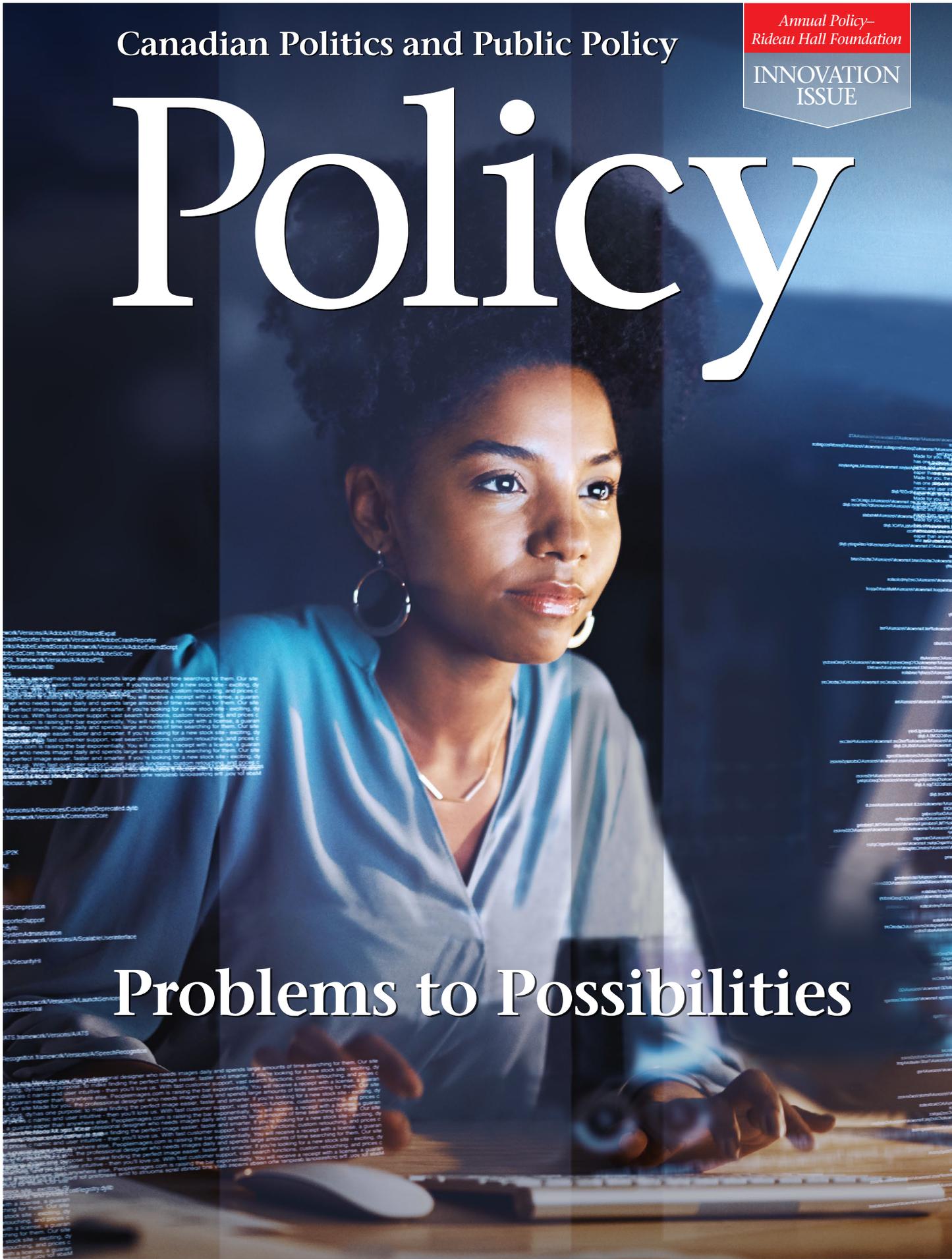


Canadian Politics and Public Policy

Annual Policy—
Rideau Hall Foundation
INNOVATION
ISSUE

Policy



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Canadian Politics and Public Policy

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New electric vehicle technology gives Canada an edge in the clean transportation market

Building a cost-effective system powerful enough to drive big electric vehicles is a challenge for engineers. A team of McGill researchers led by Benoit Boulet has developed technology that can power electric buses and trucks more efficiently and affordably than ever. Now the researchers are working with industry partners to electrify the heaviest transport trucks on the road.



Benoit Boulet, Professor, Department
of Electrical & Computer Engineering
& Director, Intelligent Automation Lab



From the Editor / Lisa Van Dusen

Problems to Possibilities

Here at *Policy*, we mark time in columns, daily online postings and bi-monthly print issues of the magazine. So, one small statement about the challenges of a global pandemic that has unleashed both tragedy and transformation is that this is the second annual *Policy-Rideau Hall Foundation Innovation Issue* since we all hunkered down and masked up.

We couldn't ask for better partners with whom to work through a crisis. For this latest joint innovation issue, *Policy* and the RHF—founded by 28th Governor General David Johnston to shine a light on Canadian trailblazers and encourage aspiring innovators to join their ranks—chose *Problems to Possibilities* as our theme. COVID-19 is still defining our days, but we're also beginning to see the possibilities of post-pandemic life.

Thank you, as always, to the entire RHF team, including President and CEO Teresa Marques, Director of Innovation and Skills Amy Mifflin-Sills and Director of External Relations and Public Engagement Allison MacLachlan for their professionalism and collegiality.

We begin this innovation issue with *Policy* editor and publisher L. Ian MacDonald's Q & A with 28th Governor General Johnston, who brings his insight and unfailing moral compass to the major questions facing the country after a year of COVID.

Teresa Marques follows that introduction with a piece informed by all the timely intelligence of her RHF network of innovators, *Beyond a Level Playing Field: Closing the Digital Equality Gap*.

Innovation Minister François-Philippe Champagne, who took over what has become a crucial economic file in January, lays out the massive response from Canadian companies who re-tooled to help with the pandemic in his wide-ranging Q & A.

Every year, the Governor General's Innovation Awards celebrate unique individuals and teams who have found solutions to the world's increasingly complex problems with collaboration, interdisciplinarity and inclusivity, using technology to bridge divides and empower others. Again this year, we have profiles of all the GGIA winners, from the doctor using 3D printing to revolutionize chemotherapy to the fibre optics specialist who found a way to "hear" the cracks in infrastructure. The RHF's involvement with the Arctic Inspiration Prize—or the Nobel of the North—always delivers some of our favourite stories for these issues. This year, Jimmy Oleekatalik writes about his AIP-winning innovation, the Niqihagut food sovereignty project, in *Creating a New Arctic Food Economy, for Generations to Come*.

Agricultural innovation is one of the great science, tech and adaptation stories of the fourth industrial revolution. In *Not Your Grandfather's Farm*, Canada-India Business Council CEO Victor T. Thomas catches us up with the revolution in agtech. Next year marks the 100th anniversary of the breakthrough at the University of Toronto that brought us insulin. Historica Canada's Anthony Wilson-Smith and Bronwyn Graves have filed *Innovation Through the Lens of History*,

about the Banting, Best, Macleod and Collip Heritage Minute and the spirit that has sustained us through a pandemic.

Throughout the COVID-19 pandemic, Canada's universities have been a front line of both institutional adaptation and innovation, combining social distancing and online classes to continue operating and generating life-saving vaccine research and public health guidance. In *University Innovation: A Transformative Force for Canada's Post-Pandemic Economy*, Université Laval's Sophie D'Amours, Chair of the Board of Directors of Universities Canada, looks ahead to how universities will help shape the innovation economy.

In *Indigenomics: Harnessing the Strength of an Economic Powerhouse*, Indigenomics Institute founder and CEO Carol Anne Hilton describes how Indigenomics provides a path to Indigenous economic empowerment. In *The Innovation Superclusters: Working for Canada*, the five Supercluster CEOs provide reports of the innovation hubs' successes more than two years into their mandates. And, in *Creating an Inclusive Innovation Economy*, Abdullah Snobar, Executive Director of Ryerson's DMZ tech incubator, describes how the DMZ's Black Innovation Programs are removing artificial barriers for Black entrepreneurs.

Enjoy the issue. **P**

Lisa Van Dusen is associate editor and deputy publisher of Policy Magazine. She was Washington columnist for the Ottawa Citizen and Sun Media, international writer for Peter Jennings at ABC News, and an editor at AP National in New York and UPI in Washington.

28th Governor General David Johnston: Policy Q&A

Twenty-eighth Governor General David Johnston founded the Rideau Hall Foundation to shine a light on Canadian excellence, and to create the conditions for more Canadians to succeed and to thrive. For this 2021 Policy Magazine-Rideau Hall Foundation Innovation Issue, Policy Editor L. Ian MacDonald spoke with Mr. Johnston by telephone.

Policy: Well, Mr. Johnston, thank you for doing this. We're in a different context this year, though, aren't we, so I wanted to start by asking you, How does innovation in a pandemic differ from innovation in normal times? In which case, we have innovation driven by a health emergency and economic crisis, so it's a different ball game, isn't it?

David Johnston: Number one, call me David, and number two, we're really planning a partnership with *Policy*, and I look forward to this.

Characteristic number one is the emergency and the latest round of measures. Secondly, it's worldwide. Thirdly, it's really complex, because of the number of different factors involved. And, number four, it shows our mutual vulnerability, our interdependence on others, in a whole host of ways. It's a plague, in many ways, that is sent to test us, to determine our strengths and how resilient we are as a society, as an economy, as a body politic. In this case, innovation is driven from a great sense of urgency. But it's innovation not simply in the scientific endeavour, which, in many respects, has been remarkable—vaccines and therapeutics, which normally take 10 years—but it's also innovation in resilience and in networks and in interactions in different agencies, govern-

ments, and so on. So, this is different than most other challenges to innovation that we have seen and will see.

“ **A pandemic tests our talent. Within each nation, and in the different centres of excellence across it, what kind of people have we educated and graduated to take positions in science, in manufacturing and procurement, in government leadership, in coordinating a vast range of activities? ”**

Policy: What about the coordination and research role of universities in all of this? Almost as the hosts and coordinators of ideas and innovation. As the former head of two of Canada's world-class universities, McGill and Waterloo, are you seeing some of that experience coming home now?

David Johnston: Well, first of all, I would say that a pandemic tests our talent. Within each nation, and in the

different centres of excellence across it, what kind of people have we educated and graduated to take positions in science, in manufacturing and procurement, in government leadership, in coordinating a vast range of activities? How talented are we?

And then, secondly, how much can we draw upon those research and applied technology resources present in those institutions to meet somewhat different circumstances? I think that really indicates a thing that I've often emphasized: a smart and caring nation. So key, with each of those adjectives reinforcing the other. The importance of being smart and the importance of being caring and able to respond to this sort of thing completely, with all of the actors, including of course the research and university communities, playing a lead role.

Policy: For example, the medical faculty at McMaster University—in a town that used to be known more for football really than anything else, for the steel mills and the wonderful people of Hamilton—is a world leader. And the whole world is looking to some of the work that McMaster is doing in this crisis.

David Johnston: I'm told, in fact, that there are three areas in Canada where researchers at universities and in combination with the private sector have played substantial roles in the development of the four vaccines that we have approved. And I would point out that our last Nobel Prize winner in medicine, Michael Houghton, comes from the University of Alberta, and in fact won the Nobel Prize for his work on vaccines in earlier epidemics. He came to Canada through the Canada Excellence Research Chair, where we were looking for the best in the world to come and work in these particu-

lar areas. He's just one specific example of how Canada has participated in this remarkable ten-month "Guinness Book of World Records" time of creating new vaccines and establishing a whole talent base around him at the University of Alberta with respect to vaccine research.

Policy: You were mentioning the Nobel Prize. I looked it up, and Canada has won 26 Nobel Prizes. Two of them, Mr. Pearson obviously with the Peace Prize in 1956 and Alice Munro for Literature in 2013. But most of the rest have been university researchers, from Frederick Banting back in 1922 and the discovery of insulin, all the way forward to Michael Houghton in 2020 for his work on Hep-C and Donna Strickland in physics at the University of Waterloo in 2018. She is one of yours.

David Johnston: We're so proud of Donna Strickland. But, you know, we celebrate the 100th anniversary of insulin next year, which is really remarkable. And Michael Houghton last year. And Art McDonald was physics at Queen's about four or five years ago based on the mine in Sudbury. I know that well because I grew up in Copper Cliff, beside the largest smokestack in the world, and that mine was very close and that's where he actually traced those waves coming from the sun that won the Nobel Prize.

Donna Strickland is a very interesting story. It has to do with innovation because Mike Lazaridis, who developed BlackBerry, which began as a co-op at the University of Waterloo, has invested probably about \$250 million dollars in physics in and around Waterloo at the Perimeter Institute of Theoretical Physics and the Institute of Quantum Computing at the university. And I said when Mike did that, because of his own drive in exploring physics, that we'd see a Nobel Prize won within the next decade. Well, we did. But it wasn't in theoretical physics, it was actually in applied physics. Donna's work involved driving a laser faster, smarter, more powerfully and more accurately. The first application was during live surgery,



Leading by example—Rideau Hall Foundation Chair David Johnston wearing a mask during a meeting in his study at his home near Ottawa. *Rideau Hall Foundation, Jill Clark photo*

and it was based on work she did at the University of Rochester.

“ One of the things that the pandemic has done is that it has tested us as a nation to see who our most vulnerable people are. And we had some glaring examples of truly terrible tragedies. The number of deaths of senior people, particularly those in institutions, is just horrific. ”

But, again, recruited from Rochester to Canada in the physics department, and here we are with the Nobel Prize. And I see more of that to come with Canadian innovation, where we are doing basic research well. We need more of the Mike Lazaridises of the world who understand the importance of the theories and then the applica-

tion that comes from it with the development of a company like BlackBerry.

Policy: In all of this, what are the challenges and opportunities in innovation for Indigenous, Black and culturally diverse Canadians, for gender equity and for the youth whose lives have been disrupted by the pandemic in the last year? We know that the Rideau Hall Foundation has the Catapult initiative that seems like it's very timely as well as very worthy.

David Johnston: A couple of things. The first would be, as Warren Buffett says, "When the tide goes out, you see who is swimming naked." One of the things that the pandemic has done is that it has tested us as a nation to see who our most vulnerable people are. And we had some glaring examples of truly terrible tragedies. The number of deaths of senior people, particularly those in institutions, is just horrific. We stand very poorly against other nations around the world in that respect.

Our minority communities, in partic-

ular Indigenous people, have been especially hit hard because of this for a whole host of reasons: the health facilities available, living in cramped quarters, having to worry about finances, etc. And there has been a good response, I think, in the case of vaccinations and some of the care in Indigenous communities. But it exposes those challenges in our society, and you judge the health of a society by how it deals with its most vulnerable populations. And we have much to do. On the good side, certainly following the Truth and Reconciliation Commission, we have seen a strong, collective effort in Indigenous and non-Indigenous Canadians alike to do things better. And certainly, the Rideau Hall Foundation is playing an important role in that. Catapult Canada is a very good example of finding ways of identifying the best paths forward for young people who are in marginalized communities of various kinds and providing them with the financial help and the mentoring and the career paths so they can advance.

A more specific initiative of the Rideau Hall Foundation is our Indigenous Teachers Initiative. RHF will invest new resources into Indigenous education and support innovation to increase program sustainability and number of Indigenous teachers across Canada. We are supporting other partners like Indspire and faculties of education across the country to develop a special stream of students, Indigenous youth, who are identified as early as grade school, who are provided with scholarship help and mentoring through high school. And then they enter into a scholarship and mentoring program for a Bachelor of Education degree and graduate as secondary school teachers or primary school teachers or early childhood educators through the colleges. At the present time, there is a disproportionately low number of Indigenous youth who take a teaching career path. It is also important to note that we recognize the importance of Indigenous-led and driven initiatives.

Policy: And when you look at the numbers of the pandemic for test-

ing positive and having to recover, and the numbers of cases and even deaths, there is no doubt that there is a discrepancy or a gap between Black and culturally diverse Canadians and white Canadians. What is your sense of that?

“*The reality is that there is a higher concentration of women in the business sectors that have been hardest hit: the restaurant and tourism industries, for example, and women working in factories or in jobs where they cannot work from home.*”

David Johnston: Well, I think that is quite accurate. One, the social conditions in those minority communities reinforce a trend of this kind. Number two, there is more of a hesitancy, I think, in those communities to trust the protocols that are part of this pandemic and to be able to provide the necessary protection. And, thirdly, there is a little more reluctance with respect to vaccines because of trust factors.

But I think the fundamental point I would make about those communities is the overall point of how important trust is. The nations that have done best in this pandemic, by and large, have had high levels of trust in their public institutions and their leadership. Think of New Zealand. Think of Australia. Think of Taiwan. Think of Singapore. And think of Finland, for example. Norway. These are countries that have high levels of trust. And, in the case of New Zealand and Australia, it was the government saying, “You’ll be hit hard, and you’ll be hit fast, and you’ll get on top of this thing.” Their mortality rate is among the very lowest in the world. And as the pandemic has come into their countries, they hit it right on and their population said,

“Yes, we understand what science is telling us and what policy is telling us, and we will make the sacrifices now so that we can get this thing behind us and get on with our lives.”

Nations that have not had that level of trust have had so much more difficulty and the bottom-line result is a very cruel one: the mortality and the percent of the population.

Policy: And what about the issue of gender equity and the extra burdens that have befallen women in all of this, both in terms of employment losses and extra burdens they’ve had to take on at home with the kids out of school?

David Johnston: Again, I think that it indicates that when you have a very unusual enemy like the pandemic sweeping through, it exposes some of our underlying problems. And the reality is that there is a higher concentration of women in the business sectors that have been hardest hit: the restaurant and tourism industries, for example, and women working in factories or in jobs where they cannot work from home. That’s been a factor.

Children not being able to go to school and having to stay at home. The mothers have to cope with that. Very often there are homes that do not have the kind of IT connections that are necessary and very often with no access to them, and very often, also, attempting to maintain some kind of semblance of functioning in a home and looking after the children and holding a job. These are all challenges, and there have been some very positive efforts to provide relief and assistance, but nevertheless, the problem is a large one and it will continue, I think, after this pandemic is over until we establish true gender equity in the world of work.

Policy: And, based on your work, you just referred to the question of public trust and one of your books, published in 2018, is called *Trust*. What is your sense of Canadians’ trust in the governments at all levels as we come through this pandemic and

what elements of that trust will need restoration when we emerge from all this? I don't know about you, but I have a sense that if there is one thing that people have no tolerance for right now, it's politics as usual.

David Johnston: Politics, and I think life, will be different following this test that we've had. At the Rideau Hall Foundation we have a partnership with Edelman to track this. Edelman has been measuring trust in 30 to 35 OECD countries for 20 years. It was interesting that in their survey in 2018, Canada for the first time fell into the "distruster" nation category.

That would be the bottom half of the measured countries. Meaning that fewer than the majority of the population trusted government, NGOs, media and business. And it was interesting that business was at the bottom of that heap and that NGOs were at the top. In 2019, all of a sudden, business rose to the top. Still, with us being a distrustful nation, but it was at the top of those four. And then as the pandemic hit, all of a sudden, in March/April 2020, business fell to the bottom and government rose to the top. Government has now come down a bit. That, I think, indicates just how trust has varied during the period of the pandemic.

As I indicated earlier, I think the nations that have been those most successful are the ones that have had the greatest trust in their governmental institutions, but also in their NGOs, their media and their private sector. I joke about starting our own Tea Party in Canada, I say to my American friends, that this Tea Party would have three "Ts" to achieve: one would be truth, the second would be transparency, and the third would be trust. So, just as we expect that from our scientists and our public health officers, we also expect that from our political leaders. To tell the truth. To be transparent about it and to constantly recognize the trust comes in on foot and goes out on horseback. That you can destroy it very easily. I think we will have some work to be done when this pandemic ends to rebuild trust.

Policy: I wonder how you think, in all of your travels and talking to people and your notetaking, how you see the nature of work changing because of the pandemic. We now live in the Zoom age and whoever heard of that two years ago?

David Johnston: It will clearly change, there is no question about that. The digital revolution is advancing at a pace that we have not seen in human history. It took 300 years for the printing press to reach the majority of the population of Western Europe and, in so doing, managed to take that backwards civilization (kind of the Dark Ages of Europe in pre-15th/16th century where Islam, India and China were well ahead of civilizations). But it was 300 years for that revolution in communication to take place. If you look at the internet, which really burst into awareness in 1993, it took 10 years for it to reach the majority of the world's population. And that digital revolution has been accelerating even more than that, but we have had the huge acceleration in the technology but not nearly so much an acceleration in the human capacity to adapt and use the tools.

So, adaptation, innovation and resilience will be very key to how we deal with that and how we use this digital revolution and other changes to our way of doing things to advance the human condition. And, you know, just the notion of working from home as part of the Industrial Revolution when people did their work at home and took it often to be sold or to work on the farms, we have come back to that in a way and will have to adjust to that. Clearly, the notion of investing in knowledge and skills will become even more paramount. We must educate our children and our workforce to be able to understand new technology, new phenomena, and the ability to learn how to learn and to be very resilient.

And, as a nation, I think sovereignty will be defined in how well we develop talent and knowledge and how well we ensure that it is available to everyone, and how well we put it to

use. That will be the defining factor of the 21st century. That's, I think, where Canada has an opportunity to have a real edge.

Policy: Finally, in terms of summing up, the difference of innovation in peacetime, if I can put it that way, and the equivalent wartime conditions of a national and global emergency, it is a different kind of research, isn't it? And there is a quality of urgency that is not normally apparent.

David Johnston: Let's not have to have a war to become innovative. But to follow the lessons from the war, which is to respond with a sense of urgency that required us to focus on what was necessary and do it with unparalleled effort and tenacity. And have the seamless cooperation of business and government and people all across the country supporting that kind of effort. I don't want us to have to have that kind of sense of urgency to have to steel the nation into working better.

We really should worry about complacency in this beautiful country of Canada, where life has been really pretty comfortable for us. No wars for 200 years. We have a wonderful geography. Vast, large and natural resources to be developed, etc. Stable government. All of those things. We shouldn't have to find ourselves in the circumstances of some of the countries that are really beset by enemies from all sides to be able to work with zeal and to improve our situation and to be innovators. And to share our knowledge with the world.

I really believe that Canada should aspire to be a place where talent has equality of opportunity. Where we believe that everybody should have the best learning opportunities available. To give them a new understanding of the human brain, the human mind. To enhance our advantages and learn better. And then use that knowledge to spread around the world and see ourselves as the prime movers in improving the human condition. **P**

Guest Column / Teresa Marques

Beyond a Level Playing Field: Closing the Digital Equality Gap

Much has been written about the societal inequalities that have been uncovered and exacerbated by the COVID-19 pandemic. The lack of access to affordable, reliable broadband—and the resulting digital divide—is one glaring example of an inequality with far-reaching implications in a world that is increasingly digital. For many Canadians, this gap denies them access to education, employment and health care—including the mental health resources needed so desperately by so many as the months of pandemic isolation drag on.

In a recent article titled *The Case for Connectivity, The New Human Right*, Anne-Marie Grey, the Executive Director and CEO of USA for UNHCR writes: "...digital connectivity should be a human right. It enables access to information, education and opportunity." I would argue that Canada is falling short of living up to the obligations created by that human right.

It is also clear that our failure to embrace digital connectivity hurts our ability to innovate and compete in the world. We know that, along with factors like diversity, collaboration and curiosity, openness to technology is critical to building a culture of innovation. How can we expect to be a country of innovators if some of us don't have access to the most basic tools?

Rural and remote communities, including First Nations and Inuit communities, are most at risk of not having access to broadband. The Canadian Radio-television and Telecommunications Commission

(CRTC) recommends that every household have access to broadband within certain specifications (50 Mbps download speed/10 Mbps upload/access to unlimited data). According to the government's National Broadband Internet Service Availability Map, as of January 2021 86 percent of Canadian households have that level of service. However, that percentage falls dramatically to 40 percent in rural areas and is estimated to be as low as 30 percent in Indigenous communities. And those in rural, remote and northern parts of our country who do have access to the internet often pay far more than their urban/southern neighbours.

“ We know that, along with factors like diversity, collaboration and curiosity, openness to technology is critical to building a culture of innovation. How can we expect to be a country of innovators if some of us don't have access to the most basic tools? ”

Where service is available, cost remains a leading barrier to access. The 2018 Statistics Canada Internet Use Survey reported that 94 percent of Canadians had home internet access. Among the 6 percent of Canadian households without home internet

access, 8 percent cited unavailability of services as the reason, while 28 percent and 19 percent, respectively, cited the cost of either internet services or equipment as barriers to access.

One government response has been to set a goal of Canada-wide broadband by 2030. But, as the data show, the issue of digital equity goes beyond the provision of the infrastructure to deliver broadband services. It is not enough to level the playing field; we also need to ensure that everyone is given an opportunity to play.

Access—in terms of both affordability for all and accessibility for persons with disabilities—and digital literacy, which is particularly an issue among Canadian seniors, are barriers to full engagement that the availability of broadband alone will not address. And it is here that the lack of digital equality intersects with innovation. If Canada is truly going to build a culture of innovation, then every citizen has to have access to all of the tools and skills they need to push boundaries, dare, learn and collaborate.

There are a number of successful initiatives that we can look to for inspiration. The Connected North Network, launched by Cisco Canada in 2013 and now led and managed by TakingITGlobal, began with a single school in Nunavut. Today, 65 schools across Canada's North are connected to educational resources, including mentors, mental health and wellness sessions, sporting events, museums, tutors, and teacher training. It's not just the schools that have benefited from the connectivity; the entire



Digital literacy figures range from 50 percent for Canadians aged 18-24 to 21 percent for those aged 75 and older,” writes Rideau Hall Foundation President Teresa Marques. *iStock photo*

community gains from upgraded networks. In March 2020, when schools closed because of the pandemic, TakingITGlobal was able to launch Connected North@Home, delivering programming to students in the safety of their homes.

Connected North is not alone in innovating to offer new solutions to the complex and multi-faceted connectivity challenge. ReBOOT Canada provides equipment, training and technical support to low-income Canadians, as well as to charities and non-profits. And the Neil Squire Society works with partners in industry and government to find innovative solutions that allow persons with disabilities to access the assistive technology they need to participate more fully in society, including via computers. The Society also offers Digital Jumpstart, a free online program that helps persons with disabilities improve their digital literacy—another vital component of real digital equality. Also with a focus on digital literacy, Connected Canadians pairs volunteers and seniors (either one-on-one or in small groups) to help improve digital literacy skills and lessen social isolation.

These organizations and many others are certainly having an impact and are helping to bridge the digital divide. But no single organization, and no single sector, will be able to do it alone. If we are going to be successful in addressing the numerous issues related to digital equality—infrastructure, affordability, accessibility and literacy—we will need a cross-sectoral approach, and one that is sustained over time. That means governments, universities, technology, community groups and NGOs working together to build a permanent bridge across the digital divide. At the Rideau Hall Foundation, we will continue to work with all of our partners to help build that bridge. With our focus on learning, leadership and innovation, we will continue to spotlight Canadian success stories, inspiring the next generation of dreamers and doers.

We will also continue to measure our progress. Our 2020 *Culture of Innovation Report* tells us that only 36 percent of Canadians feel that they have been taught how to be digitally literate and slightly more than half (57 percent) feel confident using digital tools and programs. But these national figures

hide a wide generational divide. Digital literacy figures range from 50 percent for Canadians aged 18-24 to 21 percent for those aged 75 and older. The same disparity exists in terms of confidence using digital tools.

This means that a vast number of Canadians aren't comfortable using the online services and tools that have become a lifeline for so many during the pandemic. It means that some students aren't using online educational tools to their fullest potential; some workers are struggling with the tools they use to collaborate; people are unable to access online medical assistance; and already-isolated seniors are deprived of the tools that would connect them to others.

To truly unlock the innovative potential of all Canadians and achieve equitable participation, we have to work together across sectors to ensure everyone—regardless of age, ability, income and location—has the tools and skills they need to function effectively in the digital world. Only then will no one be left sitting on the bench. **P**

Teresa Marques is the President and CEO of the Rideau Hall Foundation.

Policy Q & A: Innovation Minister François-Philippe Champagne

Canada's culture of innovation has been both challenged and accelerated by the unique demands of the COVID-19 pandemic. As has become an annual tradition for our Policy-Rideau Hall Foundation Innovation Issue, Policy reached out to the federal innovation minister for a Q & A. François-Philippe Champagne, who was sworn in as Minister of Innovation, Science and Industry in January, was kind enough to respond.

Policy: The Made in Canada innovation and retooling program saw 6,500 Canadian companies mobilize to help fight the COVID-19 pandemic. What is it revealing about our innovation landscape? Can you provide a few examples of participating companies that stand out in their progress?

François-Philippe Champagne: First of all, it has demonstrated the resourcefulness, passion, and determination Canadian companies have had in coming together to help fight the pandemic here at home.

We created a plan to mobilize and support domestic manufacturing capacity to supply vital, made-in-Canada protective gear and other medical equipment and devices needed to respond to the outbreak of COVID-19. From coast to coast to coast, Canadians showed that we are in this together. Over 1,000 companies have scaled up or retooled to produce personal protective equipment, such as GM Canada, which retooled to manufacture surgical masks and Bauer, which retooled to make face shields. We also sought to leverage industry and innovation programming – such as the National Research Council of

Canada's Industrial Research Assistance Program, Innovation Superclusters and Innovation Solutions Canada—to make industry's transition to COVID-related production as seamless as possible.

For example, we launched seven Innovative Solutions Canada challenges, including challenges focused on Made in Canada filtration materials for respirators, Point of Care and Home Diagnostic Kits for COVID-19, and Compostable and Recyclable surgical masks/respirators for health care workers. Additionally, the Innovation Superclusters Initiative leveraged Canada's five superclusters and their networks of more than 6,000 members to support national COVID-19 efforts.

Policy: What are your thoughts on how the pandemic has transformed our economic reality in ways that will require adaptation and innovation that otherwise would not have been contemplated?

FPC: The most obvious example that the pandemic has brought into focus is the need to grow our domestic biomanufacturing capacity. This has been a focus of mine since assum-

ing this portfolio, and it has already borne fruit, as you may have seen with our major investments since. These include support for a nearly \$1 billion project by Sanofi Pasteur to build an end-to-end vaccine manufacturing facility in Toronto. The resilience of our supply chains and our ability to produce things like personal protective equipment and vaccines here at home is critically important, both in terms of creating good jobs and increasing our pandemic preparedness. To that end, Budget 2021 proposes \$2.2 billion over seven years to help build Canada's talent pipeline and research systems, and support the growth of Canadian life sciences firms, including with \$1 billion of support to Canadian firms through the Strategic Innovation Fund.

“ *The resilience of our supply chains and our ability to produce things like personal protective equipment and vaccines here at home is critically important, both in terms of creating good jobs and increasing our pandemic preparedness.* ”

As we look toward building back better from the pandemic, our priority is to make sure that Canada is a top destination for businesses to invest, grow, and create jobs. We have seen the success of programs like the Strategic Innovation Fund which is helping to maintain and create over

73,000 high-quality, good-paying Canadian jobs, while responding to pressing national priorities. Building on that success, Budget 2021 proposes to recapitalize the fund with more than \$7 billion in additional funds, including \$5 billion for the Net-Zero Accelerator program to meaningfully accelerate domestic greenhouse gas emissions reductions by 2030. This program, launched last December, will help build and secure Canada's clean industrial advantage.

By investing in decarbonizing large emitters, transforming key sectors—from steel and aluminium to cement—and accelerating the adoption of clean technology across the economy, the Net Zero Accelerator will spur Canada's shift to innovative net-zero technologies and meet our goal of net-zero by 2050. Transforming industries maintains jobs by making our industries competitive as global markets change and consumers are demanding more environmentally conscious products, and creates new jobs as we position Canadian businesses to take a significant share of these growing markets.

Policy: Thinking about rebuilding our economy post-pandemic, particularly with respect to creating new jobs and upskilling our workers, how will innovation and technology play a role in that? In what sectors should we be anticipating the most growth and the most impact?

FPC: We have said that we will have Canadians' backs throughout this pandemic and demonstrated that commitment by extending business and income support measures through to the fall of 2021. We will continue to make investments to create jobs and help businesses across the economy come roaring back. Budget 2021 puts the government on track to meet its commitment to create one million jobs by the end of this year. We need to keep our eye on where the puck is going—that means developing upskilling and reskilling plans in tandem with



"As we look toward building back better from the pandemic, our priority is to make sure that Canada is a top destination for businesses to invest, grow, and create jobs," says Innovation Minister François-Philippe Champagne. *Adam Scotti photo*

industry to support our most innovative firms. Budget 2021 proposes to provide \$250 million over three years for an initiative to scale-up proven industry-led, third-party delivered approaches to upskill and re-deploy workers to meet the needs of growing industries. It also proposes \$55 million to support communities to develop local plans that identify high potential growth organizations and connect these employers with training providers to develop and deliver training and work placements to upskill and reskill jobseekers to fill jobs in demand. Finally, the Budget proposes \$708 million for Mitacs to create at least 85,000 work-integrated learning placements, or co-ops, that provide on-the-job learning and provide businesses with support to develop talent and grow.

Innovation and technology will be key to the success of these invest-

“ We must ensure that we are developing a labour force that is prepared to help our economy position itself for growth; driving our competitive edge on a global scale. ”

ments and to our post pandemic recovery writ large. We must ensure that we are developing a labour force that is prepared to help our economy position itself for growth; driving our competitive edge on a global scale. Investments in preparing our workforce to shape dynamic and emerging sectors, like clean tech and agri-food, will help cement Canada's position as a world leader in research

and innovation, building a global brand that will attract talent and capital for years to come.

Policy: Recently, we saw the publication of Corporations Canada’s first annual report on the diversity of boards of directors and senior management of federal distributing corporations. How can ensuring greater diversity at the leadership level in Canadian business help drive innovation and competitiveness across sectors?

FPC: I want to start by expressing gratitude to those raising their voices for change, including diverse people in the business and entrepreneurship world. They are the people calling for and leading this change, and we are here to support them and play our part. It has been empirically proven that organizations with greater diversity in their leadership team have better outcomes, be they financial or otherwise, meaning there is both a social and business imperative to strive toward this. The data in this report will be an important tool in the push for increased diversity on corporate boards and among senior management. With its publication, Canada becomes one of the first nations to measure corporate diversity beyond gender. This report will serve as a benchmark against which to judge future progress.

It is clear that the numbers in this report fall well below what would accurately represent the diversity of Canada. This reflects the reality today that women, racialized persons, those who identify as LGBTQ2 and those living with disabilities (including invisible and episodic disabilities), as well as First Nations, Inuit and Métis peoples, are under-represented in positions of economic influence and organizational leadership across Canada. We have taken important steps to address this reality, including launching the 50-30 Challenge; the Women Entrepreneurship Strategy; a charter on equity, diversity and inclusion for post-secondary institutions; and the Black Entrepreneurship Pro-

gram—the first of its kind in Canada. But there remains much more work to do.

“ The COVID-19 pandemic has transformed how Canadians live, work, access information and connect with each other—and that has made digital technology and connectivity more important than ever. ”

Policy: With the acceleration of online activity during the pandemic, what does this mean for privacy regulation going forward?

FPC: We recognize that adopting digital and data-driven technologies will be key to reinvigorating our economy and allowing Canadians to create new business opportunities and high-value jobs in emerging sectors. At the same time, digital technology presents risks, including to privacy. And so, as part of our work on the Digital Charter that was released in May 2019, we proposed the Digital Charter Implementation Act to modernize Canada’s privacy law for the digital age.

Put forward as Bill C-11, the proposed Act was developed in a manner that supports innovation, and is interoperable with the privacy regimes of our major trading partners. As a result, Canadian organizations will be well positioned to leverage data in a responsible way, and to compete internationally.

Policy: The pandemic has, among other things, revealed a real inadequacy when it comes to equality of access to the internet and online environments. What do we need to do to help mitigate these access issues, how do we help level the playing field to ensure we aren’t leaving

people behind and weakening our culture of innovation as a result?

FPC: The COVID-19 pandemic has transformed how Canadians live, work, access information and connect with each other—and that has made digital technology and connectivity more important than ever. Many industries have undergone an overnight shift to a virtual workforce. And e-commerce has been embraced even more by Canadians to meet their basic needs.

Budget 2021 accelerates investment in digital transformation of small and medium-sized businesses through a new Canada Digital Adoption Program. The program will provide micro-grants to smaller, Main Street businesses to support the cost of technology adoption. It will create training and work opportunities for as many as 28,000 young people to help small businesses adopt new technology. Our Computers for Schools program has also stepped up over the last year, and has provided refurbished technology to low-income families and schoolboards so they can access the digital world. We also recognize that adopting digital and data-driven technologies will be key to reinvigorating our economy by allowing all Canadians to create new business opportunities and high-value jobs such as in online health care and virtual education services. High-speed internet access is no longer a luxury—it is essential. That is why Budget 2021 proposes to add \$1 billion to the Universal Broadband Fund for a new total investment of \$2.75 billion to help us reach the goal of 98 per cent of the country having high-speed broadband by 2026 and 100 per cent by 2030. The pandemic has made clear how essential it is for Canadians and their businesses to be reliably connected at efficient upload and download speeds and we are taking action to ensure this is the case in all corners of the country. **P**

The 2021 Governor General's Innovation Awards Laureates

The Governor General's Innovation Awards celebrate unique individuals who have found solutions to the world's increasingly complex problems with collaboration, interdisciplinarity and inclusivity, using technology to bridge divides and empower others. This year's six laureates have more than met those criteria in fields ranging from health care to more concrete forms of public safety.

Alex Gillis

Dr. Xiaoyi Bao: HEARING THE CRACKS IN INFRASTRUCTURE

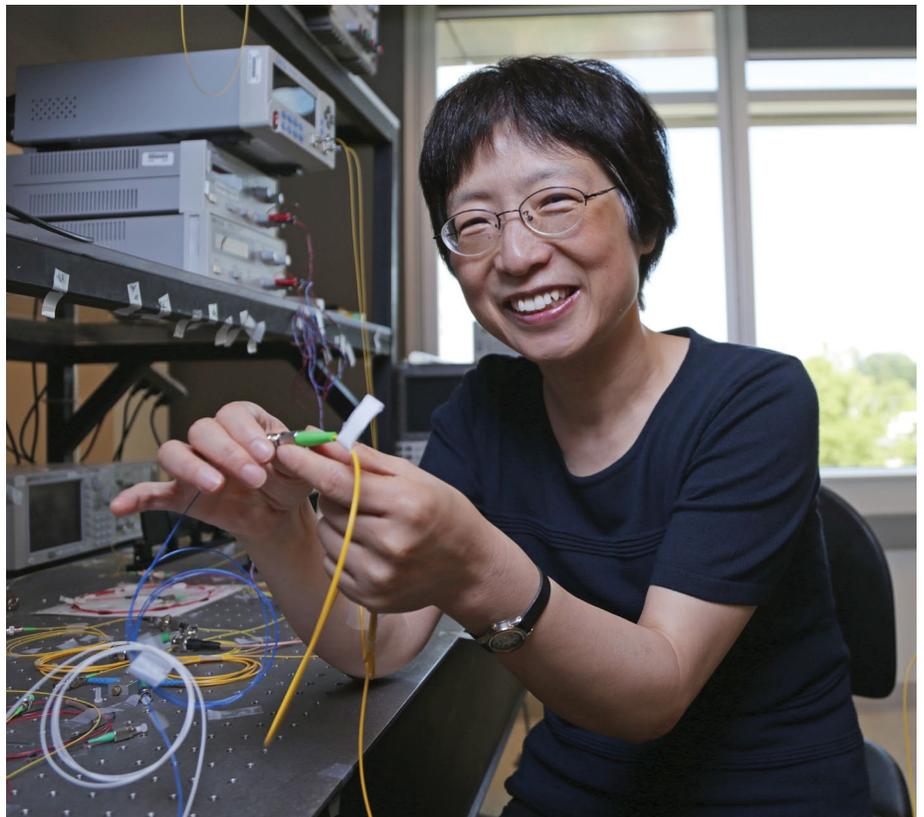
Every day, billions of people rely on public infrastructure, such as bridges, dams, railways, pipelines and nuclear reactors, making assumptions that these structures are being carefully monitored. However, most monitoring techniques rely on primitive technologies and visual assessments, with problems sometimes undetected until it's too late. Dr. Xiaoyi Bao, a fibre-optics and photonics expert and professor of physics at the University of Ottawa, received a GGIA for "distributed acoustic sensor" technology, which is composed of optical fibres and instruments that can 'hear' sounds from defects and cracks inside of bridges and other critical structures. "This is a technology that was previously considered impossible," Dr. Bao says. "My innovation was to develop an instrument to hear and locate the 'sounds' from cracks—sounds carried by optical fibres." Miles of these fibres are wrapped inside and around structures and connected to instruments

that listen for cracks. "After nearly 15 years of working with optical fibres, I set a world record for creating an instrument that could 'listen' to a

sound spectrum from everywhere in fibres, similar to ultrasound imaging of body parts," she explains.

"I'm a pioneer in detecting and locating this acoustic wave along optical fibres," she adds. "Distributed acoustic sensor technology is having a significant impact around the world. It has become a standard testing tool—and is estimated to become a \$2 billion industry worldwide by 2025. It has improved the safety of millions of people, and prevented accidents and problems of all kinds."

"I never imagined something as small as an optical fibre could have such a huge impact," she says.



Physicist Xiaoyi Bao in her fibre optics laboratory at the University of Ottawa. *University of Ottawa photo*



Dr. James Robar in the Radiation Oncology treatment room. *Keira Dorothea Robar photo*

Dr. James Robar: IMPROVING RADIATION THERAPY WITH 3D PRINTING

In 2012, when Dr. James Robar discussed an innovative idea with one of his graduate students, Shiqin Su, he concluded that someone must have thought of the idea already. Dr. Robar is chief of Medical Physics at Nova Scotia Health Authority, as well as a professor of radiation oncology at Dalhousie University, in Halifax. “Surely someone’s already integrated 3D-printing technology into radiation therapy for cancer treatment,” he thought. Doctors use radiation therapy to treat about half of cancer patients, many of whom have tumours close to the skin. A ‘bolus’ is placed on the skin to mimic tissue so that an x-ray dose can be targeted to the patient’s surface during radiation therapy. Typically, this bolus is a hand-made wax accessory or a sheet of vinyl that’s taped onto the patient’s skin, which is sometimes awkward and which often means that the radiation dose isn’t uniform.

Dr. Robar discovered that no one was using 3D-printer technology to create boluses. His technology cre-

ates a bolus that fits better and is more comfortable for patients. And the impacts are huge: each patient receives personalized medicine, radiation treatments are more accurate and efficient for patients with skin, breast and head-and-neck cancers. Also, given that every patient

undergoing radiation therapy already has a CT scan, the design of a 3D-printed device requires no additional appointments.

Dr. Robar teamed up with Peter Hickey and Alex Dunphy to create a Halifax-based company, Adaptiiv Medical Technologies, which has developed the technology and distributed it to 15 countries. The company has grown from three to 25 employees over the past four years.

“It’s been gratifying to work on practical research that’s translated to the clinic and directly benefits patients,” Dr. Robar says.

Dr. Sheila Wang: THE APP THAT HEALS WOUNDS

After the pandemic started, Dr. Sheila Wang, who’s completing her residency in Dermatology at McGill University, recognized that COVID-19 made it extremely difficult for many patients with chronic wounds to access regular care—and without timely access to care, wounds can lead to hospitalization, amputation and death. Dr.



Sheila Wang, MD, PHD. *Dr. Yunghan Au photo*

Wang, who is co-founder and Chief Medical Officer of Swift Medical, and her team created an app that uses artificial intelligence (AI) to measure, monitor and help to heal wounds, enabling patients to remain in their homes. “The user-friendly mobile app contains powerful AI technology,” Dr. Wang explains. “My co-founder and chief engineer of Swift began his career applying vision intelligence to Mars rovers and space robots. Similar, advanced technology is now used in our wound-care app—to examine the surface of a human body rather than a planet.”

The app’s impacts have been widespread. More than 3,900 healthcare organizations across North America have adopted the Swift Medical technology to monitor 450,000 patients each month. “Swift’s innovation allows nurses, doctors and patients to take precise images and measurements to determine the right treatments,” she says. “It tracks wound healing over time and helps to monitor patients at the greatest risk of new or worsening wounds.” Dr. Wang is leading an initiative to provide the Swift app to patients across Canada, enabling patients and their care teams to manage complex wounds remotely and safely during the pandemic.

Mi’kmaq Kina’matnewey: MI’KMAQ TEACHING MI’KMAQ— IN THE MI’KMAW LANGUAGE

In contrast to dominant Eurocentric school systems (and in the devastating aftermath of Indian Residential Schools), Mi’kmaq Kina’matnewey (MK), the Mi’kmaq education authority, has emerged as a powerhouse in Nova Scotia, since its founding in 1997.

“Mi’kmaq Kina’matnewey is a collective of 12 Mi’kmaq First Nations communities across the province” says Blaire Gould, MK’s executive director. “The collective is an education authority that’s community based and Mi’kmaq led.” MK received a GGIA award for its achievements in collaborative governance, effective planning, strategic influence, transformative Mi’kmaq teacher education and off-the-charts graduation rates. “We’ve achieved a lot over the past few decades,” Gould says. “We support our students across the province and consider the needs of the whole person. We offer support academically, physically, mentally and with technology.”

The result has been an enabling environment for Mi’kmaq culture and Mi’kmaq language to thrive, all the

while achieving educational outcomes that far exceed national averages for on-reserve and off-reserve education. “Our high-school graduation rates are above 90 per cent,” Gould says. “We have more than 600 Mi’kmaq students enrolled in post-secondary institutions, and our literacy and numeracy rates have increased—and our athletes have gone on to compete and win at national levels.” MK provides Mi’kmaq language support online and in person, as well as mentor-apprentice language programs in 12 communities—with a Mi’kmaq immersion program for the youngest children in two of our communities,” Gould adds.

“The 12 communities have delivered this education for a very long time,” she says. “It’s Mi’kmaq teaching Mi’kmaq,” she says.

Dr. Geoffrey Fong: ANTI-SMOKING RESEARCH WITHOUT BORDERS

Tobacco smoking is the world’s leading preventable cause of death, according to the World Health Organization (WHO). Dr. Geoffrey Fong, a psychology professor at the University of Waterloo and



Mi’kmaq Language Camp—students from all 12 communities. Shara Johnson, Communications Coordinator, Mi’kmaq Kina’matnewey photo

senior investigator at the Ontario Institute for Cancer Research, is out to change that. In 2002, Dr. Fong and his Waterloo colleagues Dr. Mary Thompson and Dr. David Hammond founded the International Tobacco Control Policy Evaluation (ITC) Project, a research program involving 150 researchers from a range of scientific fields (psychology, economics, statistics, epidemiology, chemistry and toxicology) that has expanded to 29 countries, inhabited by over 50 per cent of the world's population.

Dr. Fong and his team were awarded a GGIA for their scientific work in combatting the global tobacco epidemic, which claims more than 40,000 lives annually in Canada and over eight million lives globally. "From the ground up, we built a global evidence system to evaluate the impact of policies of the WHO Framework Convention on Tobacco Control, the first WHO treaty," Dr. Fong explains. ITC's landmark evaluation studies have supported the treaty's major policies, including smoke-free laws, graphic warnings, advertising bans, higher tobacco taxes, menthol bans and plain packaging. "We have used our findings to inform countries of the need to strengthen their policies, as well as to defend effective policies



Dr. Geoffrey T. Fong, Founder and Chief Principal Investigator of the International Tobacco Control Policy Evaluation (ITC) Project. *University of Waterloo*



Jackie Dawson conducting Arctic shipping research during a voyage through the Northwest Passage, in Nunavut. *Arctic Voices and Northern Corridors team photo*

against tobacco industry legal challenges," he says.

ITC's innovative research has led Canada and many countries to strengthen their tobacco-control efforts and improve the health of many millions of people.

Arctic Corridors and Northern Voices: INTEGRATING TRADITIONAL INUIT KNOWLEDGE AND WESTERN SCIENCE

Due to climate change, sea ice in the Arctic has been melting rapidly, opening up new shipping route—and leading to increases in tourism, fishing, resource development and shipping traffic. At the same time, communities in the region have voiced concerns about the ecological and cultural impacts that more ships will have in the region.

To address these challenges, the Arctic Corridors and Northern Voices (ACNV) project is working with the Canadian Coast Guard, Arctic communities, the shipping industry and other researchers on a project that's brokering knowledge about the region. The Inuit are a marine people and have extensive knowledge of the region, and

that knowledge is now being infused into government policy and management of Arctic shipping corridors.

"ACNV brings together all ways of knowing, so that the corridors can be effective and sensitive to ecological and cultural sites," says Dr. Jackie Dawson, an associate professor at the University of Ottawa. Dawson leads the ACNV team, which includes Dr. Natalie Carter (ACNV Community Research Lead), Natasha Simonee (community member and hunter in Nunavut) and Shirley Tagalik (chair of the Aqquimavvik Society).

The team received a GGIA for its innovative integration of traditional Inuit knowledge and Western science. ACNV also includes 59 Inuit and northern researchers and more than 130 Inuit knowledge holders. "The project is identifying sensitive and significant cultural marine sites that are important for Inuit who engage in hunting or subsistence activities—or that are important to their communities," Dr. Dawson explains. Together, their work is leading to the creation of new routes for Arctic shipping—routes that better protect marine areas. The project has made Canada a global leader in self-determined science. **P**



The town of Taloyoak, Nunavut, where the Spence Bay Hunter and Trapper Association was awarded an Arctic Inspiration Prize for the Niqihagut food sovereignty project. *Brandon Laforest/WWF Canada photo*

Creating a New Arctic Food Economy, for Generations to Come

The Arctic Inspiration Prize, often referred to as the “Nobel of the North”, was established in 2012 to recognize potentially transformative, ideas-to-impact projects in the fields of education, health, social-cultural issues, the environment, and the economy. One 2020 AIP recipient is the Niqihagut food sovereignty project, which aims to eliminate food insecurity caused by poverty, climate change and cultural loss. The Rideau Hall Foundation proudly serves as the managing partner for the AIP.

Jimmy Oleekatalik

In Taloyoak, the most northerly community on the North American mainland, we have always been going on the land. We are not farmers, but the land is where our food comes from. From here, on the southwestern coast of Aviqtuuq, which was briefly renamed Boothia Peninsula, there are only islands. All migrating wildlife has to pass through Taloyoak (formerly Spence Bay), by water or by land, so as soon as it starts to warm up, we go out fishing and hunting.

In the past 50 years, we've gone from using dog teams to using iPhones. It's a big change. But the environment is changing, too, and it is affecting our food security. Now, after being awarded \$451,000 for the Arctic Inspiration Prize (AIP)—which funds innovative projects by Northerners to improve their communities—we have money to support our plan to turn things around.

Our community of about 1,100 Inuit is located right in the migratory route of the Ahiak caribou herd, who come every summer to their calving ground in Aviqtuuq. But it is not only caribou—many species have offspring up here: seals, muskox, birds, and fish like char and cod. We also heard from a hunter who witnessed a bowhead whale calving this summer, which makes it even more special.

Yet despite our abundant wildlife—and our rich history and traditions based on hunting and gathering—many residents of Taloyoak face food insecurity. They cannot access country food, only expensive store food flown in from the south, because food from the land is under threat from climate change and from mining exploration.

“The warming climate is impacting our water, our land, our sea, and now our culture and what we eat. As never before, it is getting harder to go out hunting here in Taloyoak.”

The warming climate is impacting our water, our land, our sea, and now our culture and what we eat. As never before, it is getting harder to go out hunting here in Taloyoak. I'm the manager of the Spence Bay Hunter and Trapper Association (HTA) and every day we talk about how much it costs to go out hunting. Climate change is also

threatening our hunters' safety as the land, lakes, and ice become more dangerous to travel on, and the wildlife becomes more scarce and remote.

Country foods are the healthiest for us—caribou, fish, seal. We simply catch and eat it fresh, and it has no additives in it. It is the reason why we are here. It's a big deal here, for Elders and for youth too. But a lot of Elders, single parents, and very low-income families cannot afford store food, and neither can they access country food.

For many years now it's been talked about getting back to the basics of livelihood and diet. So, to keep our tradition alive we came up with *Niqihaqut*, which means “our food” in Inuktitut. But how were we going to start it? Where were we going to get the funds?

The Arctic Inspiration Prize was mentioned, so we went for it with high hopes, and we are so thankful to be able to be recognized and to be believed. We're still dreaming, we can't believe we won! Maybe it's because it is an inspirational project for all? It is simply people helping people.

Our community's priority is to adapt to climate change by developing new ways to improve country food access for all, especially low-income families, while supporting our hunters. We also have to monitor the land and the environment so that the wildlife is in good health. *Niqihaqut* will create a country food-based economy from a sustainable and respectful harvest and a modern cut-and-wrap facility to prepare and distribute this food throughout Taloyoak.

Niqihaqut will not only improve our people's health and well-being, it will also help lay the groundwork by informing a management plan for our proposed Aviqtuuq Inuit Protected and Conserved Area (IPCA), which would cover 40,730 square kilometres of ocean, 4,413 square kilometres of freshwater, 20,532 kilometres of rivers and 45,039 square kilometres of land.

And it will put Inuit in charge of managing it.

An IPCA is not like a regular protected area because it puts Indigenous people in control of stewarding our traditional territories, ensuring our food security with a sustainable harvest as well as economic development like small-scale fisheries, outfitting camps, and tourism.

Aviqtuuq is our home, our traditional lands. It has provided us with what we have needed to survive and thrive here for generations. We want to see the lands and resources here protected from industrial development because the area is sacred to us, and has everything we need to prosper.

Since my grandfather's era, when there was talk of building a pipeline across Aviqtuuq, we've fought to keep it safe. Nothing was happening to ensure conservation, so around 2016 we reached out to World Wildlife Fund-Canada, and that got the ball rolling. Our Spence Bay HTA was awarded over \$585,000 from the Canada Nature Fund in 2019 thanks to an application that WWF-Canada helped us develop to support our vision for Aviqtuuq. Then, last year, they again supported our Arctic Inspiration Prize submission.

I was the lead on this project, alongside our team members Paul Okalik and Brandon Laforest (WWF-Canada), Tad Talurialik (youth representative), Kublu Tucktoo (retired teacher), Joe Ashevak (Spence Bay HTA chair), Lindsay Anaija (Hamlet of Taloyoak) and Vincent L'Hérault (ARCTICConnexion).

The reason these IPCA protections are needed is because warming temperatures are not the only threat from climate change. The loss of ice in the nearby Northwest Passage will also bring shipping traffic and the danger of vessels striking whales or, even worse, oil spills that we are not equipped to clean up.

And the peninsula is also coveted by the mining industry, which has exploration claims over our land, and



Elders in Taloyoak meet to discuss the Niqihaqt food sovereignty project. Jimmy Oleekatalik photo

we are very concerned about what this could bring to our future, to our food. They promise prosperity, but it comes with a cost to our social and cultural traditions, and to our environment. Aviqtuuq is the most crucial caribou habitat during calving and post-calving, but everything is going to be affected if we have a mine. From muskox and insects to

polar bears and plankton, it's one ecosystem to us.

We see what is happening in Pond Inlet with the Baffinland mine at Mary River and how it's impacting their narwhal and caribou. We even organized a solidarity protest in Taloyoak to support the hunters because we, too, have a different vision. We're trying to protect Aviqtuuq from in-

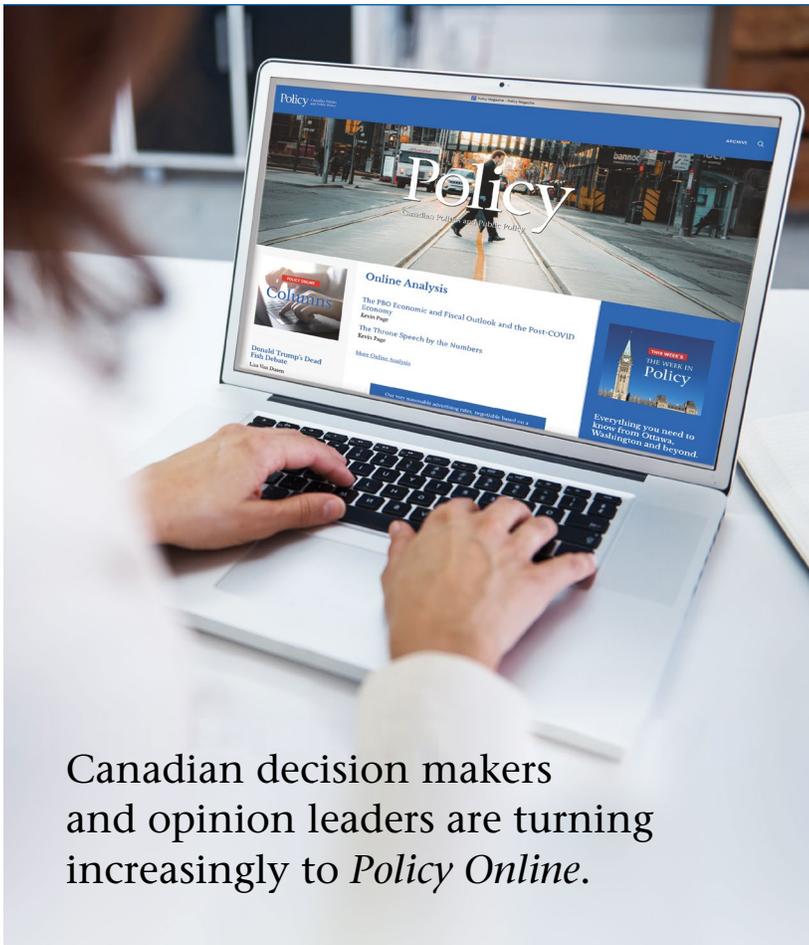
dustrial development, which could devastate the caribou population, but we need some kind of alternative income.

These projects will feed more families, create jobs, reduce poverty in the community and provide more money for social programs to support Elders, youth, and single parents, while keeping our culture and traditions alive for generations to come. It's going to benefit the whole town.

A mine might create jobs for 20 years. But a new food economy and the first-ever Inuit Protected and Conserved Area in Canada would generate jobs forever, from generation to generation, and still protect the land.

This land is very beautiful, it's our home, and it is common sense to protect it and our way of life. **P**

Jimmy Oleekatalik is manager of the Spence Bay Hunter & Trapper Association in Taloyoak, Nunavut.



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Throughout the COVID-19 pandemic, Canada's universities have been a front line of both institutional adaptation and innovation. *iStock photo*

University Innovation: A TRANSFORMATIVE FORCE FOR CANADA'S POST-PANDEMIC ECONOMY

Since the dawn of this century and the fourth industrial revolution, trends toward interdisciplinarity, inter-institutional collaboration and academic-industry technology transfer have underscored universities' status as a knowledge network. The COVID-19 pandemic has accelerated those trends in a way that can also make universities indispensable to Canada's innovation economy.

Sophie D'Amours

Every technological revolution society has witnessed was preceded by a major global crisis, and each was driven by major public investments. In each case, the distribution of economic power changed.

As we consider what technological shifts will transform our society following massive post-COVID investments, we must look at further developing and nurturing a culture of innovation in Canada. To start, we need to do a better job of celebrating our successes and ensuring Canadians are proud of new businesses, proud to be the first in a sector, or leaders in a given field. Young

people have always been the vanguard of cultural change, so we can turn to colleges and universities as environments with great potential to fuel and reinforce this culture of innovation.

A stronger innovation culture could motivate more companies to invest in research and development (R&D). Countries considered world champions in innovation invest more than three per cent of their GDP in R&D each year. In Canada, businesses are investing less and less. During the past 10 years, they have reduced their investments by about \$1 billion. In 2018 in Canada, investment in R&D amounted to 1.6 per cent of GDP and the share funded by businesses was 42.6 per cent. By comparison, the share of R&D investment by French companies is 56 per cent, German companies 66 per cent and American companies 62 per cent.

Beyond the need to invest more in business innovation to stimulate a resilient and robust post-COVID economy, it may be necessary to consider whether fiscal tools such as tax credits, Canada's primary methods for encouraging business investment, are actually delivering the expected benefits. Germany, Israel and Sweden, for example, mobilize greater business participation in innovation through targeted projects with specific missions and direct assistance.

Our allies are leaning toward a vision of a post-COVID economy and a world that are more connected (digitally and internationally), more sustainable (socially and environmentally) and more inclusive. US President Joe Biden announced plans to spend \$250 billion on the US research enterprise in coming years to help rebuild, create jobs and spur innovation. And, Horizon Europe, the European Commission's ambitious funding program for research and innovation, presents unprecedented opportunities for collaboration in research and innovation. Canada must be ready.

“ We need to invest to generate the next wave of disruptive innovation, here. The risk-takers, the curious, the problem solvers, will take us where we never imagined possible. ”

We need to invest to generate the next wave of disruptive innovation, here. The risk-takers, the curious, the problem solvers, will take us where we never imagined possible. Imagine producing 3D-printed homes and vehicles or developing personalized drugs and treatments or producing energy at home from our waste. All indications are that we'll see those innovations in the next 10 to 15 years.

In terms of knowledge, the ability of universities to carry out their research, to make discoveries leading to the development of new technologies, and to train the people who will be able to develop burgeoning sectors, is essential for realizing innovation's benefits.

“ Given our world's rate of change, we can expect that in the next 15 years, on a global scale, we will make more discoveries than we have since the dawn of humanity. What will Canada's role be in that? ”

We must also consider investment in fundamental research—the research that will help us lead the next great wave of transformative innovation. Given our world's rate of change, we can expect that in the next 15 years, on a global scale, we will make more discoveries than we have since the

dawn of humanity. What will Canada's role be in that?

As we start to consider life post-pandemic, we know we will have to work hard to rebuild our economy and make tough investment choices—choices that will require some risk-taking to increase the economic, social and environmental value of every job in Canada.

The digital shift will structurally affect all sectors in Canada. The contribution of universities in this regard will ensure a faster and more effective transition. Knowledge transfer and collaboration with organizations will need to accelerate. The crisis has also highlighted weaknesses in critical value chains. Inevitably, these sectors will need to adapt. Universities will be the levers for a rapid recovery that focuses on future possibilities.

As we transform our economy, we must make it more sustainable. The fight against climate change cannot be ignored. Countries increasingly have to pay large bills associated with damages caused by climate change—costs borne by citizens. The commitment of Canadian universities and their researchers could help Canada develop the clean technologies and knowledge needed to mitigate the risks of damage and reduce greenhouse gases at the source. It is essential we consider the role we play when 30 per cent of the European Union's massive recovery plan will be dedicated to fighting climate change.

We must also work on inclusion. Some sectors and groups have been more severely weakened by the effects of pandemic disruptions. As workers in many sectors transition to a new economy, we will need spe-

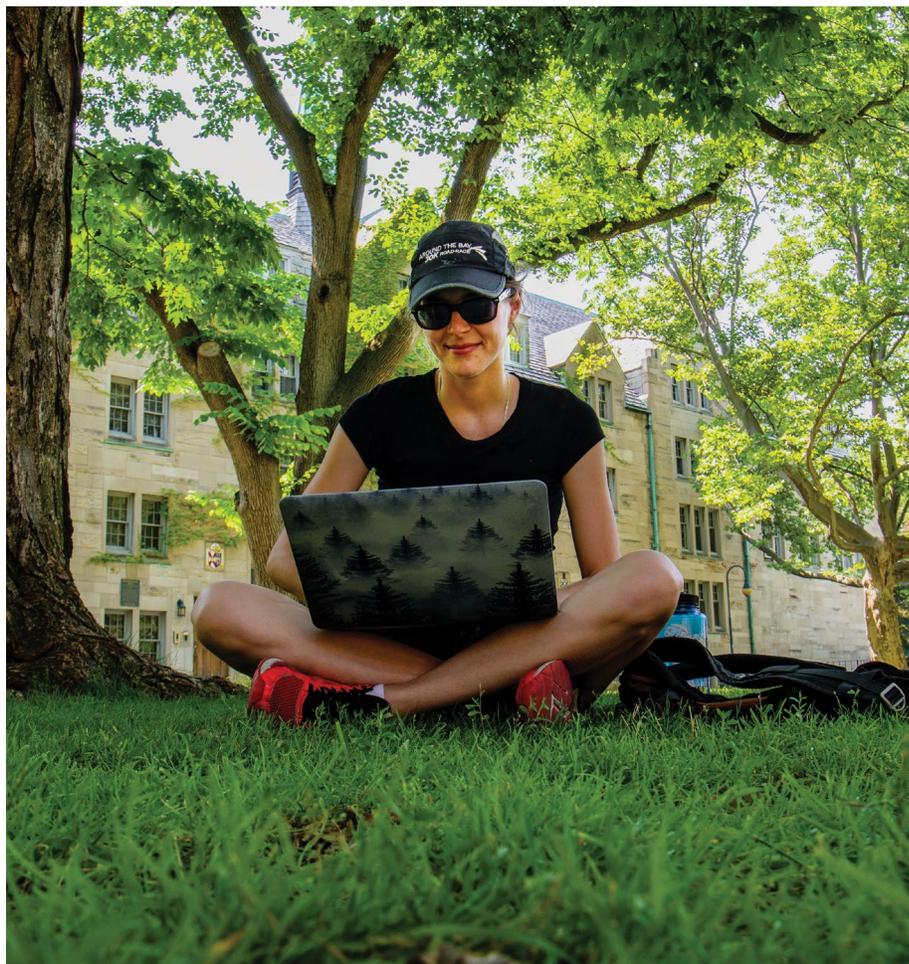
cific efforts to ensure accessibility. We will also need to continue graduating curious, skilled people ready to take on the latest world challenges.

Foreign investors will look at countries that have a skilled workforce and a strong research, development and innovation support capacity. The race for talent will be the gold rush of the 2020s. Without these highly skilled people, post-COVID prosperity will be unattainable. It is a distinctive Canadian pillar that deserves our full attention. More and better training, through and for R&D, is a requirement for a prosperous future.

It is also important to foster interdisciplinarity to better understand the ethical and social acceptability issues if we want to support the transitions ahead. Too often, significant projects perish because we underestimate the importance of the contribution of the social sciences and humanities. Innovation is about much more than technology. It is the result of human creativity, successful human relationships, and a willingness to address societal challenges.

What is the role of universities in this value-added socio-economic recovery? It is to build partnerships with their communities. In the context of innovation, those partnerships require the means to develop patents and innovations and to support research partnerships. Canadian universities now have COGNIT (www.cognit.ca), a platform to share valuable information to connect researchers with public and private organizations. This is a first—a unique and collective effort that highlights university expertise, research partnerships across the country and university patents available for licensing.

Governments must make investment choices that shape the future and support more partnerships among universities, businesses and communities. Knowledge and a skilled workforce are both essential



A student working outdoors at the University of St. Michael's College, Toronto. *Michael Swan Flickr photo*

“ It is imperative to support collaboration among government and communities, universities and businesses—as the United States, Israel, Sweden and Germany are doing. The end of the crisis is a unique opportunity to buttress bridges and rethink our models of collaboration. ”

assets for a strong and resilient national economy. These assets will strengthen our ability to create more value and quickly emerge from this crisis. It is imperative to support col-

laboration among government and communities, universities and businesses—as the United States, Israel, Sweden and Germany are doing. The end of the crisis is a unique opportunity to buttress bridges and rethink our models of collaboration.

We have the opportunity to train, innovate, transfer and transform for the benefit of all Canadians thanks to the network of Canada's 96 diverse universities, serving students, advancing research and working with communities. We also have the opportunity to develop a real culture of innovation in Canada, to put forward the innovators, to nourish Canadian pride in being leaders, and to make our distinctive strengths known internationally. **P**

Sophie D'Amours is Rector of Université Laval and Chair of the Board of Directors of Universities Canada.



"The farmer of the future is skilled in data analytics, computer science, autonomous farm drones, communications and management: new farming pioneers are emerging," writes Victor T. Thomas. *jeshoots.com photo*

Not Your Grandfather's Farm: CANADA'S AGTECH INNOVATION OPPORTUNITY

One of the cultural gaps that persists despite our small-world connectivity is the lack of refreshed knowledge about agriculture and farming among the broader population. We think about where food comes from more than we did in the days before "farm-to-table" and social media images of bucolic farm life. But today's farmers are truly redefining agriculture, from the ground up.

Victor T. Thomas

Agribusiness in Canada has changed dynamically in recent decades. Our farmers have been innovators and change-makers in a globally competitive market, yet the Canadian public seems to know little about this transformation. In fact, a 2019 study by the Canadian Centre for Food Integrity (CCFI) revealed that 91 per cent of Canadians did not know enough about modern agricultural practices. Yet, many have preconceived notions of what a Canadian farm looks like.

The famous book series and TV show *Little House on the Prairie* often comes to mind, as the popular stereotype of life on the farm as quaint and romantic. A less friendly misperception assumes Canadian farmers live and work in pre-modern environments, using horse power and aging equipment; others picture farmers as less educated and less sophisticated than city dwellers. But these stereotypes couldn't be further from reality. Canadian agri-food has developed into a robust and competitive world player that yields \$120 billion annually. It employs more than 12 percent of Canada's labour force and constitutes seven percent of the economy. The most fascinating part is that the sector has been growing at a rate nearly 30 per cent greater than the national economy.

Canadian farms and ranches are becoming centres of technological sophistication and cutting-edge innovation. The farmer of the future is skilled in data analytics, computer science, autonomous farm drones, communications and management: new farming pioneers are emerging. Last March, the *Globe and Mail* featured Kristjan Hebert, referring to him as "the epitome of the 21st-century Canadian farmer." Herbert manages 26,000 acres in Southeastern Saskatchewan. His farm produces grain and oilseed using tech data and wireless connectivity for nutrient management and disease control. He is a Chartered Professional Accountant with a Bachelor of Commerce degree. He is on the Speakers Bureau of Canada's expert roster and lectures regularly about innovation and sustainability.

The development and application of agricultural technologies (agtech) for farming are at the cutting edge of the digital revolution. Agtech supplies data, imagery and real-time information that helps with management, increases productivity and boosts environmental sustainability. It uses blockchain, artificial intelligence, advanced sensors, imaging and drones to monitor cattle,

“ The intersection of new technologies and growing world demand now offers greater opportunities than ever before. ”

inspect crops, track moisture levels, and deliver fertilizers and pesticides on crops with great results. Precision agriculture gathers data directly from animals and crops, shares that information with computers that analyze the data in real time, which allow operators to remove the guessing from many decisions.

“ Canadian agri-food has developed into a robust and competitive world player that yields \$120 billion annually. It employs more than 12 percent of Canada's labour force and constitutes seven percent of the economy. ”

Partnerships among investors, government, tech developers and academia lead the way. Innovative institutions, such as Olds College in Alberta, have launched highly needed programs for reskilling, including Smart Farm. This project will transform their existing teaching farm into an operation of the future, adapting innovative technologies to help farming leap into greater productivity, greater economic and environmental sustainability. Such smart farms are testing grounds of innovative practices, digital programs, scalability, machinery and processes. They open needed training spaces for the next generation of transformative agricultural workers, producers and managers, and showcase technologies for investors, en-

trepreneurial early adopters, and the public at large.

With all the excitement about the future, it's important to know the Canadian agri-food sector is not free of challenges. In 2017, the advisory Council on Economic Growth identified agri-food as one of the sectors in Canada's economy that has yet to achieve its full potential. To reach that potential, there are obstacles to overcome in the development and implementation of these fresh technologies. The promise of rural high-speed internet must be fulfilled, and misperceptions about laggard environmental standards in farming, ranching and food production need correcting. Most producers observe the highest ethics in preserving the land and safeguarding animals. More to the point, agtech, precision agriculture and high-tech methods, such as the calibrated use of fertilizer and measured water management offer even greater sustainable benefits and positive environmental impact.

There are even greater challenges. The 2019 Report of the House of Commons Standing Committee on Agriculture and Agri-food titled *Advancements of Technology and Research in the Agriculture Industry that can Support Canadian Exports* identified the lack of investment and cost of technology as major obstacles. RBC estimated that agri-food's output might increase by over \$1 billion annually for the next decade if the sector is properly capitalized. Global investment in agricultural technology rose by 43 percent from 2017, but Canada only receives 3.4 percent of the global share of private investment in agricultural sec-



Agtech uses blockchain, AI, advanced sensors, imaging and drones to monitor cattle, inspect crops, track moisture levels, and deliver fertilizers and pesticides on crops with great results, writes Canada-India Business Council President Victor T. Thomas. *Mark Stebnicki photo*

tor technology, less than Brazil and India. Canada needs to attract a greater share of global agtech investment to fulfil its potential and continue to innovate. Capital is also a barrier for new players and younger generations to enter the market.

Similarly, the availability of credit to Canadian farmers is 40 per cent lower than the global average, and seven times lower than in New Zealand. Moreover, adoption and implementation of the first generation of emerging technologies, programs and equipment are expensive.

Canada is blessed with land, water and resourceful people who have turned this country into the fifth-largest agri-food exporter in the world even though there are countries endowed with more arable land, more people and more favourable climate conditions. But simply maintaining current rates of progress would be to lose ground. The intersection of new technologies and growing world demand now offers greater opportunities than ever before. World demand for food is increasing as populations

grow and more people emerge out of poverty. A 2016 projection in the *Harvard Business Review* has growth in global food demand doubling (98 per cent) by 2050. India, for instance, is the third largest food market and has the largest availability of arable land. The McKinsey Global Institute Digital India report estimates that India has the potential to add up to \$70 billion dollars of economic value by 2025 within their agriculture sector by means of digitization. The opportunities cover numerous areas such as data-driven lending, digital land-registry records, and precision agriculture. Its market can use our food products and its farmlands can use the new technologies we develop. Looking ahead, this has the potential to bring food security to the most vulnerable in India.

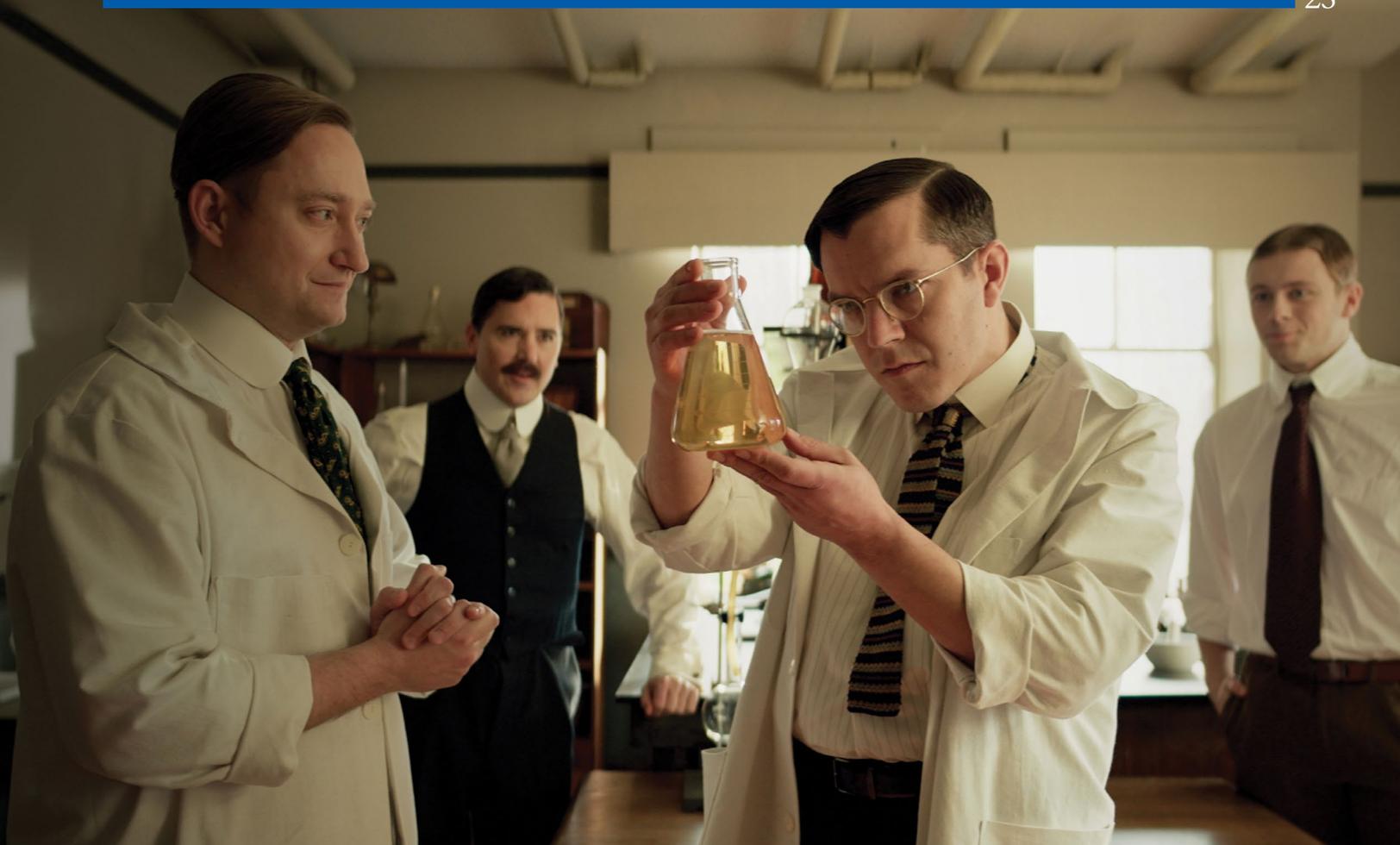
Learning and understanding the successes of the sector domestically may be a good first step to insuring that agri-food in Canada expands its competitiveness in world markets and reaches new heights. But to activate that potential and fully seize global opportunities, more energetic and concerted efforts must begin

now. With a sense of urgency, Canada needs to accelerate and scale up development and broaden applicability with regards to innovation in the ag sector. This can best be done by organizing and fostering a focused, purposeful global ag innovation eco-system composed of the principal stakeholders in the country: entrepreneurs, corporations, investors, post-secondary institutions and governments. Without such efforts, Canada could be surpassed by more tenacious nations that could competitively overtake our obvious potential.

“ Canada needs to attract a greater share of global agtech investment to fulfil its potential and continue to innovate. Capital is also a barrier for new players and younger generations to enter the market. ”

The most important move now is to create a ripe environment for the greatest Canadian agri-food innovation harvest. We need to work together as a transformative innovation cluster, stay committed to advancing our skills and technologies, and keep meeting growing global demand for our products and services. Canada must chart out new destinations for our creative minds and energies, release untapped potential through innovation and unlock the global future, so clearly emerging on our farms and ranches. **P**

Victor T. Thomas is the President and CEO of the Canada-India Business Council.



The initial use of insulin to treat diabetes failed until, as this new Heritage Minute illustrates, the formula was purified—and the first of millions of lives was saved. *Historica Canada photo*

Innovation Through the Lens of History

Next year marks the centenary of the discovery of insulin by Dr. Frederick Banting, Charles Best, J.J.R. Macleod and James Collip at the University of Toronto. As Historica Canada releases the Heritage Minute on the discovery, Anthony Wilson-Smith and Bronwyn Graves reflect on what the Minutes have taught us about Canada, innovation and the spirit that has sustained us through a pandemic.

Anthony Wilson-Smith and Bronwyn Graves

Leonard Thompson was 13 years old when he received his abrupt death sentence. Until then, as a youth in the Beaches area of Toronto, he was best known for his warm personality, fondness for sports, and a growth spurt that had taken him to 5 feet 11 inches tall. When he suddenly developed constant, insatiable hunger and thirst, doctors feared the worst—and then confirmed it. His blood sugar level was soaring, made worse each time

he ate. With a starvation diet as the only treatment, his weight fell to 65 pounds. It seemed inevitable he would slip into coma—and from there, to death.

After his parents carried him into Toronto General Hospital, doctors told his father, Harry, the only hope was an experimental, never-tried treatment. The desperate parents agreed but the injection failed, causing an allergic reaction that made Leonard even more ill. After the serum was further purified, they tried again—with immediate success. His blood sugar fell; he was able to eat and gain weight. After four months, he went home to an otherwise regular life.

And so, insulin was created, the first successful treatment for Leonard's malady: diabetes. The work of Dr. Frederick Banting, Charles Best, Prof. J.J.R. Macleod and biochemist James Collip, it is Canada's century-old gift to the world. As the Canadian actor Victor Garber—himself diabetic—observes in a new Heritage Minute about the discovery, Thompson's was the first of millions of lives saved globally since then.

As a medical innovation, the discovery ranks alongside breakthrough treatments for polio, smallpox and vaccines used to combat the ongoing COVID-19 global pandemic.

The discovery of insulin is one of the most far-reaching examples of the impact of Canadian innovators and innovation. With the centenary of the discovery in 2022 (work on it began in 1921), it was an obvious choice to become a Heritage Minute, produced by our non-profit organization, Historica Canada. (The Minutes, for those unfamiliar, commemorate people and occasions that have helped shape the country that we are today.) The discovery of insulin belongs to a long list of innovations and inventions in fields that include—but are not limited to—science, sports, communication, architecture, aviation and such everyday blessings as a baby jumper accessory (created by Olivia Poole,

“The discovery of insulin is one of the most far-reaching examples of the impact of Canadian innovators and innovation. With the centenary of the discovery in 2022 (work on it began in 1921), it was an obvious choice to become a Heritage Minute.”

drawing on the cradleboards of her Ojibwe heritage). Our mini-documentary series *Inspiring Innovators*, produced in partnership with the Rideau Hall Foundation, tells the stories in animated form of Canadians who have made this world safer, more advanced, and just plain *better* through their discoveries.

As we celebrate innovators, consider the qualities that innovation requires. Those include a willingness to look at dilemmas through different lenses, coupled with the conviction required to move forward with the resultant new ideas. Sometimes, there are further challenges, as with Elsie MacGill, the subject of a 2020 Minute. The world's first female aeronautics engineer, MacGill oversaw production of Hawker Hurricane aircraft made in Canada during the Second World War while facing down sexism and limitations in her mobility after contracting polio.

Today, amid the global challenges and tragedies of the pandemic, we again see innovative qualities. They are reflected in everything from safety measures engineered on the fly, to the mass shift from offices to working remotely at home, to refocusing the way products and programs are presented in order to appeal to a market changing in front of us.

That has been the case at Historica Canada, where the pandemic required that we quickly institute substantive changes to our offerings. Our Memory Project has, for two decades, arranged in-person visits to schools and other public institutions

by current and former members of our military to describe their firsthand experiences. When the pandemic hit full force in March, 2020, it was obvious that we could no longer continue in the same way. Our team immediately began contacting schools to re-schedule existing visits and arrange for new ones via Zoom, Teams, or similar platforms. At the same time, they introduced more than 500 of our roster of speakers—some in their 90s—to the tools needed for remote broadcasting.

The headaches in making such a pivot included technical challenges; the loss of immediacy that is part of in-person visits; the need overnight to reposition a decades-old way of doing things. But the new format also brought advantages. Our speakers, including the very elderly, could make their appearances without travelling. We can reach remote destinations and arrange a very precise match of speakers. For example, Bob Crane, a veteran of Indigenous origin in Ontario, spoke to Inuk students last fall at Jonah Amitnaaq Secondary School in Baker Lake, Nunavut.

The production of our Minute on insulin provided another example of mid-pandemic innovation. With limits on gatherings, the traditional way of shooting scenes went out the window. Instead, our people, based in Toronto and Halifax, monitored the shoot via live cams at the decommissioned Riverside Hospital in Coquitlam, British Columbia. That allowed Davida Aronovitch, our director in charge of Minutes, to stay in direct touch with our partner, Shotglass Productions, to ensure we

were in sync on the look and feel. We brought in costume and production designers for Zoom meets well before production to ensure historical accuracy, mindful that we could not make changes on-set. The script was written with an eye to maintaining distancing and avoiding crowd scenes. Despite all that, the Minute came in on time and budget—in fact, the quickest turnaround of any production of recent years.

“ We have also been reminded in the last year of another important consideration in studying our past: an event only happens once, but can be interpreted countless ways. ”

We have also been reminded in the last year of another important consideration in studying our past: an event only happens once, but can be interpreted countless ways. The overdue, widespread focus on more inclusive stories and history shows that our past is best understood when it reflects the experiences, travails and contributions of all who were part of it. Although we have long sought out experts from the communities we feature in our various programs, we formalized that process to ensure that those communities have greater involvement. The production companies with which we work are required to ensure that when we make Minutes on a specific community, some so-called “key creative” roles such as director, writer and/or director of photography will be from that community (as well as the experts we consult.)

The Canadian Encyclopedia has begun a project to add new entries exploring the geography and history of First Nations reserves and Indigenous

communities/settlements across Canada. We produced a series of videos called *Voices from Here*, in which Indigenous people speak directly to the camera in telling of their lives, traditions and beliefs. An upcoming series of podcasts will do the equivalent in featuring Black Canadian history, and a series on multiculturalism explores stories of different groups through the experiences of people within those communities. All of these measures are part of an evolving process—much like the overall study of history. Those steps are an enhancement of our mandate to offer a comprehensive telling of Canada’s history.

Another part of our mandate is to ensure Canadians watch and listen to our content. Over the last decade, we shifted from being largely event-based to focusing almost exclusively on the digital world. All of our platforms registered increases in usage last year, including Facebook, Twitter, Instagram—and our new star, TikTok. That platform—with a prime user base between 10-29 and emphasis on brief videos and youth-focused subjects—wasn’t, at first look, a natural fit. But in the seven months since we launched, it has become our most engaged platform, accounting for more than nine million views of our offerings and introducing our national story to a new, younger audience.

Our Minutes still air on television (as they have since the 1990s) but their biggest impact is online, where they routinely draw more than four million views within their first month of release (such as our recent Minute on Oscar Peterson.) We have more than 350,000 followers on our various social media accounts; reach more than 100,000 teachers annually through e-blasts, conferences and mailings and our learning tools designed for Canadian teachers, draw more than 150,000 visits annually.

Ultimately, one lesson from all this is that Canada is historically a place of cause and effect—as much a product of continuing innovation as a coun-

try where innovation takes place. We bring together different people and ways of thinking, sometimes uneasily. We see that tension reflected at times in how we look at our past, celebrating some aspects and regretting, denying or ignoring others.

“ One lesson from all this is that Canada is historically a place of cause and effect—as much a product of continuing innovation as a country where innovation takes place. ”

Historically, we’ve worried about whether there is a “Canadian identity”, even as it arguably lies in our reputation as a country where people aren’t required to fit a national stereotype. Our differences can and do sometimes divide us in unpleasant ways. But they also cause us to find creative solutions in how we think, live and look upon our lives. Out of those elements come remarkable innovations and, as history shows us, the path to better tomorrows. **P**

Contributing Writer Anthony Wilson-Smith is President and CEO of Historica Canada, and a former Editor of Maclean’s.

Bronwyn Graves is Director of Education and Programs at Historica Canada and Editor-in-Chief at The Canadian Encyclopedia.



A Centre for the Study of Living Standards report noted that if Indigenous education and labour market outcomes could reach non-Indigenous 2006 levels, governments in Canada would benefit from an estimated \$3.5 billion (2006 dollars) in additional tax revenue in the year 2026. *iStock photo*

Indigenomics: HARNESSING THE STRENGTH OF AN ECONOMIC POWERHOUSE

Canada's Indigenous Peoples have long been viewed in fiscal prioritization less as stakeholders than as a problem to be measured and a socio-economic gap to be closed. Indigenomics Institute founder and CEO Carol Anne Hilton writes that a shift toward constructive Indigenous economic design is long overdue.

Carol Anne Hilton

Indigenomics is modern, constructive generative Indigenous economic design. The term was coined as a way of heightening Canadian awareness of the rise of Indigenous economic empowerment. Stretching back into time, from the beginning of Canada until today, Indigenous peoples have been viewed through the problem lens. It is this problems lens that has created the perception of Indigenous peoples as a 'cost' or an expense to the financial system. This story has run its course.

Every day, we are witnessing the uptake of Indigenous economic empowerment as seen through the Canadian media from small entrepreneurs to Indigenous economic development corporations to multi-million- and sometimes billion-dollar nation-based partnership deals across many sectors. It's time to collectively see Indigenous peoples as having functioning generative Indigenous economies, essentially to shift the lens from problem to opportunity. It's time to design for Indigenous economic strength. This is Indigenomics.

Each year, when budget time comes around, Indigenous-focused line items are presented that demonstrate the classic case of “the social cart pulling the economic horse”—an expression of the imbalanced fiscal equation and long-term effects of Indigenous economic exclusion or the systemic dis-invitation to the economic table of this country. This year saw \$18 billion in the federal budget identified specifically to “close the Indigenous socio-economic gap.” And while flashy and compelling, there are significant shortcomings to both this language and this approach. In investing heavily in “closing the gap”—is Canada also ready to address the structural inequalities of the income gap between Indigenous peoples and the rest of Canada? Does closing the socio-economic gap also mean enhancing education outcomes for Indigenous peoples? From an economic perspective, it is important to understand that there are dual contrasts at play within this existing socio-economic gap; direct costs to maintaining current poverty levels as well as lost opportunity costs from overall lower productivity.

With a continuous imbalance between Indigenous social and economic expenditures, piecemealing together a series of annual Indigenous-focused expenditures is not constructive, generative economic design. The socio-economic gap is the effect of economic exclusion.

“*Piecemealing together a series of annual Indigenous-focused expenditures is not constructive, generative economic design. The socio-economic gap is the effect of economic exclusion. It is time to address the cause.*”

It is time to address the cause. The growth of the Indigenous economy requires structure, resources, investment, tools, institutions and leadership. In 2019, the Indigenomics Institute set in motion the target of an emerging \$100 billion-dollar annual Indigenous economy. This target's objectives are threefold: First, to shift the collective focus toward Indigenous economic strength; second, to establish a performance target, and; third, to help frame a new Canadian reality of Indigenous economic empowerment.

More than 25 years ago, the 1996 Report of the Royal Commission on Aboriginal Peoples described “the cost of doing nothing”—meaning the cost of failing to fundamentally change federal government policy toward Indigenous peoples, which at the time was estimated to be \$7.5 billion annually. This estimate included \$5.8 billion in lost productivity and the remaining \$1.7 billion in increased remedial costs due to poorer health and increased reliance on social services. This is measuring the effect.

If \$7.5 billion was identified 25 years ago as the cost of failing to fundamentally change federal government policy toward Indigenous peoples, what is that actual amount in 2021? Now 25 years later, by investing 18 billion into the closing of the socio-economic gap, are we truly ready to address the challenges of this time; the structure of Indigenous economic growth and empowerment? It is time to both invest into and measure the cause of Indigenous economic strength. Investing in the

socio-economic gap and investing in the structure of Indigenous economic growth and empowerment are two different things.

Every couple of years, the National Indigenous Economic Development Board puts out a report on the state of the Indigenous economy, measuring the closing of the socio-economic gap, and every couple of years it's the same story—there has been very little change. It is time to get over measuring the Indigenous socio-economic gap and begin to measure Indigenous economic strength.

A more recent Centre for the Study of Living Standards report noted that if the Indigenous population's levels of education and labour market outcomes were to reach non-Indigenous 2006 levels, the federal and provincial/territorial governments would stand to benefit from an estimated total of \$3.5 billion (2006 dollars) in additional tax revenue in the year 2026. Taking into consideration both fiscal savings and increased tax revenue generation, the government balance would improve by \$11.9 billion (2006 dollars) in Canada in 2026. It is estimated that the cumulative benefit for the consolidated Canadian government of increased Indigenous education and social well-being is up to \$115 billion over the 2006–26 period.” Truly addressing the closing of the socio-economic gap means building an Indigenous fiscal equation in which the social cart no longer pulls the economic horse. The closing of the socio-economic gap as an end in itself must re-set the fiscal equation of this country, and economic reconciliation must happen on the balance sheet of this country.

In any post-pandemic economic response, it is essential to highlight the tools or enablers of Indigenous economic growth. Shifting the budget narrative away from “costs” to productive, functioning economies requires a systemic approach and Indigenous economic design. In introducing the concept of an Indigenomics economic mix, 12 levers support the growth and design of the Indigenous economy. These demonstrate functioning areas of increased Indigenous economic activity and identify investment targets. A sample of these Indigenous economic enablers include: equity ownership, trade, capital, infrastructure, clean energy and entrepreneurship.

“ *The work of the Rising Economy Taskforce in the Victoria region on Vancouver Island through the region’s pandemic response is instructive. Its economic planning brought together more than a dozen sectoral partners, local governments and Indigenous peoples.* ”

The work of the Rising Economy Taskforce in the Victoria region on Vancouver Island through the region’s pandemic response is instructive. Its economic planning brought together more than a dozen sectoral partners, local governments and Indigenous peoples. This economic-response planning group highlighted the need for the Indigenous economy to diversify and increase overall resilience and to begin to take advantage of economic opportunities to better withstand financial shocks. One outcome of this pandemic response planning is the proposed development of a regional Indigenous Prosperity Center as part of the



The Okanagan Valley’s Nk’Mip Cellars, in Osoyoos, British Columbia, is North America’s first Indigenous-owned winery. *iStock photo*

post-pandemic economic response. This prosperity center will focus on an Indigenous-owned and directed Indigenous Economic Development Office for South Vancouver Island to be incubated and spun-off. This initiative sets the stage for regional Indigenous economic design. This is Indigenomics.

Canada needs an Indigenous-led Indigenous Prosperity Center. The growth and design of the Indigenous economy cannot exist within a government program. It is time to shift our lens from problem to opportunity and understand that the success of the Indigenous economy is now intrinsically linked to the success of Canada’s economy. Indigenous peoples are not a cost to the system, we are an economic powerhouse.

It is time to start seeing Indigenous peoples as having functioning, generative economies that strategically position Canada economically for a post-pandemic response. As this country faces a significant financial squeeze, one economic imperative is the re-design of Indigenous prosperi-

ty. Designing the structure, tools, investment, institutions and leadership into Indigenous economic design are essential especially in a post-pandemic response. Is closing the gap enough or will the establishment of a metric of success for a \$100 billion-dollar Indigenous economy better shift the fiscal equation of this country in a time that it needs it the most? Clear tangible structural policy pathways such as the five percent federal Indigenous procurement target can create up to a billion dollars of Indigenous economic activity annually. We are at an intersection—are we going to measure the effect of the lack of Indigenous economic design or create the mechanisms for Indigenous prosperity?

It is time for modern constructive generative Indigenous economic design. It is time to start measuring Indigenous economic strength. Our shifting economic reality demands it, and our collective future depends on it. **P**

Carol Anne Hilton is Founder and CEO of the Indigenomics Institute.

The Innovation Superclusters: Working for Canada

When companies of all sizes, academic institutions and not-for-profits come together, they generate bold new ideas that wouldn't have otherwise come to light. Investment in Canada's five Superclusters helps build first-rate innovation ecosystems with a competitive edge... and opens up a world of possibilities.

**Sue Paish, Bill Greuel,
Jayson Myers,
Julien Billot and
Kendra MacDonald**

Innovation arises when people and groups spread knowledge, contribute to investment and work together across disciplinary barriers, organizational boundaries and geographic borders. When this happens, an ecosystem develops.

Canada's Innovation Superclusters are built on this model. Operating in the domains of digital technology, plant-based foods, advanced manufacturing, artificial intelligence in supply chain and logistics, and ocean, each of the country's five Superclusters is made up of a combination of large and small companies, research institutes, not-for-profit organizations, accelerators and incubators—many of which have never worked together before.

While each Supercluster is unique, they share certain qualities. They are fundamentally collaborative: co-investing money, co-investigating promising ideas and sharing resources to find answers. They then amplify efforts to scale up the products, processes and services that arise from their discoveries.

And they are ambitious. While they concentrate on five domains in which Canada has natural and competitive advantages, they also strive to help Canadians reach some of the most challenging yet essential goals such as a net zero emissions future, digitization, building the blue economy, and advancing equity and diversity objectives.

Digital Technology

The pandemic has underscored and entrenched this truth: no distinction exists anymore between the economy and the digital economy. Which makes Canada's Digital Technology Supercluster perfectly timed and ideally suited to support Canadian companies, systems and sectors as they more fully embrace this fact of economic life.

For the Digital Supercluster, the focus is on transforming the delivery of health care services, on reimagining the operations of natural resources sectors, and on supporting other industries that could most profit from digital solutions. This ambition is needed. Spending on health care consumes steadily growing proportions of provincial budgets. Digital solutions can slow and even reduce that trend.

This ambition is evident in the work of the Supercluster. More than 300 organizations of all sizes are active right now in dozens of projects. One such project, led by DNastack, involves 16 partners who collaborated to create COVID Cloud—a platform to gather genomic sequencing data on COVID-19, share information about the evolution of the virus, and use this knowledge to inform clinical guidelines and epidemiological decisions. Ontario has adopted the platform and, on March 23, the federal government and Genome Canada announced that COVID Cloud would form the basis of a new Canadian SARS-CoV-2 Data Portal that will manage and facilitate data sharing of viral genome sequences for research and development among Canadian public health labs, researchers and other groups.

This project shows the Supercluster's speed, adaptability and relevance, and that we are looking to deliver digital solutions, to teach and train new generations of workers skilled for the digital transformation, and to make sure Canada leads the world in the new economy—the only economy, the digital economy.

Protein Industries

The annual global market for plant-based foods is estimated to reach \$250 billion by 2035. Along with this opportunity comes an equally striking sense of urgency in Canada's agri-food industry. The Protein Industries Supercluster aims to help Canada capture at least 10 percent, or \$25 billion of the market, in part by moving swiftly to not just grow and export but process and package a significant portion of the nine mil-

lion metric tonnes of commodities we produce each year.

Protein Industries Canada positions Canada to make this shift. Its actions are founded on genuine collaboration along the value chain of plant-based foods. Projects bring together plant breeders, food processors and food packagers—the key players along this chain. All projects feature big and small players, averaging six organizations per project. And at least two companies take part in research, with one of them being a small or medium-sized business. That approach produces a feedback loop along the plant-based value chain, enabling all those involved to improve the nutritional profiles of crops, increase the efficiency of ingredient processing methods, and develop entirely new food products.

This effort is evident in all 26 Protein Supercluster projects. For instance, GrainFrac Inc., Tomtene Seed Farm and Ripple Foods PBC are leading development of high-protein pulse-based ingredients for the non-dairy beverage market. Roquette and Prairie Fava are cultivating new pea and bean products, as well as solutions to process them given Canadian feedstock and conditions. And Griffith Foods, Persall Fine Foods and k2MILLING are researching new plant-based protein ingredients for the growing flexitarian market.

Such innovation is key to plans to increase capital, amend regulations, create a growing skilled workforce, and make sure foreign direct investment leads to more processing infrastructure. A handful of countries are going to make the most of this unprecedented market opportunity. Canada must be one of them.

Advanced Manufacturing

Advanced manufacturing is inspiring *what* the world creates and transforming *how* the world creates. The domain has enabled innovators and entrepreneurs to launch entirely new industries. At the same time, advances have armed manufacturers

with the precision and power to up-end processes they have been using for generations.

Canada's Advanced Manufacturing Supercluster combines research, technologies and capabilities to create projects that produce and scale up such advances. These next-generation methods are meant to maximize the competitiveness of Canadian manufacturers, position them in global markets, and then propel them to lead industrial digitalization so that "Made in Canada" is recognized as a global hallmark of manufacturing excellence.

The Supercluster's role is to be the nucleus of collaboration within the domain, bringing together the right mix of partners for projects, then backing projects with seed funding and intellectual property strategies to scale up and create jobs, wealth and value.

Since 2019, the Supercluster has been at the centre of 96 projects—21 of which are complete, 45 underway, and 30 approved and in the contracting process. Combined, they have generated 75 instances of intellectual property available for licensing, and 1,100 jobs.

A perfect example of such collaborative projects is Aspire's ground breaking production facility, which will help address the challenge of global food insecurity. Working along with A&L Canada Laboratories, Swiftlabs, Darwin AI, and TELUS Agriculture, the Aspire Food Group is building a state-of-the-art facility that integrates industrial automation, robotics, the internet of things, and deep learning in what will be the world's first fully automated, food grade insect protein manufacturing site, positioning Canada as a leader in this space.

The automated and modular technology that is being developed in Aspire's project can be scaled for use around the world and in a variety of industrial applications, and provides a good example of how advanced manufacturing can address major world challenges.

Scale AI

Supply chains have become increasingly complex. The earliest supply chains—farmer to mill to market stall—were basic. The advent of railway networks and reliable transoceanic shipping expanded their reach and intricacy. The introduction of containerization, combined with trucking and warehousing, represented a quantum leap in supply chain logistics. Then, the digital age brought software and unprecedented levels of reliability and efficiency to the storage and movement of containers.

Now, the world stands at another inflection point. Big data, advanced algorithms and potent computing power are combining to propel a new supply chain revolution. The Scale AI Supercluster brings and holds together the three groups necessary to create a supply chain ecosystem: fundamental and applied research generators, start-up disruptors and industry adopters.

This emphasis on the power of three also animates how the Supercluster operates. It funds the incubators and accelerators that support supply chain start-ups; it provides resources to train engineers and cultivate other professionals vital to the ecosystem's future; and it backs industrial projects to ensure Canadian products and services get to markets and customers fast.

Three projects epitomize the Supercluster's adhesive effect. OPTEL Group and its partners deployed a supply chain for metals and minerals that tracks the provenance of materials in circulation and puts measures in place to improve the sector's environmental performance. Roche Diagnostics led development of a solution that optimizes national distribution of COVID-19 diagnostic tests. And the Montreal Port Authority and CargoM spearheaded an AI-based solution to triage the arrival of medical equipment, food products and other critical cargo arriving at the port.

Impact on The Innovation Ecosystem

Based on data as of March 31, 2021



More than **1330**
project partners



More than **50%** SMEs



Rapid COVID-19
response

Over **80** projects approved
Worth over
\$220 million

Over **\$855 million**
leveraged from
industry and other partners



On track to surpass 1:1 target*

Over **250** IP assets realized

Over **1,100**
participants in IP
workshops



More than
6,000
MEMBERS



Surpassed target of 830

*For regular stream projects, excludes COVID-19 projects

The pandemic has made the need for smarter and more resilient supply chains clearly evident. The goal now is to make sure Canada's supply chains help our country and Canadians recover from the pandemic and emerge from it better than ever.

Ocean

Canada is an ocean nation. Our land is bordered by three oceans and has the longest coastline of any country—some 243,000 kilometres, roughly six times the equatorial circumference of the planet. So, the importance of the world's oceans to Canada is self-evident. Yet that same scale also presents a challenge: three seas and a lengthy coastline mean many ocean communities, regions and industries, and therefore many ocean needs and priorities.

Canada's Ocean Supercluster unites that multiplicity of places, people and players in common cause. The Supercluster takes decisive action to include people, groups and communities that have been under-represented in making decisions and devising solutions on matters that directly affect their health, lives and futures.

Small and medium-sized businesses and those owned by women, Indigenous peoples and other under-represented groups are essential to its success. Combining their experiences, perspectives and knowledge with the resources and capacities of the biggest companies is not only essential for Canada to contribute to solutions, but also fundamental to changing the way ocean business is done. Those solutions will be indispensable to the path of decarbonization and overcoming real existential challenges: rising sea levels, shrinking biodiversity, increasing ocean acidification and a growing volume of plastics.

The Ocean Supercluster has put in place different streams of activity so that everyone can play a role in achieving Canada's full ocean potential. Technology Leadership projects enable small and large companies to collaborate closely to develop and deliver game-changing ocean solutions and sell them to the world. And Innovation Ecosystem projects, including the Ocean Start-up Project, accelerate the freshest and most promising ideas, bringing solutions out of laboratories and into the hands of paying customers.

As a result of these activities, some \$153 million will be invested by industry players; 80 percent of projects are led by small and medium-sized businesses that invest in them; more than 100 new ocean products, processes and services have been developed for commercialization; and more than 4,300 direct and indirect jobs have been created from the more than 30 projects announced to date.

More broadly, the Ocean Supercluster is raising ocean awareness, creating more project opportunities, increasing training and employment for workers, and engaging more marginalized people in developing solutions. They are creating an ecosystem that will make our country a global leader in the blue economy and the best place in the world to start and grow an ocean company. **P**

Sue Paish is CEO of Canada's Digital Technology Supercluster, Bill Greuel is CEO of the Protein Industries Supercluster, Jayson Myers is CEO of the Advanced Manufacturing Supercluster, Julien Billot is CEO of the Scale AI Supercluster, and Kendra MacDonald is CEO of the Ocean Supercluster.



Panel speakers at the DMZ's Black Innovation Programs launch in May, 2019. Left to right: Richard Lachman, Isaac Olowolafe, Shavonne Hasfal-McIntosh, Claudette McGowan, and Paulette Senior. *Ryerson DMZ photo*

Creating an Inclusive Innovation Economy

In business, as in everything, inclusivity begins with representation. The Ryerson DMZ start-up incubator launched its Black Innovation Programs to eliminate artificial, race-based barriers to Black innovators and entrepreneurs. Those programs will be all the more crucial as the innovation economy emerges from the COVID lockdown.

Abdullah Snobar

The innovation economy has been accelerating on an upward trajectory in Canada. In 2020, we experienced our second-highest level of venture capital investment on record, and we had a 20 percent increase of startups on track to become unicorn companies.

We are entering a golden age for the innovation economy, with our momentum doubling down on our previous successes. However, in order to leverage the golden age, we need to be *truly* inclusive with our efforts and ensure we're not leaving anyone

DMZ's Black Innovation Program has supported

500
BLACK FOUNDERS

14

FELLOWSHIP
PARTICIPANTS

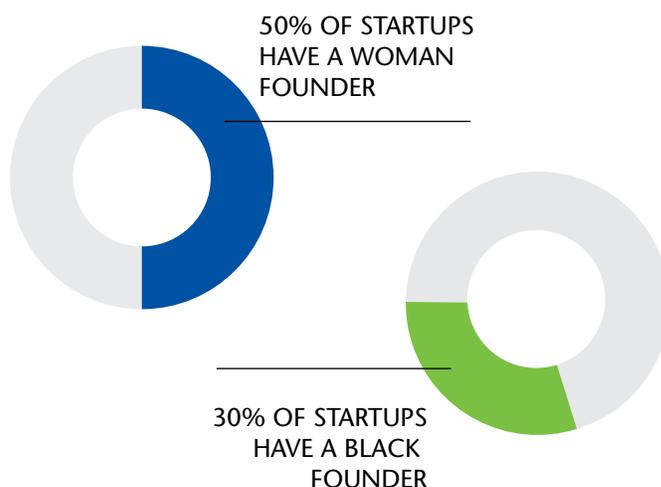
83

BOOTCAMP
PARTICIPANTS

422

LAUNCHPAD
PARTICIPANTS

Diverse founder representation in the DMZ's current Incubator cohort



behind. Our innovation ecosystem needs to make decisions intentionally; we need to remove barriers for underrepresented groups who want to break into the ecosystem and we must expand our reach. Underrepresentation of Black founders and Black leadership has been a longstanding issue in the ecosystem, as Black founders encounter steep challenges when starting and growing a business. Black founders don't lack the talent needed to secure entrepreneurship opportunities; they lack access to those opportunities: access to mentorship, learning opportunities and capital.

Recognizing this gap in support specifically for Black founders, the DMZ launched its Black Innovation Programs (BIP) in 2019 to make an impact, see growth in the number of companies owned by Black entrepreneurs and break the perpetual cycle of inequity. As we look ahead and implement innovative strategies for our economic and social well-being, I have come to appreciate a few fundamental learnings on how we can be more inclusive.

First of all, there's no lack of Black tech talent; what we're missing is a pipeline. Historically, Black found-

ers have experienced barriers when it comes to accessing support programs, venture capital and potential customers, which has resulted in a lack of Black innovators in the ecosystem. This problem cannot be solved with merely one solution, nor one program. To ensure Black innovators have the opportunity to break into the ecosystem and succeed, we need to support their entrepreneurial goals at every step of the way.

If we don't support Black youth when they become curious about starting their own business, how can we expect them to become competitive innovators? Nurturing their curiosity and providing them with the resources they need is imperative to fostering a pipeline of Black tech talent. Recognizing this gap in support for aspiring Black entrepreneurs, the DMZ expanded its programming to offer more support at the early stages of the entrepreneurial journey. The Black Innovation Launchpad is a free skills development platform that equips aspiring Black founders with the personal and professional skills needed to kickstart the entrepreneurial journey. The Black Innovation Bootcamp gives early-stage Black founders at the DMZ an additional layer of free startup support to validate their business idea and build a roadmap for implementation. Once the startup has launched a minimum viable product and is gaining early market traction, the founder can join our Incubator and access our Black Innovation Fellowship. This program gives Black-led startups in the DMZ Incubator enhanced benefits in addition to what other companies receive.

To date, BIP has supported over 500 Black founders: 422 Launchpad participants, 14 Fellowship participants, and 83 Bootcamp participants. The incredible demand we saw for these programs, two of which launched less than a year ago, highlighted not only the gap in the ecosystem and absence of a pipeline, but also the sheer appetite Black founders had to excel.

“ Now more than ever, it’s crucial we continue to invest in our startup talent—particularly Black talent—to continue the momentum we’ve created within the ecosystem. ”

Secondly, investing in Black entrepreneurs will not only help eliminate the wealth gap—it will reinforce Canada’s position on the global stage. Access to funding hasn’t been a simple feat for early-staged founders in Canada. Seed deals have slowed down significantly as the focus has shifted to later stage deals, leaving founders in a difficult position to hit the ground running.

This issue is even more apparent for Black founders. Racial bias from banks has been a longstanding issue. Studies have shown white and Black loan applicants receive different treatment in how banks encourage them to apply for loans, the products they are offered, and the information they receive. Black business owners with great personal credit are half as likely to receive full financing compared to their white counterparts. Insufficient access to capital leaves many Black entrepreneurs less economically mobile and limits the potential of entrepreneurship and impact to grow wealth for Black communities. COVID-19 has even further stressed Black communities and caused the racial wealth gap to widen. Now more than ever, it’s crucial we continue to invest in our startup talent—particularly Black talent—to continue the momentum we’ve created within the ecosystem. We must commit to doubling down on their growth trajectory so we can continue to generate top-tier tech businesses.

Through BIP, we’ve already been able to bring hundreds of Black en-

trepreneurs to the forefront—nearly 100 Black-owned startups through our core programming, and over 400 Black early-stage and aspiring founders through our Launchpad platform—and we’re committed to ensuring startups are well-positioned to receive the capital and resources needed to grow and scale.

Third, community and mentorship can elevate Black founders.

In the business world, you’ll often hear “it’s all about who you know.” Creating new business connections allows founders to meet prospective mentors, partners, and clients, and gain access to the necessary resources that can help foster their startup development. But if there aren’t leaders and mentors in your network that look like you, making lucrative business connections becomes challenging. Sociocultural barriers aren’t always obvious, but they’re still very real and destructive to success.

“ By building the right ecosystems, we can negate the structural obstacles to business building for Black entrepreneurs and add \$290 billion in business equity. ”

That’s why improving representation of Black individuals in leadership roles can help Black entrepreneurs connect with the right mentorship and overcome sociocultural barriers. Unconscious bias greatly impacts mentorship. As humans, we tend to gravitate towards mentoring people who are similar to us. The tech world has been predominantly white and male for so many years—Big Tech is struggling to create truly diverse teams, and this is still very much in line with the inequities present in startups. Organizations across industry need to commit to building

inclusive executive teams, and management needs to consciously foster the careers of Black individuals. By building the right ecosystems, we can negate the structural obstacles to business building for Black entrepreneurs and add \$290 billion in business equity.

Furthermore, we must create more formal mentorship networks with better Black representation. Through BIP, we hope to initiate a chain reaction with our founders. As they move through the program and experience success, they will be able to mentor new aspiring entrepreneurs and share lessons learned.

At the DMZ, we live by three values: Equity Over Everything, Founders First, and Be Great. Across all of our work, we stay true to this. Diverse representation in the innovation ecosystem is crucial, which is why we’re intentional with our recruitment efforts to build an inclusive talent pipeline (in our current Incubator cohort, 30 per cent of startups are Black-founded and 50 per cent are women-founded). We strive to reach founders from across Canada who represent diverse backgrounds and experiences, and have amazing potential. Everything we do, we do to elevate our founders.

Creating an inclusive innovation ecosystem is imperative to Canada’s future successes. We have the potential to set the bar on a global scale, and we can only do so by working together. We know tech developments and innovation are key to our economic growth, and bringing an inclusion lens into the innovation ecosystem is both feasible and necessary to create a high functioning ecosystem that works for everyone. **P**

Abdullah Snobar is Executive Director of the DMZ tech incubator at Ryerson University.



**Fondation
Rideau Hall
Foundation**

RHF-FRH.CA

The Rideau Hall Foundation is working with partners to foster a culture of innovation in Canada by celebrating our accomplishments as well as providing a platform for innovators to grow and connect.

La Fondation Rideau Hall, en collaboration avec ses partenaires, met tout en œuvre pour promouvoir une culture de l'innovation au Canada : en célébrant nos réalisations et en offrant une plateforme qui permet aux innovateurs de tisser des liens.

INNOVATION



ACTION

Policy



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An Opportunity for Leadership— Helping Charities Follow Up on the Budget

An Open Letter to all Parliamentarians,

In her Budget speech on April 19, Deputy Prime Minister and Finance Minister Chrystia Freeland spoke of three challenges facing Canada at this unique moment in our history: “First, we need to conquer COVID...Second, we must punch our way out of the COVID recession...The final challenge is to build a more resilient Canada; better, more fair, more prosperous and more innovative.”

From child care and job training, to home care for seniors and housing affordability for jobless Canadians, from healthcare to education, Canada’s charities have always been engaged in these priorities.

For example, the Budget has committed Ottawa to funding day care for \$10 a day, emulating the successful Quebec model. Many Canadian charities are already there, delivering affordable day care on a non-profit basis. We hear every day in tributes by MPs, during Statements by Members in the House, about the many good works by charities in their own ridings and communities.

And when the pandemic is behind us, the mission of Canadian charities will still be ongoing and more essential than ever.

That’s why we urge all parties in Parliament to support a Budget amendment to remove the capital gains tax on charitable donations from the sale of private company shares and real estate.

Long advocated by the charitable sector, this would cost the government only a foregone \$50 million a year, while stimulating at least \$200 million a year in donations to healthcare, educational, arts and cultural, religious and community organizations, creating hope and help where it is much needed and, not least, creating many new jobs along the way.

In its important pre-Budget report, *Investing in Tomorrow*, the House of Commons Standing Committee on Finance has already recommended eliminating the capital gains tax on such charitable donations.

Budget 2021 presents an important opportunity to get this done. An opportunity for bipartisan leadership. For communities. For country. For Canadians.

Yours sincerely,

Donald K. Johnson, O.C., LL.D.

Director, UHN Foundation
 Chair, Vision Campaign, Toronto Western Hospital
 Member, Advisory Board, Ivey Business School, Western University
 Chairman Emeritus & Director, Business / Arts
 Member, 2021 Major Individual Giving Cabinet, United Way Greater Toronto

“When the pandemic is behind us, the mission of Canadian charities will still be ongoing and more essential than ever.”

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