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EDITOR

L. Ian MacDonald
liamacdonald@policymagazine.ca

ASSOCIATE EDITOR

Lisa Van Dusen
livddc@policymagazine.ca

CONTRIBUTING WRITERS

Thomas S. Axworthy
Andrew Balfour
Brian Bohunicky
Derek H. Burney
Catherine Cano
Margaret Clarke
Celine Cooper
Fen Osler Hampson
Daniel Gagnier
Martin Goldfarb
Patrick Gossage
Brad Lavigne
Kevin Lynch
Jeremy Kinsman
Velma McColl
David McLaughlin
Geoff Norquay
Robin V. Sears
Gil Troy
Anthony Wilson-Smith

WEB DESIGN

Nicolas Landry
nicolas@nicolaslandry.ca

GRAPHIC DESIGN AND PRODUCTION

Monica Thomas
monica@foothillsgraphics.ca

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Cover photo by *Policy*



From the Editor / L. Ian MacDonald

Big Ideas

Welcome to our special issue on big ideas. The world is driven by big ideas; in politics and public policy, in economics, in technology and, increasingly, in medicine. All of this in a world transformed; in a digital age.

Consider that, only a quarter century ago, the Internet had no commercial applications. Or that, just a decade ago, the smart phone was developed by BlackBerry. These platforms have revolutionized the way we work and communicate. Consider also that Apple, Google and Microsoft are three of the four largest companies in the world in terms of market capitalization.

Whether in the public or private sector, big ideas generally have two attributes in common—leadership and innovation.

Contributing writer Robin Sears offers some notable 20th century examples of political leadership, from Brian Mulroney and Ronald Reagan on free trade, to Pierre Trudeau on the Charter of Rights. These were transformational policies on which leaders were prepared to spend, rather than hoard, their political capital. In 1962, John F. Kennedy famously told a Rice University convocation that “we choose to go to the moon in this decade and do the other things, not because they are easy but because they are hard.” In South Africa in the 1990s, Nelson Mandela, who had spent 27 years in prison, negotiated the peaceful end to apartheid and became the father of a united country. Where is such leadership today? Sadly lacking, concludes Sears.

For his part, our lead foreign affairs writer Jeremy Kinsman looks at a world in turmoil in late 2014—from ISIS to Ebola, from Ukraine to Hong Kong—and suggests that Canada, the US and Mexico should heed Reagan’s 1979 call for “a North American Accord,” beyond free trade, “to make the continent ‘the strongest, most

prosperous and self-sufficient area on earth.’”

BMO Vice Chair Kevin Lynch, a former clerk of the Privy Council, offers an assessment of Canada’s prospects in today’s profoundly changing world. In an era of multipolarity, economic realignment and disruptive technological change, Lynch writes that Canada is hindered by incrementalism and “short-termism” in public policy making. He offers a clear assessment of Canada’s comparative and competitive strengths and challenges in the global economy.

Gordon McBean, president of the International Council for Science, writes that “sustainable development needs to be implemented to enable future generations to meet their needs for an ethical and equitable planet.” A truly big idea.

From Big Data to Big Ideas, Pierre Meulien, Fiona Brinkman and Jennifer Gardy write how genomics will change our world in health care, industry and the energy-environment space with a “breath-taking wealth of new information” to be “digested and directed.” And Stephen Scherer, Head of Applied Genomics at Toronto’s Hospital for Sick Children, makes a strong case that Canada is already one of the world’s leading genomics countries. “I would argue in the top three,” he writes. “When I attend international conferences, everyone is talking about what is happening across Canada.”

Electronic Medical Records (EMRs) will play a critical role in modernizing Canadian health care, predicts Joe Natale, president and CEO of TELUS, a leading provider in the field. Noting that EMRs have a penetration rate of only 57 per cent of Canadian doctors, Natale writes that: “Governments across Canada need to drive EMR adoption to 100 per cent of physicians by 2020. They can do that by changing the compensation model

for physicians and health care professionals, linking pay to outcomes that are tracked through EMRs.” Definitely a big idea.

Carolyn Dudley and four colleagues from the University of Calgary consider the challenges, in both childhood and adulthood, to the one Canadian in 68 with Autism Spectrum Disorder (ASD), and note that “the incremental costs of supporting the ASD population over its neurotypical peers in Canada can be estimated to \$3.4 billion for each annual birth cohort.” What’s to be done? They propose a very achievable six-point policy framework.

Immigration Minister Chris Alexander writes that while Canada has received more than two million newcomers since 2006, the emphasis in immigration is shifting from a supply-based to a demand-driven system, closer to labour market needs.

Contributing writers Derek Burney and Fen Osler Hampson offer some big ideas of their own on Canada’s role in the world in an excerpt from their book *Brave New Canada*. The book is already in a second printing from McGill-Queen’s University Press. In a strong review, John Barrett writes that the authors offer “clear insights and compelling recommendations.”

And in a review of *The Morning After*, by Chantal Hébert with Jean Lapierre, Historica Canada President Anthony Wilson-Smith writes of the authors’ “many and startling” revelations in the backstory of the 1995 Quebec referendum, in which Canada was almost lost. A gripping story, and a national bestseller.

Finally, in a *Guest Column*, Green Party Leader Elizabeth May looks back at a big idea that really worked—the 1987 Montreal Protocol on ozone depletion, which *The Economist* also rates as the most effective mitigating policy against climate change, by far. **P**



Prime Minister Mulroney and President Reagan at the G7 Summit in Toronto in 1988, where leaders “strongly welcomed” the Canada-US Free Trade Agreement, a truly big idea. *Policy* archives photo

A Lament for the Age of Leadership

Robin V. Sears

The years between the two world wars and the last 40 years of the 20th century produced a pantheon of visionary leaders who were neither daunted by wicked problems nor confounded by big ideas. Eisenhower, Kennedy, Monnet, Reagan, Gorbachev, Trudeau, Mulroney, Mandela and others in their league saw the world as a topography of potential transformation; every crisis an opportunity for change. Today's leaders aspire, sometimes against formidable odds, to adequate management. Our challenges demand more.

If you have ever driven across Sydney Harbour on its massive and magnificent bridge you are the beneficiary of a determined political leader's very big idea. Equally, Toronto subway riders crossing the Don Valley on its even more elegant bridge have another visionary leader's big idea to thank.

It was typical of the best leaders in the inter-war and post war years of the 20th century to fight for improbable ideas, spend years overcoming resistance to them, to endure the sneers of defeated

opponents, and then be vindicated for their courage—often long after their passing—by grateful future generations.

The Sydney Harbour Bridge, the signature for decades of Australia's largest city, began in a sense as a bridge to nowhere—now eight lanes, two railway tracks a footpath and a cycleway. John Bradfield, the visionary "Chief Engineer of Sydney Harbour Bridge", first proposed a bridge in 1914, and lived to ride the first train across it in 1932. Today, the road section of the Harbour Bridge is named the Bradfield Highway in his honour.

Similarly, the Bloor Viaduct across the Don Valley realized the vision of city fathers who foresaw the growth of Toronto. After years of debate and five years of construction, the Bloor bridge opened in 1918 at a cost of \$2.5 million. Nearly a century later, it still links the east to the west side of Toronto, with five traffic lanes and two bicycle paths on the upper level, and Toronto subway trains on the lower level.

In Montreal, where they had talked of a subway for decades, Jean Drapeau built the métro in only four years from 1962-66. Then he used the earth from the subway tunnels to build two islands in the middle of the St. Lawrence River that hosted Expo '67, the most successful world's fair in history.

Dwight Eisenhower's vision, in the 1950s, of a continent-spanning network of super-highways was a big idea that transformed the way in which Americans saw their country and bequeathed dramatic economic growth and mobility for generations. Today, the Interstate Highway System, the backbone of US travel and commerce, bears his name. C.D. Howe rammed through a pipeline from Alberta to Ontario in less than 10 years from conception to opening—admittedly employing methods that helped defeat his government and would have raised the eyebrows of Crown prosecutors today.

John F. Kennedy, in a speech at Rice University in 1962, famously said:

2014 has seen the first breach by a global power, Russia, of the ironclad observance of post-war UN agreements against the use of force to seize territory. This breakdown in the centre of Europe is disturbing, but probably not uncontainable. That Russia needs the world more than it needs the Ukraine will be the inevitable choice they will soon face.

"We choose to go to the moon." And America did, "in this decade", as he promised. In Berlin in 1987, Ronald Reagan called on Mikhail Gorbachev to "tear down this wall." And together they ended the Cold War. Pierre Trudeau promised constitutional change in the 1980 Quebec referendum, and delivered it in the Canadian Charter of Rights and Freedoms of 1982. Brian Mulroney transformed the Canadian economy, and Canada-US relations, with the Free Trade Agreement of 1987 and the Acid Rain Accord of 1991. These were leaders with big ideas, who delivered on them.



"We choose to go to the moon," John F. Kennedy declared in his famous commencement address at Rice University in 1962. And America did, as he promised, "in this decade." Wikipedia photo

But it is not merely the ability to conceive and drive to completion massive infrastructure projects or societal change that distinguishes those years

and those leaders from today.

When Paul-Henri Spaak, Jean Monnet and Robert Schuman, a Belgian and two French politicians, sat down in a café in war-ravaged Brussels to conceive of the partnership that became the European Union, it took a visionary confidence that could have fairly been seen as delusional. The Marshall Plan—the tidal wave of US dollars and assistance that pumped up European post-war recovery and drove down Soviet imperial ambition—has been studied endlessly, but despite calls for similar assistance to other devastated regions, has never been replicated.

The list of grand, visionary follies is not short, but the legacy of world-changing achievements is longer. From the creation of the global network of institutions that guide international economic policy and security management, to previously inconceivable binding agreements on nuclear weapons, the International Atomic Energy Agency regimen, chemical weapons, the Law of the Sea and that governing Antarctica, the world of the 21st century is less violent, more tolerant, less fragile economically and militarily, and more committed to sustainability than any in human history.

But that foundation, those networks are now aging—products of an era that is quickly fading. Today's leaders have failed to build on the acid rain and ozone agreements of 25 years ago, in battling climate change. Canada's leadership on the abolition of land mines failed at the finish line, as did efforts to control the spread of conventional weapons, a deadly trade that is breaking all records once again.

Today's leaders managed the 2008-09 financial crisis. They put a plug in the hole, but systemic financial control mechanisms acceptable to the whole world required leadership they did not have. Bilateral trade agreements continue to multiply, but the transformational trade agreements that were the legacy of the GATT have eluded its WTO successor, with the Doha Round facing collapse once again.

And most distressing of all, 2014 has seen the first breach by a global power, Russia, of the ironclad observance of post-war UN agreements against the use of force to seize territory. This breakdown in the centre of Europe is disturbing, but probably not uncontrollable. That Russia needs the world more than it needs Ukraine will be the inevitable choice they will soon face. It seems unlikely, however delusional Russia's new czar has become, that he will be permitted by his own citizens to turn Russia into a North Korean autarky—though many Russian billions and many thousands of young lives may be squandered before he is brought back to reality, or forced from his palace.

Political managers such as Stephen Harper, Barack Obama, and virtually every European head of government who trembles at the prospect of major risk taking, long-term thinking or strategic gambles seem collectively ill-suited to this sweeping set of new threats and fundamental challenges.

China is demonstrating on many fronts its unwillingness to accept the old order, challenging it in the South China Sea, in the Security Council, and in an array of bilateral conflicts. Henry Kissinger's warning on China, now nearly two decades old, seems more relevant today than it did post-Tiananmen Square: "We may only

hope that the statesmen of the new century are more successful at accommodating a rising and unsatisfied new power into the international order, than were their forefathers at the beginning of the last century—else the 21st century risks becoming as tragic and bloody for many of the world's citizens as was the 20th."



Prime Minister Pierre Trudeau and the Queen at the Proclamation of the Constitution Act, with the Charter of Rights and Freedoms on Parliament Hill, April 17, 1982. Wikipedia photo

It is not clear that the world can be as confident of an end to the disorder sweeping the Maghreb and the Middle East, as it might be in re-establishing an agreed order in Europe or Asia. There the forces of unreason are rampaging successfully across a series of failing states from Tripoli to Cairo, to Sinai, Syria, Iraq and possibly once again Afghanistan. Despite the expenditure of hundreds of billions of dollars on both development and death by drone, and at the cost of tens of thousands of lives, the spiral into chaos does not appear to be slowing down.

In total, it is an alarming menu: unparalleled security challenges on the ground and in cyberspace by non-state actors from North, West and the Horn of Africa to the Maghreb to Central Asia, now heavily armed and flush with oil dollars; a collapse in political will and confidence in the democracies due to the military humiliations of the past decade fol-

lowed by the economic collapse and a still shaky recovery; on top of two very unsatisfied nuclear powers testing the boundaries of international order in Europe and Asia.

Those political managers such as Stephen Harper, Barack Obama, and virtually every European head of government who trembles at the prospect of major risk taking, long-term thinking or strategic gambles seem collectively ill-suited to this sweeping set of new threats and fundamental challenges. However delusional his power grab may be, no one can accuse Vladimir Putin of lacking the confidence of a grand vision: the recreation of the Russian Empire of the great czars. Chinese leaders may not be as foolish in their ambition, and are demonstrably far more effective at playing several chess games with several partners simultaneously, but the sweep of their game plan crosses decades, not an election cycle.

The idea that François Hollande or David Cameron is this century's version of the great French presidents and British prime ministers of the post-war era would be laughable if it weren't so horrifying. Angela Merkel soars in the current European political firmament, but only by contrast with her peers, not her German chancellor predecessors, such as Helmut Kohl, the father of German reunification. Barack Obama, the political vessel into which so many poured so much hope, has revealed himself to be timid to the point of dysfunction when big choices need to be made. They may be competent managers—though even that bar sometimes appears too high—but genuine political leadership is something else entirely.

We face challenges that will require visionary leadership to meet on a dozen policy files in every corner of the globe. Voters in many places have demonstrated their willingness to support leaders committed to transformational change. We even know the outlines of the required solutions in many cases: further trade liberalization, especially in services; real carbon pricing and faster moves to non-carbon energy; changes in

membership at the top tables like the IMF and the Security Council; global financial services regulation and governance that includes developed and developing nations; and perhaps most urgently, new enforceable security agreements and partnerships.

We face challenges that will require visionary leadership to meet on a dozen policy files in every corner of the globe. Voters in many places have demonstrated their willingness to support leaders committed to transformational change.

What will it take for a new generation of leaders to demonstrate the vision of a 21st century Laurier, combined with the steel of an FDR, and the breath-taking skill at reconciliation of a Mandela? Human history suggests that those leaders will emerge, unpredictably and without warning—often when and where the skies are darkest. In 1985, no one could have predicted South Africa's liberation and multi-racial democracy a decade later.

Is Hillary Clinton capable of rising above her underwhelming incrementalism to offer tough global leadership of the world's only "indispensable" nation? Is Tom Mulcair or Justin Trudeau capable of bringing Canada together again after a decade

of dither followed by another decade of deliberate division?

And who will re-bottle the rapidly spreading scorpions now threatening the lives of millions of Arabs, Africans and Asians, and soon the world?

For our children's sake, let us dearly hope they come soon. **P**

Contributing Writer Robin V. Sears is a principal of the Earncliffe Strategy Group. robin@earncliffe.ca

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The Three Amigos—US President Barack Obama, Mexican President Enrique Peña Nieto and Prime Minister Stephen Harper at the North American Leaders' Summit in Mexico in February 2014. Jeremy Kinsman writes it's time for a deeper NAFTA. PMO photo

Building on the NAFTA Legacy: A North American Moonshot

Jeremy Kinsman

As the world copes with a West African pandemic, Russian expansionism and a death cult from the Middle Ages, the continental bonds of North America's Three Amigos feel frayed. It's a radical departure from Ronald Reagan's vision, 35 years ago, of a North American accord that would forge, "the strongest, most prosperous and self-sufficient area on earth." NAFTA formed the foundation for that dream, but it will take real leadership on the interdependent endeavours of energy and climate change to pick up the torch.

Wild lunges of violence from a suddenly scarier world jarred Canada's peaceful summer. Hopeful assumptions of only a few years ago that the unchanging authoritarianism of the Middle East could be challenged by impatient young reformers, keen to link in to the 21st century, have been hijacked by a sectarian death cult from the Middle Ages. As aid workers and journalists were beheaded by ISIS on the Internet, Canada and other democracies debated how far to put their own militaries in harm's way again in the area. Robert Fowler's advice that "We've got to get nasty or get the hell out" of a region, where misplaced thrusts of liberal internationalism have caused a

train wreck, is a chastening judgment to those clinging to the ideal of eventual one-worldism and universal human rights. The Middle East will see reform but the road is very long.

Meanwhile, Russia's manipulation of a vengeful throwback civil conflict in Ukraine revived East-West hostility thought to have dissolved a quarter century ago. China's hostility to Hong Kong's peaceful democrats is ominous. The outbreak of a deadly epidemic in sparsely equipped West Africa, one that is bound to migrate, has left world health authorities scrambling.

All in all, it seems a good time to rely more on our own more predictable neighbourhood as a secure base from which to operate more globally. But in our home region, on the day-to-day political level, North Americans seem more divided than ever.

The events of 9/11 created a homeland wall in US official mentality that raised and thickened borders and spawned gigantic new agencies. Hundreds of miles of fencing on the US border with Mexico are patrolled by a US paramilitary force as large as Canada's armed forces. To the North, Canadian bureaucracies have struggled to negotiate new surveillance programs to work around US anxieties. But heavy controls have left Canadians, Mexicans, and to the extent their disabling internal quarrels permit them to notice, Americans, with a diminished sense of community with their neighbours.

Harder economic times resulting from the financial melt down of 2008 have exacerbated protectionist sentiment in the US Congress that too often draws from the patriotic narrative to counter cooperative intentions. Canada-US business facilitation initiatives such as Beyond the Border help with pre-clearance of goods but they are below the public's radar.

Intergovernmental relations, especially between Canada and the US, show the strain.

Buoyed by increased national energy

Reagan's hopes for North America had about them the quality of a big idea, especially in contrast to self-involved national agendas today. He intuitively believed in the notion of North America, distinct in history, geography, shared identity, values, and destiny.

security from the shale gas revolution, President Barack Obama still balks at approving the Keystone XL pipeline that would transport heavy oil from Alberta's oil sands to US refineries. Prime Minister Stephen Harper misplayed the politics of the issue, scolding environmental and other opponents of the project for their inability to see it as a "no-brainer," chiding them he would "not take 'no' for an answer," whatever that means. He damaged relations with the White House by distancing Canada from US efforts to encourage moderation of hard lines in the enduring Israeli-Palestinian confrontation and in nuclear negotiations with Iran. The showboat sniping at US efforts makes no difference to the outcome of those issues, but it irritated President Obama when Canada needed political capital. Playing catch-up, Harper seems to show he got the point by volunteering a six-pack of Canadian CF-18s to join in the US led allied campaign to try to contain and degrade ISIS from the air.

US-Mexico relations are what they can be, given the semi-hysteria in the US on immigration issues and border defense. The drug war is as complex and contradictory as ever. But Mexico's new President Enrique Peña Nieto is providing determined leadership with several initiatives on infrastructure development and economic reforms that have caught the attention of business partners in the US and Canada. The miasma of organized crime and local police corruption continues to reveal grotesque surprises, yet overall Mexico is making progress against the narco-political gangs.

Unfortunately, the Mexican president hasn't convinced Canadian authorities to undo Canada's recently imposed regime of visas for Mexicans. Canada-Mexico relations are

desultory. Harper and the Canadian bureaucracy sullenly resent Mexico's greater political resonance in Washington, preferring the undivided attention of two-way dealings with the US over the Three Amigos route.

Can't North Americans do better?

It's a bleak contrast to the vision of North America set out by Ronald Reagan 35 years ago. Reagan's hopes for North America had about them the quality of a big idea, especially in contrast to self-involved national agendas today. He intuitively believed in the notion of North America, distinct in history, geography, shared identity, values, and destiny. His announcement on November 13, 1979 that he was a candidate for the presidency included the surprise aspiration for "a North American accord" that would enable the US, Canada and Mexico together to make the continent "the strongest, most prosperous and self-sufficient area on earth." It could "show the world by example that the nations of North America are ready, within an unswerving commitment to freedom, to seek new forms of accommodation to meet a changing world."

In years since, the world has changed more profoundly than imaginable back then. New conditions of rising regional competition and weakened multilateral institutions mean North Americans are going to need to rely more on themselves.

Some Canadians don't see closer integration as the answer for Canada because they judge that a declining US is "done" as the leading force in the world. They argue for urgent strengthening of Canadian ties to Asia to compensate. Succeeding in Asia is mandatory for a country with internationalist goals—including for oil and gas exports—but not because of a false



Mexican President Carlos Salinas, US President George Bush and Prime Minister Brian Mulroney at the signing of the NAFTA in Texas, September 1992. In the first row, trade ministers Jaime Serra Puche, Carla Hills and Michael Wilson. Policy archives photo

perception that a diminishment of US economic and military preeminence is making the case for a stronger North America yesterday's story.

It has been a rewarding story but far from complete. Since Reagan's vision encouraged Canadian and Mexican partners to join with the US in the North American Free Trade Agreement, trade between the three has more than tripled, and direct investment is up fourfold. And as this year marks the 25th anniversary of the implementation of NAFTA, this should be cause for celebration. But today those gains are banked, taken for granted. They were very real, especially for Canada. Moreover, the "identity" damage many Canadian cultural nationalists feared from closer economic integration with the US didn't happen. Canadians and more "conservative" Americans diverge on many basic social issues even more today than 25 years ago, despite increased economic ties, and most Canadians wouldn't have it any other way.

In recent years, strategists, scholars, and business circles with a wider geo-

Since Reagan's vision encouraged Canadian and Mexican partners to join with the US in the North American Free Trade Agreement, trade between the three has more than tripled, and direct investment is up fourfold.

political lens, preoccupied with the rise in competitive regionalism, have argued for taking the North American story to the next level, making the case for shoring up a shared home base by strengthening NAFTA as the framework for our common economic space. Prominent voices in Canada, the US, and Mexico call for reinforcing common infrastructure such as the electricity grid, overhauling and simplifying trade and other economic rules to reflect current realities and new opportunities, and bonding together in a concerted effort to forge common approaches to some very big policy challenges. US Commerce Secretary Penny Pritzker is already a protagonist.

This autumn, the US Council on Foreign Relations produced a task force report asserting "It is time to put North America at the forefront of US policy," to create a continental base for US global interests. It would be a mistake to discount the report just because it radiates self-focused US corporate and global strategic agendas. In any case, it will be up to Canadians and Mexicans to make sure the benefits are to the wider communities in all three countries, and that closer integration works for social safety nets as well as for the interests of US private equity.

Realistic voices point to partisan political gridlock in Washington and the choking self-indulgence of the US political system and its manipulation by special interests, to argue that US leadership won't be up to such a far-reaching task. But this report from a group loaded with corporate interests sees the possibility of trade-offs in US politics that would enable the US to work on a big package of immigration reform, strengthened continen-

tal perimeter security, more common norms for a “made in North America” manufacturing label, and indeed an energy/environment swirl that could move North America to an improved competitive position globally.

The CFR notes the big additional spatial dimension, projecting the NAFTA community across the Atlantic to meet the EU. Everybody’s public “pivot” is to Asia but in reality the more important forefront deal will be trans-Atlantic, enabling a stronger base from which to engage across the Pacific.

Dan Hamilton of Johns Hopkins wrote a seminal book a decade ago with Joseph Quinlan on the Trans-Atlantic Partnership that forms the world’s strongest relationship, enhanced because of its shared democratic governance. The relationship is built as much on direct inter-investment, supply chains, and affiliate sales as on export trade. The Trans-Atlantic Trade and Investment Partnership (TTIP) negotiations between the US and the EU will eventually bind these advantages. Canada’s landmark pending Comprehensive Economic and Trade Agreement (CETA) treaty with the EU is something of a precursor, much as the Canada-US FTA was the template for the NAFTA. Mexico’s special relationship with the EU predates both. The CFR looks to a big Trans-Atlantic FTA, a comprehensive deal between NAFTA and the EU, positioning the wider trans-Atlantic region to reach out and compete more effectively in a regionalizing world.

There will be ample protectionist and political resistance on both sides of the Atlantic but there always is.

A grand bargain on energy/climate change cooperation could be a centerpiece. At a Berkeley conference a few years ago on “North American Futures”, a top administration official encouraged a call by ex-Undersecretary of State Tom Pickering and former Canadian deputy prime minister Anne McLellan for the three countries to attack the issue as a “project model.” Acting as “first movers” globally could hopefully break the

international log jam of competitive blame-laying on climate change that has stalled meaningful progress (and thereby help restore multilateral co-operation more generally).

No issue more starkly reflects partisan divide in the US. A recent Gallup poll found that 61 per cent of Democrats consider climate change a priority public policy challenge, but only 19 per cent of Republicans do.

Hopes that Canada could take the lead on the energy/environment swirl overlooked the fact that the current Conservative Government largely shares the Republican view. But its refusal to acknowledge the need for real mitigation policies on greenhouse gases from the oil sands (forecast to grow by 65 per cent from 2005 levels by 2020), essential to mollify environmental opposition in the US to Keystone XL, is shown by polling to be out of date and out of synch with the Canadian public. One way or another, policy remedy or governmental change will likely intervene to enable Canada to contribute to serious work among the three North American partners (four, with Alberta, which does have some strong carbon capture projects, as well as a \$400 million clean technology fund and a \$15 per tonne carbon charge to large emitters). The US partisan divide is a factor, but President Obama, who sees the imperative of global warming as a legacy challenge, is determined to exercise executive privilege to move the US position forward.

So much for the surface economic and geo-political case behind a renewal of the big North American dream today.

So where’s the music?

My epiphany occurred in 2001 when as High Commissioner in London, I joined my US and Mexican Ambassador colleagues to celebrate NAFTA’s tenth anniversary with a series of huge co-hosted receptions for the British political class at their annual party conferences. At these events, the political Brits saw the unexpected: three countries they thought they had always understood in a com-

pletely new light. Canada appeared part of a much bigger North American enterprise with a demonstrably different “special” relationship to the US from Britain’s; modern Mexico emerged as the “new” Mexico, with a self-confident and buoyant middle class of thirty millions; and the US came across as both strengthened and softened in the company of such family relatives.

We are comfortable as the Three Amigos, the 500 million North Americans, with separate identities and some bad family history, but now together as stewards of our own continent and futures, and as Europe’s essential partner.

When Ronald Reagan proposed his vast North American project, he acknowledged it “may take the next hundred years.”

This is a scale of thinking that Google in-house vocabulary terms a “moonshot” idea, doing something very ambitious in a very different way, as opposed to incrementally improving mechanical parts of what is already being done.

But is it really vaster than the shocking changes we are living through globally and having to react to? The difference is that we can drive this moonshot change ourselves. The time for real leadership is now. **P**

Jeremy Kinsman was Canadian ambassador in Moscow in the 1990s and to the European Union 2002-06. He is co-author of The Diplomat’s Handbook for Democracy Development Support, published by CIGI, and is attached to the University of California, Berkeley, and Ryerson University. kinsmanj@shaw.ca

In memory of
Dr. Robert Pastor, author of
*Toward a North American
Community*,
1947-2014.

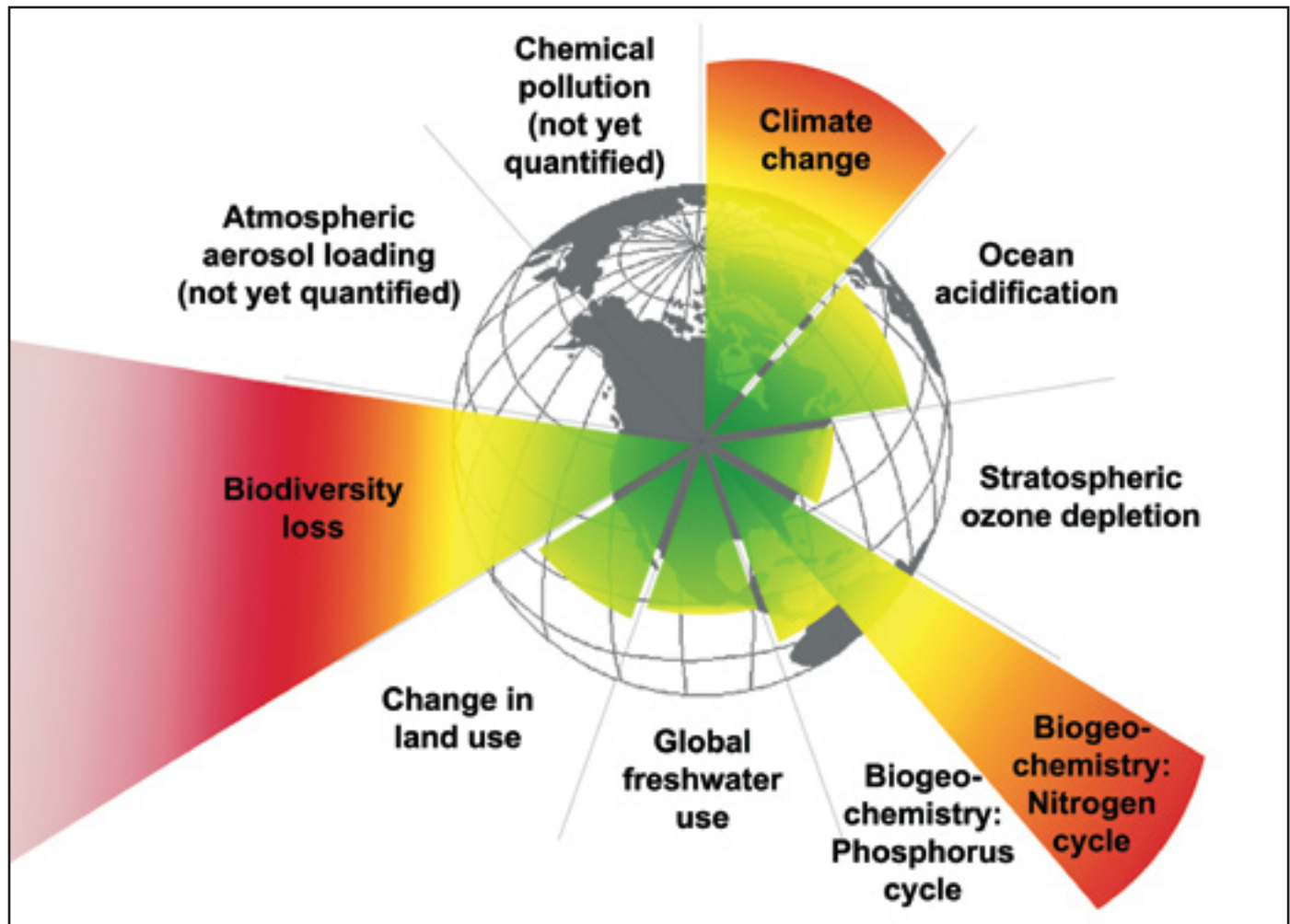


Figure 1: The globe represents the proposed safe operating space for planetary systems with the wedges representing an estimate of the current position for each. Source: Steffen et al., 2011. How Defining Planetary Boundaries Can Transform Our Approach to Growth. Solutions. <http://www.thesolutionsjournal.com/node/935>

Future Earth: A Sustainable Planet for Future Generations

Gordon McBean

Now in the Anthropocene, the Age of Man, sustainable development needs to be implemented to enable future generations to meet their needs for an ethical and equitable planet. The International Council for Science and global partners have initiated a new research program Future Earth: Research for Global Sustainability. To fully address societal concerns and link society, economy and environment, the Future Earth program will engage stakeholders across societies to “co-design”, “co-produce” and “co-deliver” the program.

In 1987, the UN's World Commission on Environment and Development presented its report *Our Common Future, From One Earth to One World* which defined sustainable development as: “humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainable development explicitly requires looking ahead, well beyond the next election, and not compromis-

ing the needs of future generations and is very much about one world.

Canada has been a leader on these issues as reflected by the 1988 Toronto Conference on The Changing Atmosphere: Implications for Global Security, which was opened by Prime Ministers Brian Mulroney of Canada and Gro Brundtland of Norway, who had been the chair of the World Commission on Environment and Development. The Conference's summary opened with: "Humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a global nuclear war". At the 1992 UN Conference on Environment and Development in Rio de Janeiro, chaired by Maurice Strong of Canada, Mulroney and his Environment minister, Jean Charest, played leading roles. The Conference agreed to the Framework Convention on Climate Change, Convention on Biological Diversity and Commission on Sustainable Development, which provide a framework for action to address the issues of global environmental change and sustainable development.

More recently, Prime Minister Stephen Harper signed the 2009 Copenhagen Accord which states that "climate change is one of the greatest challenges of our time. ... deep cuts in global emissions are required... Adaptation to the adverse effects of climate change ... urgently required."

The scientific judgment now is that the Earth's evolution is defined by human's massive impact and we have entered the Anthropocene—the *Age of Man*—according to Professor Paul Crutzen, Nobel Prize winner for his analysis of ozone layer chemistry. Maintaining our global environment for human development and well-being requires that humanity respect planetary boundaries that delineate a "safe operating space" for humanity (Figure 1). Our Planet is already beyond the boundaries for biodiversity loss, nitrogen cycle and climate change and actions are needed. Stratospheric ozone depletion is one area of progress with the

Our Planet is already beyond the boundaries for biodiversity loss, nitrogen cycle and climate change and actions are needed. Stratospheric ozone depletion is one area of progress with the Montreal Protocol on ozone depleting substances having a strong scientific basis.

Montreal Protocol on ozone depleting substances having a strong scientific basis.

In the previous issue of *Policy Magazine* on Sustainable Energy, David McLaughlin noted that Canada will get only about halfway to the common US-Canada target on greenhouse gas emissions while the US will achieve it. The Fall 2014 Report of the Commissioner of the Environment and Sustainable Development concluded that: "Current federal measures will have little effect on emissions by 2020". Although Environment Canada had recently committed to the principle of transparency, "the Department's approach to some of the planned regulations for greenhouse gas emissions has not been consistent with federal requirements and the principles of world-class regulation, in terms of the extent and nature of consultation."

The Future Earth approach, discussed below, is emphasizing consultation across all sectors of all societies. It's definitely a big idea on the environment.

In the past few years, Canadians have been impacted by the increasing numbers of extreme weather-climate events of which the Calgary and Toronto floods are only two examples. In January, 2014, the Parliamentary Budget noted that the 280 per cent increased spending in the first six months of 2013-14 of Public Safety Canada's Emergency Preparedness program activity and the \$4.1 billion federal liability associated with major flooding and rainstorm events in 2011 through 2013. The Insurance Bureau of Canada President Don Forgeron stated "Water is our biggest problem, and adaptation is our solution." As Dan Gagnier, former head of the Energy Policy Institute of Canada, observed in *Policy*

Magazine's sustainable energy issue, "Quite frankly we are beyond mitigation and need to focus hard on adaptation". The conclusion is that Canadians and people around the globe need to adapt: "making adjustments in our decisions, activities and thinking because of observed or expected changes in climate, in order to moderate harm or take advantage of new opportunities." We need to recognize that we also need mitigation now to protect our grandchildren from the impacts beyond 2050.

The World Health Organization recently reported on Global Mortalities and Climate Change with projections for 2030 and 2050. Compared with a future without climate change, they project that there will be by 2030, the following additional deaths per year: 38,000 due to heat exposure in elderly people; 48,000 from diarrhoea; 60,000 from malaria; and 95,000 due to childhood under nutrition. By 2050, the number of additional deaths due to heat exposure will be over 100,000 per year with approximately 250,000 additional deaths due to climate change per year between 2030 and 2050.

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To achieve sustainable development requires an integrated approach across social, environmental and economic issues, including climate change and disaster risk reduction, and to understand the abilities and needs of present and future generations. The International Council for Science, working with the

International Social Sciences Council, UNESCO, UNEP, United Nations University, World Meteorological Organization and a global consortium of national funding agencies, has initiated a new global program, Future Earth: Research for Global Sustainability. The goal is to provide the knowledge required for societies in the world to face risks posed by global environmental change and to seize opportunities in a transition to global sustainability. The program will be structured in three interacting themes: dynamic planet; global development; and transformations towards sustainability. A cross-cutting theme is research on both natural and social-economic components and the interactions between them. There will be research to examine the fundamental and innovative long-term transformations that are needed to move towards a sustainable future. Significant shifts in political, economic and cultural values and changes in institutional structures and individual behaviours, with technological innovations, will be needed to address global environmental change and its consequences.

To strengthen international science for the benefit of society, all societies, and its vision of a world where science is used for the benefit of all, excellence in science is valued and scientific knowledge is effectively linked to policy making.

The approach to implementing Future Earth recognizes the need to fully engage stakeholders from governments, business sector, non-governmental organizations and others around the world in consultation with a transparent approach. The implementation of Future Earth will be undertaken by having Scientific and Engagement Committees working together from the beginning to co-design the program leading to co-production and co-delivery of knowledge to societies.

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This fits well with the mission of the International Council for Science to strengthen international science for the benefit of society, all societies, and its vision of a world where science is used for the benefit of all, excellence in science is valued and scientific knowledge is effectively linked to policy making. Future Earth will be managed by a global network of program offices, located in Tokyo, Colorado, Paris, Stockholm and Montreal with regional offices in Africa, south Asia and Latin America. The program will bring together the existing programs on global change, biodiversity, human dimensions and climate change that have been underway for two to three decades and have provided the present basis for knowledge.

While preparing this article, I attended the Science and Technology in Society Forum 11th Annual Meeting in Kyoto, Japan. Japan's Prime Minister Shinzo Abe spoke at the opening ceremonies and about 1,000 global leaders in science and technology, policy, business and media from approximately 100 countries, regions and international organizations met to discuss how to strengthen the "lights" (the benefits) and control the "shadows" (such as health and environmental impacts) of science and technology. The Forum's statement included the words: "Global environmental problems are reaching a critical stage. The need for a consensus on specific measures to reduce CO₂ emissions is urgent". This Forum was followed by the inaugural meeting of the Innovation for Cool Earth Forum (ICEF) in Tokyo. As Prime Minister Abe stated there, the ICEF is to be a meeting of world's leading policy makers, business persons and researchers to address climate change through inno-

vation. These sessions give one some hope that the issue of greenhouse gas emissions may be addressed and the "lights" will shine while the "shadows" are diminished for an ethical and equitable planet now and for many future generations.

As David McLaughlin wrote: "It is time to rethink this approach". He was speaking of emissions' targets but it is clear that we need to rethink our overall approaches to human-economy-environment so that a sustainably developed future becomes a reality. There are many intersections across our society, economy and the environment and within the environment. For example, actions to reduce smog in cities can be effectively linked to GHG emissions, noting also that the occurrence of smog with its health implications will increase as the climate warms, unless smog-creating emissions are reduced. Climate warming is also projected to cause a metre or more in sea level rise, affecting our economy as well as societies. Following the example of Future Earth with its engagement of stakeholders across societies, there is need for open, transparent consultation with the stakeholders in Canada, including the broad scientific community and all societal sectors, to co-design, co-produce and co-deliver a sustainable development policy and actions for Canada. For the benefit of all grandchildren, it is essential that future policies address these issues for the decades to come. **P**

Gordon McBean is President of the International Council for Science, Professor at the University of Western Ontario and Co-Director, Centre for Environment and Sustainability and Director, Policy Studies, Institute of Catastrophic Loss Reduction.
gmcbean@uwo.ca



Canada's Prospects in Today's Profoundly Changing World

Kevin Lynch

The world has entered a new era of multipolarity, economic realignment and accelerated, disruptive technological change. Yet, Canadian policy makers persist in tinkering with short-termism. Canada is perfectly positioned to exploit global shifts and, with the right branding, emerge as a new breed of world leader economically and otherwise. But it will require a shift in both perspective and strategy that can only be led by government.

Why is Canada seemingly trapped in an incrementalist mindset in our public policy thinking? It cannot be explained by the world around us, which is anything but static, or even terribly predictable. It is certainly not explainable by technology trends, which appear poised for another inflection point and promise a new technological revolution. And it is definitely not reflective of the absence of either great opportunities or great challenges, as both are beckoning. Rather, Canadian policy makers appear mired somewhere between a great complacency and a great fixation on the short term, neither of which is conducive to policy innovation or long-term thinking.

And yet the need for new thinking to respond to novel circumstances, both

local and global, seems glaringly self-evident. The world is well launched towards a new global normal, which will be quite different than the western economic pre-eminence of the postwar period. A multi-polar world is emerging, where economic power is being dramatically redistributed, and geopolitical power will eventually follow. The centre of international economic gravity is shifting to China and Asia, after a hiatus of four centuries. The demographics of aging are reshaping labour markets and putting new pressures on social systems in many countries, including China. The information revolution is transforming just about everything—how we work, how we communicate, how we interact.

In short, the status quo is being rudely cast aside, but nonetheless we tinker.

Where is the bold thinking to diversify our trade, energy and investment markets? To tackle our innovation and productivity deficits? To build our human capital advantage in a demographically challenged world? To mobilize public and private capital for competitiveness-enhancing infrastructure? To unite technology and policy for better environmental outcomes?

The irony is that Canada is so well placed to prosper in this new global normal, provided that we act, not react, in the face of the momentous global changes underway; that we adapt, adroitly and quickly, to the new opportunities and old challenges, not be a distant follower; and that we adopt a longer term perspective, not continue to be seduced by the tyranny of short-termism.

So what will this take?

Above all, vision, leadership and a willingness to be a policy innovator. What follows are 10 observations on Canada's potential in this profoundly changing world. They range from attitudes, to education, to fiscal frameworks, to natural resources, to productivity, to income mobility and equality, and beyond. If the list sounds eclectic, it both is and is not: success in this new global normal is complex, redefines traditional measures of competitiveness, and erases easy distinctions between what is economic policy and what is social policy.

Observation 1: Attitudes matter
(Chart 1A and 1B).

Trust, a central banker once quipped, arrives on foot and leaves in a Ferrari. The global financial crisis certainly sent the Ferraris racing. But so have other events such as environment disasters, corporate governance fiascos, privacy breaches in government and companies, political improprieties, etc. The cumulative impact has been a substantial decline in public trust in leadership, both public and private,

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in many countries and across many sectors of the economy. The consequence of diminished trust is a diminished ability to mobilize publics for change, whether by a corporation or a government.

According to the Edelman Global Trust Barometer, techies have replaced bankers as the trusted masters of the universe. Last year, on the Global Trust Barometer, only about 43 per cent of Americans professed to trust the US financial system, whereas a majority of Canadians did so and Asia topped the charts for trust in their financial systems.

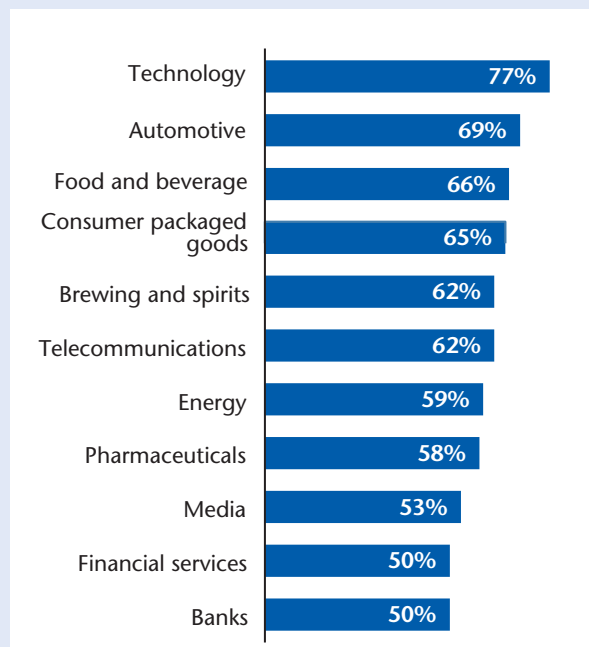
What about differences in a broader range of attitudes beyond trust? The Pew Research Institute conducts attitudinal surveys on a variety of issues around the world. As a 2013 Pew Research Global Attitudes Survey noted, North America is a tale of one continent but two very distinct public

moods. Pew found that: "by almost every measure, publics in Canada and the United States see the world they are experiencing through different lenses."

Canada has demonstrated a capacity to forge a different policy path than its giant southern neighbour—be it in financial sector regulation, fiscal policy, public pensions, health care, or tax policy, to name a few. These have reshaped relative public moods and influenced relative economic performance. Too often, when the rest of the world looks to North America, it only sees the enormous size of the US market and the US-Canada similarities, not the differences in approach and potential.

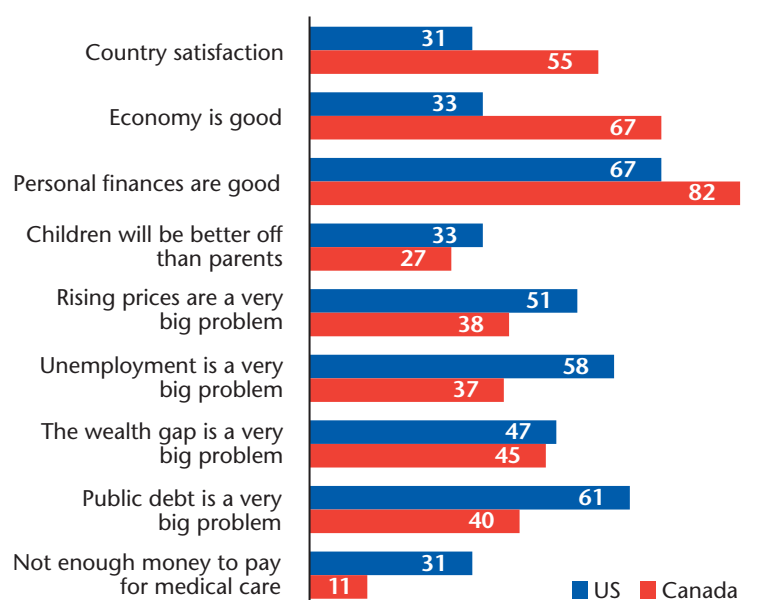
Canada has considerable under-realized global brand potential, and this comes at a cost: to our firms in selling abroad, to attracting foreign investment, to interesting the best and

CHART 1A: The 2013 Edelman Global Trust Barometer



Source: Edelman

CHART 1B: Pew Research 2013 Attitudes Survey: The North American Divide (% agreement with statement)



Source: Pew Research

brightest students to study here, and to encouraging entrepreneurs to emigrate here.

Observation 2: A new two-speed world (Chart 2).

The global “macroeconomic” context is structurally changing. A two-speed world is rapidly emerging, with the advanced economies moving into the slow lane, as aging demographics and slowing productivity take their toll, and the dynamic emerging market economies now leading global growth, driven by globalization, urbanization, demographics and the information revolution.

In this shifting environment, Canada has fared relatively well to date due to a number of global strengths, particularly our abundant natural resources, healthy public finances, and a strong financial sector. But going forward, with global growth shifting ever more from the OECD countries to the emerging markets in Asia and elsewhere, Canada, with 89 per cent of its trade today with “slow growth economies”, faces an imperative to diversify our trade in order to expand

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export-oriented growth in the future.

Observation 3: Fiscal sovereignty (Chart 3).

Fiscally, things really are different today across most OECD countries. The US government net debt-to-GDP ratio, at 87 per cent, is in territory that it last explored just after the Second World War, and debt-to-GDP ratios are well above the Maastricht upper levels of 60 per cent of GDP in most EU countries. The global financial crisis has had a severe impact on government debt levels, particularly in countries where there were banking failures.

The exceptions to this recent trend are the Nordic countries, Canada, Australia and New Zealand, with net government debt-to-GDP ratios ranging from 36 per cent in Canada to roughly 0 per cent in Sweden. Canada and several other countries also have actuarially funded national

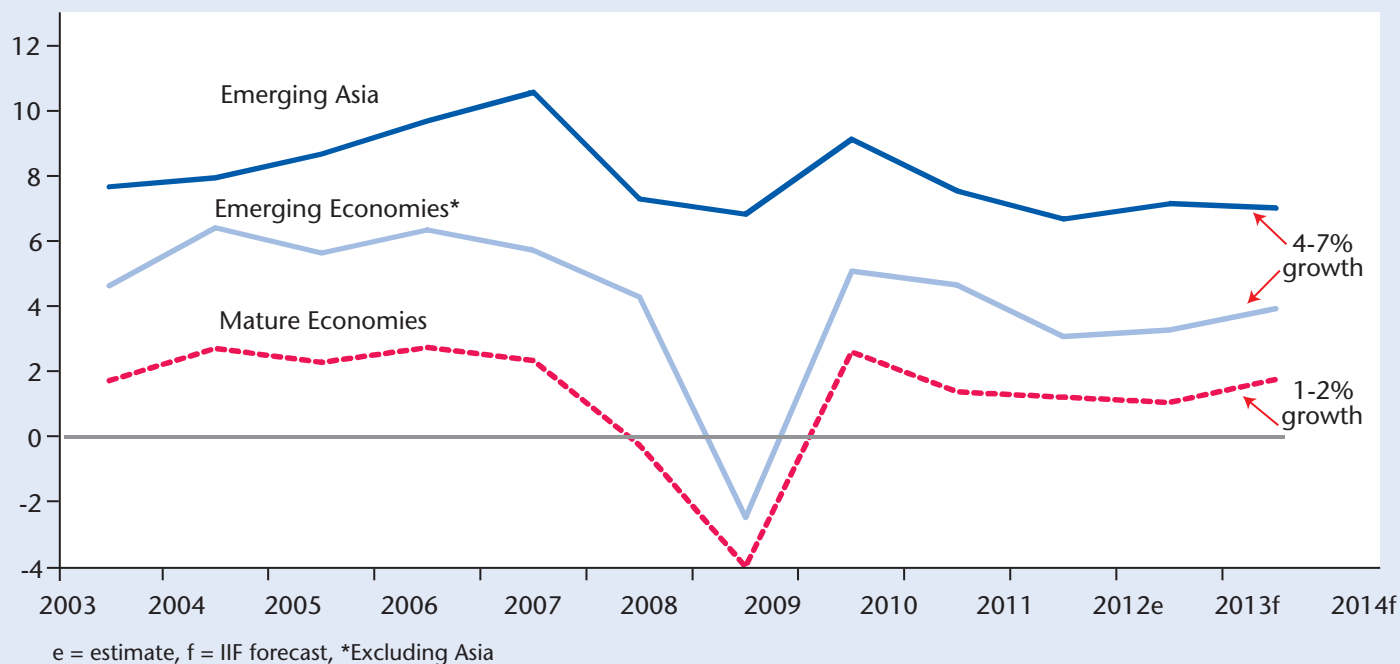
pension plans. Relatively low government debt-to-GDP levels avoid crowding out of private sector debt, provide “national insurance” in an uncertain and volatile world, and create the capacity to act in support of national priorities.

Observation 4: Emerging markets growth = demand for natural resources (Chart 4).

The emerging market economies now leading global growth are in need of energy and natural resources to fuel that growth. With ballooning middle classes, they are also in need of agricultural resources and value-added foodstuffs.

Canada is in the enviable position of being a dominant producer of most natural resources. Canada is a major energy producer with the third largest oil reserves in the world. It is the fourth largest producer of gas and

CHART 2: Two Speed World: The Visual



Source: IIF Capital Flows to Emerging Market Economies, Jan 22, 2013

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the sixth largest global producer of oil. Today, Canada is the largest exporter of energy to the US. Canada is also a prominent global agricultural producer.

Clearly, as world demand for natural resources grows, spurred by rapid Asian expansion, this will benefit resource-rich countries like Canada. While the potential is evident, the challenges for Canada are also clear. We need to invest more in research and innovation to improve the productivity of how we develop and produce these resources; we need to invest in the transportation infrastructure to service these new regions efficiently; and, we need to develop the distribution partnerships abroad to bring our

resources and foodstuffs to market.

Observation 5: Energy revolution (Chart 5).

We are in the midst of an energy revolution, in both demand and supply. Demand, which will rise over 30 per cent between 2010 and 2035, is shifting from the OECD countries to the rapidly growing emerging economies. Indeed, 97 per cent of energy

demand growth will come from non-OECD countries, a dramatic reversal of past energy growth trends. Reflecting energy efficiency gains, energy substitutions and lower potential growth, there will be no growth in US energy demand, a major risk for Canada, which exports 100 per cent of its oil and gas to the American market.

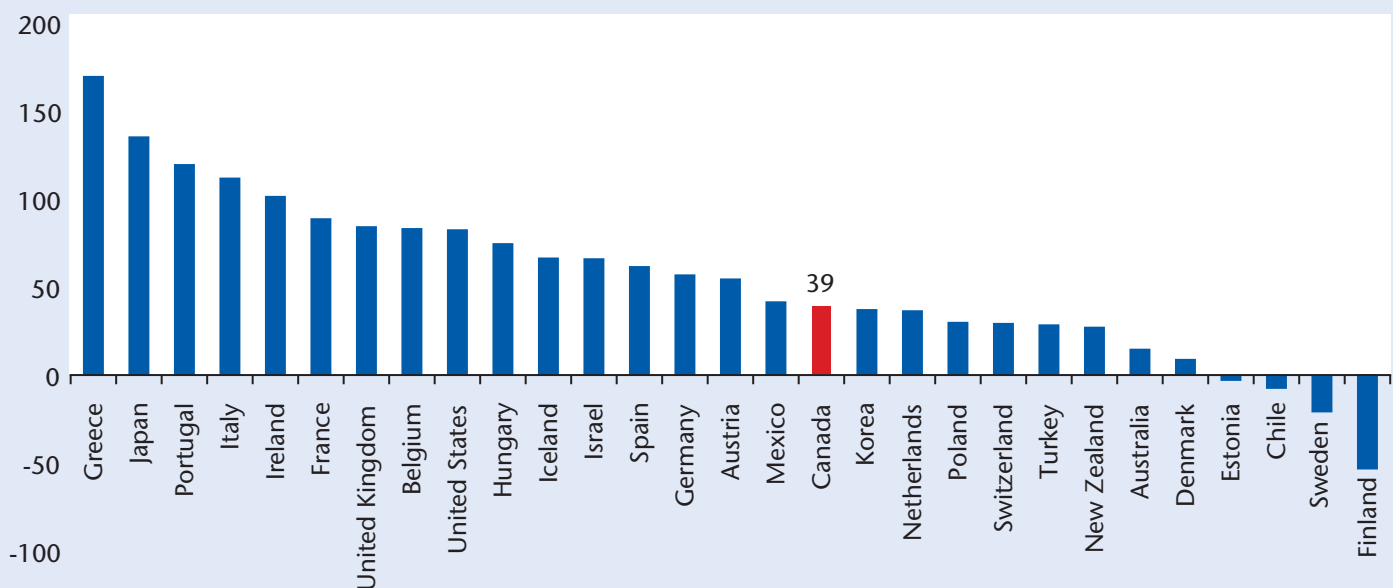
CHART 4: Canada's Energy and Natural Resource Ranking

ENERGY AND NATURAL RESOURCES	RANKING
Uranium	2nd
Hydro	3rd
Natural Gas	4th
Crude Petroleum	6th
Potash	1st
Titanium	1st
Aluminum	3rd
Tungsten	3rd
Diamond	4th
Nickel	5th
Platinum Group	5th
Molybdenum	6th
Zinc	6th
Gold	8th

RESERVES
Large shale gas reserves
3rd largest oil reserves in world (oil sands)

Sources: Canadian Minerals Yearbook, US Geological Survey (USGS), Food and agriculture organization of the United Nations (FAOSTAT)* latest year, IEA, British Geological Survey, Forest Products Association of Canada, International Energy Association

CHART 3: 2013 General Government Net Debt, OECD Countries (% of GDP)



Source: IMF World Economic Outlook, April 2014

Note: Portrays general government net lending and general government net debt for all levels of government

Supply is shifting dramatically to “unconventional” sources—oil sands, shale oil, shale gas, etc. The advent of shale gas and oil is moving the US into net energy self-sufficiency, another major risk for Canada’s energy sector.

Canada has abundant “unconventional energy supply” potential, but it is “trapped” in a North American market with excess supply and little demand growth. The impacts are threefold: Canadian oil sells at a

substantial discount into traditional American markets (an average discount of \$23 in 2013 with peaks over \$40); incremental Canadian oil and gas supply does not have security of demand in the US; and, Canadian and American gas sells well below prices in either Asia or Europe. The simple answer to these three impacts is: diversification.

To expand Canada’s unconventional oil supply capacity will require oil exports to new markets in Asia and else-

where, and this needs energy transportation infrastructure to tidewater, either on the west or east coasts. Similarly, to expand gas exports and raise net gas prices will require LNG exports to either Asia or Europe, and this too needs pipelines and LNG facilities. The potential is enormous, but the transportation hurdles must be overcome and there is a limited window of time to tap these new markets as competition is fierce, including from the United States.

CHART 5: Canada’s Energy Exports to the US and a Comparison of LNG Pricing

CANADIAN ENERGY OPPORTUNITIES AND RISKS	CANADA’S ENERGY EXPORTS TO US, 2010 %, BY VALUE		NATURAL GAS GLOBAL PRICING 2013 AVERAGE (US\$/MMBTU)	
	Crude Oil (including Oil Sands)	99.50%	North America (HH)	3.89
	Hydro	99.20%	Japan/South Korea (JKM)	16.56
	Natural Gas	100%	Europe (Netherlands TTF)	10.38
			UK (NBP)	10.35

As of Feb 13, 2014

CHART 6: World Economic Forum Rankings: Soundness of Banks 2013-14

TOP 10

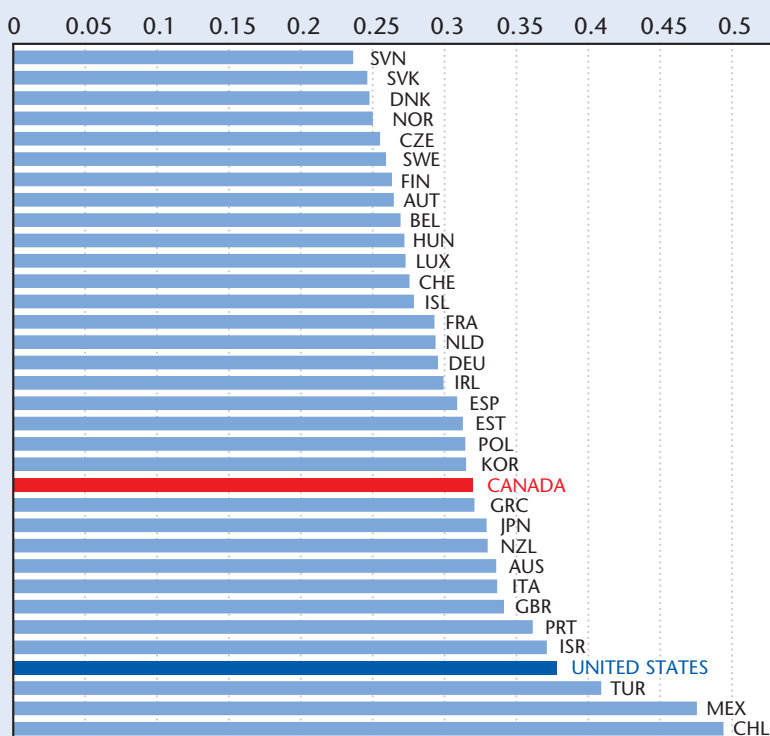
RANK	COUNTRY
1	Canada
2	New Zealand
3	South Africa
4	Hong Kong SAR
5	Singapore
6	Finland
7	Panama
8	Norway
9	Australia
10	Chile

OTHER SELECT COUNTRIES

RANK	COUNTRY
12	Brazil
43	Japan
58	United States
62	France
64	Germany
72	China
88	Italy
105	United Kingdom

Source: World Economic Forum

CHART 7: Measure of income inequality (Gini coefficient) in OECD countries, late 2000s (a lower number indicates greater income equality)



Source: OECD

Observation 6: Institutional frameworks matter (Chart 6).

Macro frameworks matter greatly to economic outcomes, as the global financial crisis demonstrated once again. Effective frameworks positively influence market confidence, they lower perceptions of systemic risk, they improve public trust, and they support long-term economic growth.

Canada has a banking system ranked first in the world for safety and soundness, an efficient central bank with a clearly defined inflation target and a track record of success in hitting it, an effective financial sector regulatory system, and world class financial institutions. It taxes corporations at a much lower rate than the US, thereby creating an incentive for firms to operate in and from Canada.

However, in a world where trade often follows investment linkages, it has made a rules-based foreign in-

vestment regime much more discretionary and unpredictable, and thus relatively less attractive to needed capital flows. Canada should consider focusing more on the behaviour of capital and less on its ownership, and shift from increasingly arbitrary ownership rules to effective regulation geared to transparent objectives.

Observation 7: Where economic and social policy converge (Chart 7).

Sustained competitiveness and dynamic societies typically go hand-in-hand over the long haul. For a country to be competitive and resilient, wealth accumulation and wealth distribution both matter. Sustainable competitiveness requires dynamic societies, with equality of opportunity, upward mobility, and dispersion of income. Thus, rising income inequality and declining economic mobility in many countries should be a worrisome trend

for policy makers and markets.

Today, rising income inequality is becoming an economic, social and political issue for a number of countries, both developed and developing. While income inequality has increased in Canada, it has not changed much over the last decade. Moreover, it is better than in most G7 countries, particularly the US, on the basis of standard Gini coefficients or ratios of high income to low income earners. The challenge for Canada is not to ignore the implications of income inequality and economic mobility, but to deal with our specific issues, and not mistakenly import those of others.

Observation 8: Competitiveness is complex and changing (Chart 8).

The “competitiveness context” for all countries and sectors is changing. While competitiveness is complex and varies across countries and industrial mixes, for high income-high

CHART 8: The Competitiveness Context

Rankings	Global Competitiveness Index (WEF)	Global Opportunity Index (FDI) (Milken)	Soundness of Financial Systems (WEF)	Net Debt to GDP, 2013 (IMF) (Lowest to highest)	Tertiary Education, % of Population (OECD)	K-12 Pisa Results: Math (OECD)	Innovation Capacity (WEF)	Number of Universities in Top 10 (Times Higher Education)	Ranking of Cities—EIU Global Liveability (# of cities in top 10; ties settled based on rankings)
#1	Switzerland	Hong Kong	Canada	Norway	Canada	China (Shanghai)	Switzerland	United States	Australia
#2	Singapore	Singapore	New Zealand	Finland	Japan	Singapore	Finland	United Kingdom	Canada
#3	Finland	Denmark	South Africa	Sweden	United States	Hong Kong	Germany	Germany	Austria
#4	Germany	Canada	Hong Kong	Chile	New Zealand	Taipei	Israel	Netherlands	Finland
#5	United States	United Kingdom	Singapore	Estonia	Finland	Korea	United States	Australia	New Zealand

Canada	14th	4th	1st	14th	1st	13th	27th	6th	2nd
United States	5th	22nd	>40th	22nd	3rd	36th	5th	1st	N/A

Sources: IMF, OECD, Milken, Times Higher Education, EIU

cost economies today, there are several core drivers of competitiveness, with innovation, talent, frameworks, and entrepreneurship ranking near the top.

Looking at a variety (9) of competitiveness indicators across a wide range of countries, Chart 8 presents the top 5 countries on the basis of each measure, as well as the rankings for Canada and the US. What emerges is that size is not as much a determinant of competitiveness as is commonly supposed; indeed, nimbleness and innovation appear to be better enablers. The fundamentals, such as education, research capacity, quality of urban life, infrastructure, and frameworks like the rule of law, matter more than low labour costs.

On balance across these measures, except for innovation, Canada scores reasonably well. The question is whether “good” is good enough in to-

day’s hyper-connected and extremely competitive global economy.

Observation 9: The good, the bad and the ugly of Canada’s competitiveness (Chart 9).

Pursuing this question of our competitiveness further, Chart 9 presents an admittedly qualitative snapshot of “the good, the bad and the ugly” of Canada’s competitiveness scorecard. Canada has fared well over the last 15 years because of a number of strengths, and these we need to maintain and strengthen.

But our weaknesses are becoming increasingly evident and problematic in today’s changing world, with economic growth shifting away from our traditional markets, with competitiveness increasingly driven by innovation not just input costs, and with talent and entrepreneurship more and more essential in a demographically challenged world. We must

adapt to the new global reality with a greater trade orientation to emerging markets, with more business focus on innovation in products and services, and with a relentless quest for excellence in our education, research and training systems—improved global university rankings; higher PISA scores and better vocational training.




Observation 10: Diversification unlocks opportunities (Chart 10).

Canada has much to offer the large emerging market economies, and their ever-expanding middle classes, and Chart 10 provides an indicative matching of our potential and their needs.

But we will not fully realize these opportunities with our current, incremental approaches. Rather, diversification will be key, and this will take new thinking to seize these new opportunities.

Canada needs new thinking and clearer public strategies in areas such

CHART 9: Canada Relatively Speaking: the Good, the Bad and the Ugly

GOOD... 	Solid economic fundamentals	➔	Lowest net debt (to GDP) in G7; low inflation (2% over decade); actuarial sound national pension plan
	Strong human capital	➔	1st in OECD for PSE education; multi-cultural workforce; Strong public university system; strong research capacity
	A sound financial system	➔	WEF rates Canada 1st in world for soundness of banking system
	Robust natural resources (energy, minerals, agriculture)	➔	Third largest oil reserves in world; major producer in most natural resource categories
	Solid institutions, safety nets, legal frameworks	➔	Ranks first among G7 for quality of institutions; income inequality much less than US; multicultural society
BAD... 	Canadian trade mainly with “slow growth” countries	➔	89% of Canadian trade with OECD; China less than 5% of Canadian exports
	Population is aging	➔	Canadian labour force growth slowing; immigration and education key
	Global education rankings	➔	Only 4 universities in the top 100 world rankings (and 7-9 in top 200)
UGLY... 	Business productivity growth is low	➔	Canadian business productivity growth slowing (0.8% in 2000s), and levels are only 72% of US
	Business R&D spending is weak	➔	Canadian business R&D spend 1% of GDP, (US is 2%), and we ranked 22nd ranked in OECD

Sources: IMF, OECD, Milken, Times Higher Education, EIU

as energy and trade diversification. It requires trade and investment agreements with the key emerging market countries such as China, Brazil and India, and a “Canada brand” strategy in these new markets as our competitors aggressively deploy. It requires new infrastructure to facilitate these changing trade patterns, and new FDI links to build the commercial and distribution partnerships.

Last word: New thinking for these new opportunities.


In this changing world, to realize the full potential of “Advantage Canada”, we must think more globally, plan more long-term, and create more of a sense of urgency to turn our potential into the firms, jobs, growth and wealth that will provide the next generation of well-educated Canadians with good jobs and a rising standard of living in an ever more competitive global marketplace.

- We need to avoid “parochialism”—individuals, companies, universities, countries need clear “going global” strategies, understood by all, because that’s where their markets are, their competitors, their partners, their students—their future.
- We all need to avoid “status quoism”—in a profoundly changing world, the status quo is not a long term strategy for success. To compete, innovation and productivity need to be part of our structures, our DNA.
- We all need to avoid “silo-ism”—in a multi-sector world, we need to understand all sectors, not just our own: those who work well across sectors often are most transformative in the longer term.
- We all need to avoid “short termism”—it is hard to build for the fu-

ture with a quarterly mindset and without a longer term strategic focus. To paraphrase Tom Friedman, if strategy were a sport, it would be a marathon, over and over and over again. **P**

Contributing Writer Kevin Lynch is Vice Chair, BMO Financial Group, and a former clerk of the Privy Council.

CHART 10: Canada’s Relative Global Strengths and Opportunities

CANADA’S RELATIVE GLOBAL STRENGTHS		EMERGING MARKET OPPORTUNITIES
Solid economic fundamentals, including low inflation, fiscal probity and low corporate taxes Lowest net debt (to GDP) in G7; Corporate tax rate 9 pp below US		Natural Resources 30% increase in global energy demand, China and India accounting for 50% of this
Strong human capital Workforce is highly skilled, multicultural and multilingual		Infrastructure and Housing 27T expected infrastructure spend in emerging Asia alone; large requirements in South America
Robust natural resources (energy, minerals, agriculture) Major producer in most natural resource categories		Financial Services Wealth management, asset management, pensions and insurance
A sound financial system Rated 1st in world for sound banking system		Agriculture and Food With 800-900 million new middle class in Emerging Markets, doubling by end of decade, enormous increase in demand for higher value added foods
Good public education system 1st in OECD for PSE education; World class university research capacity		Tourism 110 million outbound Chinese travelers in 2015; strong growth elsewhere in Asia and South America
Strong institutions, rule of law, civic values Canada 1st in G7 for quality of institutions (GCI)		Education Huge need to educate youth in Brazil, China, India, elsewhere. Estimates of 1B+ youth to educate in any given year
		Healthcare Spending to triple in Asia alone by 2020; large increases in South America



Big Ideas, Big Data

HOW GENOMICS WILL CHANGE OUR WORLD

Pierre Meulien, Fiona Brinkman and Jennifer Gardy

A computer-generated image that maps out part of the complex network of interactions between thousands of proteins in cells. Behind each piece of the image is data that unveils secrets of a given protein's role in important cell functions. Red lines denote new interactions more recently uncovered by research. Image courtesy Fiona Brinkman

Genomics is the most dynamic, rapidly progressing field of science of the 21st century. But, already, the societal deliverables of this breathtaking field are moving beyond the wealth of information being gleaned from genomic mapping to the myriad applications of that data for innovation in health care, environment and industry. Every day, researchers in Canada and beyond are leveraging high-performance computing and novel analytical techniques to turn Big Data into Big Ideas across our economy's key sectors.

If the 20th century was that of the computer, the 21st century will be that of biology. In the past decade alone, technological advances have fueled discovery in the field of genomics at a dizzying rate, spurred by the reality that we can now decipher the biological code encrypted in DNA at a speed and cost unthinkable just ten years ago.

But reading genomes—the genetic instruction books of life present in all living things—isn't enough. In order to harness the knowledge we can now glean by reading the genomes of humans, crops, trees and microbes to drive change in our health care, our industries and our environment, that breathtaking wealth of

new information has to be digested and directed. What will drive progress and success in these areas is analysis of these datasets in the context of other variables—markers of human health, geographic and environmental data, biochemical pathways, climate models. In other words, Big Data.

Big Data is an all-encompassing term for any collection of datasets so large and complex that they become difficult to process using traditional data processing applications. Genomics datasets are a prime example, given that a simple bacterium's DNA is millions of letters of code (called base pairs) long, a single human genome contains about three billion base pairs of DNA, and the wheat genome contains a whopping 16 billion base pairs. Since 1982, the number of DNA bases in the world's main gene database, GenBank, has doubled approximately every 18 months. Combine data about how the genes, proteins and other associated molecules are changing in the organism with environmental or clinical metadata about where the sequences came from and the amount of data coming out of genomics experiments can quickly become hugely challenging to analyze. A simple computational analysis of 22,000 sequences from a microbial genomics experiment involves running 140 trillion DNA sequence comparisons against GenBank.

Despite these challenges, researchers in Canada and beyond are leveraging high-performance computing and novel analytical techniques to harness the power of genetic information and other datasets, turning Big Data into Big Ideas across our economy's key sectors.

Of all the food consumed by Earth's seven billion people, 85 per cent of the caloric value comes from just 12 species of plant; either directly through our intake of cereals, vegetables, and rice, or indirectly through feeding of livestock and fish. These crops have been selected over millennia for their production yield, but we don't know what traits we've unintentionally eliminated from these varieties, from

flavor profiles to pest resistance. We have dramatically decreased the biodiversity of our crops, leaving them vulnerable in ways that could substantially impact our food systems.

Cancer strikes two in every five Canadians and when it does, it does so in a very individual manner—no two cancerous growths have exactly the same characteristics, though all are driven by changes in our DNA.

Genomics researchers are tackling this problem from many angles. Some are genetically characterizing older varieties of crops stored in the world's seed banks and reverse engineering biodiversity into modern crops, hoping to enhance their innate resilience. Others are using genomics approaches to understand what happens to crops when they're stricken with fungal infections or pest infestation in order to better protect these precious resources.

Similar approaches are being deployed in the forestry sector, helping Canada to effectively manage the almost 600 million seedlings planted nationwide each year by understanding the combination of genetic and environmental factors that determine the right tree to plant in the right place, and our forests' genetic basis for resilience to pests such as the pine beetle. Canadian researchers are even working toward a genomic catalogue of all our planet's biodiversity, developing a DNA-based identification system capable of reading 'the barcode of life'.

Beyond preserving biodiversity, researchers are also concerned with monitoring the health of our environment—another area in which genomics is transforming the landscape. Many studies have set out to discover "biomarkers"—genetic readouts from samples such as soil and water or from organisms like salmon that signal change, either positive or negative. These analyses require integrating large genomic datasets

with environmental measurements across a range of metrics. In Canada, researchers are sequencing the microbial DNA present in clean and polluted water to identify novel biomarkers of water quality that perform better than traditional coliform counts and, if pollution is detected, help track the cause. Genome-wide studies of fish genes, coupled with reproductive data, have been used to better model the impact of steroids on fish populations and forecast future populations, while the recently sequenced Atlantic salmon genome—a Canadian-led project—has yielded data that are informing best practices for aquaculture and breeding.

Earlier and more accurate forecasting of the environmental impacts of toxicants is of great value to environmental risk assessors—improving our ability to know when to act (and when not to). Genomics can also instruct us how to act. Written into the genetic code of many microbes is a remarkable—and highly marketable—ability to digest pollutants, from carcinogenic polychlorinated biphenols (PCBs) to petroleum byproducts. Leveraging these organisms for bioremediation in, for instance, oil sands tailings ponds and oil spills, is a promising new strategy made possible by our understanding of these microbial genomes and the many useful functions they encode.

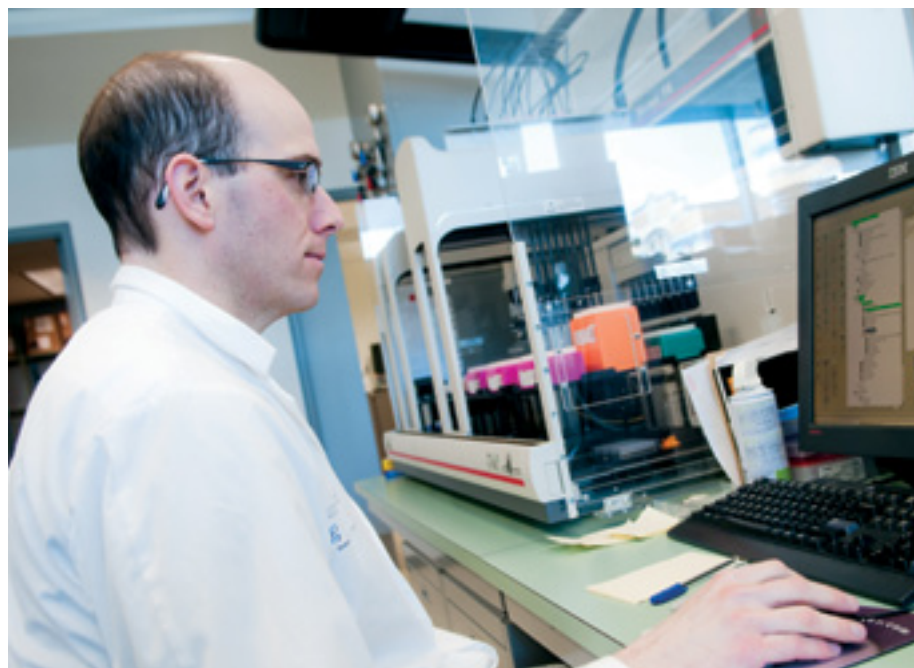
Cancer strikes two in every five Canadians and when it does, it does so in a very individual manner—no two cancerous growths have exactly the same characteristics, though all are driven by changes in our DNA. Canada is participating in the International Cancer Genomics Consortium, which is sequencing the genomes of over 25,000 tumors of 50 different types to understand how and why they developed. This genomic revolution is already leading to changes in the way cancer is treated. Canadian scientists and clinicians are working hand in hand to sequence tumour DNA from patients, interpreting the resulting genomic data through the lens of biochemical pathways to personalize treatment plans targeting

individual tumours and the genetic changes that caused them. This tailored approach is already showing promising results, and we envision a future in which every patient presenting with a cancer will have their tumour genome sequenced as part of the standard of care.

Genomics isn't just affecting chronic disease. By reading the DNA base pairs in a viral or bacterial pathogen's genome, we are gaining important insights into infectious disease. Canadian researchers have been at the forefront of using new genomics technologies, combined with epidemiological and clinical data, to better understand and control disease outbreaks and epidemics. They can use such data to track outbreaks of foodborne or respiratory illnesses, figuring out how a disease is moving through a community, and quantify how the disease-causing microbes change over time—impacting treatment or vaccination programs. These are all insights critical to designing effective, evidence-based provincial and federal public health initiatives.

While the opportunities for the Canadian economy presented by genomics and Big Data are clear and multiplying, we still have challenges to overcome. Chief among these is the issue of efficient and effective integration of genomics datasets with other data streams. If done correctly, with appropriate data standards, Canada will be positioned to be leaders in translating Big Data into Big Economic Efficiencies. If not, we risk floundering in a sea of data and missing the potential for significant discovery. Integration requires the collaborative effort of stakeholders across a range of domains, each working together to develop standardized vocabularies and formats for data exchange.

Data exchange and integration must be supported by appropriate data governance to ensure effective, secure and appropriate use of the many datasets. Several initiatives are approaching this issue, including the Global Alliance for Genomics and Health, Europe's ELIXIR initiative,



A researcher looks at data coming from a next-generation genome sequencing machine at the McGill University-Génome Québec Innovation Centre, one of five such centres supported by Genome Canada across the country. Photo courtesy of Genome Canada

and the international Global Microbial Identifier project. These consortia will develop the policies and practice around data sharing, privacy, and data interoperability, but their recommendations and best practices will still face significant regulatory hurdles on the road to implementation. Interdisciplinary teams of physical and social scientists, lawyers, policymakers and others are convening to address these issues, and government support at levels from municipal to federal will be key to their success.

Data processing analysis will also remain a challenge, especially as our genomic throughput increases and we generate ever-larger datasets. The data from one water quality biomarker study alone would take over 7000 days to analyze on one computer, so a high performance computing infrastructure and network, such as that provided by Compute Canada and CANARIE, is key to enabling discovery in a Big Data world. We also require new tools for data visualization and statistical analysis scaled to the Big Data level and customized for the genomics landscape. This is an area in which Canada, through its strong computational biology research community, can play a lead role in developing the tools of tomorrow.

We are living in the era of biology, with genomics technology driving everything from the market value of a dairy cow, to the drugs a doctor prescribes to treat an individual patient's condition. Genomic data is bringing value and innovation to industries across Canada's bioeconomy, and with the OECD's prediction that the global bioeconomy will reach over a trillion dollars by 2030, our nation, with its unique and significant natural resources footprint, should be primed to claim a significant portion of this. By adopting a Big Data approach to a genomic exploration of the world around us and promoting policies and practices that support data integration, analysis, and appropriate governance, we can translate genomics data into economic efficiencies in a wide range of sectors, positioning Canada as a leader in the new global bioeconomy. **P**

Fiona Brinkman is Professor, Molecular Biology and Biochemistry at Simon Fraser University. brinkman@sfu.ca

Jennifer Gardy is Senior Scientist at the BC Centre for Disease Control. jennifer.gardy@bccdc.ca

Pierre Meulien is President and CEO of Genome Canada. pmeulien@genomecanada.ca



Stephen Scherer, head of Applied Genomics at Toronto's Hospital for Sick Children and project leader for one of Genome Canada's Genomics and Personalized Health projects, says that "Many countries are looking to us." Photo: Robert Teteruck, The Hospital for Sick Children

Canada's Advantage in Genomic Medicine

Stephen Scherer

In the early 1990s, Canada was not considered to be in the top 10 countries in genome science. Today, we are recognized as in the top five, arguably the top three. Canada's health care system offers unique opportunities for the development of genomic science that have already delivered results, with breakthroughs in autism, cardiac disease and drug reaction research. With those successes come great expectations, which Canada is poised to meet.

There is an emerging technology that promises to change health care for Canadian patients. It may be the most powerful and comprehensive diagnostic tool in the history of medicine. It is fueling exciting new scientific discoveries. Canada is emerging as a world leader in the field. As a society, we need to ensure that our science investments, health policy and ethical frameworks keep pace with genomic science.

Genomic sequencing is becoming faster, cheaper and better—a trend that

can deliver significant health benefits to Canadians. I have been a part of this transformation throughout my career, and yet, there are still moments when I am awestruck. This past September, The Hospital for Sick Children in Toronto recognized the 25th anniversary of one of its major research achievements. In 1989, Lap-Chee Tsui's research laboratory discovered the gene that causes cystic fibrosis. As a graduate student on that team, I observed the long hours of making small, steady incremental contributions towards this discovery. Talking with my former mentor, we marveled at how, back then, identifying a cystic fibrosis gene took more than five years of painstaking work. Using today's technology, it would take us a week.

This acceleration in science is about more than boosting the ability of researchers to uncover the nature of inherited diseases. Today, we can know our own personal genetic inheritance. Put another way: If you came to my laboratory on a Monday and spit in a cup, I could show you your full genomic sequence by Friday. That knowledge could have profound health implications for you, your siblings and your children. Increasingly, Canadians want to know such detailed information about themselves, as do their physicians. There are important ethical considerations, but by proceeding carefully and confidently, Canadian researchers can deliver scientific gains and help strengthen health care.

Genetic sequencing can often confirm a medical diagnosis, saving critical time. It is helping to tailor treatments and therapies for some types of cancer. It is used to find rare diseases in patients. At the McLaughlin Centre at the University of Toronto, one personalized medicine project isolated genetic variants that cause congenital heart defects, a condition found in 1 per cent of children. As a scientist, one of my own research interests has been to identify the formula for diagnosing autism spectrum disorder at an earlier age. This will help create more advanced genetic

Today, we can know our own personal genetic inheritance. Put another way: If you came to my laboratory on a Monday and spit in a cup, I could show you your full genomic sequence by Friday.

diagnostic tests enabling earlier detection and behavioral interventions helping children. In Canada, we are uniquely positioned to reap such benefits in genome science and personal medicine. Our universal health care system creates both opportunity and incentive to continue investing in this field. Such investments often also seed other international investments with a notable example being my own laboratory's leadership role in the international effort to sequence the genomes of 10,000 families with autism.

Everyone has access in one of the world's most ethnically diverse, and therefore genetically diverse, countries. A universal health care system is also well-suited to collecting and utilizing the vast amounts of data that are essential to genetic discoveries in health care.

There is an opportunity because we have a relatively stable patient population. People and families do not move around among health providers as much as they do in the United States. Everyone has access in one of the world's most ethnically diverse, and therefore genetically diverse, countries. A universal health care system is also well-suited to collecting and utilizing the vast amounts of data that are essential to genetic discoveries in health care.

As for incentive, genome science can make the system work better for patients and doctors, while helping to sustain the universal system itself. Right now, a physician orders a test to look for genetic evidence of a specific inherited condition that

could be causing the symptoms they have observed in the patient. If they fail to confirm a diagnosis, they order more tests.

However, the cost of full genome sequencing is also decreasing, and we anticipate in 2015 it will be in the \$1,000 range. Sequencing a patient's full genome could often remove the need for multiple tests. There is less trial and error. Plus, it would likely contribute to improved care. Sequencing the full genome often uncovers genetic evidence for inherited conditions that had not yet been identified by the clinician. In many cases, these conditions were contributing to the patient's symptoms, and so treatment can be improved.

To fully realize the benefits of genomics in health care, important policy conversations need to happen. For one, personal health information of patients who undergo full genome sequencing need to be protected. Canada has not yet enacted genetic non-discrimination laws, as have many other countries. With Senate hearings ongoing there does look to be good progress towards this end.

Identifying a patient's full genome has implications for that person's health and possibly also those who share their genetic history, that is, their family. Genetic counseling needs to be widely available, and clinicians will need to consider impacts on the patient relationship.

There are emotional impacts. Identifying a patient's full genome has implications for that person's health and possibly also those who share their genetic history, that is, their family. Genetic counseling needs to be widely available, and clinicians

will need to consider impacts on the patient relationship.

Of course, policy is not up to me, but as a scientist and leader of an organization dedicated to advancing biomedicine, I can say this: Canada cannot easily import the genomic science and solutions it needs. We have to do it ourselves because our health care system and the population we support are unique to us. The truth is, there are few countries Canada can look to for an example. We're already one of the leaders. Many countries are looking to us.

Canada cannot easily import the genomic science and solutions it needs. We have to do it ourselves because our health care system and the population we support are unique to us. The truth is, there are few countries Canada can look to for an example. We're already one of the leaders. Many countries are looking to us.

Canadian governments have made solid commitments to boosting national genomics research capacity. Led by Genome Canada and six regional Genome Centres, Canada has made a significant and sustained investments. In the early 1990s, Canada was not considered to be in the top 10 countries in genome science. Today, we are recognized as in the top five, and I would argue top three. When I attend international conferences, everyone is talking about what is happening across Canada.

Such leadership comes with important obligations. Expectations are rising. Soon after identifying a new disease-causing genetic mutation, people start asking about a cure, especially those affected by that condition. It is understandable, but these types of advances are, unfortunately, coming more slowly than the diagnostic advances. There have been



A researcher loads a sample onto a next-generation genome sequencer at the Genomics Innovation Centre at the BC Cancer Genome Sciences Centre. Photo courtesy of Genome Canada

notable successes in treatment. In one Canadian example, defibrillators were implanted in people who tested positive for a fatal gene that causes sudden cardiac death. Furthermore, genetic testing is already leading to a reduction in adverse drug reactions, which cost billions of dollars to Canadian governments annually.

There is also encouraging progress on drug development. One of my colleagues at the University of Toronto, Aled Edwards, is chief executive of the Structural Genomics Consortium. They bring together scientists in academia and the pharmaceutical industry to discover and validate targets for new medicines.

Genomics technology is already allowing health providers to do things in medicine that have never been done before. As these new tools improve wellbeing, it can unleash human potential in ways never imagined before. That is the true beauty of health research breakthroughs. They yield exponential returns outside the hospital and the laboratory. People of all ages, living longer and healthier lives, contribute to our communities

in the arts, science and the economy. They are parents, friends and mentors who enrich the lives of others. It is impossible to measure, but we know from our own life experience that such value exists. It is the reason Canadians treasure their universal health care system. Genomics can help sustain and strengthen that system.

We are on the right track. Canada needs to keep moving forward with confidence; advancing science, adding to humanity's storehouse of knowledge and continually improving care for Canadians and people throughout the world. **P**

*Stephen Scherer is Senior Scientist and Director of the Centre for Applied Genomics at The Hospital for Sick Children (SickKids) in Toronto and Professor of Medicine at the University of Toronto.
stephen.scherer@sickkids.ca*



TELUS President and CEO Joe Natale speaks to the Canada 2020 conference on October 3 on medical records in the digital age. Photo by Fred Chartrand, Canada 2020.

Leveraging Technology to Revolutionize Canadian Health Care

Joe Natale

Everywhere we look, technology is transforming health care delivery. At TELUS, technology is connecting more than 10,000 Canadians suffering from chronic disease with their doctors through Remote Patient Monitoring, resulting in a 40 per cent reduction in return visits to emergency rooms. That's just one example of the change revolutionizing Canadians' relationship with health care; a process that, with greater public trust, public-private collaboration and political will, can make Canada's health care system, once again, the envy of the world.

Using the power of technology to advance the delivery of health care in Canada should excite every one of us who believes that we share a fundamental responsibility to provide a standard of care for Canadians that ranks alongside the best health care systems in the world.

At the recent Canada 2020 Conference, I questioned why it is that I can use Uber to get a car instantly in 200 cities, stream limitless music mixes on Songza, and that my own children can Skype with their friends in three time zones



Leveraging the benefits of Electronic Medical Records

-  Share information quickly and securely.
-  Enables collaboration across continuum of care.
-  Gathers data from multiple providers.
-  Reduces duplicate testing, referrals, and provides access to medical history.

Canada 2020 Conference • Joe Natale • Ottawa October 3, 2014

simultaneously, and yet it takes months to schedule an MRI.

Despite our enthusiasm to adopt technology in almost every other aspect of our lives, Canadians have been slow to demand the digitization of our health care system. With constantly overcrowded emergency departments, wait times that are challenging, and the increasing pressure health care costs are applying to the budgets of every province and territory in this country, it's simply not acceptable that we would ignore the remedies technology offers.

Historically, governments believed that they alone were burdened with solving the conundrum of health care and they endeavored to do so through large, multi-year, complex projects that tried to address many problems through a single 'top-down' technical or software solution.

That no longer needs to be the case. Working in partnership in pursuit of our shared goals for health, the health and technology sectors can start small, take a modular approach and add functionality incrementally. Governments can set the objectives,

define the service needs, identify the rate to be paid and then challenge the private sector to deliver the goods. In turn, the private sector will compete to deliver the best, most efficient and most innovative health solutions to help meet the challenge of health care for Canadians.

Every family has an unofficial "Chief Medical Officer", a person who takes responsibility for managing the medical history and treatment of loved ones. In my family, I was that person, helping my grandmother through the system, carrying her medical records in a tattered paper file between hospitals and clinics, doctors and specialists, and working to share the latest information about her health with all of them.

This was many years ago and an online health record would have provided great comfort to both our family and our caregivers. I'd like to think that my daughters and our family's care providers will have access to that information when it's needed. But the truth is that today, Electronic Medical Records or "EMRs" have a

penetration rate in Canada of just 57 per cent of physicians.

Our population is aging. Consider that 75 per cent of seniors with complex needs who are discharged from hospital will receive care from six or more physicians. How will their information be shared between wards, operating rooms, emergency departments, administrative offices, outpatient care?

That's not good enough. Our population is aging. Consider that 75 per cent of seniors with complex needs who are discharged from hospital will receive care from six or more physicians. How will their information be shared between wards, operating rooms, emergency departments, administrative offices, outpatient care?

Governments across Canada need to drive EMR adoption to 100 per cent of physicians by 2020. They can do that by changing the compensation model for physicians and health

care professionals, linking pay to outcomes that are tracked through EMRs. There are models of success to draw from.

In England, governments have stimulated change by paying a premium to those who attain a level of practice performance that's achievable only through the use of an EMR. Clinicians are encouraged to increase quality of care and technology adoption simultaneously.

It follows then that the next logical question is how to pay for new incentive models, new initiatives or new solutions. Part of the answer lies in taking waste out of the system.

By identifying waste—reducing the number of visits to hospital, mitigating the administrative costs of paper-based systems, automating scheduling, providing access to physicians through email, reducing duplicate testing—and harnessing it as a resource, we can invest in those solutions that will leverage the largest incremental benefit.

It's a win for the system, a win for physicians—and most importantly it underpins improvement in the quality of care for Canadians not just today, but tomorrow and for foreseeable generations.

There has never been a more pivotal time to be in the technology industry. No different than the advent of the printing press, the steam engine or electricity, technology is driving profound and revolutionary change.

When it comes to health care, it's easy to be excited by the possibilities. Google Glass—which hasn't yet entered the consumer market—has a contact lens in development that will use a hairline fibre to measure the glucose levels of a person with diabetes and send the data to their mobile device.

That is incredible. But the innovations that are reality today are equally meaningful.

For example, at TELUS, our technology is connecting more than 10,000 Canadians suffering from chronic

disease with their doctors through Remote Patient Monitoring, integrating devices that measure pulse, weight and blood pressure into a treatment routine at home. The result is a 40 per cent reduction in return visits to emergency rooms.

In Ontario, doctors are using telemedicine to monitor people with heart problems in communities all over the province, allowing a patient in Cobourg to consult with specialists in Toronto through clinics connected with specialized cameras and devices.

In Ontario, doctors are using telemedicine to monitor people with heart problems in communities all over the province, allowing a patient in Cobourg to consult with specialists in Toronto through clinics connected with specialized cameras and devices, saving travel time but more importantly reducing stress for the patient and their family.

In the pharmacy sector, Canadians are refilling millions of prescriptions through our consumer health portal, and the more than 13,000 physicians currently using a TELUS EMR will soon be able to connect with insurance providers to help see a patient's coverage plan and have a conversation about the treatment efficacy and costs in the doctor's office.

These are a few of many examples of the potential realized when we leverage technology for health. Better quality health care, better personalized service, at a lower cost. In B.C. alone in 2012, the government estimated that by helping to reduce medication abuse, reducing adverse drug events, and increasing provider efficiency, their drug information system alone helped save more than \$200 million.

Digital health care solutions rely on highly capable, secure wireless networks with extensive coverage and capacity.

Despite our vast and complex geography, our fourth generation networks reach 99 per cent of Canadians. These networks make it possible to bridge time and distance; to deliver information to the point of care; and for patients to be in control of their own care at home. They can provide people with access to their own health records, and make it possible for Canadians in remote communities to have the same quality of care as Canadians who live in urban centres. They connect patients with physicians, physicians with labs, people with their insurance companies and with their pharmacists.

And while the potential impact of technology on health care improvement is revolutionary, its effect on the bottom line is of equal weight.

Canada is trending towards spending almost a quarter of a trillion dollars annually on health care by 2020. A 2011 report by the Fraser Institute indicated provincial health spending in Ontario and Quebec already consumes more than 50 per cent of the total government budget.

Canada is trending towards spending almost a quarter of a trillion dollars annually on health care by 2020. A 2011 report by the Fraser Institute indicated provincial health spending in Ontario and Quebec already consumes more than 50 per cent of the total government budget. By 2017, that will also be true for British Columbia, Alberta, Saskatchewan and New Brunswick.

In every province, health care budgets are threatening cash-strapped governments with costs that could cannibalize funding for other critical services like education, infrastructure and public safety.

The truth is that doctors and nurses are trying their very best every day. Our governments are putting every dollar they can into health. But more dollars alone are not enough. Our practitioners are world class but they

can only do so much if they don't have access to the modern tools that drive productivity, accuracy and ultimately customer service. The pain points are all around us. Health care delivery in Canada has to change.

Today, Canada ranks 7th among 15 peer countries with respect to our medical error incident rate; we have the worst access times to a doctor or nurse when in need of care; the most extreme delays for specialist appointments; and the highest use of emergency rooms.

Today, Canada ranks 7th among 15 peer countries with respect to our medical error incident rate; we have the worst access times to a doctor or nurse when in need of care; the most extreme delays for specialist appointments; and the highest use of emergency rooms of the 11 developed countries compared in the Commonwealth Fund's 2013 International Health Policy Report.

The causes are multifactorial and complicated. But I am optimistic.

I know that today no doctor graduating medical school knows what it's like to grow up without the Internet. This generation of doctors, and every generation that follows, will demand access to the most modern technologies. And I know that today, more than half of Canadian physicians utilize an electronic medical records system. There is forward momentum.

But to move faster, we need to overcome the stigma that lingers around the public sector and the private sector working together in areas of the public interest.

Mismanagement and mistakes in the past have stirred a skeptical public who still find the idea of a partnership between the public and private sectors in health to be discomforting. And in some cases their wariness has been understandable.

But we have taken that tuition value from those experiences and applied it to new ideas for delivery models. Together we will show Canadians that dedicated teams comprised of the public and private sectors can be responsible custodians of their private

history, their sensitive data, can earn and deserve their trust and help them take care of the most important thing that they and their families have—their health.

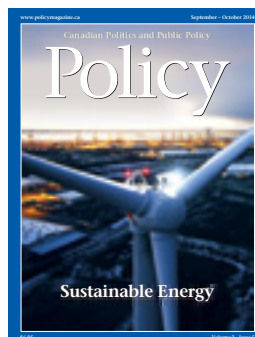
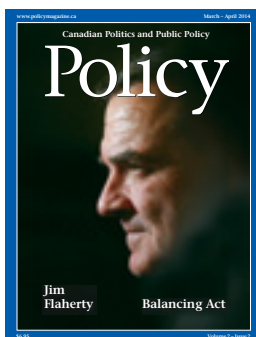
Let's leverage the stable, innovative, and tremendously capable technology sector that has been created over past decades to the fullest extent possible to solve our health challenges. We have the expertise, we have the networks and we have the commitment. Let's take a page from Silicon Valley and make choices with tomorrow in mind.

If we agree that we share the responsibility of addressing the complex challenges of health care, then it follows we should ask ourselves: if we can't respond, then who can? Let us not leave this challenge to the next generation. Let's own it. Together, we can build a responsive, agile and modern health care system that is the envy of the world as it was fifty years ago, ensuring world class health care for all Canadians. **P**

Joe Natale is President and CEO of TELUS. Adapted from a presentation to the Canada 2020 conference in Ottawa, October 3, 2014. joe.natale@telus.com

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The Autism Opportunity

NEEDS AND SOLUTIONS FOR CANADIANS WITH DISABILITIES

Photo courtesy of Kelly Brothers Productions

Carolyn Dudley, Herb Emery, Jennifer Zwicker, David Nicholas and Margaret Clarke

The federal and provincial governments have announced their intention to work together to develop a national dementia strategy in response to the growing awareness of the rising numbers of Canadians who will live with the condition. The time is opportune for the federal government to extend the scope of the strategy to include neurodevelopmental disabilities (NDD). In particular, adults with Autism Spectrum Disorder (ASD), one of the most prevalent and costly NDD in Canada, have unmet needs and large gaps in services. Unlike these conditions, with the onset later in life, ASD needs are lifelong. Federal initiatives on employment are a good start but a comprehensive strategy that will address housing, caregiver burden, income supports and health issues is still needed.

Autism Spectrum Disorder is a neurodevelopmental condition that is characterized by lifelong impairments in social relationships and communication, and repetitive, rigid behaviours. Most individuals require some level of lifelong support but face an adult support system that is struggling to meet current needs.

Autism is one of society's most costly neurodevelopmental conditions. Based on a 2006 study from the US, by M.L. Ganz, the net present value at birth of the incremental costs of supporting the ASD population over its neurotypical peers in Canada can be estimated to be \$3.4 billion for each annual birth cohort. Cost categories included in this calculation were

for the increased use of health care services, special equipment, home care support, special education, and respite. The most substantial costs amounts are in the area of adult care and lost employment opportunities of both the individual with autism and his/her parent.

Currently, most resources and sup-

ports are directed towards children and adolescents in the first quarter of their lives, but for adults and their families there is a meager fragmented system to support the remaining three quarters of their lives. As the person with autism turns 18, they face a support cliff in most provinces. Moreover, there is a disconnect in most provinces between the childhood system of care and the adult system of care. Many families are left feeling they have to start over again and the valuable developmental and functional gains from costly childhood interventions are not furthered. At age 18, the day-time activities and structured learning provided through the education system often come to an end and adults with few employment options, post-secondary opportunities or appropriate day programs face a difficult void.

Federal initiatives like the programs and services offered by Employment Social Development Canada (ESDC), in particular the Opportunities Fund are important initial steps in filling this void. Community Works Canada, together with Ready Willing and Able, will reach close to 1,000 individuals with ASD and employers to begin better pathways to employment.

In some provinces individuals with NDD at age 18 will be excluded from future government supports solely based on their IQ score being over the IQ cutoff, even when they lack skills for full independence. Adults with ASD and other NDD need to have comprehensive transition assessments that take into account their employment skills beyond IQ. Unique provincial programs, like Meticulon, a successful IT placement company funded by ESDC and the Sinneave Family Foundation is using MIND MAPS to help determine an individual's strengths and weaknesses prior to job placement.

These programs are a start. Still, adult outcomes across provinces and shown in the research literature are poor. For those with IQ in the normal range, only a minority live independently. Canadians with ASD, along with other neurodevelopmental conditions, have extremely low labour

Full-time employment that results in a living wage is rare and most adults with ASD are dependent on income derived from combinations of partial work, family support and public support via income support programs. Most live with their aging parents.

force participation. Full-time employment that results in a living wage is rare and most adults with ASD are dependent on income derived from combinations of partial work, family support and public support via income support programs. Most live with their aging parents. Many need assistance with daily living skills, like bill paying and cooking, while others require full-time supports to manage the most basic of needs. There are a variety of effective programs to teach these skills, but they are not widely available in Canada.

Anxiety, depression, epilepsy, and schizophrenia are significantly more prevalent in this population. Challenging behaviours, when present, add another layer of difficulty. Aggressive behaviour can be unmanageable for families and lead to decreased community integration and a poorer quality of life for individuals. The child and youth-based service system that offered dollars for respite to families and specialized services like behavioural psychologists and speech therapists, are often less available when the person with NDD turns 18. This situation occurs in the context of an eventual decreased support capacity of the family due to parental aging and possible illness. Physical fitness programs may help to decrease anxiety and behavioural problems. Recreation, specifically, moderate to high intensity exercise programs, known to decrease mental health disorders, is available to only five per cent of Canadians with disability. The Abilities Centre, founded by the late Jim Flaherty, is pioneering programs to address this need together with Olympian Hayley Wickenheiser.

Quality housing options are not readily accessible despite the growing need for housing and support services. In a National Housing and Residential Supports



Hayley Wickenheiser, a University of Calgary Masters student, began a high intensity "Stepping Out" program for adults with autism. Photo courtesy of Kelly Brothers Productions

Survey of caregivers for those with ASD, it was found that the ideal living situation for many individuals with ASD was living at home with their family, with a minority reporting that a group home or their own home was the preferred option. Living at home however, is only viable in the context of a strong system of community services and available respite options.

Financial and emotional lifelong burden for caregivers is high. The time costs of caring for children with severe disabilities compared to those without disabilities is significant and does not decrease with advancing age. In a recent study by Zuleyha Cidav and colleagues, average earnings in families with children with ASD, for instance, are 28 per cent lower than in families whose children do not have health limitations and 21 per cent less than families with children with other health limitations. Consider, for example, the costs for caregiving time alone for the most severe adults, who require 24-hour support. This level of support equates to \$158,000 per year, or \$5.5 million over the lifetime. Loss of employment opportunities and out-of-pocket expenses put families under excessive financial burden. Lifelong caregiving is linked to chronic stress which

WHAT POLICY SOLUTIONS WILL HELP?

- 1) **Include Neurodevelopmental Disability Issues in the Current Discussions on Long-Term Care:** A long-term care strategy is on the agenda of government for the aging population, in particular for those who live with varying NDD such as ASD, the needs for some are similar to those living with dementia and Alzheimer's disease. We recognize that there is much variability in the level of support needs of persons with ASD given the vast range of ASD manifestations. Yet, proactive planning for this range of needs offers potential solutions for individuals touched by the range of these neuro-affected conditions, including ASD. This offers an opportunity to broaden the discussion to include those with NDD. Housing options that are available for a spectrum condition regardless of which province one lives in are needed. Research and reports exist, the need is apparent; take this opportunity to also help this growing demographic and their aging families.
- 2) **Stimulate the Market of Qualified Caregivers:** Finding and paying for qualified staff to provide respite for short and longer term periods is difficult. The turnover rate of staff serving adults with developmental disabilities is 50 per cent. With the difficulties recruiting and retaining qualified staff, and a growing number of adults in need of support, a critical challenge in delivering effective services exists. Stimulating the market to increase the availability of qualified workers who can help fill roles needed; in-home support, out-of-home respite workers, group-home ASD trained staff and life-skill coaches, are only a few examples of the support-care positions needed.
- 3) **Income Supports:** Many people living with neurodevelopmental conditions rely on the combination of income assistance, family supports and low wages from partial or low level employment. Income assistance programs are offered in varying amounts across provinces to those with severe disability. A feasible step to addressing some of the income needs would be to remove the age test for eligibility for the federal Old Age Security and Guaranteed Income Supplement pension benefits for persons living with an NDD.
- 4) **An Insurance Model to Finance Lifelong Support:** Alternative models to finance care are available. In the province of Quebec, the government is proposing autonomy insurance as an initiative to address the long-term care needs of the aging population and those with disability. Autonomy insurance is an innovative social project intended to address the increasing demands on services for long-term care. If implemented, autonomy insurance would be available to all adults with disability based on their profile of needs and will provide the appropriate level and type of service needed.
- 5) **A National ASD/NDD Platform:** The lifespan needs for a spectrum condition are complex, varied and intertwined. For instance, enhancing employment outcomes constitutes one component of a cross-ministerial strategy needed to deal with the gaps that exist. Provinces still vary considerably on what is available. The recent employment initiatives by the federal government will seek to develop best practice in employment and are expected to make a profound difference for adults. A strategy that also addresses income supports, quality housing options, brain health and caregiver burden is needed. This needs to be supported by robust data collection and analysis at a national level to monitor progress and implement program refinements based on evaluation findings, particularly as this new system of care scales up.
- 6) **Broaden the Active Canada 2020 Framework:** There is a need to specifically target individuals with disabilities to receive at least twice weekly moderate to high intensity exercise as part of their recreation and activity routine. We suggest that caregivers should be provided with similar opportunities.

often leads to compromised mental and physical health of the caregiver.

In many provinces, governments share some of the costs for individuals with high needs but when dollar amounts do not cover full costs, or when—regardless of costs—qualified and available support people cannot be found, then the burden of lifelong care reverts to the aging or other family. These issues were expressed in the 2007 report, *Pay Now or Pay Later: Autism Families in Crisis*, where the Standing Senate Committee on Social Affairs and Technology heard from parents and advocacy groups about the emotional and financial stresses that families face.

We applaud the efforts over the past decade in the areas of early intervention programs for the preschool years and the recent efforts on employment initiatives. The federal government's commitment to improve employ-

ment outcomes through Community Works Canada and Ready, Willing and Able programs, designed to prepare and support youth for employment, will help. These initiatives are elements that move towards enhanced quality of life, but even with better employment outcomes; in-kind supports for caregiving, housing options, income supports, and fitness initiatives still need to be addressed.

With the recent announcement by Health Minister Rona Ambrose that the federal and provincial governments will work together to develop a national dementia strategy, the best opportunity to address the needs of the large and growing population of adults with ASD is to emulate the dementia strategy to address ASD and other NDDs. Let's build on the federal momentum seen on employment issues and address the remaining lifespan gaps to make Canada a world leader in the implementation

of a comprehensive sustainable neurodevelopmental strategy. **P**

Carolyn Dudley is a Research Associate at the School of Public Policy, University of Calgary. cdudley@ucalgary.ca

Herb Emery is a professor and Program Director for Health Policy in the School of Public Policy at the University of Calgary. hemery@ucalgary.ca

Jennifer Zwicker is a Research Associate at the School of Public Policy, University of Calgary. zwicker1@ucalgary.ca

David Nicholas is an associate professor and Research Coordinator (Central and Northern Alberta Region) in the Faculty of Social Work at the University of Calgary. nicholas@ucalgary.ca

Margaret Clarke is a professor in the Faculty of Medicine, Department of Pediatrics and Psychiatry at the University of Calgary, and Senior Vice President of the Sinneave Family Foundation. margaret.clarke@albertahealthservices.ca



New Canadians being sworn in at a Citizenship ceremony. A nation of immigrants, Canada has attracted more than two million new immigrants since 2006. Government of Canada photo

From Supply to Demand-driven in Immigration

Chris Alexander

Canadians have generally positive views of immigration and a strong belief that it brings great advantages to our labour market and economy. We are moving from a supply-focused system, in which applicants waited in a queue for years to one that is driven by demand, in which we quickly and proactively accept into Canada those prospective immigrants whose skills fit current labour market needs. Why do so many talented people want to come live in Canada these days? The answer is as big as the country itself.

Immigration to our country is a phenomenon that is centuries older than Canada itself. It has immeasurably shaped and enriched our society, our economy, and almost every aspect of Canadian history.

Thanks to our successful history of immigration, Canada is internationally renowned as a place where newcomers have the opportunity to flourish and to succeed, to make great contributions, and to work at realizing their dreams.

Canadians have generally positive views of immigration and a strong belief that it brings great advantages to our labour market and economy. This widespread support of immigration can be partly explained by the fact that so many Canadians have been touched by immigration in one way or another. Whether it be their family background or their day-to-day interactions, every Canadian is aware of the impact immigration has on our country.

At the same time, Canadians' broad support for immigration also depends on the effectiveness of our immigration system, and on immigration policies that adapt to new challenges and meet the needs of our changing world. Government must ensure that Canada's immigration system is fast, flexible and fair, that it responds to our national interests and modern labour-market realities, and that it helps drive future success. Canada has welcomed an annual average of more than 250,000 immigrants since 2006, the highest sustained level of immigration in Canadian history.

We're making substantive changes in both our policies and operations, welcoming more permanent residents, and attracting to Canada the world's most talented and innovative immigrants, who will contribute to the Canadian economy and help our country flourish.

At the same time, we've been transforming our immigration policies and programs so they are best aligned with our country's current economic and social needs.

In recent years, we've introduced a series of reforms to ensure that as we welcome newcomers to our country and continue to honour our great humanitarian traditions, we are also bolstering our economy and labour market while ensuring Canadians come first.

Canada has welcomed an annual average of more than 250,000 immigrants since 2006, the highest sustained level of immigration in Canadian history.

We have made tremendous improvements to how we manage our immigration system, most notably by significantly reducing the backlogs that plagued the system for years. These improvements have opened the door to the development of creative immigration policies that better serve Canada's current and future economic needs.

Accordingly, we're making substantive changes in both our policies and operations, welcoming more permanent residents, and attracting to Canada the world's most talented and innovative immigrants, who will contribute to the Canadian economy and help our country flourish. These reforms will culminate in January 2015, when we launch Express Entry, Canada's next-generation approach to managing and processing applications in our key economic immigration programs.

Express Entry will enable us to select immigrants based on the skills and attributes that Canada needs. Canadian employers will use it to select the highly skilled workers they need to fill available positions only when they cannot find a qualified Canadian or permanent resident to do the job.

Express Entry will work in two steps. First, prospective immigrants will indicate their interest in coming to Canada by providing information electronically about their skills, educational credentials, language ability, work experience and other attributes.

Second, candidates who meet the criteria for one of the designated immigration programs will have their profiles placed in the Express Entry pool.

These designated programs are:

- The Federal Skilled Worker Program, Canada's flagship economic immigration program, through which more immigrants come to Canada than through any other program;

- The Federal Skilled Trades Program, which was created to quickly and efficiently bring to Canada skilled tradespersons who work in the construction, manufacturing, transportation, and service industries, and;
- Canadian Experience Class, which provides a pathway to permanent residency for qualified temporary workers and students with Canadian work experience.

Once their profiles have been placed in the pool, candidates will be ranked against each other based on a comprehensive ranking system, which will consider factors linked to immigrants' economic success once in Canada. Candidates may also be nominated by Canadian provinces and territories to meet labour market needs in specific regions of Canada. Only the highest-ranked candidates, including those with provincial or territorial nominations, or valid job offers from an employer in Canada, will be invited to apply for permanent residence. Once candidates receive an invitation to apply, the second step will be to submit an electronic application for permanent residence which will be processed within six months or less.

We are moving from a supply-focused system, in which applicants waited in a queue for years and were passively considered for acceptance in the order in which they applied, to one that is driven by demand, in which we quickly and proactively accept into Canada those prospective immigrants whose skills fit current labour market needs.

The Start-Up Visa Program is another example of how we're making innovative changes to the immigration system. We introduced the program in April 2013 to target immigrant entrepreneurs with the potential to build innovative companies here in

Canada, creating jobs for Canadians, and offering us another opportunity to compete on a global scale.

This program is the first of its kind in the world. By granting permanent resident status upfront, it allows immigrant entrepreneurs to take risks and build successful new companies in Canada.

Eligible entrepreneurs with viable business proposals can become permanent residents immediately, once they have secured the support of a Canadian venture capital fund, angel investor group or business incubator, and their immigration application has been approved.

The Start-Up Visa Program allows applicants to be bold and to take risks, which is true to the nature of entrepreneurship. At the same time, the involvement of Canada's private sector ensures checks and balances are in place.

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When entrepreneurs' business plans are reviewed by key private sector investors, they will ensure that those plans are sound and that they make good business sense. Since investors' success depends on choosing winners, they will only invest in ideas they think have merit and will succeed.

This past summer, at the Vancouver business incubator that committed to investing in their start-up idea, I met Stan Korsei and Alex Zadorozhnyi, the program's first two successful immigrant entrepreneurs, who came to Canada from Ukraine.

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Their company, Zeetl Inc., developed an application that allows companies to monitor social media for customer complaints and concerns and instantly establish a temporary direct phone line for the customer to call.

These two entrepreneurs exemplify the kinds of individuals we hope to bring to Canada through the Start-Up Visa Program. By bringing together Canadian venture capital funds, angel investors, and business incubators with foreign entrepreneurs, the program will continue to foster innovation, and create more jobs and economic growth in Canada.

Canadians have good reason to be proud of our immigration system, which has been central to the development of our country over many generations. Reforms will support a strong, prosperous and socially-integrated Canada as we continue to welcome record numbers of individuals who contribute to our economic success.

Why do so many talented people want to come live in Canada these days? The answer is as big as the country itself.

It's the quality of life in our cities—three of the five most liveable in the world according to the *Economist* Intelligence Unit. It's our per capita income—the highest in the world in recent years by many measures for any country with over 30 million people.

But it is mostly a sense of opportunity that draws so many newcomers. They know the importance of financial stability: Canada's banks have been rated the best in the world for seven straight years by the World Economic Forum.

They know the importance of a start-up culture: Toronto and Vancouver are among the top 10 cities in the world for business start-ups, with

many other Canadian cities and towns catching up fast.

They know the importance of low taxes, sound laws and a solid state business environment. Canada has been rated the top jurisdiction in the world in which to do business by Bloomberg, Forbes and KPMG.

Toronto and Vancouver are among the top 10 cities in the world for business start-ups, with many other Canadian cities and towns catching up fast.

They also know that a society succeeds, when all of its citizens enjoy such opportunities. *The New York Times* recently concluded that Canada had the strongest middle class in the world among the many countries it studied.

These achievements were no accident. For Canada to return to balance in its federal budget, for our infrastructure spending to be stronger and more sustained than ever, for Canadian families to be saving, on average, \$3,500 in annual federal taxes compared to what they paid in 2006, tough choices have had to be made.

We owe a special debt of memory and thanks to Jim Flaherty, one of our longest-serving finance ministers, who brought Canada's performance on tax, financial and economic issues to a new peak. He left a legacy of excellence, of which we are all beneficiaries. **P**

Chris Alexander, Member of Parliament for Ajax-Pickering, is Minister of Immigration.
chris.alexander@parl.gc.ca

BOOK EXCERPT

A Brave New Canada in an Uncertain World

Derek H. Burney and Fen Osler Hampson

The past quarter-century has produced dramatic changes in the global geopolitical landscape. From the fall of the Berlin Wall to the collapse of the Soviet Union to the economic rise of China and the contagion of Islamic fundamentalism, events have shaken the order that prevailed for the second half of the 20th century in ways that are still playing out. For the United States in particular, the impact has been significant. For Canada, that reality will be key to our role in the world.

Aldous Huxley's *Brave New World* was intended as satire but there is nothing satirical about the need for Canada to be brave in meeting the challenges of a dramatically changing world.

With the fall of the Berlin Wall and then the Soviet Union more than 20 years ago, then-US President George H.W. Bush predicted that the world was on the cusp of a "New World Order." To other pundits, in the memorable phrase of the American political scientist Francis Fukuyama, we had also reached "the end of history" with the collapse of the Soviet Union and communist regimes in Eastern Europe. At the time, there appeared to be no attractive alternative to western-style democracy and market economies and the values that go with both. Yet, in what is surely a relatively brief passage of time when measured by the broader sweep of history, much has changed in our world. We are neither at the end of history nor has a new world "order" emerged. In fact, there seems to be more chaos and turbulence than ever before.

China, which had quite self-consciously eschewed the Soviet model of *glasnost* and *perestroika*, but nonetheless embraced western-style capitalism under one-party rule, has risen to become the second largest economy in the world. The United States, which like a young and vigorous David stood over the fallen Soviet Goliath when the Berlin Wall came crashing down, has suddenly become the world's "weary titan." It is showing many of the symptoms of imperial decline and "overstretch" that Great Britain displayed at the end of the 19th century.

Europe, which picked itself up after the ravages of the Second World War and embarked upon one of the most ambitious strategic enterprises in history—political and economic consolidation leading to the formation of the European Union so that Europeans would never fight themselves again—is faltering under the weight of massive public debt and the ravages of a serious financial meltdown that shows few signs of abating because the political will to drive needed policy solutions is simply not there.

In the triumphalism that accompanied the end of the Cold War little thought was given, save by a few Cassandras, to the threat posed to global stability by the unrelenting assaults from extremist Islamic factions, most evident the events of 9/11 but spreading ever since beyond Afghanistan to the always volatile Middle East and North Africa. Although many left-wing critics at the time derided the great conservative American thinker, Samuel P. Huntington, his prediction in the mid-1990s that we were about to witness a "clash of civilizations" between the dark forces of Islamic extremism and the West proved to be singularly prophetic, as Osama bin Laden and his al-Qaeda acolytes



launched a day of devastating terrorist attacks on American soil on the key symbols of American prosperity and power. These climactic events, and especially the financial meltdown and prolonged recession that began in the last decade, have had a deleterious effect on America's capacity and inclination to lead on global challenges. They have shaken confidence, too, in the values of pluralism, liberty, and tolerance that underpin western-style democracies. Equally, they have diluted the tone and many of the sinews of US relations with key allies, including Canada. Personal relations at the top and the informal cooperative spirit among senior officials have suffered in the process as well. Relations may be correct, but they are no longer warm. The US approach to allies is now less magnanimous.

In the absence of a single threatening power like the Soviet Union, the US feels that it no longer needs close allies and has begun to return to its pre-Wilsonian default of isolationism, or narrow self-interest. No country is more affected by this change than Canada. While there is little evidence of a new order or that we have reached the "end of history," what is palpable is that the tectonic geopolitical and economic plates of the world are shifting, setting in motion powerful forces that are shaking the postwar world to its very foundations.

Alas, there has been precious little analysis of what these changes mean for Canada, our place in the world, and our strategies for global engagement. Many pundits are caught in a time warp of the 1960s and 1970s. To some degree, Canadians can be forgiven for their lack of interest in international affairs because they have been fed a steady diet of bromides that suggest that Canada's future is pinned to the fate of the United Nations, a liberal international order, and a benign and mostly satisfactory relationship with the United States. In the words of a well-known tourist commercial of the mid-1990s, Canadians have bathed themselves in the belief that "the world needs more Canada." We seem to have convinced ourselves that we are a "land of tranquility, safety and whales coming up for air in slow motion" and "a place to go for global spiritual renewal." In truth, that was always fiction, not reality. Others have become smug because we weathered the severe economic depression better than most, albeit primarily on the back of strong demand for our commodities.

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The rest of the world, including many of our close allies, views us, if anything, as cosseted and complacent. Yes, we are a place of comparative tranquillity, but that had more to do with geography and happenstance than the way we choose to protect our interests and influence.

Unlike many other countries, Canada faces few threats, existential or otherwise. We remain comfortable and protected within a North American cocoon. But even that may be less certain in our future than it was in our past.

During the Cold War, the Americans had no choice but to look after our security interests because we were their front door to a potential Soviet bomber and missile attack across the North Pole. In the Trudeau era, we could avoid paying our full dues in NATO to defend western Europe because we knew that others would fill the gap. However, that didn't always stop some of our leaders from lecturing our allies, including the Americans. Pretensions of moral superiority rang hollow in the absence of tangible commitments.

Any serious analysis of Canada's international relations and role in the world must first grapple with the ways the world is changing before offering foreign policy prescriptions or a new vision of Canada's interests.

A successful foreign policy cannot be based on a one-dimensional view of the world. The problem with some of the recent studies on Canada's foreign policy and our place in the world is that they look backwards to the Cold War and the halcyon days of Pearsonian internationalism, rather than looking forwards. A successful foreign policy cannot be crafted by looking at the world from a rear-view mirror. We must grapple with the world as it is today, and how we suspect it will change in the coming years, not chart our future according to the past.

However, one of the difficulties in describing our contemporary changing world is that we confront the dilemma humorously identified in John Godfrey Saxe's poem "Six Blind Men and the Elephant," based on an Indian legend. Some feel the trunk and say the elephant is a snake, some feel a leg and say it is a tree, others feel a tusk and say it is a spear. As Saxe concluded his poem, "And so these men of Indostan / Disputed loud and long, / Each in his own opinion, Exceeding stiff and strong, / Though each was partly in the right, / And all were in the wrong!" Unlike Saxe's elephant, which may have been hard to see but was nonetheless an elephant, the contours of our current world are not only hard to see, they are also mutable, and there may well be more than one elephant in the room.

Any reset of Canadian foreign policy must begin with a careful examination of relations with the United States, which is still the biggest elephant in the room. The US has huge domestic challenges of its own. Sluggish economic growth and political gridlock in Washington on necessary fiscal reforms are sapping much of

Americans' confidence and optimism. The inconclusive outcome of western intervention in Afghanistan haunts any future outlook as does the debacle of a different sort in Iraq, one with similar civil war fallout. Both exemplify flaws in leadership, primarily, but not exclusively, by an unusually inept US administration (the utterly dysfunctional House of Representatives deserves some blame as well). Afghanistan is unravelling because the US has been unwilling to confront the real source of instability in the region—Pakistan. Having successfully ejected the Taliban from Kabul in 2002, the US and its allies then played an inconsistent game of containment and counter-insurgency but one that stopped short of eradicating the threat from within Pakistan, presumably for broader strategic reasons. The US hesitated, too, on a broadly-gauged diplomatic solution, relying instead almost exclusively and somewhat erratically on military means to restore stability. Military engagement was hampered by alliance caveats of one form or another and ultimately by withdrawal timetables determined in advance because of US electoral campaign demands. An increasingly corrupt Karzai regime only aggravated matters.

A successful foreign policy cannot be crafted by looking at the world from a rear-view mirror. We must grapple with the world as it is today, and how we suspect it will change in the coming years, not chart our future according to the past.

As the provocative title of Richard Haass's (president of the US Council on Foreign Relations) recent book, *Foreign Policy Begins at Home*, suggests, the US must reduce not just runaway fiscal deficits, but also its mounting piles of public debt. As demonstrated by mandatory sequestration cuts, most of which remain in place, the US's ability to fund its formidable military machine will be diminished. What resources are available will almost surely be directed at strengthening the Pacific "pivot" against China. There is little support in the US on all sides of the partisan divide post-Afghanistan and Iraq for nation-building exercises and democracy promotion in other parts of the world. The Middle East has become a muddle, with potentially explosive tendencies from Egypt to Syria, Iraq, Israel and Iran. Meanwhile, the nuclear aspirations of rogue states like North Korea and Iran continue unabated and unconstrained by any real threat from the US or the international community.

Canada is not immune from the implications of the lone superpower functioning on global issues with diminished credibility. The value of being an ally and neighbour of the US loses its currency when domestic political priorities and constraints overwhelm other considerations. Geography is the inescapable reality of our destiny and relations with the US will persist as a priority without equal. Our partnership has enormous advantages for Canada, notably in the economic sector and in terms of our security. But these ties also give us a comfort zone that breeds complacency. Besides, when North America is looked at by others, except possibly for resources, Canada is inevitably a distant second, an afterthought. This imbalance of power and attention is not likely to change any time soon. Any reset of Canadian foreign policy must begin with a careful examination of the elephant we know, the one right next door. After years of essentially running in idle, our relationship with the US merits recalibration.

Canada should consider a Third Option with Legs strategy, one that would enable us to move beyond excessive reliance on the US market and concluding trade and investment agreements with Europe and key players in Asia and Latin America to complement, balance, and simultaneously strengthen our capacity to manage relations with the US. Canada should use its comparative advantages assertively (and demand some degree of reciprocity from others) to safeguard and enhance our national interests.

More generally, Canada should assume and assert a role in world affairs commensurate with our capabilities and our potential by being selective and opportunistic. Canadians want their country to do constructive things in the world. We clearly have the capacity and inclination. What is needed now is the political will to deliver.

It is not a question of the world needing "more Canada." It is a matter of "more from Canada to the world." The key to a more mature global outlook for Canada is recognizing our limitations as a country of 35 million in a world of more than 6 billion people. We should not aspire to be all things to all people. Rather, we should muster and focus everything we've got: our economic strengths and our diplomatic skills into avenues where there are real prospects for influence and success in a world that cries out for us to be bold and brave. **P**

Excerpted from Brave New Canada: Meeting the Challenge of a Changing World by Derek H. Burney and Fen Osler Hampson. Montreal and Kingston: McGill-Queen's University Press, August 2014.

Derek H. Burney is Senior Strategic Adviser for Norton Rose Fulbright and was Canadian ambassador to the United States from 1989 to 1993. Fen Osler Hampson is Distinguished Fellow and Director of Global Security at the Centre for International Governance Innovation. He is also Chancellor's Professor at Carleton University.

A Compelling Read on Canadian Foreign Policy

Derek H. Burney and
Fen Osler Hampson

Brave New Canada: Meeting the Challenge of a Changing World.
Montreal and Kingston: McGill-Queen's University Press, 2014.

Review by John Barrett

For the foreign policy junkies scouring the media for opinions and analyses, Burney and Hampson are household names. Their most recent work—*Brave New Canada: Meeting the Challenge of a Changing World*—is a compilation of policy prescriptions that build, as the authors acknowledge, on a 2012 report co-authored with Thomas d'Aquino and Len Edwards. The result is a book that can be read on two levels.

If you are looking for a punchy, sharply written resumé of how we got to where we are today in the world, this is it. But the authors have greater aspirations. Their goal is to create foreign policy for Canada. This is the second level: a guide to policy decisions in a complex and turbulent world. And here it offers clear insights and compelling recommendations.

First, the circumstances around us. The authors see five key trends “reshaping our world.” The US is more focused on itself today; the global economy is undergoing a major transformation; international institutions are declining in effectiveness and relevance; the Post-Cold-War order is breaking down and new geostrategic rivalries and threats are emerging; and pluralistic democratic values are under siege in many parts of the world.

What should Canada's response be? That depends on a basic premise: Canada has to engage with the world's fast-growing emerging market economies if we are to secure our country's future. More precisely, we

must seek real, committed strategic engagement in the Asia-Pacific region—and actively pursue regional confidence-building measures to that end.

The starting point for such engagement is squarely economic: “...the more we do to enhance trade and economic partnerships—and that should be the driving force—the more committed we will need to be on issues of security and stability.” They propose a “Third Option With Legs”, aimed at reducing our excessive reliance on the US economy through closer economic partnerships with the EU and major Asian and Latin-American countries. While the recently signed CETA agreement may satisfy this with respect to the EU, the real area of attention is Asia-Pacific.

What distinguishes this book is its interest-based realism. For example, as much as Canada needs emerging markets for trade and investment, we can't be going there cap in hand. State-owned enterprises in these countries do not play by conventional, market-based rules. As the authors note, Canada's negotiating positions must insist that the playing field is level and the economic partnerships mutually advantageous.

As the authors chart Canada's course through turbulent waters, they issue a few broadsides. Many hit the target (and make for lively reading); some miss. “Multilateralism” is a particular *bête noire*. They roundly criticize Copenhagen (climate change); Doha (trade); Dubai (World Conference on International Telecommunications); UN Security Council (Syria). The G20 is castigated. They want UN and Security Council reform—who doesn't? Such criticism is warranted; but it's not the whole story. Forging deeper bilateral relationships with emerging and Asia-Pacific countries occurs just as much in multilateral institutions. Constant interaction on international security matters within, for example, the International Atomic Energy Agency or the UN Office on Drugs and Crime presents such opportunities

The section on non-proliferation is rather thin. The authors call for “intensified Canadian diplomacy in nuclear non-proliferation” and to “put money and diplomatic capital into serious arms control projects”—but where and how would this capital best

be spent? How do we engage in the US administration's nuclear security initiatives, the complexities of dealing with Iran, UNSCR 1540 on non-proliferation, compliance with nuclear-related treaties and agreement?

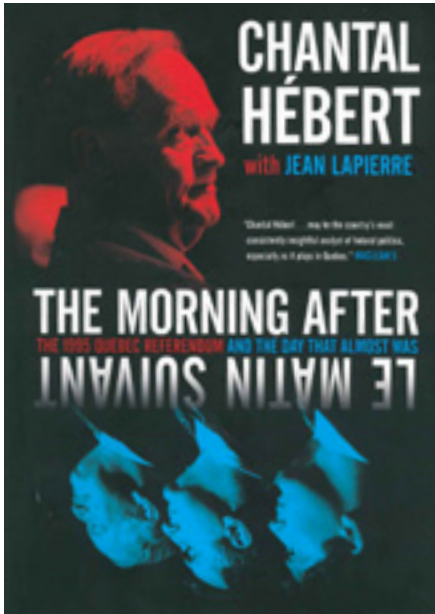
That said, interesting and cogent ideas flow throughout the chapters. One overarching recommendation is that Canada return to the use of confidence-building measures of a kind that worked between East and West during the Cold War. Such measures can be applied to a broad range of issues because they open and nurture deeper political relationships that are in our interest. Canada has been—and still is—a master of this craft and the authors point to ways in which such skill can be applied anew.

The sections on conflict prevention, promoting pluralism, and re-directing Canada's development assistance policies bring home the authors' hard-nosed approach. As much as one might want values to lead the way in foreign policy, Canada's ultimate security and economic well-being is best preserved and enhanced by putting our interests first. Human rights, pluralism, freedom of religious expression—these are critical to promoting long-term political stability and good governance in the world. But that's not why one has engaged in conflict prevention in the first place.

Burney and Hampson have established the point of departure for any serious discussion of Canada's foreign policy—of where it is day, of where it should be going. As the authors say, in meeting the challenges of a changing world, we must be “strong, bold, committed, and driven by interest and real conviction.”

That makes it a compelling read for foreign policy professionals, political parties and public commentators. **P**

John Barrett is President and CEO of the Canadian Nuclear Association, and a former Canadian ambassador to Austria and Slovakia, as well as to the International Atomic Energy Agency in Vienna. barrettj@cna.ca



How Canada Was Almost Lost

Chantal Hébert
with Jean Lapierre

The Morning After: The 1995 Referendum and the Day That Almost Was. Toronto: Knopf Canada, 2014.

Review by
Anthony Wilson-Smith

The novelist and screenwriter William Goldman once wrote of Hollywood: “Nobody knows anything.” Behind all the glib rhetoric, grand promises and collective certainty among major players, no one knows really knows what will work, sell or happen next.

As Chantal Hébert and Jean Lapierre demonstrate so ably in *The Morning After: The 1995 Referendum and the Day That Almost Was*, that observation applies equally to politics. The authors asked leading participants in their title’s event a basic question: how would they have responded to a majority Yes vote in favour of starting a process toward making Quebec a sovereign country? The Yes side, after all, came within 54,288 votes

of doing just that out of more than four and a half million votes cast. The answers make clear, more than anything else, the astonishing amount of confusion, uncertainty and disagreement behind the unified fronts both sides sought to present.

The revelations are many, and startling. We already knew that then-Premier Jacques Parizeau was keen and intent on moving swiftly and unilaterally toward declaring independence. But his Yes partners—Lucien Bouchard and Mario Dumont—are far more ambivalent and troubled. Bouchard, easily the most popular figure on the Yes side, felt cut out by Parizeau once a Yes victory seemed likely. Bouchard believed a deal on sharing political and economic powers with the rest of Canada was both possible and highly desirable. Dumont was a frustrated federalist who wanted dramatic change, but had no taste for independence. Still in his 20s, he felt out of his depth and relied on Bouchard to lead him.

The federalist side was no more unified. Prime Minister Jean Chrétien refused to consider the possibility of a Yes vote—even as it seemed likely. Meanwhile, his putative allies were preparing to cut him out of the loop. Parizeau says he had in hand a list of Quebec federalist political and business leaders prepared to declare their acceptance of a Yes vote and the need to move ahead accordingly. In Ottawa, Brian Tobin, usually a vocal Chrétien supporter, felt his boss and other cabinet ministers from Quebec would have to resign after a Yes vote and discussed that scenario with other cabinet ministers. Preston Manning, whose Reform Party had the third-highest representation in the House of Commons, was prepared to work with Parizeau to swiftly negotiate Quebec’s exit. Perhaps most astonishingly within English Canada, Roy Romanow, premier of Saskatchewan, was considering the collapse of Canada and a scenario grouping Saskatchewan “and the three other Western Canada provinces into a new national entity.” He ceased only when Alberta’s Ralph Klein told him “thoughts along those lines bordered on treason.” And so on, as each of the principals reveal new wrinkles, sub-plots, concerns and different intentions.

The access accorded Hébert and Lapierre is extraordinary. Hébert’s understanding of the country’s dominant linguistic and political cultures is unparalleled. She injects her voice in subtle but important ways. For example, Bouchard recalls that he “was friends with the premiers, really friends with all of them”. His point is that he could have negotiated effectively with them. But Hébert notes those relationships came well *after* the referendum, and that “on the actual morning after the vote, Bouchard had no personal rapport with most of the men who would soon be his fellow premiers.” Lapierre, now a radio and television commentator, has friends on both sides, a result of his unique status as founding member of the Bloc Québécois and federal Liberal cabinet minister before and after that experience.

Both sides made promises beyond their ability to keep. Parizeau counted on speedy support from France leading to widespread international recognition. But the United States had already made clear its support for a united Canada. Some No leaders said there would be no negotiation without a large Yes majority—but others were prepared to immediately do so. Focus groups showed many Quebecers would vote Yes because they believed Bouchard could make them a better deal—within Canada. Others voted No because they believed this was the best way to change the status quo—which they also didn’t like.

Ultimately, the most unfathomable result is that aside from a couple of occasional bumps, we have since had close to two decades of constitutional peace—defying all the predictions of sovereigntists and some federalists. Of all the outcomes each side forecast, that still seems one of the most unlikely. This superb book shows that in politics just as in show biz, William Goldman had things right. **P**

Anthony Wilson-Smith, now president of Historica Canada, is a former journalist and co-author of the 1996 book Double Vision: the Inside Story of the Liberals in Power.
awilson-smith@historicacanada.ca

GUEST COLUMN

The Montreal Protocol—A Really Big Idea

Elizabeth May



With the challenges plaguing global treaties to stabilize greenhouse gases in the atmosphere, to avert levels of climate change that would exceed humanity's ability to adapt, it has become fashionable to blame the multi-lateral treaty making process itself. As greenhouse gas levels rise, in Canada and globally, it is common to hear a tone of derision when speaking of the Kyoto Protocol. And that contempt tends to bleed into the whole notion that any cumbersome process within the United Nations system can accomplish anything—especially if that “anything” is to save life on earth.

I know that cynicism is false and presents a dangerous self-fulfilling prophecy. And I know it is false because that same cumbersome process within the United Nations system has already saved life on earth. In 1987, Canada led the way to protect the ozone layer with a successful treaty called the Montreal Protocol.

But the Montreal Protocol, as pointed out in a recent article in *The Economist*, has done more than stop the increasing flow of ozone-depleting substances to the stratosphere. It has also contributed substantially to reducing global warming. Some, not all, ozone depleters regulated under the Montreal Protocol are also greenhouse gases. *The Economist* magazine conducted its

own study of the efficacy of measures to reduce greenhouse gases. The *Economist* editorial recently reported:

“CFCs are powerful greenhouse gases and the Montreal Protocol has reduced them by the equivalent of 135 billion tonnes of carbon dioxide (compared with doing nothing), making it by far the world's most effective action to tackle climate change. We have reviewed the carbon-cutting records of 20 policies which rein in greenhouse-gas emissions ... The protocol does almost as much as everything else on the list put together.”

Given the success of the Montreal Protocol, the *Economist* is calling for it to be expanded to include more ozone depleters with a global warming potential. As the world moves towards the deadline for a new climate treaty at the 21st Conference of the Parties set for Paris in December 2015, the *Economist* concludes, “the road to Paris should run through Montreal.”

In my new book, *Who We Are: Reflections on my Life and Canada* (Greystone, 2014), I share the story of the negotiations in Montreal in September 1987. The world was fortunate to have the kind of federal government that listened to scientists. Former prime minister Brian Mulroney was not drawn to the denier crowd about the threat to the ozone layer. Mulroney listened to scientists and accepted their advice. Meanwhile, US Secretary of the Interior Don Hodel tried to stop the Ronald Reagan White House from agreeing to limit CFCs. He famously maintained that all we needed was broad-brimmed hats and sunscreen. There are still Republicans in Congress who think the whole notion that the ozone layer is damaged—by the release of chlorine molecules in the stratosphere as CFCs, methyl bromide and other substances break down—is some sort of anti-capitalist plot.

The Montreal Protocol was so successful that the Kyoto Protocol was modeled on it. The Montreal Protocol pioneered the notion of “common, but differentiated responsibilities.” That is what allowed the developing countries to sign on to the agreement. They still wanted access to refrigerants to prevent food spoilage. So while wealthy industrialized countries agreed to cut ozone-depleters by 50 per cent, poorer nations were allowed to *increase* by 15 per cent. All nations agreed that as the science dictated deeper cuts, nations would do so. The same architecture is in Kyoto.

The primary difference between the Montreal and Kyoto Protocols is that Montreal had an effective enforcement mechanism in allowing trade sanctions against any country that failed to meet the terms of the agreement. Due to the creation of the World Trade Organization, pressure on Kyoto negotiators led to the removal of trade sanctions as an enforcement mechanism. Kyoto has no scheme of punishments for non-compliance.

Still, the major difference between the Montreal and Kyoto Protocols is that the countries that ratified the ozone agreement lived up to its terms. The countries that ratified Kyoto did less well, with Canada setting the disgraceful precedent of renouncing the terms of the treaty and then legally withdrawing—the only nation to do so.

But then again, the fate of the two treaties may be a lot simpler than all the analysis of treaty terms can reveal. Maybe it was the difference from having Canada led by a prime minister who respected the science, recognized a global threat and stuck to his word, versus one who does not. **P**

Elizabeth May is Leader of the Green Party of Canada.
elizabeth.may@parl.gc.ca



The great indoors. We didn't check the forecast for cold weather. Or bring out the colouring books and crayons. But we did provide the heat so this family could enjoy the day together. When the energy you invest in life meets the energy we fuel it with, indoor fun happens.





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Smart Cities is a concept driven by the needs of citizens, rapid urbanization and new frontiers of technological development. ABB products and solutions are at the heart of Canada's critical infrastructure needs, from supply of power, water and heat to the automation of plants and buildings we live and work in. www.abb.ca/smartcities

Certainly.