YORKU

SPECIAL RESEARCH EDITION 2010

Susan McGrath documents the global plight of refugees

The People Crisis

PLUS

The Snows of Mars
Bilingualism and Alzheimer's
Who Was Jesus?
A Green Gallery

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INSIDE

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YORK U

THE MAGAZINE OF YORK UNIVERSITY

RESEARCH 2010

STAN SHAPSON

York's Research Blueprint

This special issue of *YorkU* magazine provides an exciting glimpse into the broad range of research and innovation at York University. Our scientists have placed instruments in space and on Mars for vision research and climate monitoring, and our social scientists have informed immigration and refugee settlement policies. We've attracted neuroscientists and health researchers with expertise in issues from bullying to autism, and our specialists in business and law have aided numerous policy-makers. Collaborations between the fine arts and computer science have resulted in a unique interdisciplinary research hub stimulating the burgeoning digital media industries in the Greater Toronto Area.

York researchers are ready to respond to the challenges of the future through strong partnerships, knowledge mobilization and commercialization. The Sherman Health Science Research Centre and the recently approved Life Sciences Building will provide future opportunities for large-scale research collaborations in health care and life sciences.

I invite you to engage with our researchers as you visit the new York Research Tower on the Keele campus, atop the new location of the Archives of Ontario. Our state-of-the-art facilities will provide further partnership opportunities so that we can intensify our innovations in technology and society and, true to our research roots, continue to find solutions to the world's challenges.

Stan Shapson is York's vice-president research & innovation.

SAMUEL SCHWARTZ

Forging Ahead

York's four principles – excellence, innovation, relevance and responsibility – have been the focal point of the growth of teaching and research in York's first 50 years. That York has upheld its values towards its vision is clear from its many research partnerships, and in the accolades that students continue to receive. In 2009 alone, York has forged research partnerships and collaborations with the Southlake Regional Health Centre and York Central Hospital, and created a joint nursing academy with the University Health Network. York has also become a full member of TRIUMF, Canada's accelerator laboratory and premier facility for studying the nature of matter.

Scholars within each Faculty at York are extending the boundaries of their research – York's climate change initiatives include 160 researchers from our many specialized research centres as well as across many disciplines and Faculties. Our knowledge mobilization efforts ensure that our researchers' expertise reaches society and the community in a way that helps us understand the world and how to thrive in the unpredictability of it.

This year the Archives of Ontario has relocated to York's Keele campus. We will have further resources available on campus to continue to fulfil our academic and research goals, and our vision for York to engage the world through its eminent scholarly and research activities.

Samuel Schwartz (MA '69, LLB '72) is a partner at Davis LLP. He is a member of York's Board of Governors and chair of its Academic Resources Committee.

YORKU

THE MAGAZINE OF YORK UNIVERSITY

SPECIAL RESEARCH EDITION 2010

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This **Special Research Edition of *YorkU*** showcases key stories about research at York University published from April 2007 to Summer 2009. Each feature story shows the issue it is reprinted from (unless new), and each Universe item shows the year; stories are printed in their original form although designs and minor text references may have been altered. *YorkU* is published bi-monthly, five times during the academic year, by the Marketing & Communications Division of York University.

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PHOTOGRAPHY BY BRIAN REISER

How knowledge mobilization turns research into action. **BY MAMDOUH SHOUKRI**

Driving Innovation

The first line of our Mission Statement makes it clear: "The mission of York University is the pursuit, preservation and dissemination of knowledge." The first two items – pursuing and preserving knowledge – are pretty straightforward. Creating new knowledge is one of the most cherished functions of a university – a magnificent opportunity to expand human knowledge through our research and teaching.

But knowledge is of no benefit to anyone if it sits on a shelf. The greatest responsibility of the university is to mobilize that knowledge – to share it with the community and the world to help solve the problems we face, to improve competitiveness, to increase prosperity.

Today's universities are expected and challenged by governments and society to link their knowledge creation to societal needs, and to become more entrepreneurial in dealing with industry. At York, we take this obligation seriously.

York was the first university in Canada to develop an institutional capacity to broadly support knowledge mobilization. York's Knowledge Mobilization Unit provides services for faculty, graduate students and community and government organizations seeking to maximize the impact of academic research and expertise.

Today's universities are expected to link their knowledge creation to societal needs.

Knowledge mobilization is the intersection between researchers and research stakeholders; it's where research and evidence help inform decisions about public policy, social programming and professional practice. It includes methods of knowledge transfer, translation and exchange. More than this, it extends them to include the co-production of knowledge.

Knowledge mobilization drives social innovation, environmental sustainability and a greater cultural understanding; it turns research into action. Consider ResearchImpact, the Web site of a knowledge mobilization network that connects researchers from York University and the University of Victoria with community and government organizations.

ResearchImpact disseminates information through a number of channels, including blogs, Twitter and other social media tools. It provides easy access for researchers and community organizations to information on some of the 100 collaborations enabled by York's Knowledge Mobilization Unit. A few of the many projects highlighted on ResearchImpact include:

- Research by York Faculty of Education Professor Stephen Gaetz in collaboration with University of Victoria nursing Professor Bernie Pauly and community partners, which evaluates community-based programs to end homelessness.
- York psychology Professor Henny Westra's project on how to effectively provide mental health information to young adults.
- The work of York alumna Tamara Miller (MA '08), which informs the Web strategy of the not-for-profit organization Free the Children.

Through streaming videos available on the Web site, researchers can initiate a dialogue with the Knowledge Mobilization Unit – just one example of how knowledge mobilization creates knowledge that is accessible and participatory, that engages all of our stakeholders and disseminates knowledge quickly to policy-makers and practitioners in the field.

In a little more than two-and-a-half years, York's Knowledge Mobilization Unit has collaborated with more than 100 non-academic stakeholder groups, placed 25 graduate student interns with community and government partners, and attracted more than $12 million in external research funding.

So while the idea of knowledge transfer is nothing new, York's approach to knowledge mobilization is. We're focused on connection, communication and collaboration with our partners in government, in industry and in the community. The last line of our Mission Statement gives us our marching orders: *Tentanda via*: the way must be tried.

Mamdouh Shoukri is York's president and vice-chancellor.

PHOTOGRAPHY BY GARY BEECHEY

2007

Meet the Playbot

York vision expert John Tsotsos rolls out the ultimate kids' wheelchair

John Tsotsos has a dream. In fact, the Distinguished Research Professor in Vision Science and former director of York's world-renowned Centre for Vision Research has had it for a while – more than 15 years. Back in 1992, when he was still a professor at the University of Toronto, he began to build a machine he dubbed "Playbot" to help mobility disabled children. For a while the dream was on hold due to lack of funding, but now Tsotsos, who holds a Canada Research Chair in Computational Vision at York, is back in the game thanks to funding from the Canada Research Chairs Program and the Canada Foundation for Innovation/Ontario Innovation Trust.

What is Playbot? It is a child's motorized, robotic wheelchair with a robotic arm that can manipulate objects. It has a camera system so it can "see" and a communication panel with symbols on it that a child can press if he or she has limited arm mobility. The panel "talks" to the arm.

"Imagine a child is seated in the chair," explains Tsotsos. "He or she could point to an icon of a toy on the panel and then point to a sequence of action icons that he/she wants the robot to perform with the toy. In effect, the icons create a sentence Playbot understands. For example, the child could ask Playbot to 'fetch' a toy to the wheelchair's table for closer inspection or manipulation. Playbot will actually be able to visually locate toys in the child's environment. It can be very tedious and tiring to grab objects with traditional robotic arms, because children have to rely on their vision to continually 'adjust' it."

Along with children, says Tsotsos, Playbot may also help mobility impaired people of all ages lead a more independent life.

PHOTOGRAPHY BY KC ARMSTRONG

2007

Let Freedom Ring

The governor general opens York's new Tubman Institute focusing on slavery

During the 1800s, Canada meant freedom to hundreds of American slaves escaping forced servitude by way of the Underground Railroad. For every newcomer to the tiny hamlet of Buxton in southwestern Ontario, an enormous brass bell, housed in the local church and known as the Buxton Liberty Bell, would ring out the sound of their freedom.

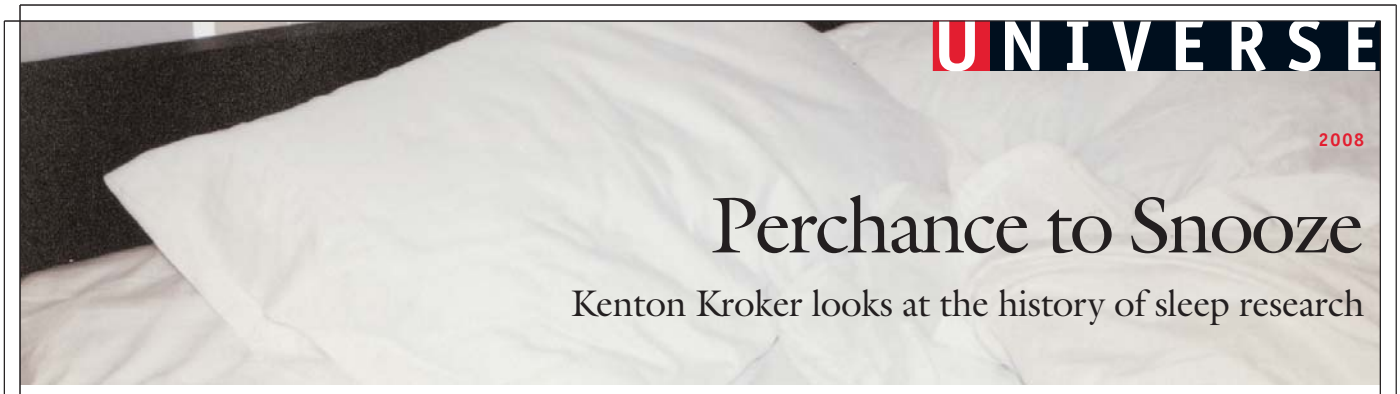
On March 25, 2007, that sound rang out again at York as Canada's Governor General Michaëlle Jean officially opened the University's new Harriet Tubman Institute for Research on the Global Migrations of African Peoples by ringing a replica of the historic Buxton Bell. Jean's visit and the opening of the Tubman Institute coincided with the 200th anniversary of the British abolition of the trans-Atlantic slave trade. During the occasion, Jean received an honorary doctorate of laws from York.

"I am so proud to be here today to congratulate you for launching the Harriet Tubman Institute," said Jean. "You are telling us of the great struggle slaves and former slaves underwent to reclaim their dignity as human beings. You are reminding us of the importance of remaining vigilant even today, as slavery, slavery-like practices and human trafficking persists around the world."

Named in honour of Harriet Tubman, a Maryland woman who fled slavery in 1849 and became a conductor on the Underground Railroad, the research centre will explore the history and forced migrations of African people around the world.

The original Buxton Bell, which remains in the church steeple, still rings for services.

PHOTOGRAPHY BY GARY BEECHEY



2008

Perchance to Snooze

Kenton Kroker looks at the history of sleep research

Kenton Kroker can appreciate a good night's sleep, and now the York science & technology studies professor has published a book on "sleep as an investigative object", entitled *The Sleep of Others and the Transformations of Sleep Research* (2007). "My primary field of research is in the historical and social structures of biomedical knowledge," says Kroker, who is based in the Faculty of Science & Engineering. "My current research interests include the history of insomnia and the history of biomedicine, especially the different ways in which instruments and investigative practices interact to generate concepts of health and disease."

In *The Sleep of Others* (the first-ever history of sleep research), Kroker covers just that when he draws on a wide range of material to present the story of how an investigative field – once dominated by dream study – transformed itself into a laboratory-based discipline. "We've gone from sleep being a private concern, to philosophic speculation and psychological research and, now, to an issue of public health and biomedical intervention," he says.

How did Kroker become interested in sleep research? "Actually, I was in a doctor's office and saw some pamphlets on sleep disorders. That led to getting interested in the history of sleep. I was looking for a master's thesis topic at the time and it seemed like a natural. I expanded my master's into a PhD and, later, the book. Sleep study is really only about a century old. And for a graduate student it was great because there was so little written on it I had pretty much free rein as to what counted and what didn't!"

When not writing books about sleep, Kroker also teaches a graduate humanities course entitled "Knowing Dreaming." You can bet it isn't a snore.

2008

Bee Cam

A sophisticated camera helps identify each species in 3-D

How do you describe a bee? Because most are small, it's hard to delineate colour and structural patterns verbally, notes York biology Professor Laurence Packer, whose research focuses on bees, especially their puzzling global decline. Just in the Toronto area, bumblebee species have fallen from at least 15 in the 1970s to – at most – 10 today.

So to help track and catalogue bee populations (800 species in Canada), Packer's lab has purchased a specialized "bee camera" that's able to take pictures of bees in different planes of focus. A computer then merges the images allowing researchers to see a bee's image in virtual 3-D – better than you would see them with your eyes in the field or under the microscope, Packer says.

"With this camera we can catalogue and share high-resolution images rather than bagging up bees and sending them off for identification. It's especially useful since we're working on an identification key for bees of Canada in order to create a bee database." This will enable Packer's lab to predict pollination changes resulting from global warming in both agricultural and wilderness situations.

The camera also reveals morphological structures throughout the specimen which are otherwise hard to see, and are important in identification. "For each species of bee we want a species page so a user on a database can click and point and see it accurately," says Packer. "The camera gives us images of higher quality than we could get under a microscope. And, of course, it will be easy to share images with other researchers."

PHOTOGRAPHY BY RSQUARED

2008

Gifted Patients

York research offers new insights into schizophrenia

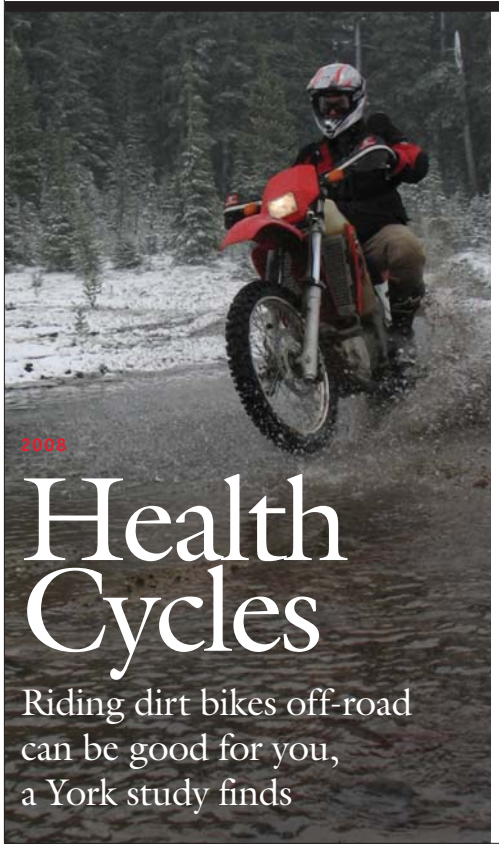
A York study is the first to confirm that a small number of schizophrenic patients have superior verbal abilities. In fact, they rank in the upper five to 10 per cent of the general population, right alongside similarly gifted healthy people. The study was conducted by York psychology Professors Walter Heinrichs and Joel Goldberg of the Faculty of Health and Hamilton neuropsychologist Stephanie McDermid Vaz (MA '01, PhD '05).

"There are no previous research reports of schizophrenia patients with superior ability in any aspect of standard cognitive performance," says Heinrichs, the lead author. "We were originally studying memory in the illness and as the database started to grow it became apparent that we had recruited a very high-functioning sample. So we decided to look for gifted patients and found them."

Verbally gifted schizophrenic patients, as defined by their vocabulary scores, were significantly more independent in community living than typical patients. However, both groups still experienced equivalent levels of delusions, hallucinations, apathy and other common symptoms.

"There are two main reasons to study exceptional cognition in schizophrenia," says Heinrichs. "First, gifted patients help us understand to what degree better cognitive performance translates into better outcomes for mentally ill people, especially in terms of functioning on their own in the community. The future of treatment may lie in improving cognition in these people."

The second, says Heinrichs, has to do with a basic understanding of schizophrenia's disease process. How can gifted patients be just as "crazy" as their more cognitively typical peers? One possibility is that the brain mechanisms that cause psychotic illness are different from those that cause cognitive impairment, he says. "The challenge is to isolate what neural defects the gifted and more typical patients have in common as well as those that distinguish them. We may be able to make progress in specifying what goes wrong in the brain in schizophrenia by studying these exceptional patients."



2008

Health Cycles

Riding dirt bikes off-road can be good for you, a York study finds

Get fit riding a motorized dirt bike? It seems counterintuitive but research findings by Jamie Burr (MSc '06), York School of Kinesiology & Health Science researcher, indicate off-roading could be beneficial to your health.

Burr did a pilot study in Fall 2007 for the Ontario Federation of Trail Riders in which he collected data from 12 riders in both the field and the laboratory. Results indicated that participation in sports such as off-road motorcycling that require physical exertion would be considered hard-to-vigorous exercise. Burr and research colleagues plan to expand this initial study into a national one which, he says, will be much more in-depth and will relate findings to general states of health and wellness.

Why do the study? "We were trying to answer the question, 'Does participation in off-road motorcycling have reasonable energy demands to be considered a legitimate form of exercise?' There's generally been a difference of opinion between off-road motorcycle enthusiasts and health policy-makers regarding the potential health benefits of this sport. That could impact the sport's future and funding," Burr says.

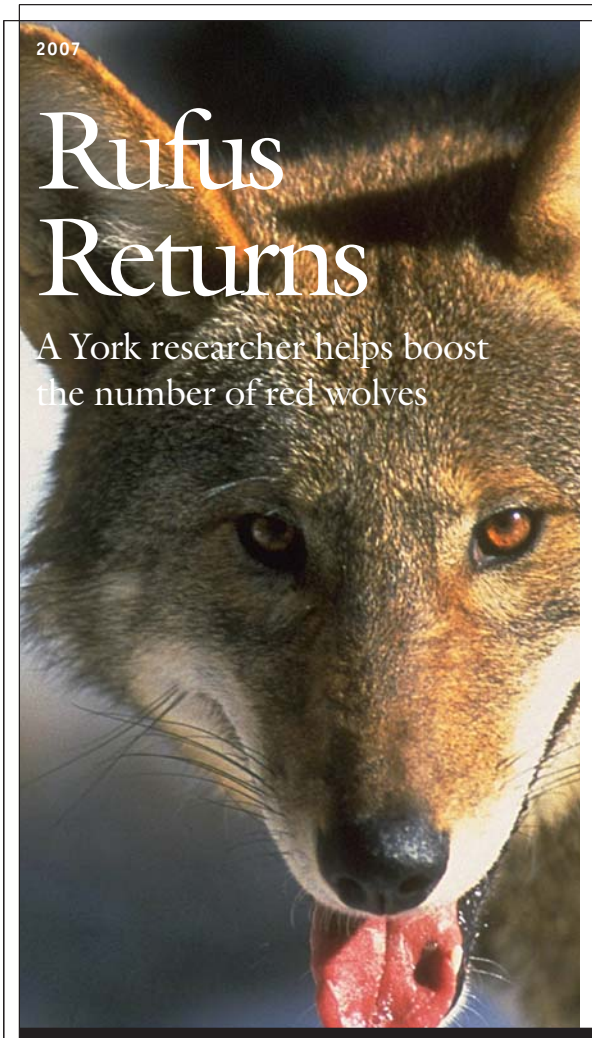
The study used a small group of experienced riders in an enduro-style off-road event. Novices were studied at a professional riding school using heart rate monitoring on representative terrain. All 12 riders were later studied at the Human Performance Laboratory at York to determine maximum oxygen use while walking, jogging and running at maximal exertion, among other tests. "We found off-road riding generally seemed to require physical exertion that would be considered within the range of hard-to-vigorous exercise," says Burr. "But further research still needs to be done to support our initial observations."

COURTESY MATT HOCKIN – MOTO-GUIDE.COM; PHOTOGRAPHY BY RSQUARED

2007

Rufus Returns

A York researcher helps boost the number of red wolves



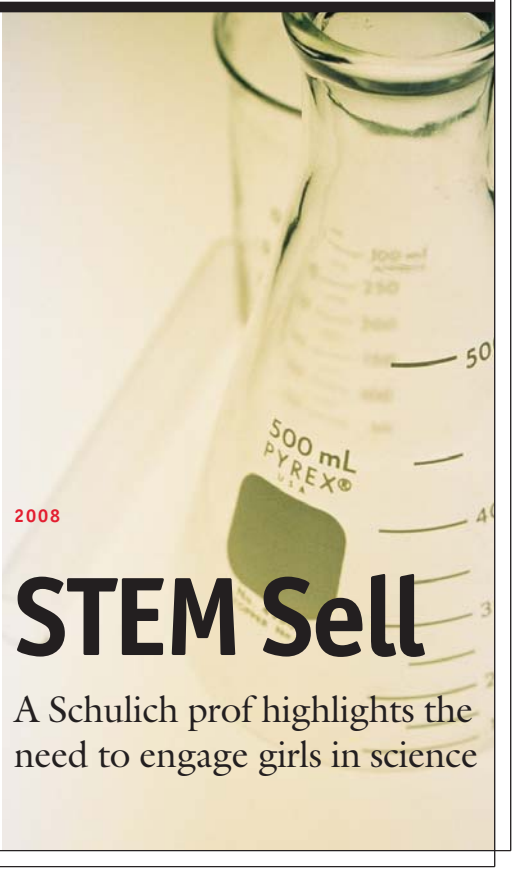
It's not always the case that your PhD research contributes to helping save an endangered species, especially when the species in question has been persecuted nearly to extinction. But that's just what York grad Karen Lockyear's (PhD '07) work is about.

Lockyear studies wolves. More specifically, the red wolf. *Canis rufus* is distinguished from the grey wolf (*Canis lupus*) by colouring and size. It's a bit bigger than its close cousin, the coyote (*Canis latrans*), but smaller than a grey.

Due to hunting, red wolves' numbers plummeted so drastically that they were declared endangered by the late 1960s, and extinct in the wild by 1980. US wildlife officials rounded up the remaining few, and scientists established a captive breeding program to save the last vestiges of the species. Lockyear's research is contributing to the ongoing efforts to bring red wolves back in healthy numbers for long-term conservation. The hope is that free-ranging populations can be re-established (one already has been in North Carolina).

"My study, which I've just completed, looked at whether changes in inbreeding levels – which are inevitable given the small number of founding animals in the program – and age are affecting reproductive potential or fertility of individuals," says Lockyear. She looked at breeding success, litter sizes and fecal hormone patterns in males and females (indicating individual fertility and when the best time to breed animals might be), and also worked on improvements in assisted reproduction techniques, including cryopreservation of sperm and artificial insemination (AI) of females.

"Fecal hormone monitoring is a great non-invasive way to determine the optimum time for AI. But it must be very precise," she says. "This study represents the first documented case of successful artificial insemination of a red wolf using this technology. It's encouraging and it might be useful with other wild canid species."



2008

STEM Sell

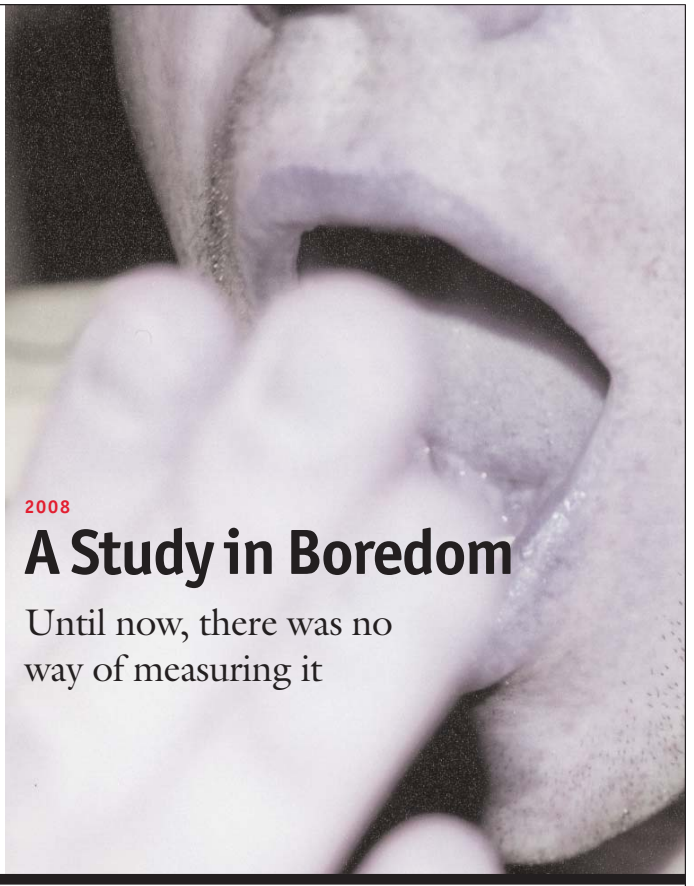
A Schulich prof highlights the need to engage girls in science

Dr. Myra Sadker (1943-1995), who pioneered much of the research documenting gender bias in education, once said, "If the cure for cancer is in the mind of a girl, we might never find it." Now Schulich School of Business Professor Emeritus Ronald Burke is echoing Sadker's prediction in a new book dealing with the looming shortage of science, technology, engineering and mathematics (STEM) researchers and workers, and the lack of women and minorities entering STEM professions. One way to head off the crisis would be to encourage more women and minorities to enter postsecondary studies in STEM, he says. But sadly, many prestige universities such as MIT and Harvard have the lowest female enrolment in North America in areas such as physics.

Women and Minorities in Science, Technology, Engineering and Mathematics: Upping the Numbers draws together essays by academics and experts, including co-editor Burke, highlighting the challenges women and minorities face at various stages of the STEM journey. It offers "action strategies" on such topics as: How do you make science interesting to girls? How do you make sure they take science courses in high school and encourage them to do so at university?

"There is convincing evidence that scientific excellence and technological innovation were and still are important for both past and future economic performance," says Burke. "This is a wake-up call. Countries like China and India are outperforming us when it comes to encouraging women to enter STEM professions." Burke says the book will be valuable for women trying to understand what kinds of careers are out there, and informative for policy-makers at all levels as well as for women already in STEM fields.

PHOTOGRAPHY COURTESY OF BARON CRAWFORD; PHOTOGRAPHY BY RSQUARED



2008

A Study in Boredom

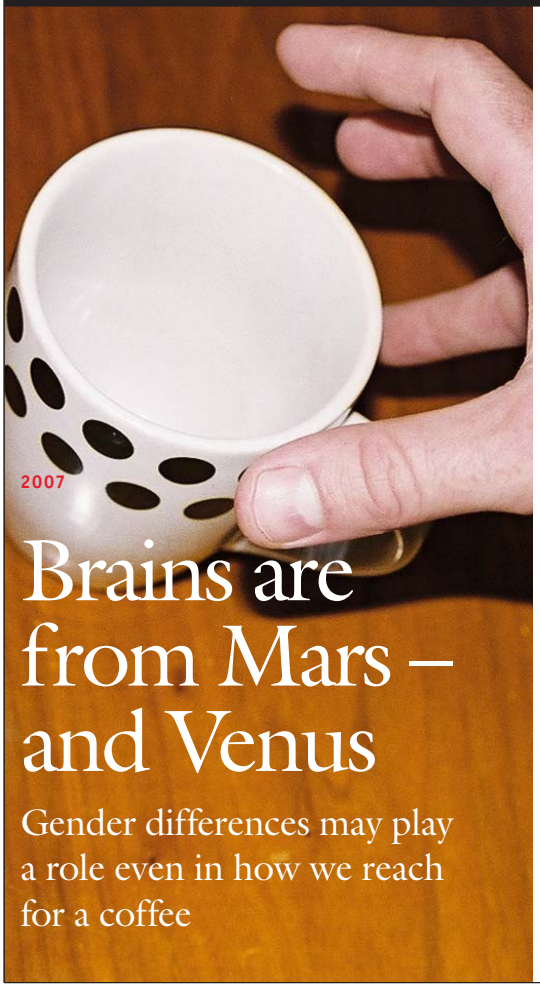
Until now, there was no way of measuring it

We've all faced boredom at some point in our lives. But, curiously, little is understood about the phenomenon. And until now, there was no way to measure boredom "in a given moment," says Shelley Fahlman, a York PhD student in clinical psychology. But that's changed with Fahlman's development of a new scale that measures boredom in a given moment.

Fahlman began her boredom investigations several years ago with an initial study that revealed that "life meaning" was integral to psychological well-being and that it wasn't strictly boredom that caused a person to be depressed. "One reason depression and boredom are found together is because they are both related to the larger issue of one's sense of meaning and purpose in life," Fahlman says.

Fahlman collected 200 individuals' descriptions of what it is like for them to be bored and then analyzed the results in order to develop a scale. She then had a different group of people do "really boring tasks" and fill out surveys in controlled lab conditions in order to test out her measure.

"Boredom is experienced by everyone. I think society underrates its seriousness," says Fahlman. "And because it is a serious problem for many people – and often related to other destructive behaviours – it's important we better understand it."



2007

Brains are from Mars – and Venus

Gender differences may play a role even in how we reach for a coffee

A new study by two York researchers has demonstrated that men's and women's brains work differently when they're reaching, say, for a cup of morning coffee – or any other object for that matter. "Work" in this case really refers to the way male vs. female brains process information (brain activity) in reaction to visual stimuli (reaching for a java).

Lauren Sergio is in charge of York's Sensorimotor Neuroscience Laboratory, where researchers study the fundamental neural mechanisms underlying the production of visually guided limb movement. "In order to accurately reach for an object, you have to transform a sensory signal into a complex pattern of muscle activity. The control processes employed by the brain which underlie this seemingly straightforward task are not, as yet, completely understood," says Sergio, a School of Kinesiology & Health Science professor in the Faculty of Health.

"In the past, researchers assumed the cortical networks for visually guided movement were the same for males and females. But in our experiment we used functional magnetic resonance imaging [fMRI] to show there were, in fact, significant sex-related differences in human brain activity during visual-to-motor transformation tasks," says Sergio, who worked on the project with recent doctoral graduate Diana Gorbet (BSc Spec. Hons. '99, MSc '02, PhD '06).

Sergio and Gorbet observed that in females, movement-related areas on both sides of the brain lit up during a series of hand-eye coordination experiments. Curiously, men's brains lit up on both sides only during the most complex tasks; otherwise, only one side showed activity. These findings may have implications for the design of stroke rehabilitation therapies, says Sergio. "If someone has a stroke on one side of the brain – in one of the areas that differs between males and females – it may be important to take into account the sex of the patient."

PHOTOGRAPHY BY RSQUARED

2007

Flight Stimulator

Richard Dyde's discovery

SERENDIPITY IS A WORD Richard Dyde can appreciate. It explains how he wound up as a scientist in York University's Centre for Vision Research studying astronaut balance and vision with Prof. Laurence Harris, and came to write a book about British aviation pioneer Sir George Cayley, whose airplane designs predate the Wright Brothers' by over a century. While completing his PhD in neuroscience in the UK, Dyde e-mailed a question to a York professor and received a job offer in reply. After moving to Canada in 2001, Dyde (or Richard Dee as he's known to his readers) wrote an unpublished book containing a reference to Cayley that prompted publisher McClelland & Stewart to commission a full biography. While in England researching *The Man Who Discovered Flight: George Cayley and the First Airplane* (2007), Dyde happened to look at one of Cayley's 1793 school notebooks upside down. Examining an apparent doodle, Dyde realized he had discovered the earliest written explanation of the principles of flight. "No one else did anything like this for another 50 years," says Dyde. "No one even came close. It's one of the untold stories of science."

PHOTOGRAPHY BY JEFF KIRK

2008

Exposing Exposures

Researcher Ann Novogradec looks at esophageal cancer and the environment

It might seem odd that a student with a Bachelor of Administrative Studies in marketing would end up studying the environmental causes of esophageal cancer, but that's what happened to Ann Novogradec (BAS Spec. Hons. '01, MES '03), who is now in her sixth year of Canadian Institutes of Health Research-funded PhD studies in York's Faculty of Environmental Studies.

Novogradec says her interest in marketing came from growing up in a family business. "My parents ran their own successful custom upholstery business," she says. Sadly, it was also a personal experience that sparked her interest in studying esophageal cancer. Halfway through her undergraduate degree, her father was diagnosed with what would turn out to be a terminal case. "I grew immensely interested in the disease, the people who are diagnosed with it and the environments they are exposed to," she says. After her father's death, Novogradec continued her studies, taking her MES where she refined her research direction with the help of York professors such as Louise Ripley and Harris Ali.

"My outlook on business changed considerably. The new face of business – for me – included exposures to hazards, threshold limit values and risks associated with the manufacturing and use of various products – not just marketing techniques, sales, efficiency and profits."

Novogradec found there was very little mention in current research of involuntary exposures that people undergo on a daily basis, while lifestyle and voluntary exposures were benchmarked in the literature as the main causes of many cancers. She hopes her research will offer insights into the study of esophageal cancer by comprehensively exploring both the living and working environments of esophageal cancer patients.

2008

The Martian Winds

Canadian snow could help us understand them

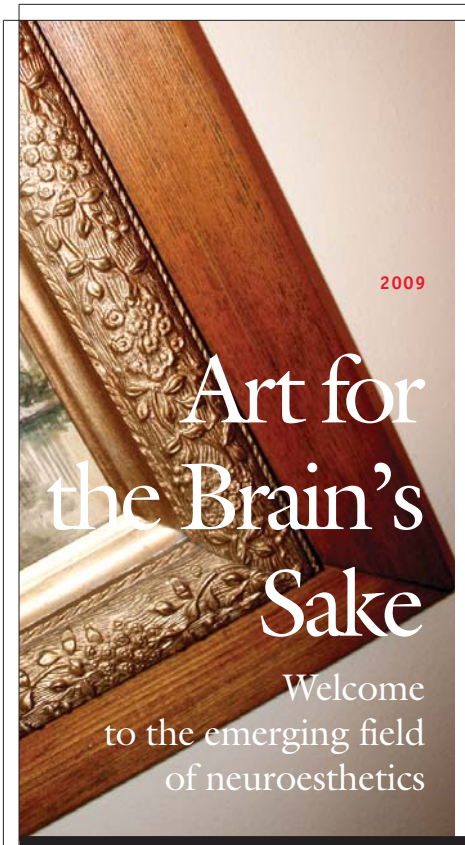
Could studying blowing snow in the Arctic Circle one day help us understand Martian dust storms? Professor Peter Taylor and colleagues in York's Earth & Atmospheric Science Program certainly hope so. Taylor heads up the team studying blowing snow as a segment of the Storm Studies in the Arctic program, funded by the Canadian Foundation for Climate and Atmospheric Sciences and based in Iqaluit, capital of Nunavut.

Precise sensors mounted on a 10-metre tower near the Iqaluit airport measure the size and number of blowing snow particles, along with wind direction and velocity, humidity, temperature and visibility. Other weather stations have been deployed by helicopter in remote locations up to 100 kilometres from Iqaluit. The team is hunting for the precise wind and surface conditions that give rise to blowing snow and reduced visibility. "The data we collect here studying snow should contribute strongly to our basic understanding of how other aeolian [wind] processes work and why Martian dust storms occur," says Taylor.

Taylor is part of the York-led team of Canadian atmospheric scientists working on NASA's Phoenix Mission, which touched down on Mars in late May. The team is responsible for the lander's weather station, which is studying the Martian atmosphere. Phoenix will examine climate at the red planet's northern latitudes, as well as the geological history of water and the potential of the soil to support life.

It's a long way from the Arctic, but "studying blowing snow should give us important clues to dust on Mars and how it affects the planet's daily surface temperatures," says Taylor.

PHOTOGRAPHY BY BRYAN MCBURNEY; COURTESY OF PETER TAYLOR



2009

Art for the Brain's Sake

Welcome to the emerging field of neuroesthetics

Call it Sally McKay's brainstorm – to investigate what neuroscience (the study of the brain) can tell us about what goes on in our grey matter when someone looks at a work of art. McKay is part of the brave new world marrying art theory with hard science. The field is called "neuroesthetics", or NA, and McKay, a PhD student in York's Graduate Program in Visual Arts, is convinced that it has much to offer art criticism.

"The idea is to use neuroscience to see just how useful the study of isolated brain activity in a lab setting can be for describing the experience of art," she says. "Put simply, NA is the study of art and the human brain. They are very different areas, of course, but they are both deeply concerned with consciousness."

McKay, who is both an artist and curator, says she studies ways artworks set a stage for consciousness. "I locate my research in the field of neuroesthetics because, like many artists, neuroscientists address consciousness as an embodied, physical phenomenon."

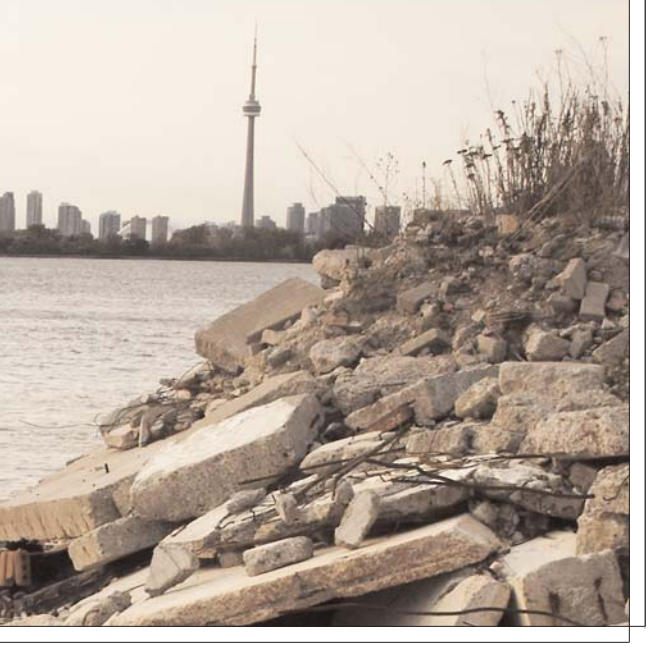
McKay has been conducting interviews with neuroscientists and teaching herself how to read their technical papers, she says. She's even undergone a two-hour brain scan of her own and is volunteering on a neuroscience research project at Sunnybrook Health Sciences Centre in Toronto. But she's not about to become a lab scientist, she says.

"My project is grounded in my experiences in the art world. I'll work with the neuroesthetics literature and technical essays and papers that address colour perception and imitation, as well as volunteer for neuroscientific experiments, in order to experience first-hand the socio-technological apparati that determine relations between scientists and their objects of study."

2007

On the Waterfront

Gene Desfor studies the urban space where land and water meet



Could anything offer a more intriguing study – or more opportunity for multidisciplinarity – than Toronto's beleaguered and fought-over waterfront? Indeed, that may be one reason principal investigator and Faculty of Environmental Studies (FES) Professor Gene Desfor decided to research it. Assisting Desfor in this initiative – called "Changing Urban Waterfronts" (CUW) – are researchers from York's social sciences, humanities and "hard" sciences. The project, now underway, investigates Toronto's waterfront during the past 100 years using ideas from both social nature and political ecology. "The harbour is a special place where land and water meet," says Desfor. "You can see it as an interactive space in which the social and the natural are constantly remaking one another. 'Urban nature' is inherently political because it's produced, partially anyway, by social processes. 'Problems' with nature are socially constructed."

For example, FES Professor Gail Fraser and research assistant Dave Andrews have been studying the diet of double-crested cormorant chicks on Toronto's Leslie Street Spit. Their findings highlight the links between socio-political and natural processes and could have a bearing on decisions made by wildlife managers who are facing concerns from fishing and aquaculture industries about (the "problem" of) rising cormorant populations on both the Spit and throughout the Great Lakes.

The overarching question CUW seeks to address, says Desfor, is: How have various discourses and practices combined to produce and regulate Toronto's waterfront as a socio-economic and ecological place and space? Researchers are concentrating mainly on Toronto's eastern waterfront, including the Port Lands, the Don River Valley and the Leslie Street Spit. The three-year project is funded by the Social Science & Humanities Research Council of Canada.

PHOTOGRAPHY BY RSQUARED; JEFF KIRK

Greening Steeltown

A Hamilton harbour cleanup could create a billion-dollar benefit

You might not think of swimming in Hamilton's harbour now, but in the years to come it could be a different story, thanks to a report by Ed Hanna, an Associate Fellow with York's Institute for Research & Innovation in Sustainability (IRIS). Hanna says cleaning up the harbour now – cost: $90 million – could mean governments, business and the people of Hamilton and Halton Region will benefit by almost $1 billion in the future, once the harbour gets off the Great Lakes pollution hot-spot list.

The report was prepared on behalf of Environment Canada by both IRIS and York's Schulich School of Business in association with DSS Management Consultants Inc., of which Hanna is a principal. "IRIS provides an exceptional opportunity for university/private partnerships in sustainability research," says Hanna. "The harbour project involved many current and former York students."

Among the York faculty members involved was Professor Peter Victor, an economist and former dean of the Faculty of Environmental Studies, who has partnered with Hanna on several major pollution-related studies in Ontario.

John Shaw, who manages Environment Canada's Great Lakes Sustainability Fund, was so sure of the economic paybacks a cleanup would provide that he commissioned IRIS to find a way to measure the economic, environmental and social impact benefits. That was a unique approach, says Hanna. "Most benefit assessments deal with benefits from the perspective of one group, but do not separate the benefits out as clearly and discretely as is the case here, and certainly not from the perspective of so many diverse interests."

IRIS was established by York University in 2004 to create an interdisciplinary, University-wide research institute that is a focal point for the sustainability-related activities of all 10 Faculties at York.

PHOTOGRAPHY BY RSQUARED

The People Crisis

Susan McGrath leads a broad look at the global plight of refugees.

BY MICHAEL TODD

PHOTOGRAPHY BY LINDSAY LOZON

Susan McGrath began her PhD at 45 – an age when many people might have begun to think about retirement. It was while doing her doctorate at the University of Toronto that she volunteered with the Canadian Centre for Victims of Torture. The experience led to a growing interest in refugees. "I became aware of the many issues around refugees coming to Canada, and the issues around trauma, and what their needs are," says McGrath, who is now a member of the centre's board.

Then, while working as a professor in York's School of Social Work in 2006, she was written up as "someone to watch" by the *Toronto Star* for her initiatives in the Jane-Finch community. Jane-Finch was where she helped establish the York University-TD Community Engagement Centre. Based at the Yorkgate Mall at the northwest corner of Jane Street and Finch Avenue, the engagement centre conducts a wide variety of outreach activities, from providing community meeting space and help with tax forms to the ability to take university courses.

Now McGrath has achieved another academic milestone. As director of York's Centre for Refugee Studies, she was awarded a $2.1 million grant from the Social Sciences & Humanities Research Council of Canada (SSHRC) for a project titled "A Canadian Refugee Research Network: Globalizing Knowledge", the culmination of work she has done over the past few years in developing national and international networks of academics, policy-makers and practitioners.

Negative perceptions of refugees have been increasing for at least the last decade, and even more so since 9-11. As with Europe and much of the rest of the developed world, North America's borders have tightened. This initially slowed the flow of refugees into both Canada and the United States, although the numbers are now increasing again. The global figures are startling: by the beginning of 2009, there were at least 42 million forcibly uprooted people worldwide, including 16 million refugees and asylum seekers. Among those, 11.3 million were living in segregated settlements or refugee camps and over eight million had been there for 10 years or more. A further 26 million were internally displaced in their own countries. This means they are not recognized as refugees under the UN convention. Many, if not all, of these people, says McGrath, live in poverty under the threat of violence and without basic human, social or economic rights.

Second only to Australia in global resettlement programs, Canada resettled some 10,800 government and privately sponsored refugees from overseas in 2008 – a ratio of one for every 3,000 Canadians. But the number of claimants is rising. "Roughly 35,000 people made refugee claims in Canada in 2008, an increase of 6,000 from the previous year. Just over 18,000 claims were finalized with an acceptance rate of approximately 42 per cent," says McGrath. Yet with a case backlog nearing 60,000 – projected to rise to 84,300 by 2011 – the situation in Canada has become pressing. "Refugee claimants are waiting years for their claims to be processed. It is a time of

great distress. Many have had to flee without their families."

One area McGrath and her colleagues have studied in detail is that of Darfur and Southern Sudan and the plight of internally displaced persons (IDPs) there. To be a refugee means, by definition, crossing a border, but many of the neighbouring countries in Africa and Asia that have taken in millions of refugees can barely care for their own citizens. "Many refugees are being temporarily hosted by poor countries without adequate resources. They need humanitarian assistance from other countries to do so. Kenya is an example. For years it has taken in refugees from Somalia, Sudan and Ethiopia," says McGrath.

International support has not kept up with the numbers, and as a result, many countries now actively discourage people from coming in. The result, says McGrath, is a kind of physical and psychological limbo for asylum seekers. For instance, not being able to seek refugee status by entering Chad, but fleeing persecution, rape and mass murder from factions within, IDPs in Sudan find themselves trapped in Sudanese camps facing an existence without the basics of food, water, shelter, security and safety. These camps are typically under-resourced, located in remote, inhospitable areas with little or no infrastructure, and poorly protected. The prevalence of sexual and gender-based violence perpetrated against women and children in refugee camps by fighting forces, by the host community, by men from their own communities and even by the people who are supposed to be there to protect them is astounding, notes McGrath.

"Documentation is vitally important," says McGrath. "It's important to bear witness to what goes on in the camps and elsewhere."

These are among the issues that will be explored by the Refugee Research Network (RRN), a major collaborative and interdisciplinary research project based at the Centre for Refugee Studies bringing together researchers at home and internationally to examine all levels of the refugee experience. The issues range from the years that many refugees spend in limbo in camps waiting for legal status and durable solutions to the difficulties encountered as they try to settle, learn a new language, seek employment and reunite with their families. McGrath says the project's purpose is to mobilize and sustain a Canadian and international network of researchers and research centres committed to the study of refugee and forced migration issues, as well as to finding solutions to the plight of refugees themselves.

The RRN will be composed of clusters of researchers who will come together to look at issues such as protracted refugee situations, refugee law and environmental causes for displacement, such as drought brought on by global warming. "We'll also look at how we can develop people's skills and capacities while they're in a camp so they have opportunities for sustainable livelihoods when they leave or return home."

The RRN is a "network of networks", says McGrath, who suggests knowledge it generates can help support practice and policy that addresses the root causes of forced migration and refugee flows, and develop more predictable, effective and comprehensive solutions to the plight of refugees and forced migrants. "The mandate of universities is to create knowledge. That's what we do. But the other part of that equation is to make sure that knowledge is accessible by the people who need it."

McGrath says researchers will benefit from coming in contact with a wide swath of disciplines to work on refugee issues. "The whole idea is to link up researchers, policy-makers and practitioners globally in both north and south interactions."

The network currently involves 22 researchers at 12 Canadian universities as well as 10 international universities and 17 partner institutions, including the Canadian Council for Refugees, the United Nations High Commissioner for Refugees, the UN World Food Program and IBM Canada. Five researchers are York faculty members. McGrath will see to it that the RRN fosters interaction among academics, policy-makers and practitioners through online activities and direct engagement. An interactive Web site will host research findings in a variety of forms.

McGrath hopes the RRN will become a destination for both academic and community-based knowledge and for the documentary observations collected by NGO personnel working with refugees in the camps. "Documentation is vitally important," says McGrath. "It's important to bear witness to what goes on in the camps and elsewhere."

Political pressure and other tactics need to be brought to bear on those countries or governments that create refugee situations, and those that are complicit, suggests McGrath. "We can help people on the ground but at the end of the day we also need to challenge governments who are creating displaced persons and countries that are treating refugees and internally displaced people badly."

In the end there is no quick fix. "These are complex issues," says McGrath. "There's no instant solution. But if we can bring researchers together with practitioners and policy-makers and refugees – and find a place for their voice and stories – it will be a good start.

Research for All

How York's Knowledge Mobilization Unit could help your organization.

BY SANA MULJI DUTT

PHOTOGRAPHY BY KC ARMSTRONG

THINK OF York University's Knowledge Mobilization (KM) Unit as the Google of research in the social sciences and humanities. But it's real, not virtual. The KM Unit searches and matches York researchers with outside organizations so that decision-makers in the community can use the latest, often cutting-edge, research and advice from York in carrying out their work. It's a win-win partnership. KM paves the way for an organization to improve the outcome of its policies and decisions, while providing tangible evidence for researchers of the value of their scholarship. In essence, the researcher and the organization become co-creators of knowledge that enhances social well-being.

The brokers of such an exchange are aptly called mobilizers. Michael Johnny, manager of York's KM Unit, and KM officer Krista Jensen, both in the Office of Research Services, have matched over 100 projects between York University researchers and community organizations since the unit's inception in 2006. The unit has also placed 25 graduate students with organizations, and supported the development of 11 successful grant applications.

KM is based on a sophisticated push-pull framework that converts ideas and innovation into value for society. Collaboration is at the core, whatever the question. What kinds of companies go public? How do the homeless see their own health problems and needs? Such issues are investigated through an exchange between the researcher and the organization, each benefiting from the results. "Process, not content, is the key," says David Phipps, director, research services & knowledge exchange. "It doesn't matter if you are talking about homelessness, immigration, seniors or health. We are concerned with the process of engaging users at every stage of the research cycle: planning, execution, evaluation, dissemination."

Among recent projects is the Inclusivity Action Plan Program which emerged out of a monthly networking event, KM in the AM, on the topic of immigration in York Region, the sprawling set of suburban communities just north of York University. Speakers for the session included York geography Professor Lucia Lo and Janet Rurak, executive director of the Character Community Foundation of York Region. The KM Unit matched psychology Professor Michaela Hynie and nursing Professor Mina Singh with York Region to make assessments that helped the region move forward in providing services for its increasing immigrant population. Similarly, KM supported the York Infrastructure Project, led by Lo and a team of researchers from York University and Ryerson University, which allowed the academics to share their findings on issues concerning public infrastructure and communities.

True to that philosophy of sharing information, the KM Unit is now building ResearchSnapshots, a database of summaries for the non-academic audience, through researchimpact.ca, an online network of knowledge mobilization services in collaboration with the University of Victoria. Here, people can look at studies that may have direct relevance to their business or organization – from consumer behaviour to social issues. KM has also provided opportunities for graduate students. A 2008 KM intern examined entrepreneurial opportunities for Filipino Canadians in the Markham area, including how accessible and effective the relevant government services were.

All of which has led to considerable support from the community. Daniele Zanotti, CEO of the United Way of York Region, says, "It is important that community agencies are working from the best knowledge available so that they can make well-informed decisions. York's KM Unit makes research, as well as researchers and graduate students, accessible to non-academic decision-makers."

Stan Shapson, York's vice-president, research & innovation agrees. "By facilitating linkages and strong collaborations with the community organizations," he says, "KM supports the work of York's social sciences and humanities researchers and is an integral part of York's research infrastructure."

MATCHING MINDS: Geographer Lucia Lo

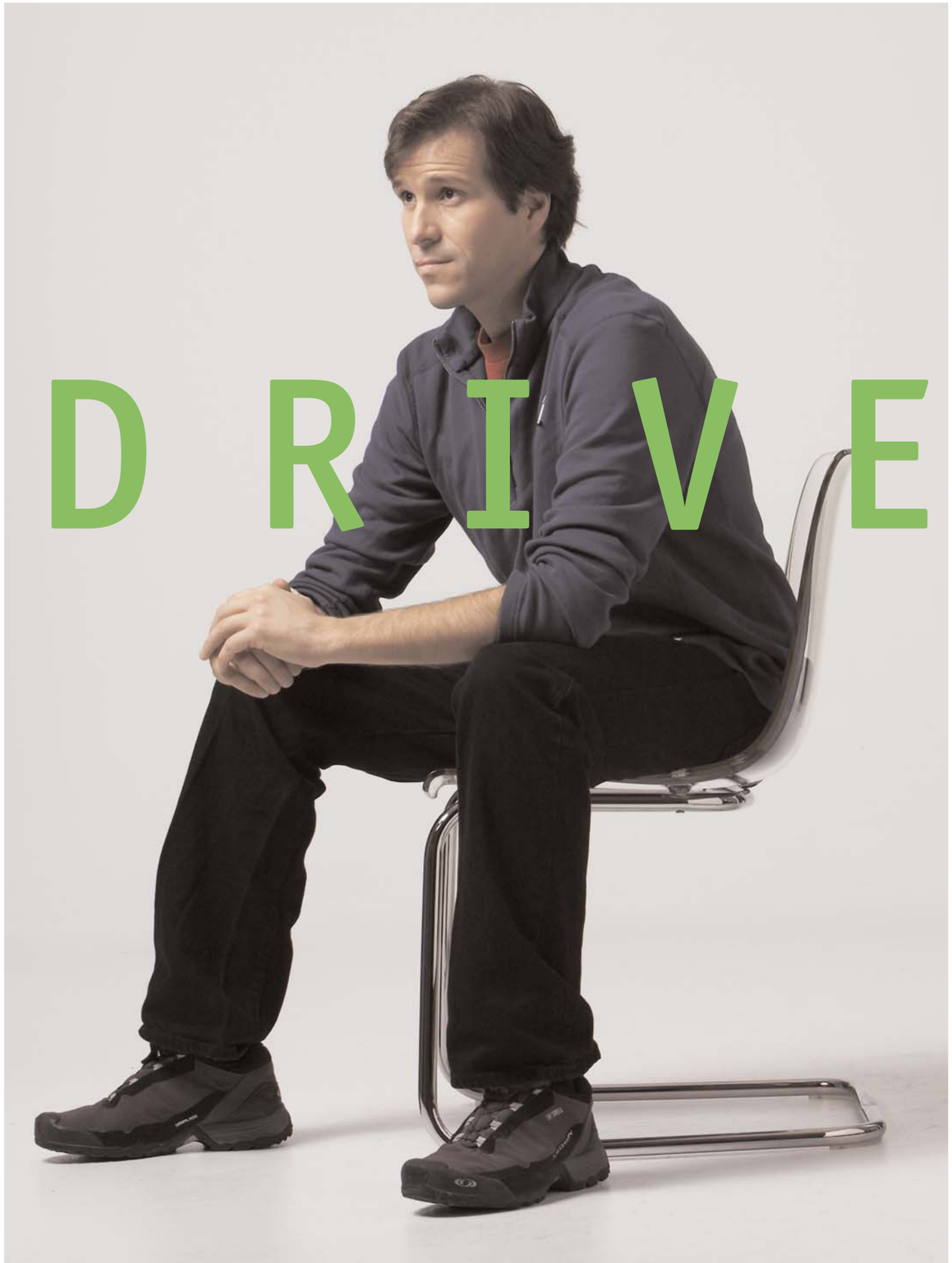
York's Jose Etcheverry is on a mission to convince Canada that renewable energy works – and time is running short.

BY MICHAEL TODD

PHOTOGRAPHY BY JEFF KIRK

Reprinted from February 2008

POWER DRIVE



Jose Etcheverry is pumped. With the recent Ontario Liberal victory still fresh, he is "cautiously optimistic" that people like Premier Dalton McGuinty and his new energy minister will be seriously listening to people such as himself in the not-too-distant future. In fact, a variety of local and international politicians, including McGuinty, have already conferred with Etcheverry on matters of energy policy and Etcheverry can't wait to discuss the possibilities of local, sustainable, clean and renewable energy sources – such as wind and solar.

It's not surprising really that Etcheverry and McGuinty have talked. Anything over a two-minute conversation with Etcheverry – who was recently hired for a permanent teaching position at York in the Faculty of Environmental Studies (FES) while he finishes his PhD – and you're aware of his passion for "fighting the good fight". But he is nothing if not humble about his luck at "being the right guy in the right place at the right time." Ego, he says, plays no part in his mission to promote cleaner, greener ways to power cars and coffee makers.

It isn't only high-level politicians who listen to what Etcheverry has to say. Environmental heavyweights such as David Suzuki are well aware of Etcheverry's ability to talk scientific and economic sense about an issue that is often clouded by well-meaning, but sometimes ill-informed, sentiment. Such awareness may be why he served as a research and policy analyst on climate change with the David Suzuki Foundation (a position he still holds part time).

Etcheverry got his honours BA in geography and environmental studies from York in 1996 (he was among the first students to take the environmental studies undergrad program, previously offered only at the master's level). He later received his master's from the University of Toronto and is currently pursuing PhD research there focused on renewable energy technology transfer, climate change and energy policy. In coming to York, Etcheverry has joined a wide group of faculty who are actively engaged in studying and solving environmental issues and helping society deal with them (see following stories).

In FES Etcheverry teaches about climate change and sustainable energy policies. Outside the classroom, he is on the steering committee of the Canadian Renewable Energy Alliance and a member of the board of BC's Sustainable Energy Association, among other affiliations. In 2006 he was appointed by Hermann Scheer, the much-honoured general chairman, to become one of the chairs of the World Council for Renewable Energy. He has also represented Suzuki on an advisory committee to former Ontario energy minister Dwight Duncan, now finance minister.

"Mixing hydro with intermittent renewables is a no-brainer. It's been done for some time and it works."

These days Etcheverry is worried that if Ontario and Canada do not act soon ("we have a five-year window and are rapidly approaching the fork in the road"), we will be among the global energy revolution's losers, not winners. "My work is focused on developing practical policy solutions to climate change through collaboration," says Chile-born Etcheverry, who has worked in Europe, South America and Mexico on energy issues (he's focusing on analysis of climate change policies in Mexico in 2007-2008 and is talking directly to the energy advisers of Mexico's president). One of his current projects involves development of the World Wind Energy Institute – a new training network involving renewable energy centres located in Brazil, Canada, Cuba, China, Denmark, Egypt and Russia.

"Ontario is out shopping for electricity solutions right now and that's why I'm pleased about the recent election, because the Suzuki Foundation has already done some good groundwork there. The new renewable power options are extraordinary. The best part is, many of them have huge potential in Canada and we have large- and small-scale solutions for the coming carbon crunch.

"We can think of these renewable solutions – sun, wind, water – as something like the Web, a kind of energy Web. If you think of what the Internet looked like 30 years ago, that's what our power generation is like now. The new power grid – using small-scale, local, just-in-time power generating sources – will behave very much like the Internet. Flexible. Not centralized in one big location. Able to interconnect. The days of the old grid are numbered. Right now we buy power from outside Ontario. I argue that's big money not benefiting our local economy. Instead it's exported away from our province. What I'm saying is, we have the expertise to build and implement these new renewable power sources locally and the money will stay here and create jobs and benefit our economy."

Etcheverry says many people are still stuck in the old power mindset, but he notes the old model's ultimate undoing will be its high cost. "Building reactors and all the infrastructure needed to go with them is astronomically expensive compared to local options that are cost-effective and can be scaled up or down, and are cleaner and more reliable than the old models."

We need to put the pieces together sooner rather than later, he says. "Mixing hydro with intermittent renewables is a no-brainer. It's been done for some time and it works. There are lots of low-tech options such as pumped storage [where you pump back to a reservoir the water you need to generate electricity, using spare electrical capacity]. Distributed generation such as wind farms, solar and high-tech storage batteries are here. There's a Zebra battery installation [for energy storage] in Halton right now. Smart meters are being installed throughout the province. So key bits of the puzzle already exist here in Ontario. But we need to put it all together.

"The other advantage is that if we get it together we can decrease our energy consumption and lower pollution. This buys us time to develop other technologies. Ontario has already reduced overall electrical energy consumption last year by 2.5 per cent, and that was taking weather and business as usual into account, so this is doable."

Very doable, Etcheverry stresses. "It takes a minimum of 10 years to build a nuclear plant – to say nothing about the issues of security and the problems around radioactive waste disposal – but you can build a wind farm or a combined heat and power plant in a few months and back them up with storage options to have a reliable and clean energy supply year round.

"Ontario is in a perfect position. We have the resources, the workforce, the transportation network and the technological expertise to do this here – we'll be able to create good jobs, increase wealth, help the local economy and move into a better future. What we need now is strong political will and sound policy directions."

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GREEN GALLERY

Here are five of York's many researchers who are working on environmental issues.

Reprinted from February 2008

Losing the Buzz

Laurence Packer sounds the alarm about bees.

BY MARTHA TANCOCK

PHOTOGRAPHY BY LINDSAY LOZON

It takes no great leap for Laurence Packer to imagine a world without bees. He's been monitoring their populations for years, long before the shocking news in 2006 that half the honeybees had mysteriously disappeared in the US and Europe. "When you lose bees, you lose flowers and all the things that feed upon those flowers," says Packer. "You get a much simpler natural world." Bees pollinate a third of the world's food crops and 95 per cent of its flowers. Without them, wave goodbye to fruit, berries, most vegetables and nuts, and watch the colour drain from nature's palette.

Packer, a biology professor in the Faculty of Science & Engineering, has been sounding the alarm for some time. "Bees are the agricultural equivalent of canaries in a coal mine and their death signifies a much larger problem." Since he became besotted with the iridescent creatures as an undergraduate student in Britain, Packer has been a keen observer of the non-honeybee "canaries" (he studies all but honeybees). He's travelled all over the world on field trips and routinely adds new species to his vast 80,000-specimen collection. These days, he is dispatching graduate students to Patagonia, Costa Rican coffee plantations and restored oak savannahs to assess the impact of habitat change on the biodiversity of native bees, whose survival is critical if honeybees disappear. Two years ago, a researcher returned with the disturbing news that many bumblebee species are in severe decline in Ontario and one is probably extinct.

While habitat loss may explain the disappearance of bees, so might genetics. Packer's lab has also found that bees are 10 times more prone to extinction than other organisms because their sex-determining system can turn females into sterile drones. Small populations are especially vulnerable.

Lately, Packer has turned his focus on classification. His PhD students are cataloguing and reclassifying bees using DNA bar-coding and detailed identification keys he has developed. Their efforts are previewed in the *Canadian Journal of Arthropod Identification* and will ultimately appear on a database Packer wants to create to avail his collection, now stacked in drawers in his lab, to every scientist and backyard gardener via the Internet. The database will also feature stunning, almost three-dimensional digital images. It's an ambitious project that Packer hopes will raise awareness – and concern – about his cherished bees. "I want people to watch bees the way they watch birds. People don't love things unless they know about them."

On the Radar Early

Irene Henriques promotes profitable sustainability.

BY ANN SILVERSIDES

PHOTOGRAPHY BY LIAM SHARP

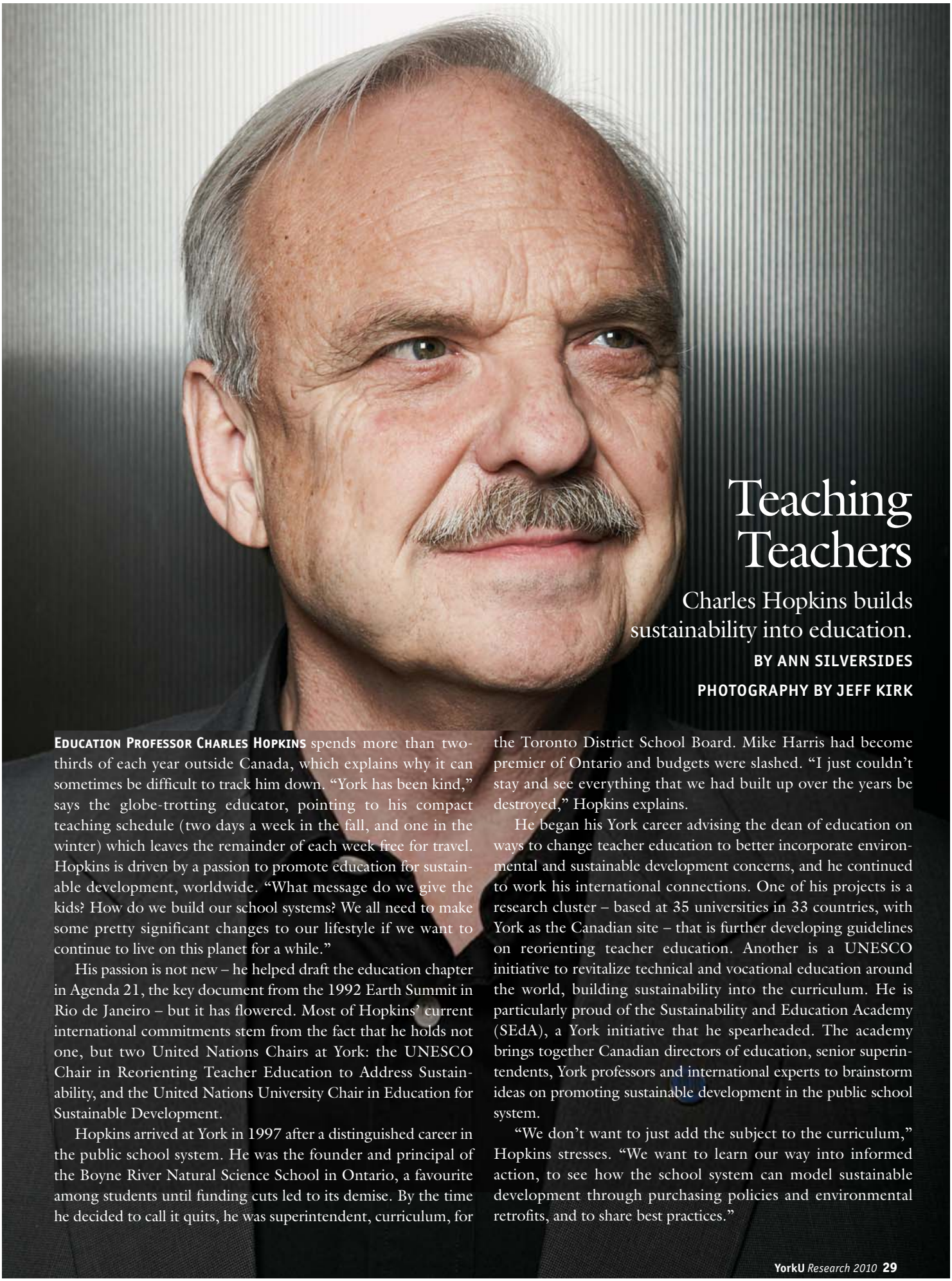
EVERY INCOMING MBA STUDENT at the Schulich School of Business takes Professor Irene Henriques' class on how to create shareholder wealth in a way that "drives towards a more sustainable world." The goal is ambitious, but the economist argues that with "ingenuity, passion and leadership, anything is possible." Her own passion for the subject has led to her participation in a string of national and international committees; she now chairs the public advisory committee to the NAFTA-related Commission for Environmental Cooperation of North America. "I love this whole area because it combines economics, business, sociology, policy and politics, though each can give you a really big headache!"

An 18-year Schulich veteran and an executive member of York's Institute for Research & Innovation in Sustainability, Henriques says her fascination with the economics of sustainability was sparked after she finished her PhD thesis. The subject was R & D, and how one company's invention of an improved production method is sometimes, without payment, adopted by others – a "positive" spillover, she argued, since society as a whole benefits.

That led her to think about negative spillover – how companies rarely pay or account for the harm they do to the environment. Henriques, who grew up in Montreal, the child of Portuguese immigrants and the first in her family to go to university, joined Schulich in 1990. At the time, there was very little research on what Canadian businesses were doing about environmental issues. "It just wasn't on the radar."

So in 1992 she and a colleague did a national survey and found that companies were further ahead than government in "reading the tea leaves" about environmental issues. As a result of that work, she was asked to join an OECD committee to look at the issue internationally, focusing on manufacturing. There she learned that regulations and enforcement are critical to getting companies onside with environmental concerns. "A huge concern of mine is how government has backed away and allowed for voluntary environmental programs. The result is that you have no third-party verification to build confidence in what is happening." Governments have to display leadership and promote goals, she says.

Henriques' personal motto is that you only have control over about 15 per cent of your time and should use it to focus on things you can influence, in her case students and research. "I love doing the research. I think, man oh man, this is so much fun." And in class, "I try to instill a way of thinking, to get students to question why we do things the way we do."



Teaching Teachers

Charles Hopkins builds sustainability into education.

BY ANN SILVERSIDES

PHOTOGRAPHY BY JEFF KIRK

Education Professor Charles Hopkins spends more than two-thirds of each year outside Canada, which explains why it can sometimes be difficult to track him down. "York has been kind," says the globe-trotting educator, pointing to his compact teaching schedule (two days a week in the fall, and one in the winter) which leaves the remainder of each week free for travel. Hopkins is driven by a passion to promote education for sustainable development, worldwide. "What message do we give the kids? How do we build our school systems? We all need to make some pretty significant changes to our lifestyle if we want to continue to live on this planet for a while."

His passion is not new – he helped draft the education chapter in Agenda 21, the key document from the 1992 Earth Summit in Rio de Janeiro – but it has flowered. Most of Hopkins' current international commitments stem from the fact that he holds not one, but two United Nations Chairs at York: the UNESCO Chair in Reorienting Teacher Education to Address Sustainability, and the United Nations University Chair in Education for Sustainable Development.

Hopkins arrived at York in 1997 after a distinguished career in the public school system. He was the founder and principal of the Boyne River Natural Science School in Ontario, a favourite among students until funding cuts led to its demise. By the time he decided to call it quits, he was superintendent, curriculum, for the Toronto District School Board. Mike Harris had become premier of Ontario and budgets were slashed. "I just couldn't stay and see everything that we had built up over the years be destroyed," Hopkins explains.

He began his York career advising the dean of education on ways to change teacher education to better incorporate environmental and sustainable development concerns, and he continued to work his international connections. One of his projects is a research cluster – based at 35 universities in 33 countries, with York as the Canadian site – that is further developing guidelines on reorienting teacher education. Another is a UNESCO initiative to revitalize technical and vocational education around the world, building sustainability into the curriculum. He is particularly proud of the Sustainability and Education Academy (SEdA), a York initiative that he spearheaded. The academy brings together Canadian directors of education, senior superintendents, York professors and international experts to brainstorm ideas on promoting sustainable development in the public school system.

"We don't want to just add the subject to the curriculum," Hopkins stresses. "We want to learn our way into informed action, to see how the school system can model sustainable development through purchasing policies and environmental retrofits, and to share best practices."

Yes, It's Real

Jack McConnell knows the truth about climate change well.

BY DAVID FULLER

PHOTOGRAPHY BY KC ARMSTRONG

Ask Professor Jack McConnell for his opinion on climate change and you'll get a flood of stories about Arctic waterways, microsatellites, pollution and politics. This isn't surprising, coming from the principal investigator at York's Gordon G. Shepherd Atmospheric Research Facility, and McConnell happily admits to being a longtime proselytizer about the need for humans to clean up their act. "People always ask me, 'Is climate change real?' and I say, 'Yes, it's human-induced, you know.' Ten years ago they would say, 'Ah, you're stupid.' Now, it's beginning to seep in."

McConnell was one of 90 scientists from across the country, including three at York, who signed a letter to Prime Minister Stephen Harper in April 2006, calling for Canada to take a leading role in fighting global warming. For starters, McConnell says, the government could reinstate environmental monitoring programs cut by both Liberal and Conservative governments over the past 10 years. "They're saying things like, 'Ozone is not an issue anymore' and 'We know all we need to know about climate change'. Well, things change and you have to be sure you catch the change early enough," he explains.

Being able to monitor the atmosphere locally was one of the goals behind the addition of a new floor on top of the Keele campus's Petrie Building, where the research facility is located. Special roof hatches allow McConnell's colleagues in York's Centre for Research in Earth & Space Science to sample air quality and test new instruments. He and others in the Faculty of Science & Engineering are also proposing new projects to the Canadian Space Agency for satellite measurements of weather in Canada's Arctic, where climate change is melting the ice cap and fuelling concerns about pollution and sovereignty over waters that were once frozen Canadian territory. "There will be more and more ship traffic through the Arctic," McConnell says, noting one ship can produce as much pollution as a small town.

Although optimistic we'll come through this global crisis, where climate change is now measured in decades instead of centuries, McConnell admits he's still concerned. "I always get a little bit nervous," he says. "Things are happening a lot faster than some of the current models predicted."

Arctic Meltdown

Hydrologist Kathy Young finds summer snowbeds are beginning to disappear.

BY MARTHA TANCOCK

PHOTOGRAPHY BY KC ARMSTRONG

Kathy Young is no alarmist. When a rash of giant Arctic mudslides made the national news last fall as yet more proof of global warming, she wondered at the fuss. She'd seen something similar almost 20 years ago. "Just because it happens in one place," she says, "doesn't mean it's happening everywhere in the Arctic." Her perspective is resolutely unapocalyptic.

That said, the York hydrologist who has been studying Arctic wetlands for 23 years was taken by complete surprise last August when she made her annual research trek to Resolute Bay in Nunavut. Some "late-lying" snowbeds in the area – so massive they endure for decades – had disappeared. They'd shrunk over the past 10 years but, even after record high temperatures last July, Young never imagined they'd vanish.

"It's really shocking," says the 46-year-old professor, based in the Department of Geography, Faculty of Liberal Arts & Professional Studies. She spends precious summers studying such phenomena – and recharging her spirit – in the still, white beauty of Canada's North. "Snowbeds are really important because they keep wetlands saturated after the main snowmelt."

In a complex ecosystem like Polar Bear Pass, her current focus, the impact could be widespread and devastating. A lot is known about the flora and fauna but little about the hydrology of the 100-square-kilometre wetland cutting across uninhabited Bathurst Island, northwest of Resolute. In summer, this designated wildlife sanctuary blooms with sedges and grasses, arctic poppies and mosses and is home to foxes, wolves and lemmings. Here polar bears hibernate, caribou and muskox graze and migratory birds rest. Changes in water flow patterns and water storage are bound to affect plant growth and grazing patterns – though they haven't yet. Young wants to find out why. What happens here could happen in other Arctic wetlands.

She and her graduate students are carefully monitoring and correlating changes – by aerial mapping of ponds and lakes, sampling snowbeds and ground ice, and collecting data at four all-weather, polar bear-proof stations. So far, they've found that isolated ponds and small patchy wetlands may be drying up – but those whose water source is a nearby snowbed are persisting despite longer, warmer summers. So the state of the snowbeds is critical.

Young and fellow Arctic hydrologists will share their analysis with hunters and trappers in Iqaluit and Pangnirtung on Baffin Island when they visit for a "floating" conference next year. If the conference title – Hydrological Uncertainty – is any clue, nobody really knows what surprises lie ahead.

Theatre Thinker

Drama scholar Darren Gobert gets stellar reviews from students and peers alike.

BY MARTHA TANCOCK

PHOTOGRAPHY BY KC ARMSTRONG

Reprinted from April 2008

Darren Gobert misses New York City. So every couple of years he returns for his fix – directing a piece of experimental theatre he's fashioned from one of the classics. The York English professor can create quite a buzz in the Big Apple, as he did in 2002 when his cast brandished snarling chainsaws to chop down the orchard, symbol of czarist Russia, in his radical interpretation of Anton Chekhov's *The Cherry Orchard*.

The 36-year-old with spiky black hair and a designer wardrobe can create a buzz on any stage. His students give him glowing reviews – and so do his peers. Last fall, the drama scholar shared the spotlight on the academic stage with four other outstanding young Ontario researchers to win a prestigious, $20,000 Polanyi Prize. For good reason.

Only four years into his academic career at York, Gobert is about to knock 19th-century Russian Konstantin Stanislavsky off his pedestal as the acclaimed pioneer of modern method acting. Molière, Gobert will argue in a soon-to-be-published piece, pre-empted Stanislavsky by about 250 years. The 17th-century French playwright and director was encouraging his actors to build character from the inside out – drawing upon their emotions, memories and experiences – long before the Russian director came on the scene.

Molière's ideas likely stem from French philosopher René Descartes' revolutionary 1649 treatise *Passions of the Soul,* the first discourse on how emotions relate to mind and body. In an upcoming book, Gobert will trace how Descartes' understanding of emotions percolated through plays right up to the late Victorian period, when the psychoanalytic movement revisited his theories and interpreted them anew.

Meanwhile, Gobert, book review editor of the journal *Modern Drama,* has recently edited a special issue on contemporary British drama. He also plans to write a book on Caryl Churchill, author of Broadway hits *Top Girls* and *Cloud Nine* and his "favourite living playwright". And he'd like to write another about speech prefixes, those names in script margins that signal who speaks. This is no trivial pursuit. Over time, these prefixes have indicated characters, actors, roles (like the protagonist, or first actor, in ancient Greek plays) or been absent, as in plays by Gertrude Stein. So for Gobert they raise intriguing questions of identity.

Gobert grew up in a northern Ontario mining town and had no clue his life passions would be theatre and philosophy. The bilingual working-class boy had acted in amateur productions but, even after three delirious years studying drama, philosophy and literature at the University of Ottawa, thought his future lay in law. Not so, he soon discovered. He dropped torts at McGill University's law school, marched down the hill to the English department, found a mentor and started work on a master's paper on philosophical issues in 20th-century German drama instead.

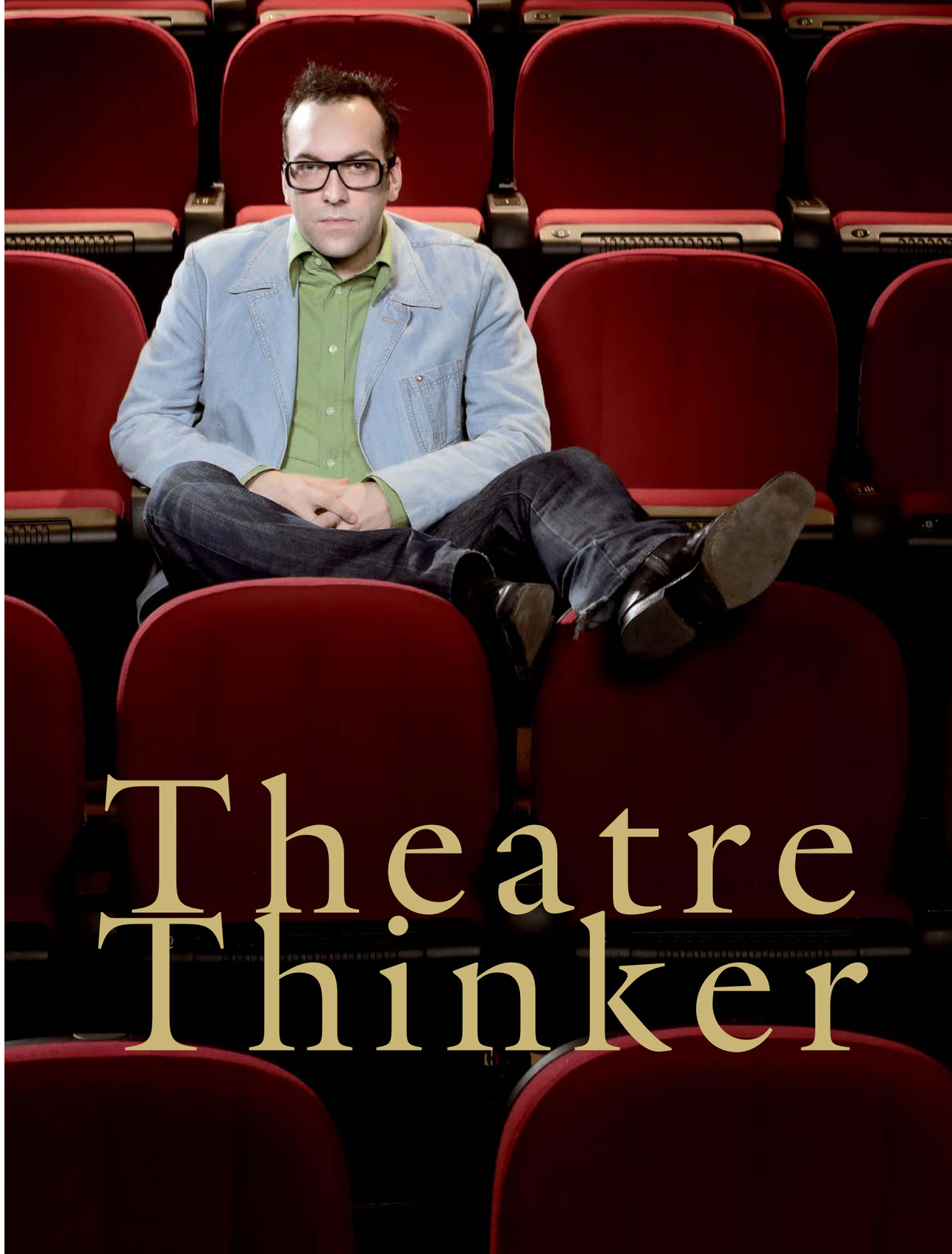
He'd finally found a way to blend his seemingly incongruous passions. "Suddenly I understood. I was interested in very abstract ideas but loved the practicality of theatre. I loved how everything immaterial becomes anchored in material conditions on stage. I wanted to throw myself into intellectual life but also into theatrical life. I wanted to pursue both at full throttle."

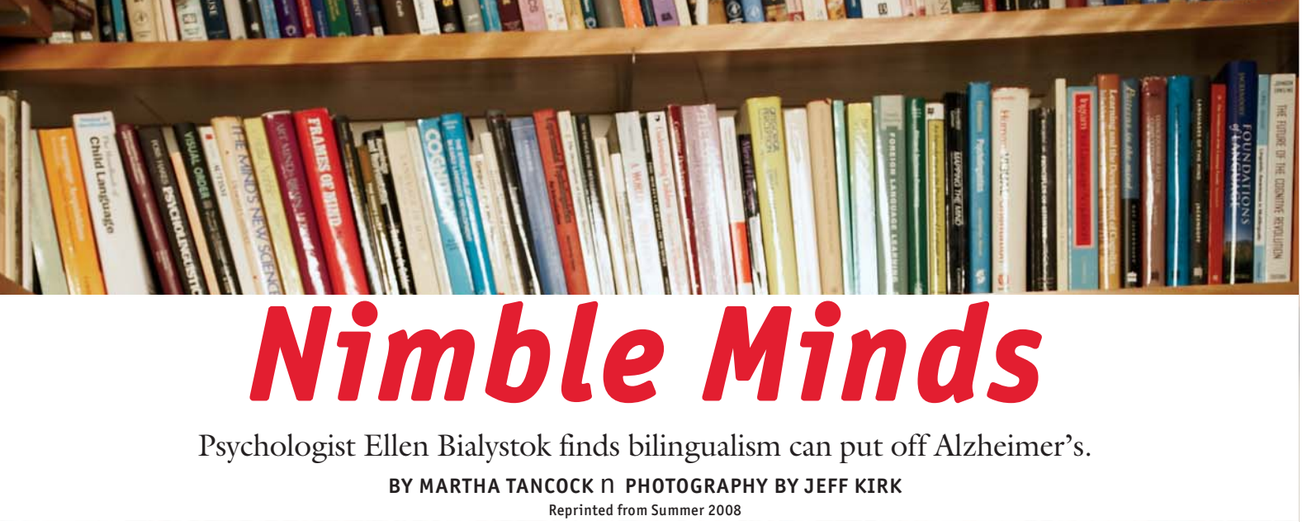
With an MA and a pocketful of scholarships, Gobert headed for New York. It was 1996 and he was 24. He would study comparative literature at Columbia University and immerse himself at the same time in the real world of theatre. "One of the things I love about New York is it rewards hustle. I was hungry for it." Within two years, he had formed his own company, A Jovial Crew, and was directing plays.

Eight years later, his PhD in hand, he landed a job in York's Faculty of Arts, grateful for the freedom to roam far and wide intellectually. Judging by posts on ratemyprofessors.com, Gobert is a hit on the teaching stage as well. Always interested in the broad narrative, he draws links between ideas and drama from ancient to modern times. "He makes every text absolutely sexy," said one student, who took his drama survey course. "Darren's lectures were like intriguing plays that also amaze!" said another. "Great reading list and hot outfits."

It's true. Gobert doesn't just deliver, he performs his lectures. Far from off-off-Broadway, he's found a captive audience in the 125 undergrads who take his drama survey course every year. Before each class, "I think as if I am writing a script – what's in the foreground, what's in the background, what's the grace note," says Gobert. "I try to make it clear in delivery and I always dress to match the subject matter." If he's teaching *commedia dell'arte,* for instance, he might wear a patchwork shirt and trip or drop his papers when he enters. Or he'll dress elegantly and talk formally when teaching Racine.

Students rave about the experience and give top marks to their "funny", "passionate" and "challenging" prof who learns everybody's name. Says one fan: "Taking a Gobert class should be a York prerequisite." Now that's buzz.





Nimble Minds

Psychologist Ellen Bialystok finds bilingualism can put off Alzheimer's.

BY MARTHA TANCOCK ∩ PHOTOGRAPHY BY JEFF KIRK

Reprinted from Summer 2008

IT'S HARD TO BELIEVE NOW, but up to the 1960s research suggested that bilingualism made you stupid. Now we know the opposite is true – thanks in no small part to psychologist Ellen Bialystok. The Distinguished Research Professor in York's Faculty of Health has made a career of proving that bilingualism makes you sharper. Speaking two languages is like going to "brain gym". It forces the brain to choose between one language and another and, in so doing, stays limber. From cradle to grave, it turns out.

Bialystok's pioneering work has made her a world authority on the subject. Every time she publishes a new study, she's tied up for days talking to reporters around the world. Especially in the last few years.

Early on, much of Bialystok's research focused on children. Under some conditions, she found, bilingual children learn to read faster and score higher in some kinds of cognitive tests than their monolingual peers. Now, as she examines how bilingualism affects cognitive aging, baby boomers entering their sunset years are taking note. In 2007, Bialystok published a high-profile study that found lifelong bilingualism can delay symptoms of dementia, including Alzheimer's disease, by four years.

More than one person has commented on how the real focus of her research is aging, laughs Bialystok. "What I'm really interested in is the continuity of mental life. We're not like snakes. We don't shed our brains and grow a new one as we age. We have to understand how the cognitive mind of a two-year-old becomes an adult mind and how it changes across the life span."

Bialystok never planned to be a leading researcher and respected authority on bilingualism. But, she says, "One thing led to another." Good at math and physics in high school, she "did what smart girls in Toronto did" in the 1960s. At the University of Toronto, she took sociology and philosophy because, she says, sciences were not really acceptable for girls. "I never bothered to think what my options were." In second year, she majored in psychology because she hated sociology. The Hall-Dennis Report of 1968 was about to radically change Ontario's educational system and Bialystok decided to join the revolution in public education. In 1976, she earned a PhD in language and cognitive development at the Ontario Institute for Studies in Education (OISE). But there were no jobs at universities, so she settled for being a research assistant in OISE's Modern Language Centre. She took charge of a project on second-language learning and six years later had a budding reputation in the fledgling field. In 1982, she landed a job in York's Psychology Department.

At first, Bialystok returned to her doctoral enthusiasms. How, she wondered, did children acquire literacy skills? Did they learn spatial relationships through words or objects? If they were learning two languages, were they aware of multilinguistic structures? She devised a grammatical test to find out whether children could recognize language structure – and got such surprising results, she couldn't resist exploring a new direction in her research.

Children were trained to recognize correct sentence structure, then asked to decide if simple sentences had the correct structure or not. Some sentences were correct but were nonsensical, like "Apples grow on noses." Bilingual children had no trouble recognizing the sentence as having the correct grammatical structure. But monolingual children couldn't get past the nonsensical meaning. Bialystok realized bilingual children could filter and ignore competing and irregular verbal information better than monolingual children. It was a light-bulb moment.

She remembered a 1962 landmark study at McGill University that showed bilingual children have better "cognitive flexibility" and spent the next few years proving it. Every time she gave a talk, though, people asked her if there were long-term benefits to bilingualism. By 2004, she had an answer. Middle-aged and elderly bilingual adults performed faster than their monolingual peers when given the Simon Test – an on-screen test that measures how fast they choose the correct answer among competing stimuli. Clearly, speaking two languages enhances mental performance – at all ages.

"To a person, journalists wanted to know if there were implications for dementia," remembers Bialystok. Last year, she came up with that answer. Lifelong use of two languages can delay the onset of symptoms of dementia by four years. She and her research team at the Baycrest Centre's Rotman Research Institute in Toronto examined the diagnostic records of 184 patients with cognitive complaints and determined that 71 was the average age that dementia set in for one-language speakers and 75 for two-language speakers.

Next question: Can bilingualism prevent dementia and Alzheimer's? No, says Bialystok, but it can reduce the rate of the natural decline of a person's executive processes – a set of cognitive abilities responsible for things like prioritizing tasks and focusing attention – after age 60. "A bilingual person with dementia or Alzheimer's can maintain better cognitive performance longer because bilingualism gives you a cognitive reserve, like a reserve fuel tank," she says. Bialystok is 59, when mild cognitive impairment – forgetting things – typically sets in for everybody. She's not bilingual either. However, she's quick to point out other ways to build your cognitive reserve – learning, reading, exercising (very important), socializing, solving cryptic crosswords. She does them all. She expects to keep digging into that cognitive reserve. "It's a very exciting field."

The Roots of Jealousy

Infant behaviour expert Maria Legerstee looks at how the green-eyed monster affects babies. **BY MICHAEL TODD**

PHOTOGRAPHY BY MIKE FORD

Reprinted from December 2008

ACCORDING TO an old Russian proverb, "jealousy and love are sisters." So perhaps it's reasonable to infer that this powerful feeling might arise in infancy, or at least have roots in childhood and family settings. A pioneering new handbook co-edited by York psychology Professor Maria Legerstee is devoted to unlocking the processes of jealousy's development. Interestingly, the book was sparked not by work with adults, but by Legerstee's own research with infants.

The Handbook of Jealousy: Theories, Principles and Multidisciplinary Approaches will present a complete picture of jealousy, dealing with its functions, origins and differentiation during infancy and childhood, says Legerstee. "It's a unique book, the first of its kind." Due in 2009, its 20 papers and three commentaries will chart how jealousy unfolds while also looking at the familial, cultural, cognitive and biological factors that drive its development.

Legerstee herself had never done any work in the area of jealousy before. So where did the idea come from? "It developed from the babies' responses in an experiment I had put them in," she says. "My research focuses on infant socio-cognitive development. That refers to the ability to understand other people. I use the infants' ability to communicate to infer what they know about people."

It's a topic the Faculty of Health professor, who has taught at York since she established the Centre for Infancy Studies in 1991, knows well. She is the author of *Infants' Sense of People: Precursors to a Theory of Mind* (2005), and co-editor of a special section of the journal *Infant Behavior and Development,* titled "What Does It Mean to Communicate for Infants?". She is also preparing to edit a new book on early socio-cognitive development.

Legerstee conducted her study on jealousy with 3-, 6- and 9-month-old infants. Each communicated with a female experimenter in three situations while the mother sat at their side in a triangle. In one situation, the experimenter communicated face-to-face with the infant in a normal, baby-friendly fashion. In another, the experimenter looked at the infant but was unwilling to communicate with it. Then, in two "unable" conditions, the experimenter first drank water from a bottle while looking at the infant and later was interrupted by the baby's mother, who began to talk with her to the exclusion of the infant. In all cases the experimenter was looking at the infant.

"What I wanted to know was whether infants would discriminate between the unable and unwilling experimenter. That is, does the infant differentiate between the different communicative motives of the woman?" explains Legerstee. "The infants reacted with more sadness and gaze aversions and less smiling when I was unwilling to communicate with them than when I was willing. However, the infants did not get upset when I was unable to talk because I was drinking. But when I was unable to talk to the infants because I was interrupted by their mother, and we began to engage in an energetic and vivid dialogue together to the exclusion of the baby, the babies got very upset."

Could this be jealousy?

Legerstee also discovered another curious phenomenon. While absent at a conference, she had student researchers try to replicate her findings with the infants and mothers. Reviewing the videotapes of the interactions later, she found her students had merely kept up a monologue with the mother (the student talked, the mother listened). Intriguingly, the babies were not upset. They merely watched the spectacle of the student talking to/at mom.

"I realized that here I had my experimental control," says Legerstee. "Infants reacted negatively to being excluded by their mother, but not when being excluded by a stranger. I had shown what the distinguished neuroscientist and psychobiologist Jaak Panksepp calls 'the affective precondition for the emergence of human jealousy, namely, the existence of a social bond that is threatened by the perceived intervention of a third party'."

Legerstee says some people might be cautious about calling the infants' response "jealousy" and feel that what she discovered could be more akin to "separation distress", a basic human social emotion and one of the foundational processes for human sadness. However, says Legerstee, "while separation distress is elicited in a dyadic situation, that is, a fear of being separated from mother, and jealousy involves a triadic one – a fear of losing mother to someone else – both may have the same root."

"But this is only a theoretical position," stresses Legerstee. "No one really knows for sure what's going on in the mind of a baby."

Nano Mechanic

Biochemist Gerald Audette is at the cutting edge – sometimes literally – of work with cellular proteins.

BY DAVID FULLER

PHOTOGRAPHY BY LINDSAY LOZON

Reprinted from Summer 2008

HE DOESN'T WEAR COVERALLS or skin his knuckles reefing on lug nuts, but you could call Gerald Audette a kind of high-end mechanic. He spends hours taking sophisticated machines apart to see how they work. The difference between Audette, a professor in York's Faculty of Science & Engineering, and those in the automotive fraternity is the size of the mechanisms they work on: his are microscopic – and alive. Welcome to the world of bionanotechnology, where lean protein machines are the stars inside your body's cells, meeting, greeting and passing on DNA in an endless dance that few have ever seen close up.

Using a process called X-ray crystallography, Audette and his lab team are making detailed studies of how proteins, the engines of cellular processes, work and how that might point the way to new methods of treating disease. By understanding the physical structure of proteins, Audette says, researchers can learn about processes such as how bacteria transfer DNA to other cells. Then they can design more specific drug treatments for cancer or the new superbug bacteria and viruses. "You need to know the nuts and bolts of what's going on," Audette explains, looking through his collection of 3-D protein portraits.

Audette's research was the basis for a successful $1.6-million joint application to the Canada Foundation for Innovation with York biology professor and fellow crystallographer Vivian Saridakis, whose study of a specific protein and its biological function requires the same equipment. The two found out in June last year that their proposal for an X-ray diffractometer, the first one at York, and a cryocooling system to keep their crystal samples safely chilling at -180 C had been accepted. "This brings us onto a level playing field with other researchers," Audette explains.

The method he and Saridakis use involves purifying a protein so it can be turned into a crystal that will reveal its component parts when X-rayed. By combining visual clues from the resulting images with computer models of protein structure, Audette can locate the individual pieces of hardware on each protein and discover how it physically transfers DNA to adjacent cells. "It's like building a 3-D puzzle and the image is our guide," says Audette.

Once scientists understand how proteins work, he explains, drugs can be developed to suppress or modify a protein's function and reduce cell damage from cruder, less discriminating drug compounds. The process can also help speed up the development of therapeutic drugs by eliminating a lot of trial and error. "By having a structure to guide our design, it allows us to rapidly zero in on what kinds of compounds we need to synthesize. Instead of screening 100,000 compounds, you're now screening a hundred," he says.

Like any mechanic with a creative flair, however, Audette wasn't content to leave the proteins the way he found them. He wanted to customize a few to see what would happen. As a post-doctoral researcher at the University of Alberta, he once suggested cutting a tail-like section off one protein, to see if it would help with a related problem of producing enough sample for study. The result was a classic "eureka" moment when he discovered the section rapidly began growing longer, much longer, after being cut. That set him on his second research path – developing biological nano "wires" or tubing that could replace carbon filaments used in the manufacture of nanotechnology. "Everything nano has carbon nanotubes in some variety or other," Audette explains. "The problem is, as we branch out into more biological applications for these things, we're finding that carbon nanotubes, which are made of soot, induce cell death – they are toxic. Our system is completely biological in origin."

His passion for science came naturally to Audette. As a boy in St. Albert, Alta., he helped his mother, a nurse, do blood-group testing. His father has a PhD in analytical inorganic chemistry and helped him find a place in graduate studies at the University of Saskatchewan in Saskatoon. His other passions, when he's not dismantling proteins, include the Japanese martial art of kendo – he's a third-degree black belt at his club in Mississauga – and playing with his young son. As an enthusiastic new faculty member (since 2006), Audette is equally excited to be at York in the early days of its degree program in biochemistry, launched in 2003. And once "Prairie Kendo Vagabond", as he's known to bloggers, gets all his new equipment installed, he can settle in to some serious tinkering in his tiny garage.

Believe It or Not

Barrie Wilson raises eyebrows (and a few hackles) with his interpretation of who Jesus was.

BY MICHAEL TODD

PHOTOGRAPHY BY MAJA HAJDUK

Reprinted from October 2008

Will York Professor Barrie Wilson's new book, *How Jesus Became Christian,* change the world or the face of Christianity or what people believe? Probably not, but that's OK, because Wilson would be happy if it simply opened a few minds. "There's lots in the book for people to get riled up about," says Wilson. "But at the same time I don't see it as a negative book."

In Wilson's view, Jesus, who was a devout Jew, a prophet and a powerful storyteller, had his brand of Christianity hijacked, changed and later peddled by another religious genius named Paul, with help from his excellent writer/PR man, Luke the evangelist.

Wilson outlines his take on how Christianity developed in a book that he says "isn't designed for an academic audience, but for the general reader." He tackles a central question of religious history, one that's so simple it's often overlooked: How did a young, well-respected rabbi become the head of a cult that bears his name, espouses a philosophy that he wouldn't have wholly understood, and possesses a clear streak of anti-Semitism against the generations of Jews who followed him?

Wilson, a professor emeritus of humanities and religious studies whose academic specialty is early Christian and Second Temple Judaism, writes: "Jesus was thoroughly Jewish. Mary, his mother, was Jewish and Judaism was the religion he practised throughout his life. Jesus' teaching focused on the important Jewish issues of the day…. But what happened? How did Jesus the Jew become a gentile Christ?" Wilson attributes some of what happened, and the distortions of that earlier faith, to Paul.

"Paul's movement or brand of Christianity was, I suggest, not rooted in the real teachings and sayings of the historical Jesus (interestingly, Paul never met him) but solely in Paul's personal mystical vision of Christ," says Wilson. "Paul established the new religion through anti-Semitic propaganda that ultimately crushed the Jesus movement. In essence, one of the world's great religions grew and prospered at the cost of another."

In the book, Wilson investigates the hypothesis that Christianity's origins are rooted in a colossal cover-up and that the original Jesus movement developed into the Ebonites – an early Jewish/Christian sect. Wilson argues that the original Jesus movement, led by Jesus' brother James, was eventually overtaken by Paul and his "Christ movement", which stripped Jesus of his Jewishness and de-emphasized his teachings. Paul catered to the God-fearers of his time, who were gentiles who admired Judaism but were leery of converting. Paul's Jesus as deified Christ, Wilson says, was in stark contrast to the earlier Jesus movement's Jesus, who was seen as a teacher.

"The book grows out of my interest in some of the puzzles of early Christianity," says Wilson. "How did the image of Jesus get changed? How did we go from the nice Jewish rabbi and teacher who was talking about the kingdom of God to something that 100 years later was radically different, in which we suddenly find Jesus being talked about as a divinity, as part of the Godhead? He's changed dramatically from a human teacher into a god who is worshipped. I take the fact that Jesus was Jewish seriously. I don't think a lot of my contemporary scholars do that."

Paul emerges as the ultimate religious innovator who invented a new religion and propelled it into its eventual prominence. In other words, the Jesus we know through the Gospels, Acts of the Apostles and other accounts is not the historical Jesus but a carefully constructed and embellished one.

"The discovery of the Dead Sea Scrolls 50 years or so ago opened up a whole new insight into a major Jewish group of first century BC and first century, along with some Gnostic writings found around the same time in Egypt," says Wilson. "Those finds gave us a new perspective on a different form of Christianity that we didn't really know much about. It was a form of Christianity that rivalled mainstream Christianity or what became mainstream during the second, third and fourth centuries."

Wilson, who converted to Judaism after he married his Jewish wife Linda 32 years ago, also investigates the tradition of Christian anti-Semitism and links it to the Jesus cover-up. He says he found that in the texts of the second century, early Christian leaders attacked every aspect of Judaism, vilifying the leaders, trying to rob the Old Testament or Hebrew Bible of its value and denying the Jewish concept of God.

"Everything that the Jewish heritage valued was either being spoken of derogatorily or else was appropriated by the new Christian movement. And out of this I made an interesting discovery as I wrote the book. I began to see the roots of early Christian anti-Semitism. The early form of Christianity lived in harmony with its neighbours with one minor exception. But when Paul comes on the scene, havoc is created. Everywhere he goes he stirs up trouble. People want to kill him. This man did something differently than Jesus' early followers said and did. The question is, why?"

For answers to that question readers may have to wait for Wilson's next book.

York's Stephen Gaetz helps explode myths about the homeless.

BY MARTHA TANCOCK ∩ PHOTOGRAPHY BY CHRIS YOUNG

Reprinted from October 2008

Home Truths

Were it not for the Sex Pistols, York education Professor Stephen Gaetz (MA '85, PhD '90) might not be crusading for an end to homelessness today. When the punk band burst upon the music scene in the late 1970s, it opened a tantalizing window on a defiant youth subculture that Gaetz, then a bored suburban Calgary student, found irresistible. His life changed forever when an anthropology prof at the University of Calgary let him write an essay about the band.

Anthropology, the young Gaetz realized, could take him in unusual directions. East to York University, first, where he expanded that essay into an MA thesis on punk rock, then across the Atlantic to do research for a PhD on marginalized young people in urban Ireland. "I knew from The Pogues and other British punk bands that Ireland had an interesting youth culture," says Gaetz.

On the gritty streets of Cork, Gaetz came face to face with the urban outlaws the Sex Pistols and The Pogues sang about. When he arrived in 1987, Ireland was an economic basket case, not the Celtic Tiger it is now. Cork reeled from the closure of its Ford plant and unemployment was high at 17 per cent – 60 per cent in public housing estates. The joyriding car thieves – and future subjects of his doctoral thesis – he hung out with wanted to know if he had a swimming pool like other "Americans" they saw on TV.

Cork cured Gaetz of a few biases. One day he interviewed a young tough called Seamus. "Being a middle-class kid from Calgary, I asked him, 'Do you want to get a job?'" "No," sneered Seamus, "I want to be on welfare. And when I grow up I'm going to raise my kids on welfare." The truth beneath the sarcasm was that Seamus was profoundly depressed, hated not being able to work and was bored out of his mind. "That was a big lesson for me: You have to understand where people are at," says Gaetz. "How you think about them affects how you work with them. They can tell when you're being disrespectful."

Seventeen years later, Gaetz returned to Cork and bumped into Seamus. The once surly, rudderless lad was a skilled operator at a chemical plant and coaching a local soccer team. "It was so affirming to know that all the young people we think are pathological losers who belong in jail, if they get a chance to work and feel included, become successful and contribute back to their community. It's all about respect."

Back in Canada, Gaetz finished his PhD at York, then left academe to help street kids. For seven years, he worked as a health promoter for the fledgling Shout Clinic, serving homeless youth in downtown Toronto. He also did some useful and groundbreaking research. Based on his study of oral health, Shout set up Canada's first free dental service for street youth. His research with Bill O'Grady, a University of Guelph sociologist, on the kids' money-making strategies led to the development of an innovative training program. The same study bolstered a campaign protesting then-premier Mike Harris's Safe Streets Act, which banned "aggressive" panhandling and squeegeeing. "Shout was an exciting place to be," remembers Gaetz. "It leapt into a leadership role in Canada."

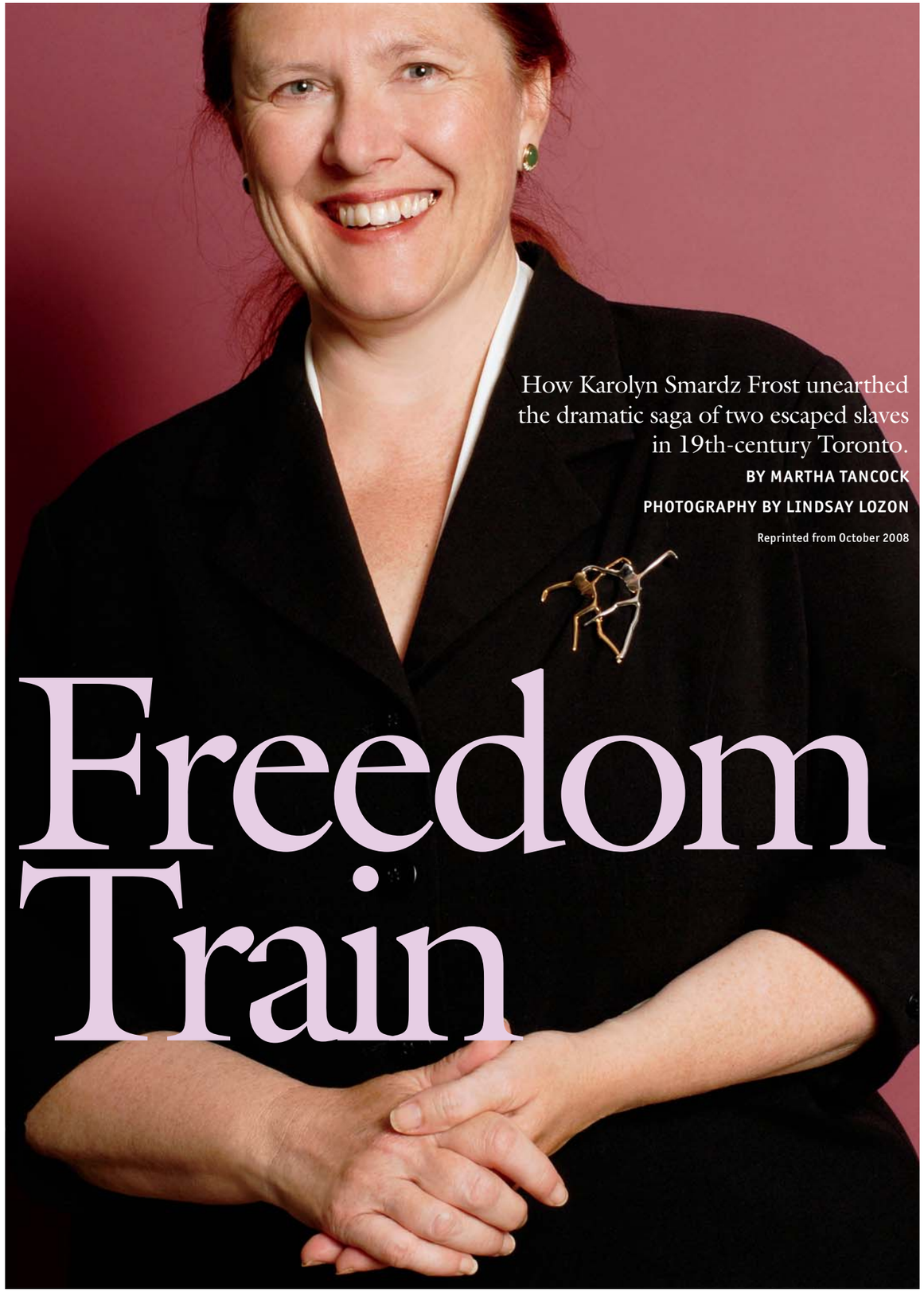
So has he. A researcher at heart, Gaetz left front-line service to join York's Faculty of Education in 2000. Since then the professor and associate dean has done more myth-busting studies with Guelph's O'Grady. They've found that remanding people in jail without bail produces homelessness, that squeegee kids and panhandlers would prefer real jobs, and that homeless people are more likely to be victims than perpetrators of crimes.

But, Gaetz wondered, who benefited from this research? Homelessness has worsened in Canada over the past 15 years, yet governments make no plans to end it and community-based agencies respond to it haphazardly. Research is fragmented among many disciplines and hard to find. "There has been no glue sticking it all together," says Gaetz. "This has become my thing. How do we mobilize research that will have an impact on solutions to homelessness?"

In 2005, the man with a mission invited front-line workers, government policy-makers and former homeless people to help him organize the first national conference on homelessness in Canada. It was a major success. "People were clear," says Gaetz. "They said, 'We need better access to research, we need to make research matter and we need to create stronger networks.'" So Gaetz, again collaborating with stakeholders, created and in 2007 launched a comprehensive Web site. The Homeless Hub is the world's first virtual research library, information exchange and networking centre on homelessness in Canada.

Then in May 2008, Gaetz received a whopping $2.1-million grant from the federal Social Sciences & Humanities Research Council to build a Canadian Homeless Research Network over the next seven years. The knowledge cluster will involve 15 researchers – six from York – at four Canadian universities and 13 partners, including municipalities and service providers from across the country.

Thanks to a 47-year-old punk rock fan, York now leads the charge to make homelessness research matter in Canada. "We've tried to bring people together for a conversation," says Gaetz. "Now, that conversation will happen."



Freedom Train

How Karolyn Smardz Frost unearthed the dramatic saga of two escaped slaves in 19th-century Toronto.

BY MARTHA TANCOCK

PHOTOGRAPHY BY LINDSAY LOZON

Reprinted from October 2008

If Karolyn Smardz Frost hadn't persuaded the Toronto District School Board to let her dig up the playground at Sackville Street Public School as an archeological education project in 1985, the world wouldn't be any the wiser about Thornton Blackburn. The "colored" cab owner listed in Toronto's 1856 street directory would have remained as invisible as the foundations of his little house buried beneath the schoolyard. And Frost, who teaches history at York, may never have spent the next 20 years digging up this fugitive slave's past and writing her award-winning *I've Got a Home in Glory Land: A Lost Tale of the Underground Railroad*.

When she started, the young archeologist with a master's degree in classics had only the barest of facts, gleaned from gravestones and an 1888 *Toronto Telegram* interview: Blackburn was born in Maysville, Kentucky, started Toronto's first cab company, died and was buried in Toronto with his wife Lucie and mother Sibby. Frost would soon discover how hard it would be to piece together the arc of this man's life. Illiterate and childless, he left no descendants or letters. "I was searching for a 19-year-old man known mainly by his first name who had been owned by Kentucky slaveholders called Smith and Brown," says Frost.

For years, she clocked tens of thousands of kilometres driving around Ontario and south to Kentucky, Michigan and Virginia, combing through deeds, wills, birth and death registers, newspapers and court records in libraries, municipal offices, churches and cemeteries. She interviewed descendants of slaves in Canada and of slave owners in the United States. She visited places where Thornton lived and worked, funding her forays with donations from private foundations and historical societies. Bit by painstaking bit, she assembled Thornton's life story. Along the way, Frost went back to university. "I earned a PhD in American history just so I could write this book."

From the opening scene, *Glory Land* tells a gripping tale. On July 3, 1831, Thornton and his beautiful wife Lucie, dressed in their Sunday best and carrying forged identity documents, waited for the ferry to take them on the first leg of their escape north to freedom. Caught and jailed in Detroit two years later, they sparked that city's first race riot when friends rallied to rescue them, then rowed them to safety in Upper Canada. Their infuriated owners filed for extradition without success. Not long afterwards, Thornton risked his only return to the US – to steal his mother Sibby out of bondage. For more than 50 years, the Blackburns flourished in Toronto and used their wealth to help refugees like themselves start anew in a free land.

Glory Land is the first biography of an escaped slave based on original research, rather than a first-hand account. The title comes from a verse in the Negro spiritual Do Lord. "Glory land" suggested heaven but came to mean Canada for freedom-seeking slaves before the American Civil War ended slavery in 1865. The Blackburns were among 30,000 American blacks who escaped to Canada, but whose story would surely have been lost without what *The New York Times Book Review* called Frost's "heroic research".

For Canadians, the book is an eye-opener. Canada's legal rationale for receiving refugees was first articulated to protect Thornton and Lucie Blackburn from extradition in 1833. "Every refugee has benefited from that decision," says Frost, former executive director of the Ontario Historical Society. "It's a piece of history every Canadian child should know." And who knew that Toronto was such an important terminus on the Underground Railroad, a lively centre of abolitionist debate where an unschooled Thornton could work with *The Globe* editor George Brown on antislavery committees? Or that blacks, more than whites, formed the network that spirited fugitive slaves to safety? "This book is an attempt to set the record straight about the Underground Railroad," says Frost.

Glory Land won the 2007 Governor General's Literary Award for Non-Fiction. Hailed for historical depth, the book also reads with "the breathtaking urgency of a thriller", wrote *The Boston Globe*. At its heart beats a love story. Thornton and Lucie were newlyweds who plotted their escape in haste before Lucie's new owner could sell her down the river at the fancy-girl auctions. "I hope and pray this enthralling – and true – story will go to film," says Frost.

Meanwhile, hooked on resurrecting lost tales, she is hard at work on *Steal Away Home,* a book about a lifelong friendship between a Southern belle and her black maid after the latter escaped to freedom during a trip to Niagara Falls. Still, Frost is not about to say farewell anytime soon to the Blackburns. Though busy teaching African Canadian history in York's Faculty of Liberal Arts & Professional Studies and involved with York's Harriet Tubman Institute for Research on the Global Migrations of African Peoples, she accepts all speaking invitations, from scholars in Cape Town, South Africa, to history buffs in Belleville, Ont. "I put too much effort into this to let it go."

Frost still wonders what Thornton and Lucie looked like. She's just waiting for the day when someone comes up to her after a talk and says, "My family knew the Blackburns. Would you like to see a photo?" That would be hitting pay dirt for the archeologist who dug up a remarkable story that could have remained buried forever beneath the trampled playground of Sackville Street Public School.

The Snows of Mars

MOMENTOUS: Artist's rendering of Phoenix lander on Mars with York-designed instruments

York's decades of involvement in space pay off with a groundbreaking mission to the red planet.

BY DAVID FULLER

Reprinted from February 2009

A **YORK SCIENCE TEAM** made headlines around the planet in September 2008 with a simple weather report. The bulletin, delivered by Professor Jim Whiteway of York's Department of Earth & Space Science & Engineering, was short, to the point and historic – it snows on Mars. "Nothing like this view has ever been seen," Whiteway said at a NASA briefing as he described an image captured by a York-designed instrument on the Phoenix Mars Lander. But his use of that one wintry word quickly caught the attention of the world's media. "I didn't think to call it snow," says Whiteway, a professor in York's Faculty of Science & Engineering, recalling how he was convinced by NASA staff to forgo his usual term "precipitation".

The announcement was momentous for scientific reasons but also for York's long-established space program, a leader in Canada. The instrument, known as a lidar (laser radar) and developed by Professor Emeritus Allan Carswell, allowed the York team to "see" the streaks of white stuff falling from clouds about three to five kilometres above Mars' polar region. It was an event 40 years in the making for the team, which also included Professor Peter Taylor, late Professor Diane Michelangeli and York research associates and graduate students, as well as personnel from the Canadian Space Agency, Natural Resources Canada, MDA Corp., Optech Inc., Dalhousie University and the University of Alberta.

The story actually began in 1968, when Carswell, an expert on lasers at Montreal's RCA Victor Research Laboratory, accepted an invitation to join York's science faculty from Professor Ralph Nicholls, distinguished research scientist and founder of the University's Earth & Space Science Program. By 1974, Carswell's research led him to set up a technology spinoff company, Optech Inc., which is now a world leader in

applications of lidar technology. Among the students Carswell introduced to his techniques was Whiteway, who came back to York after six years in Wales to expand his work on Earth-based lidar systems into models that could fly in space.

When he arrived at Toronto's Pearson International Airport in 2003, Whiteway picked up a newspaper from the seat of his taxi and read about York's successful bid for a role in the Phoenix project. Within days he was immersed in an undertaking that would dominate his life for five years and lead to the launch of Phoenix on Aug. 4, 2007. Tragically, it was just a few weeks after the launch that his colleague Michelangeli, an expert in atmospheric computer modelling and the original team leader, died of cancer after having worked on many of the essential parameters for the mission. Taylor, meanwhile, was a former researcher at Environment Canada whose experience studying winds in the Arctic and other exotic locations made him a natural choice for the project. "I never thought I'd be doing weather on Mars," he says.

SUCCESS: Phoenix on Mars

"When the lidar worked, I was doing cartwheels around the room."

After hurtling through space for 10 months and making a tension-filled seven-minute descent, Phoenix landed on Mars' arctic plain on May 25, 2008, ready to start a three-month study of dirt, dust and, perhaps, water – the primary object of the $450-million mission that could help answer the question of whether life had ever existed on Mars. The successful touchdown touched off a classic NASA celebration of the kind that Whiteway had planned to avoid when his big moment arrived. But on day three, when the lidar was switched on for the first time and began transmitting data, that all changed. "I was kind of joking with the team saying, 'No emotion, we're professionals'," Whiteway recalls, "but when the lidar worked, I was doing cartwheels around the room."

Carswell, who was present for the landing and the initial use of his lidar equipment, says he almost lunged at the computer screen when he first saw the results. The sense of relief was made doubly sweet, says Whiteway, by the fact that the sensitive equipment, which even NASA admitted was the most challenging and "high-tech" instrument on the mission, almost didn't make it to the launch pad in time. "We were having some problems – the deadline for launch was very firm and we were coming up against it." But he says the team drew on its years of experience preparing lidar for use on ships and airplanes in both the Arctic and the tropics to get it delivered on time. It was that kind of expertise that first drew the mission's principal investigator, Peter Smith of the University of Arizona, to call on Carswell and his team back in 1999 for an earlier project that was cancelled after the loss of the Mars Polar Lander, and again when a revived project was mounted two years later – hence the name Phoenix.

With celebrations over, the York team carried on charting Mars' air pressure, temperature and cloud formations for the next five months, much of it while living on Mars time, which adds an extra 40 minutes to each day. "If you work until midnight on the first Monday," Whiteway explains, "by the following week, you're up until 5am." The sleep deprivation caused by the time change and long hours only intensified the group's fears that Martian dust devils and freezing temperatures could still throw the lidar's precision parts out of alignment. The first observation of snow came on Aug. 15, 2008 but it wasn't until early September, on the 99th sol, or Martian day, that a second set of results confirmed it was snowing. The projected end of Phoenix's three-month mission had just passed. Yet that's when things got interesting, says Taylor, who went to Tucson for the final month of the mission. "The most interesting meteorology happened in the last 30 to 40 days," he says. During this time, the team started seeing more dust devils as the winds and cloud cover increased and temperatures began to plummet to as low as -95 C. Meanwhile, the University of Arizona team working Phoenix's digging claw and soil analyzers were able to confirm that Mars' polar surface consisted of water ice and not frozen carbon dioxide.

On Nov. 2, 2008, when Phoenix's solar-powered batteries failed and it stopped communicating with two satellites orbiting high above the planet, its performance had surpassed expectations. The scientists had confirmed that, even if it's a frozen sheet the size of the Mediterranean and covered in dirt, there is water on Mars and some of it falls from the sky. "That, to me, is profound," says Whiteway. "It's not that long ago that with Mars, the question was 'what happened to the water?' We know now."

With the mission officially concluded – although some optimists hold out a faint hope that Phoenix, like its namesake, will rise again at the end of the year-long Martian winter – the York crew, along with teams from the US, the UK, Denmark and Switzerland, began analyzing the data for journal articles and a series of conferences in 2009. But, some may ask, was discovering snow and ice on a distant planet worth the trouble and expense? "I'm biased," says Whiteway, "but when you're going somewhere and you find something that changes the conception of the evolution of that planet and our solar system, I think that's money well spent."

ILLUSTRATIONS COURTESY OF NASA

An Early Start

Undergrads are getting involved in important research

Reprinted from October 2008

BETTER NAVIGATION: A Canadian Forces search & rescue helicopter in action

PHOTOGRAPHY BY MCPL KEVIN PAUL; CANADIAN FORCES PHOTO

SURVIVORS OF remote airplane crashes, diabetics and those suffering from degenerative eye conditions are among the many who could benefit from research being done at York University – by undergraduate students. The students work as interns with faculty members, graduate students and other researchers, thanks to innovative scholarships.

"Getting introduced to research early on is a key motivator for young scholars," says Stan Shapson, vice-president, research & innovation. "These awards help create tomorrow's research leaders." Students become full members of their respective teams, conduct independent research, publish papers and attend conferences, all while completing their bachelor degrees.

"I don't think I would have applied for a master's before this experience," says Giulia Uguccioni, a former Dr. James Wu research intern. Uguccioni, 23, investigated the importance of the PGC-1alpha protein to our bodies' health. Study of the protein, which is prevalent throughout the human body, especially in muscle, may lead to a better understanding of the impact of exercise and how diabetes develops. Uguccioni graduated with a bachelor of science degree in 2007, and is now pursuing her master's in science, working in the same lab.

Abdullah Merei, 22, has had a similar positive experience. In his fourth year of a computer engineering degree, the Mary and Hubert Lynch research intern says his experience has encouraged him to consider graduate studies. He is working on a project to develop an advanced navigation system that will help helicopter search & rescue missions reduce their search time and increase their probability of success.

Many undergraduate researchers were volunteers first. "When I was volunteering in the physics lab it was great; but in the back of my mind I was always worrying about how I was going to pay for tuition," says Dominik Swierad, 21. "These scholarships take that worry away and let me focus on my work." The awards are renewable until the student's graduation.

In 2007, Swierad, a computer engineering student, received a Lynch Internship and began working on virtual reality projects. Using the immersive visual environment at York, easily imagined as a precursor to *Star Trek*'s holodeck, Swierad helps with several studies on how visual defects can affect everyday tasks such as driving and locating objects in a room. These experiments promise to help with the diagnosis, management and treatment of glaucoma and other visual conditions.

Based on the tremendous success of these initial internships, York University is working to establish additional awards for students of all disciplines. Donors at all giving levels can help. For more information, contact Shirley Freek, associate director and chief development officer, research & innovation, for the York University Foundation, at 416-650-8210 or sfreek@yorkfoundation.yorku.ca.

PARADISE LOSING

In an excerpt from her influential book, *Silence of the Songbirds*, a York biology professor writes about the tragic decline in songbird species – and what we can do to help fight it.

BY BRIDGET STUTCHBURY

PHOTOGRAPHY BY KC ARMSTRONG

Reprinted from October 2007

BIRDS WERE AMONG nature's delights during my childhood, but they were not the stars of the show. Visits to the cottage were a kid's dream, filled with swimming, canoeing, and building makeshift forts in the woods. During games of hide-and-seek I shrank into the ground, breathing in the tangy scent of pine needles, and passed the time watching whirligig beetles clumsily rowing into each other, blue damselflies dancing an aerial ballet over the water, and spiders doing tightrope walks. My family would gather at the living-room window to admire the imposing figure of the great blue heron standing on his rock or when someone spotted a merganser duck and her fluffy brood bobbing in the waves along the shoreline. On crisp fall mornings, loud and insistent honking sparked a stampede to the dock, where we counted the low-flying geese as they headed south one squadron after another. I don't remember paying much attention to the little songbirds that nested in the blueberry bushes, cedars, and pine trees. The red-eyed vireos, song sparrows, and yellow-rumped warblers went about their business year after year despite three noisy kids and a dog that invaded on weekends and summer vacations.

Little did I know that songbirds would lead me on a life of discovery and adventure, from dodging surprised rattlesnakes in the desert of Arizona to dodging aerial bombardment by angry howler monkeys in the tropical rainforests of Panama. The gateway to my passion for these feathered jewels began with the graceful swallows, though my own interest was in their fierce battles for nesting cavities. As an undergraduate student, my summer home at a field station in southern Ontario was also home to dozens of nest boxes that were lined up row after row in several different hayfields, each one with a vigilant tree swallow perched atop or flying nearby. Shiny blue backs glittered in the sun as the bickering swallows circled their boxes like little fighter jets, scolding and chasing intruders that dared to come too close. The nest boxes are so valuable that both males and females have knock-down, drag-out fights with the desperate stragglers that arrive later in spring and have no place to breed. Once, during nest checks, I opened the door of a box to find two females fighting so intently they did not even notice the giant face peering in at them.

I studied the swallow battles for several years and earned a master's degree, but this was not enough for me. I was hooked for life on the challenge and satisfaction of posing questions of nature and devising ways to work out the answers. My PhD at Yale University in the late 1980s was on another swallow, the purple martin, though this time I wanted to know how young males finesse their way to home ownership among older males who control all the nest cavities.

I got to know tree swallows and purple martins intimately after holding dozens in my hand and spending hundreds of hours watching them at their nesting houses. But until the end of my PhD, I had barely given a thought to what their lives were like *after* they left their breeding grounds. My outlook changed forever when I was invited along on a field trip to Brazil with the Purple Martin Conservation Association and Dr. Gene Morton, a senior scientist at the Smithsonian Institution's National Zoological Park – and, as it turned out, my future husband. After a gruelling day of travel in early February, we ended up in southern Brazil at a small lodge in the Itatiaia National Park sipping a well-earned *caipirinha,* the national drink. The next morning I sat on the patio taking in my first look at wild toucans, parrots, and other exotic tropical birds. But we were there to study martins, not bird watch, so after breakfast we began the long drive to the busy town of Ribeirão Preto in the state of São Paulo. We needed to find the park in the centre of town where martins slept at night by the thousands, so our driver pulled up to a group of men standing by the side of the road.

In his rough Spanish, Gene told them we were looking for the swallows, or *golondrinas.* Amid wide smirks, winks, and knowing looks, they gave us the directions. Our Brazilian driver laughed and explained that *golondrina* was the local nickname for the prostitutes who, like the martins, congregated in the park at night. This seemed like such a foreign world to me, yet it was just as much a home for purple martins as the familiar nesting houses I had studied thousands of kilometres away. The next year I worked with Gene at the National Zoo and began a study of hooded warblers on their wintering grounds in Mexico, and we married a few years later, after I took on a faculty position at York University, in Toronto.

Over the past decade our family has lived a migratory lifestyle of our own while studying birds, dividing our time between our suburban home north of Toronto, our old farmhouse in northwestern Pennsylvania, and the tropical forests of Panama. Our children are growing up with parents who net and band birds in the backyard, raise dozens of Promethea silk moths on the screened-in porch, and drive around town with an antenna on the roof of the minivan listening for radio-tagged purple martins. Their patience is sometimes pushed to the limit when they run away from the picnic table yelling

"Bee!" while I calmly explain that the offending creature is a *wasp*, not a bee.

I have spent my entire adult life studying and enjoying birds, taking for granted that they will be there for future generations to do the same. When I did my graduate work on tree swallows, the alarm bells were not yet ringing, and one heard very little about disappearing songbirds. Times have changed though, and now we have a long list of North American migratory songbirds that are disappearing at a frightening rate. Wood thrush, Kentucky warblers, bobolinks, and the eastern kingbird are among the victims. By some estimates, we may have already lost almost half the songbirds that filled the skies only 40 years ago. The threats are almost too many to count: destruction of wintering habitat, pesticides, cowbirds and other predators, light pollution, and poor breeding habitat are among the problems birds face.

In many ways we live in a fantasy world, consuming resources on our planet with abandon and ignoring the realities of how ecosystems really function.

The early warning cries of the songbirds suggest that their enormous migration, even bigger in number and scale than that of the extinct passenger pigeons, is now at risk. If we could change the natural world enough to wipe out billions of passenger pigeons, it is not out of line to think that we are able to inadvertently cripple songbird migration. We can put a man on the moon and send an e-mail to the other side of the planet in a blink of an eye, but we can also burn a hole in the ozone layer, send our pollution across oceans and disrupt climates around the globe.

We are seeing dramatic songbird declines around the world, not just in North America. In Britain a wide variety of songbird species have suffered enormous losses in numbers since the 1960s, including a 95 per cent drop in tree sparrows and an 80 per cent decline in corn buntings. The possible causes are as varied as for North America: loss of wintering habitat in the tropics, loss of breeding habitat, exposure to pesticides, climate change, and increased predation pressures. On the other side of the globe, extensive loss of woodlands in southern Australia has meant that once common songbirds, like the hooded robin and brown creeper, are now missing from whole regions. There is good evidence of population declines of many other species, and some ornithologists predict that unless drastic changes are made, the country will lose half its land birds over the next century.

IN THE PAST FEW DECADES the environmental crisis has grown from the confined problem of extinctions of individual species to a full-blown global biodiversity crisis. We are losing entire groups of animals and plants, not just one species at a time. The migratory songbird declines are not limited to just a handful of unlucky birds; instead, dozens of species are in a chronic downhill slide. They come from every walk of life: grassland birds as well as forest birds, birds that spend the winter in Mexico and those that go all the way to Argentina, insect eaters and fruit eaters, those that breed in the far north and others that prefer the southern states. Their common decline tells us that our environmental problems are sweeping in scale, large enough to affect birds as they travel across two continents.

The scale of biodiversity loss is so huge today, and includes such plummeting numbers, that we risk losing the general basic services that sustain ecosystems. Although fewer than two per cent of bird species have gone extinct in the past 500 years, by some estimates the total number of birds has dropped by 20 to 30 per cent. In the coming century, roughly 30 per cent of birds and mammals worldwide will be threatened with extinction or will become so small in number that they are functionally extinct. Their jobs as pollinators, fruit-eaters, insect-eaters, scavengers, and nutrient recyclers will not get done, and this will disrupt ecosystems and affect everyone on the planet.

Birds are not just bio-indicators of environmental change; they are nature's blue-collar workers, helping to sustain the environment that we share with them. The planet's ability to cope with increasing carbon dioxide levels depends in large part on the health of our forests; healthy forests will soak up more carbon dioxide and buy us more time to get our carbon emissions under control. Birds are intimately tied to the health of forests, and vice versa. Tropical deforestation is cutting migratory bird populations off at the knees; they are losing their best wintering habitat and suffer lower survival and often longer-term consequences too, like delays in migration and lower breeding success. Tropical deforestation also has a hidden cost: it forces migrants out into agricultural landscapes where they find less food and are likely to encounter deadly pesticides. Migrants connect the ecosystems of the tropics and the northern forests; their own healthy populations depend on both, and so do our human populations.

In many ways we live in a fantasy world, consuming resources on our planet with abandon and ignoring the realities of how ecosystems really function and support life and human society. How can the vicious cycle be broken? The global problems of overpopulation, overconsumption of natural resources, broken ecosystems, rising temperatures, and increasing world poverty

seem inevitable and overwhelming. Even solving one part of the problem, the collapsing bird-migration system, seems insurmountable. Consider all the environmental roadblocks birds face during their journey: tropical deforestation, lethal pesticides, loss of important habitat used for migration, cats, colliding with buildings and towers, and, as if all this was not bad enough, loss and fragmentation of their rich breeding grounds.

Yet there is hope for migratory birds and the state of the planet. There are simple actions we can take every day that will help to promote a healthier world for birds, for ourselves, and for our grandchildren (see table below). We can help our migrants find safe winter homes by buying shade coffee as well as bird-friendly produce like organic pineapples and bananas. To help save the boreal forest, North America's bird nursery, we can buy "green" paper products made from recycled paper and wood products from forests that were harvested sustainably. It is so easy! People living in major cities can turn their lights out at night, and everyone can keep their cats indoors and ask their neighbours to do the same. Our day-to-day choices add up to an enormous ecosystem boost for birds and other wildlife.

Birds are worth saving, not just for practical reasons but because they are a fascinating window on nature and the history of life on earth. They teach us how the natural world works at its most basic level. Inside their bodies, migrants are fine-tuned flying machines that can navigate precisely over thousands of kilometres without the benefit of electronic wonders like Global Positioning Systems. Their internal clocks tell them when to breed and when to migrate, and trigger precise hormonal changes that affect their entire bodies from head to toe to match the change in seasons. Over many thousands of years songbirds have shaped the natural world around us; trees make fruit and flowers for them, insects hide from them, and predators hunt them down. Songbirds are beautiful to see and hear, and their fascinating behaviour reminds us of our own lives: moving to a new home, finding food, choosing partners, and the challenges of raising children.

How You Can Make a Difference

WHAT TO BUY OR DO	WHY
Buy shade coffee or sustainable coffee that is organic and fairly traded	Increases tropical forest habitat for birds and other wildlife; conserves soil; provides fair profits for farmers; fewer pesticides in environment
When buying produce from Latin America, such as bananas and pineapples, choose organic when available	Reduces the amount of dangerous pesticide use in the tropics; fewer birds killed; safer for farmers and consumers
Buy organic, or avoid altogether when possible, the North American crops that pose the greatest risk to birds: alfalfa, Brussels sprouts, blueberries, celery, corn, cotton, cranberries, potatoes and wheat	Reduces the amount of dangerous pesticides in the environment; fewer birds killed; safer for farmers and consumers
Buy wood and paper products that are certified by the Forest Stewardship Council	Increases amount of forest being logged sustainably and responsibly; better habitat for birds and a healthier forest
Buy disposable paper products (toilet paper, paper towels, tissues) that are made from recycled paper and that are not bleached with chlorine	Reduces logging pressure on forests; increases habitat for birds; creates less pollution
Turn off the lights at night in city buildings and homes during peak migration periods	Fewer birds killed and injured by hitting buildings; saves electricity
Keep your cat indoors	Fewer birds killed; healthier and longer lives for pets

THE ART SHARKS

Schulich's Don Thompson paints the high-priced contemporary art world with a marketing brush.

BY MICHAEL TODD

PHOTOGRAPHY BY JEFF KIRK

Reprinted from Summer 2009

ART LOVER, if you bought a stuffed shark by contemporary British artist Damien Hirst as an investment ($12 million in 2003), you might want to take it back. Why? Well, according to Don Thompson, professor emeritus of marketing at York's Schulich School of Business, buying contemporary art as an investment is a mistake.

Thompson himself collects because he genuinely loves art and art auctions, but he says he's always been curious about how art is priced. He notes that when Hirst sold his first shark in 2003, it was the second-highest amount ever paid at that time for a work by a living artist (a work by Jasper Johns was tops). "When someone asks me, 'Why is that work worth $10 million, and who determines which one-thousandth of one per cent of artists become stars?', I realized I had no idea," says Thompson. "Nor did any of the existing literature answer it. So I hope my book is the answer."

That book is *The $12 Million Stuffed Shark: The Curious Economics of Contemporary Art* (Doubleday Canada, 2008). To research it, Thompson spent a year at auction houses in New York City and London talking to dealers, artists and specialists at high-end auction houses such as Sotheby's and Christie's. His mission was to make some sense (if it could be made) of why some contemporary art fetched stratospheric prices. "I think one thing that perplexes people – myself included – is, who are the gatekeepers who influence which artists will make it to the level of the Hirsts and Jackson Pollocks and Jeff Koons of the world, and which won't? Secondly, why are pieces worth 10 or 100 times what I think they should be worth?"

One curious aspect of contemporary art pricing is that a piece's price isn't based on scarcity or the fact that the artist is no longer living. Hirst, for instance, is still very much alive and has produced (and sold) nine of his shark pieces. They are all virtually identical.

"These guys are still producing! So why do works sell for five or 10 million?" On the other hand, scarcity does play a role in the pricing of important historical, Impressionist and modern art, says Thompson – buyers fear that no other work like it will come up again during their lifetime. Thompson limited his study to contemporary works which, he says, "typically refers to art created after 1970."

Thompson's book is an in-depth, behind-the-scenes exploration of the way the contemporary art market functions – how auctions are organized by the name auction houses, how art is priced, and the role galleries and dealers play in the pricing and marketing of artists like Damien Hirst.

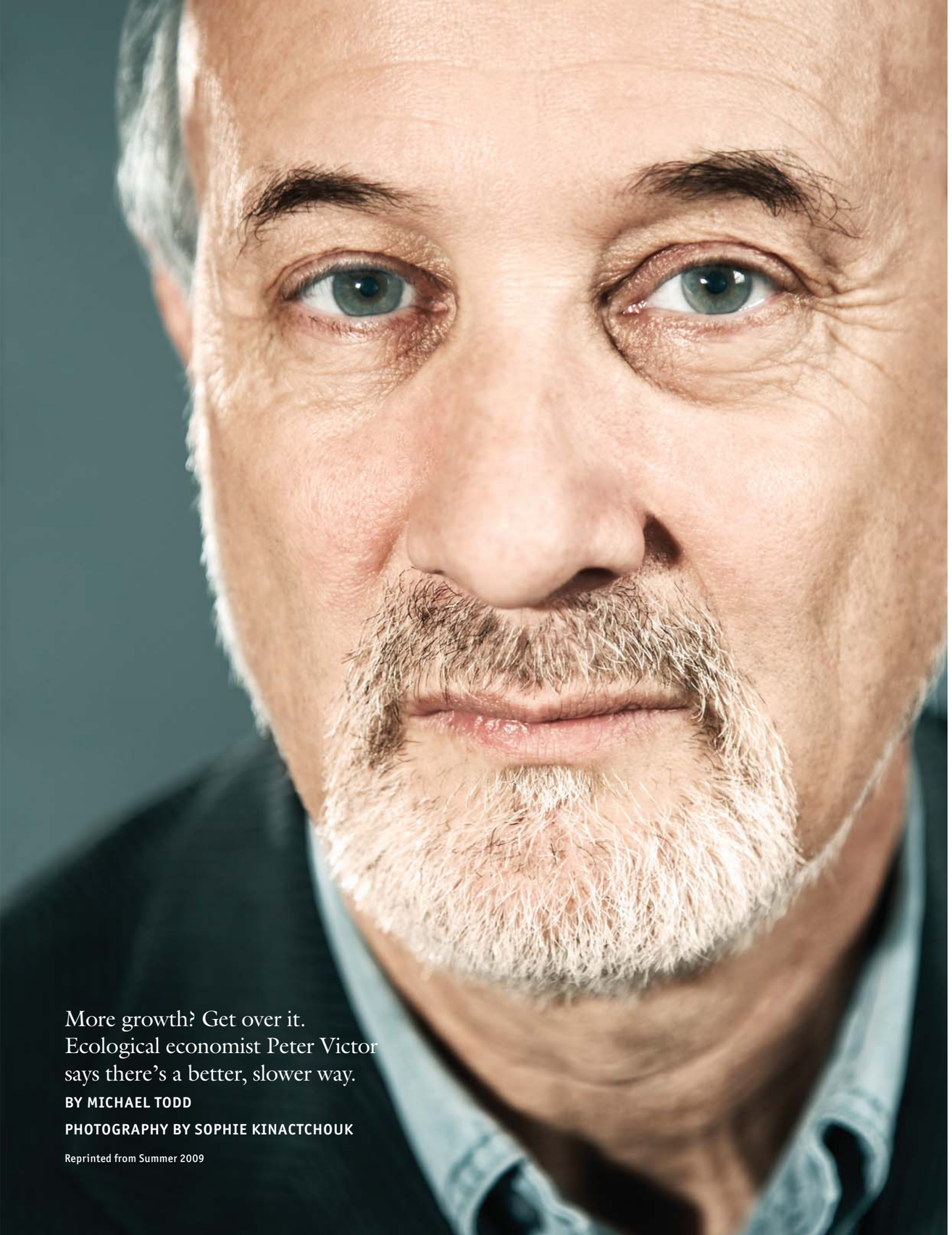
"Hirst is probably the richest and best-known contemporary artist in the world," says Thompson. "In the 1990s he came up with the concept of the shark as a contemporary symbol for the times. He said the shark looks 'dead when it's alive and alive when it's dead'. For him it represents that space between life and death." Hirst had an Australian fisherman catch the shark, pack it in ice and ship it to the UK. On its arrival the artist had it taxidermied and mounted in a tank of formaldehyde. "Hirst didn't catch it or mount it but he conceived it – therefore he is the artist, and that's at the centre of conceptual art," says Thompson. The embalmed shark – titled *The Physical Impossibility of Death in the Mind of Someone Living* – currently resides in New York's Metropolitan Museum of Art where it is the single most viewed object in the museum's collection.

"Hirst went into shock/conceptual art more than most but he wasn't alone – he's just the best known," says Thompson. The difference, he argues, between Hirst and his lesser-known contemporaries is that Hirst and his manager are the smartest art marketers in the world. But is Hirst the "best" artist? "I couldn't say," says Thompson. "I'm not an art critic. My conclusion is that marketing may be as important in contemporary art as artistic skill."

Hirst is a top brand, which is why he can charge what he does. "Very often you are buying what an adviser, dealer or auction house specialist tells you will establish you as a cultured and cutting-edge collector," says Thompson. "And the branding part – branded artist, branded dealer – protects you from your friends not having proper respect for what is now hanging on your wall. Branding offers risk avoidance and trust."

One thing Thompson learned is just how rich really-rich people are. "For the buyer of the stuffed shark, the $12 million purchase price represented four-and-a-half days' income," he notes. "This is what characterizes the upper reaches of the contemporary art market – a lot of collectors who are really rich." And if you aren't among the super wealthy and still want to collect? Well, just don't delude yourself that your latest purchase will fund your retirement. Says Thompson: "Buy it because you love it, or because it touches your soul, but don't buy it as an investment."

The G-Word



More growth? Get over it. Ecological economist Peter Victor says there's a better, slower way.

BY MICHAEL TODD

PHOTOGRAPHY BY SOPHIE KINACTCHOUK

Reprinted from Summer 2009

HOW MUCH IS TOO MUCH? How do we know when to stop? What will happen if we don't? And what, if any, are more sustainable alternatives to past economic growth policies? These are some of the questions around the "G-word" that economist and York environmental studies Professor Peter Victor contemplates daily (and did so long before the current economic crisis). Victor, an ecological economist, defines himself as "an economist who understands economies not as stand-alone systems, but as subsystems embedded in, and dependent upon, the biosphere."

Victor lays out his take on growth in detail in his newest book, *Managing Without Growth: Slower by Design, Not Disaster* (Edward Elgar Publishing, 2008). He conceived of "economies as subsystems of the biosphere" years ago. It all began when he was working on his PhD at the University of British Columbia in the late 1960s. His research from that time was later published as a book with the title *Pollution: Economy and Environment* (1972). "At UBC I got caught up in the environmental movement and my PhD research gave me the opportunity to break new ground. I remember the literature review in my thesis covered only three papers – there was so little written on this then."

Victor's work on slow/no growth dates back to 2001 when he got a call from his old thesis supervisor Gideon Rosenbluth (now in his 80s and still going strong) to collaborate on research about growth and the environment. "We settled on the question of whether it is possible to have full employment, eradicate poverty, maintain fiscal balance and protect the environment without economic growth," says Victor. They published several papers and then Victor decided to embark on his book in 2006 with Rosenbluth's encouragement.

In the book, Victor doesn't advocate a knee-jerk reaction to economic crisis so much as a thoughtful approach that will carry us through decades to come. How? By choosing green over brown-based economies, he says. "The burden placed on the biosphere by global economic growth since the end of World War II is simply unsustainable," says Victor. "A better approach would be to deliberately manage the economies of developed countries on the basis of little or no growth."

It's not a matter of quitting the production/consumption model cold turkey. Instead, he says, rich countries need to gradually reduce their dependence on growth in the long term. According to Victor's research and systems modelling, an economic slowdown could be achieved without sacrificing prosperity. If the economic growth rate, as measured by increases in gross domestic product, was deliberately slowed, even to zero, between 2010 and 2035, Victor says, Canada could continue to provide enough jobs and revenue to fund government services and dramatically reduce poverty and greenhouse gas emissions.

"I'm not saying zero growth should become the overarching goal of economic policy," says Victor. "But I don't think we should bother with growth as a policy objective." Economic growth in rich countries has been disappointing, he says, noting that growth in Canada hasn't eliminated poverty and may, in fact, have increased it. He notes also that growth has not brought full employment, and has increased demands on the environment. "The burden placed on the environment by the economy for natural resources and waste disposal has risen. When economies were small in relation to the environment – in the sense that these material and energy flows were modest – maybe it was acceptable for economists to ignore them," he says. "But now they are large – so large that some scientists refer to our current age as the 'Anthropocene' in recognition of the magnitude of human impacts on the planet."

Victor argues there is the possibility that increases in GDP do not necessarily require an increase in material and energy inputs in the future. Over time, he says, we have reduced the material and energy requirements per dollar of economic output. "The material and energy intensities of economies have already declined," he notes. "The trouble is these reductions in intensity have been too small to keep up with the increases in the scale of the economy, so the combined effect has been increases in the use of material and energy."

Of course, in the end, we may learn nothing from past mistakes and could plunge once more into a same-old-same-old model of production, consumption and debt. Says Victor: "I'm worried we'll rely on Band-Aid solutions to the recession. The short-term severity of the current crisis may distract government from the long-term dangers of relying on growth alone to keep economies afloat. Growth is not the answer."

I wasn't sure what I was in for researching Canada's casinos. **BY THOMAS KLASSEN**

A Bit of a Gamble

Several summers ago, as part of my research on gambling, I drove from Windsor, Ont., to Sydney, NS, stopping at each casino along the way. As it turned out, there were quite a few – both casinos and racinos (race tracks with electronic gambling machines). You may be asking, This is work? But for me, it was.

My interest in gambling is long-standing but literally academic. It emerged in high school when friends would ask me to join their card games. I usually declined, because I invariably lost, but sometimes I came along to watch. The games – held in an attic or basement and filled with teenage references to Las Vegas, high rollers, card sharks and James Bond – had an illicit and exotic aura.

If I won a jackpot, would it belong to York University, which funded my trip, or to me?

In the decades that followed, I watched in fascination as throughout Canada casino gambling and table games swung from being illegal and deviant to mainstream. In other words, as gambling was transformed into "gaming". How, I wondered, had gambling in less than two decades become an activity that was promoted by governments as entertainment and a form of leisure? More importantly, what did this shift mean?

Answering these two questions requires an interdisciplinary approach. No single academic perspective can adequately explain how 66 casinos, 28 racinos and more than 72,000 electronic gambling machine venues with 88,000 machines arose throughout Canada. Accounting for this transformation requires, at the very least, an examination of social, political, economic and psychological conditions and pressures.

Fortunately, at York University, interdisciplinary questions are at the heart of many research projects. My own background – trained as a sociologist, with a decade of experience in government, but now teaching political science – is an example of crossing disciplinary boundaries.

As I began my travels, it quickly became apparent the answers I sought would relate to the sheer size and varied nature of Canada. The regional variations became even clearer in interviews I did with casino operators, government officials, health care professionals, former addicted gamblers, reporters and other researchers. In Ontario, the general view is that the expansion of gambling is necessary and economically rational, to attract tourists and keep Ontarians who want to gamble from spending money in Las Vegas. In Quebec, the provincial expertise in gambling technology (often now exported to other nations) is a source of pride. In the Maritimes, where video lottery terminals are often found in bars and restaurants, gambling has been the most controversial and public debate most prominent.

As with any voyage, my research trip included overcoming personal fear. Not one fear, but two. First, since I did not know how to gamble, and still don't, I worried that I would quickly be spotted as an imposter. Fortunately, no one minded, even as I wandered around casinos and talked with patrons. Casino players are far more concerned about their own activities than those of others. Nevertheless, I still harbour some insecurity that by not being a gambler, I might have missed, or failed to understand, some aspect of what I seek to explain.

The second fear was that I would win money. Unable to play at any of the games, I did use the slot machines on two occasions, since I am capable of moving my right arm. If I won a jackpot, would it belong to York University, which was funding my research trip, or to me? I quickly lost $20 – my upper limit – and returned to my more passive hands-off research, relieved of the possibility of a windfall.

At the end of my travels, I did have some answers for the two questions that had motivated me: what caused this to happen and what does it mean? Those answers, which appear in a book I co-edited, reflect the complexity of social, political and economic events and the very nature of our nation, as well as the characteristics of human beings. For researchers, the factors that cause any outcome are never simple – unless you're in a casino.

Thomas Klassen is a professor in the Department of Political Science and the School of Public Policy & Administration at York. He is co-editor of *Casino State: Legalized Gambling in Canada* (2009).

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