf{Pioneering Again} does not rest on an act of will about the future, but on the recognition of the facts of the present. This is fundamental. As we understand long-term societal changes, evolutions and transformations, they never start with or result from a sheer act of will to bring

\textsuperscript{69} Reference to be added.
\textsuperscript{70} The slogan of the World Social Forum.
something into being. Second, will and courage do have a major role to play in *Pioneering Again*. But the will and courage that we need is the will and courage to notice and explore the subtle signs and fragile insights that something truly historic is already going on in our lives and our midst. Third, since we have argued that reliable knowing necessarily requires a reliable community of interest and practice, the emergence of at least one formal and sector-spanning national and international support network is required – a network that is explicitly dedicated to identifying and knitting together those who are already open to the fact and character of the societal transformation in which we now find ourselves. Fourth, in time, formal supportive infrastructures and research institutions to own the work of exploring and understanding long-term societal change, evolution and transformation will be required. This step reflects the fact that serious work always takes more than a few interested journeymen and that work that is not owned by an ongoing institution is soon abandoned.

The storyline of the development of *Pioneering Again* might run like this:

In 2006, the Government of Canada created a Royal Commission into Enabling Canadians to Shape Their Future. The term was for five years with a mid-term report. The budget was $25m a year. The mandate included the responsibility to work with Canadians and their present institutions in all sectors to create the ongoing institutions and networks that are needed if Canadians are to both understand and shape their future. While many initially decried the fact of the Royal Commission, the government knew that truly fundamental societal changes need to be approached slowly and with a substantial support that enables those who are at all interested to learn. Mike Pearson's Bi and Bi Commission in the 1960s is used as an example. This act put the future squarely on the table in a non-partisan and inclusive way. Given the power of websites and the Internet and the emerging capacity of Canadians to self-organize, by the time its term was over a critical mass of Canadians were openly committed to the new work of co-creating the world’s first society and economy that is truly aligned with the emerging character and requirements of the 21st Century.

In 2008, as it became apparent that the new view of persons and societies was not just a figment of the imagination of a few, Pugwash shifted its focus for threats to the promise of this new understanding. Alberta created another Heritage Trust Fund foundation, this one dedicated to ensuring that this work takes root in Alberta. The Banff Centre was re-formed as the world's first major research centre dedicated to developing an integrated understanding of long-term societal change, evolution and transformation. This stimulated the emergence of a new integrating science – the science of long-term societal change, evolution and transformation. By 2010, four universities in the world had established formal graduate programs and research centres, one of which was in Canada.

In 2010, for the first time, a political party focussed its platform on the work of establishing Canada as the world's foremost 21st Century country. The positive response from Canadians was powerful enough for all parties to begin to align themselves with this new project. For the first time, truly scientific and systemic approaches were taken to re-conceiving and thinking through the future of our universities, schools, public services and corporations. Questions such as these were seen to be legitimate and urgent: “What would we be if we became a learning society and no longer a society in which some learned?” “What would be the functions, structures and technologies of the public service Canadians need to serve them well in the middle of the 21st Century?” “How can we create the ethical market place we require by nurturing internal restraint?” “How do we transform our existing value chains into value ecologies?” And, as Bruce Mau put it, “Now that we can create virtually anything; what should we create?”
In 2012, Canada convened the world’s first conference of nations who had committed themselves to the new project of becoming a co-creative culture. Yes, there was competition among those present, but it was firmly within a deeper commitment to sharing mutual experience and supporting each other. The nations that gathered were from every continent and represented some from what used to be called the first and third worlds. Together they included twenty-two percent of the world’s population. Canada was coming to be recognized as a leader of this new work. Our growing capacity for second order perception and thinking meant that we wore this recognition that we were making a difference proudly, but lightly.

By 2015, it was clear that a sea change had taken place in both federal/provincial relationships and in the relationships among what we used to call the sectors of our society. Not that evil had been abolished, but the over-arching project of becoming a 21st Century society and economy provided a new context for cooperation, risk and boundary-crossing. The project had become more important than individual egos.

A non-trivial systems understanding of human cultures meant that innovation was valued in every sector and practice of our society, not just those with a cash value. It was also recognized that a truly innovative society must also be moral, wise, secure, integrated, sustainable and deeply humane. The new understanding of science as a reliable way of knowing was also taking hold. This orientation provided a basis for beginning to deal with the culture wars that had been festering for several decades. It also gave new energy to science. The fact that teenagers could see a line of sight from science to their aspirations for a truly 21st Century society, meant that they flocked to science in numbers not seen since Sputnik.

It was now clear that new technologies can contribute to increasing the generosity of the earth and that we have a vested interest in protecting and enhancing its generosity.

By 2020, a plurality of Canadians had committed themselves to the new journey. While the work will not be finished for a few hundred years, the new project is securely at the heart of Canada’s emerging identity.

5. **Reminder:** We have explored these four possible worlds to demonstrate a few essential points that tend not to be explicitly understood in Canada in 2005:

- Every culture is committed, largely unconsciously, to a core cultural project.

- A culture’s core project infuses, in-forms and limits all that the society is, does and can become.

- While every culture tends to assume that its cultural project is given, forever, it is not. It is as historically conditioned as is every other aspect of the culture.

- In the end, reality wins; a culture’s core project must be aligned with the fundamental trends of an epoch or it will fail as a culture.

- The earth is indifferent to the human future. It has another four billion years before the sun exhausts its fuel. It will go on with or without us.

- The choice is ours. Best we make it wisely.