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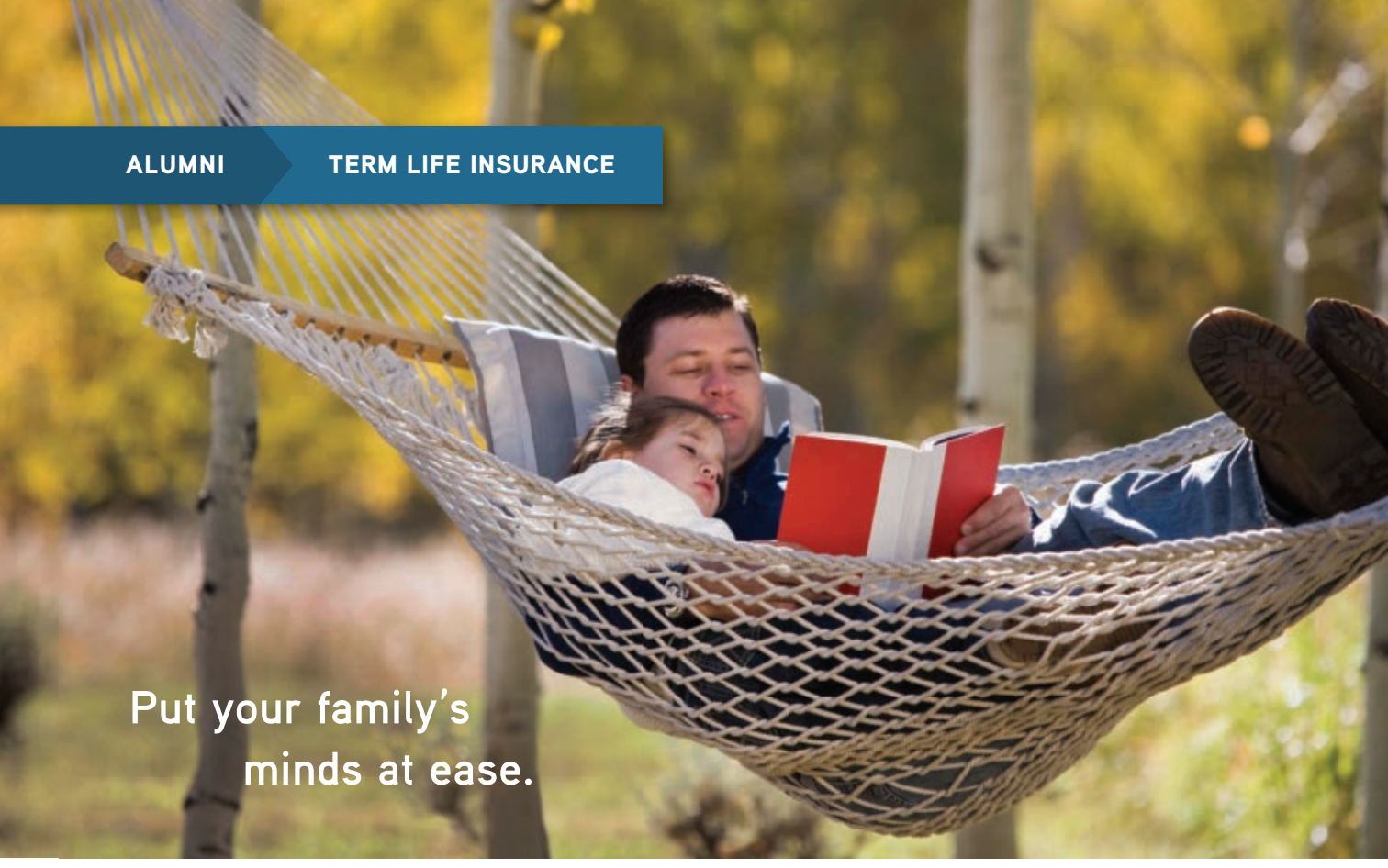

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Summer 2012

Volume 39, No. 4

32 Revolutionary Road

How an intrepid group of profs and students sparked progress for women across the university

BY MARGARET WEBB

Above: A march from Queen's Park to City Hall in support of International Women's Year, May 26, 1975

COVER PHOTO: CHRIS THOMAIDIS, MTO COMPASS SYSTEM; ABOVE: BORIS SPREMO/GETSTOCK.COM

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UNIVERSITY OF TORONTO

Departments

There's always an engineering solution to a technical problem if you make it complex enough

– Prof. Jan Andrysek, of the Institute of Biomaterials and Biomedical Engineering, on his efforts to both simplify and improve the artificial leg for people in developing countries, p. 22

21 What can a computer reveal about a work of fiction?

13 PhD student Eugenia Duodu helps get youth interested in careers in science

45 For ABC correspondent Muhammad Lila, who reports from Pakistan and Afghanistan, risk-taking is part of the job

Letters

I often walked out of Northrop Frye's classroom feeling more connected, modestly smarter and that the world made more sense.

JOHN BOROVILOS
BA 1970 VICTORIA COLLEGE, MEd 1976 OISE, TORONTO

Real Freedom

I can't thank you enough for the good memories you evoked with "Frye's Anatomy" (Spring 2012), your tribute to the great scholar and teacher Northrop Frye. Taking a class with Prof. Frye in Old Vic was both inspirational and a life-changer. He had a low-key but intense style of lecturing that was completely mesmerizing. He revealed how to read for greater insight and, importantly, how to make legitimate and imaginative connections in literature – and in life. I often walked out of his classroom feeling more connected, modestly smarter and that the world made more sense. He taught me how to think independently and gave me an understanding of both responsibility and the concept of real freedom – something I've tried to pass on to my own students as part of their "educated imagination."

JOHN BOROVILOS
BA 1970 VICTORIA COLLEGE, MEd 1976 OISE, TORONTO

Surprise Visitor

In the late 1970s, I studied at a *yeshiva* (rabbinical seminary) on the West Bank. It was headed by two rabbis, one of whom had earned a PhD in English literature from Harvard University. One day, a handful of us stared wide-eyed as none other than Northrop Frye, accompanied by his wife, walked into the *Beit Midrash* (study hall). As the aforementioned rabbi spoke to him and noted that his adviser at Harvard had been Douglas Bush, Mrs. Frye, hearing a familiar name in this profoundly unfamiliar setting, began to exclaim excitedly, "Norrie – he knows Doug! He knows Doug!"

It was later reported to us that Frye was struck in particular by two things: the yeshiva method of text study known as *havruta*, in which students sit in pairs, read texts together and discuss them as they go; and the rapt attention and reverential silence in which students listened to the *shiurim* (lectures).

Just a minor footnote to Frye's illustrious career, I know, but I think it deserves to be remembered.

YEHUDAH MIRSKY
JERUSALEM

Wistful Thinking

I never had the privilege of hearing Northrop Frye in person, let alone of taking classes from him. Pondering over his books has made me wistful for "the real thing." We shall not see his like again.

ED BEBEE
OTTAWA

An Appreciation

I have been receiving *U of T Magazine* since 1975, but the Spring 2012 issue is the first time I've read it in its entirety (including the ads) because *all* of it was interesting to me. When I think of the sleep-inducing issues of yore, I wonder what makes the magazine so much better a read now. The fine variety of subjects and lengths of the pieces, the sprightly format, the photos of my fellow alumni accompanying pieces *by* as well as *about* them – these aren't hard to appreciate. There's more I'm sure, but I'm glad to leave the rest to the editors' admirable and, I hope, long-time management.

JOHN DIXON
MEd 1972, MA 1974, TORONTO

Know Thyself

I was encouraged to see that two articles from the Autumn 2011 issue, "Marshall's Laws" and "Mind Games," show that the dictum "know thyself," attributed to Socrates, is alive and well within the pages of *U of T Magazine*. Being a student at St. Mike's during the McLuhan years I regret that I never took courses from the venerable professor. "Marshall's Laws" reminded me that his work has helped me to know myself and my place in our technological age, and to avoid enslavement by the media. "Mind Games" reminded me that, by and large, psychology and psychiatry have displaced philosophy in shaping our present self-understanding. The article's insightful conclusion notes that the psychiatrist's job is to make diagnoses of biological origin and to treat them with effective agents. This recognizes mental health and mental illness for what they truly are, which rescues me from the constraints of the clinical model of life so prevalent in the Western world.

ALLAN SAVAGE
BA 1974 ST. MICHAEL'S, QUEBEC CITY

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Serendipitous Circumstances

The Toronto region is a great home for a global university

THROUGH THE CENTURIES, universities and their towns or cities have sometimes progressed in parallel, and sometimes not. The University of Toronto has been very lucky in this geographic lottery, and continues to benefit from the development of the Toronto metropolitan region.

Regional growth has yielded an outstanding and ever-expanding pool of local applicants. It also drove the creation of our east and west campuses in the 1960s, leading in turn to more choices for our students and U of T's unique regional academic system. The arrival of an extraordinary number of immigrants has made our campuses a diverse mirror of the region and the world. Moreover, we've benefited from partnerships with outstanding hospitals, cultural institutions, municipalities, social agencies and a huge array of investor-owned and non-profit enterprises alike.

These regional opportunities – academic and otherwise – and the diversity of the region have helped the university attract faculty, staff and students from across Canada and around the world. In turn, the university's global prominence arguably adds lustre to the metropolitan Toronto region.

Synergy between academic institutions and their regions is nothing new. We see it, for example, in the emergence of Silicon Valley. Students and faculty at Stanford and Berkeley are certainly part of that success story. Perhaps surprisingly, Toronto has also emerged as a globally recognized innovation hub. The region places fourth in the OECD for entrepreneurship, and recently was ranked fourth worldwide for startups in information and communications technology. It hasn't hurt one bit to have three U of T campuses in the region. In 2011 alone, the university itself spawned 25 new companies. And thousands of our remarkable alumni throughout the region are leaders in the Toronto startup revolution.

This spring, addressing the Toronto Board of Trade, I acknowledged our geographic good fortune and shared some evidence of it. Among the statistics: Toronto is the third-largest financial and digital media centre and the fourth-largest health sciences and biotechnology cluster in North America. Furthermore, even a conservative estimate shows that the Toronto region contributes more to Canada's GDP in percentage terms than what New York, Chicago and Boston combined contribute to the United States' GDP.

But those numbers are only part of a larger and more complex story. The Toronto region's outsized clout reflects consistent multi-sector strength. And that strength doesn't simply add up. Through cross-sector convergence, it has multiplicative or synergistic effects.

The Toronto design sector – the third-largest in North America – provides a telling example. More than 28,000 designers work in the region. The design sector depends on strengths in information and communications technology, marketing and advertising, product development, and the creative and cultural industries. And of course, great design drives success in these areas. Once again, it's about convergence.

The same could be said of your university. As I've written elsewhere, Toronto is one of a handful of universities in the world consistently ranked as top-tier across all major disciplines. This characteristic – coupled with the curiosity and creativity of our faculty and students – facilitates interdisciplinary synergy. It's a terrific asset for education as well as scholarship and research.

How can the University of Toronto amplify this success? In my view, we need to build more national and international networks. Regions and institutions are only as good as their partners. This is part of a modern Copernican revolution: away from the zero-sum game of "brain drain" versus "brain gain," and into the new world of "brain chains" – interlocking jurisdictions that are stronger together. It's multiplicative convergence again: this time in terms of populations, cultures and perspectives. And in this task, we are extraordinarily fortunate to have a distinguished alumni community stretching from sea to sea to sea in Canada, and spanning over 170 countries around the world.

There are different versions of the old tale of the three princes of Serendip. What the versions have in common are the importance of the princes' education, a narrative of travel and return, and the enduring influence on human affairs of simple good fortune. We truly have serendipitous circumstances – and hope that, wherever you live or travel, you will continue to regard the University of Toronto's three campuses as a second home.

Sincerely,
David Naylor

Calendar

MORE EVENTS!
Check out the latest campus happenings at **www.utoronto.ca.**

JULY

Koffler Scientific Reserve Events

Enjoy a nature walk or workshop at Koffler Scientific Reserve (KSR) at Jokers Hill. **July 14: Trees and Shrubs for Beginners**. At this workshop, naturalist Richard Aaron will introduce people to common trees and shrubs found at KSR. $75. 9:30 a.m.–4:30 p.m. **July 21: Bugs, Bees and Butterflies: Summer Nature Walks**. KSR director Arthur Weis explains the important roles these diverse, highly evolved creatures play. Free. 11 a.m–12:30 p.m. and 1:30–3 p.m. For details, registration and to read about September and October events, visit ksr.utoronto.ca/events. 17000 Dufferin St. King City, Ontario.

For more info: **ksr.info@utoronto.ca** or **ksr.utoronto.ca/ContactUs**.

Alumni

June to August
Soldiers' Tower
The Memorial Room museum in Soldiers' Tower is open on select dates in June, July and August. Carillon recitals on Wednesdays in July and early August at 5–6 p.m. 7 Hart House Circle. For a schedule: 416-978-3485 or soldiers.tower@utoronto.ca.

June 30
Chicago
26th Annual All Canadian Universities Alumni Event: Sarah McLachlan at the Ravinia Festival. U of T alumni and friends are invited to join other Canadian university alumni in Chicago to enjoy the music of Sarah McLachlan. Private event tent for dinner and drinks. $125 for pavilion seats; $100 for lawn seats. Tickets are limited and are available at www.ravinia.org. Doors open at 5 p.m. Dinner and drinks at 6 p.m. Concert begins at 7:30 p.m. 200 Ravinia Park Rd., Highland Park, Illinois. www.alumni.utoronto.ca, 416-978-1669 or deirdre.gomes@utoronto.ca

July 7
Vancouver
Baseball and BBQ Alumni Gathering for U of T alumni and friends at Nat Stadium. Tickets include an all-you-can-eat barbecue, reserved grandstand seating and your own section in the picnic area. A limited number of tickets are available for the U of T Vancouver Alumni Group. Register early. Tickets: $37. 6-9 p.m. Nat Bailey Stadium, 4601 Ontario St., Vancouver. Visit www.alumni.utoronto.ca or contact Deirdre Gomes at 416-978-1669 or deirdre.gomes@utoronto.ca.

Exhibitions

April 30 to September 14
Thomas Fisher Rare Book Library
How Does My Garden Grow: The Education of a Gardener. An exhibition of British and Canadian works on horticulture from the Thomas Fisher collections. Free. Mon. to Fri., 9 a.m–5 p.m. 120 St. George St. 416-978-5285 or www.library.utoronto.ca/fisher/exhibitions/current.html

Special Events

July and August
St. George Campus
Programs organized by the Faculty of Applied Science and Engineering. **July 2–July 27: DEEP Summer Academy.** Advanced study in engineering, technology, business and science disciplines for high school students. Tuition: Domestic starting at $400 and international starting at $675. 8:30 a.m.–3:30 p.m. **July 23–27: Girls' Jr. DEEP** for girls in grades 4 to 8. $280. 9 a.m–4 p.m. **Aug. 6–10 (Week 1) and Aug. 13–17 (Week 2): Jr. DEEP** for students in grades 5 to 8. $280 for one week, $550 for two. 9 a.m.–4 p.m. **Aug. 6–10 (Week 1), Aug. 13–17 (Week 2): ENGage** for black youth in grades 5 to 8. $100 for one week. 9 a.m.–4 p.m. For more info on programs: outreach.engineering.utoronto.ca/preuniversityprograms or enrichment@ecf.utoronto.ca.

August 2
Hart House
Hart House Craft Beer Festival. Sample beer from craft breweries and enjoy a gourmet barbecue in Hart House's quadrangle, one of Toronto's most historic outdoor settings. CIUT DJs spin summery beats. 7 Hart House Circle. Tickets are $35 ($30 for students) and include eight beer samples and barbecue. Additional beer sample tickets can be purchased on site. For more information on this event, please visit www.harthouse.ca.

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Life on Campus

"I need to stay connected at all times"

Student Eva Ahmed on why she prefers LRT to cellphone-unfriendly subways

p. 12

Dr. Homer Tien at Sunnybrook Health Sciences Centre

Facing an Emergency?

Traumatologist Dr. Homer Tien advises that you don't waffle

WHEN DR. HOMER TIEN IS ASKED WHY he received the Order of Military Merit in December, he shrugs. "I guess because I've been in the Forces for a while," he offers modestly.

Only later does the colonel, who is also director, trauma services, at Sunnybrook Health Sciences Centre and a U of T professor, recall his exceptional advancements. "In '96, I was the first medical officer posted to the Canadian military counterterrorism team on the NATO mission in Bosnia. And, oh yeah, in 2006 I was the first Canadian surgeon deployed to Kandahar," he says.

Since then, Tien has been deployed to Afghanistan five times, most recently last fall for a two-month tour of duty. At the Kandahar military base, Tien would start the day by strapping on a 9 mm Browning pistol. "I'm so used to wearing a gun, I didn't even think of it," he says. Then he'd grab a coffee at the base's Tim Hortons and head to the military hospital. He would perform such procedures as digging shrapnel out of the bodies of British, American and Canadian coalition soldiers, and caring for civilians who had stepped on landmines. "Amputation is common with a landmine injury," he explains. "Sometimes we have to do a triple amputation, which is really sad, especially with a child."

On occasion, Tien would work 36 hours straight – without complaining. "The only thing I have to do on the base is work," he explains. At home, he's busy helping his wife drive their three daughters to music lessons and sporting events.

Tien enlisted in the Canadian Forces in 1990 to pay for ›

PHOTO: TIM FRASER

The Vic One program, established in 2003, explores ideas and events from a multidisciplinary perspective in small classes limited to 25 students

In Pursuit of Justice

Two U of T students explore the issue of former child soldiers in Uganda

THE PROBLEM OF CHILD SOLDIERS in northern Uganda is well known. What's less clear, and what U of T students Salvator Cusimano and Sima Atri are exploring, are the consequences – for the kids as they grow up, and the prospect of justice for the families of the people they killed.

Last year, the students – who are now in the final year of the program in peace, conflict and justice – spent three months fact-finding in the east African country, where a rebel group led by Joseph Kony had recruited thousands of children. Examining the issue for an independent study project, Cusimano and Atri surveyed nearly 700 people in 17 villages – some of whom were family and friends of loved ones who were killed – to determine how these former militants can reintegrate into society.

"Research has focused on what these kids experience when they return to their communities, but it's important to know what community members and the victims want from the justice process," Atri says, referring to family and friends of those killed by the militants.

"Many appreciated sharing their experiences, because no one in the government has asked them what happened," Cusimano says.

Cusimano and Atri have completed a paper about their findings, which they plan to publish in academic journals. As well, they've produced a report that recommends, in part, a truth-and-reconciliation approach to justice, financial reparations for victims, and a renewed investigation into the complicity of Ugandan government officials and armed forces. They have presented their findings to NGOs and at the United Nations, who lauded their on-the-ground research.

Atri says while the *Kony 2012* video "missed some important facts," it refocused attention on the crimes of the Lord's Resistance Army. What matters now, Cusimano says, is righting the wrong: "Something has to be done for those who suffered extreme hardships as a result of these harms." – **SHARON ASCHAIEK**

EPHEMERA

Prof. Catherine Heard recently instructed each of the 17 students in her class to create a graphic novelette. "The graphic novella is a way of exploring narrative expression," says Heard, who teaches in the Vic One program's Norman Jewison Stream for Imagination and the Arts. "It isn't associated with high art – you can insert it very easily into the public sphere."

The novelettes were published in *The Book of Norman*. The title is a nod to the program's namesake and a play on *The Book of Mormon*. Jessica Wong wrote about Omar Khadr's imprisonment at Guantanamo Bay (above), while other students tackled propaganda and starvation in North Korea, and a struggle with identity as a second-generation Japanese-Canadian. The book is available at the Hart House Library and at magazine.utoronto.ca.
– **SUZANNA CHANG**

medical school at McMaster. Later, his military service funded surgical training at U of T and a two-year fellowship with Sunnybrook's trauma team. Tien also earned a master's degree in clinical epidemiology at U of T, graduating in 2007. Now a U of T assistant professor, he excels in teaching the intricacies of treating blast injuries and gunshot wounds.

Perhaps Tien's greatest teaching, though, is leadership. "In medical school there is very little formal teaching of leadership training but in the military you receive a lot. You learn to be decisive in an emergency situation and assertively pass on your decisions. You learn you absolutely must not waffle."

Tien also has a teaching role in the Forces. In 2007, for example, he trained military medical technicians to perform on the battlefield an emergency cricothyrotomy, which involves making a cut in the neck and inserting a breathing tube through the slit. "Medical technicians had never done it before, and they do a very good job in a very difficult environment," says Tien, whose research focuses on military medicine, including war surgery.

Back in Toronto, Tien cares for Ontario's most seriously injured. They come by helicopter or ambulance after falling from the high beam of a construction site or being cut out of a mangled car on the 401. About 50 per cent die before they get to Sunnybrook's Tory Regional Trauma Centre where Tien is the medical director, but a remarkable 90 per cent survive if only they can arrive with a beating heart.
– **SUSAN PEDWELL**

PHOTO: LEFT, COURTESY OF SIMA ATRI; RIGHT, JESSICA WONG

Deep Saini, vice-president, U of T, and principal of U of T Mississauga

Unlimited Potential

U of T Mississauga campaign targets pressing societal challenges

THE UNIVERSITY OF TORONTO MISSISSAUGA has joined U of T's Boundless campaign, aiming to raise $60 million to educate the western GTA's next generation of innovators and, through groundbreaking research, address regional, national and international challenges.

Prof. Deep Saini, vice-president of U of T and principal of U of T Mississauga, made the announcement at a ceremony in UTM's Instructional Centre in late May.

Students played a central role at the event. On stage, chalkboards displayed original artwork created by UTM students illustrating the "boundless" theme. Students from U of T's Faculty of Music performed, and among the opening speakers were two U of T Mississauga student leaders: undergraduate Marijana Josifovska, the founder of Investors Beyond Borders, and Eugenia Duodu, a PhD student and youth advocate (see p. 13). "I am one person, but my impact can be global," said Duodu, echoing the theme of the evening's celebration.

Prof. Saini spoke about the campaign's priorities to increase scholarships, student mentoring programs and faculty chairs. He said the campaign will also enable the launch of two bold initiatives: the Centre for South Asian Engagement, which will involve the community's South Asian diaspora, and the Institute for Management and Innovation, which will help foster "an innovation culture for our nation."

"U of T Mississauga is at a turning point in its evolution," Saini said. "We are entering an era defined by transformative growth, social impact, community engagement and boundless potential." He noted that U of T Mississauga would retain its special "people vibe," fostered by a collegial, close-knit campus in which "students can grow, flourish and spread their wings." – **ALLYSON ROWLEY AND NICOLLE WAHL**

A Vision for Tomorrow

Victoria University, the Faculty of Arts and Science and the Tanz Centre recently launched their own fundraising campaigns

The late Northrop Frye, a **Victoria University** alumnus and former professor, once said "the fundamental job of the imagination in ordinary life is to produce, out of a society we have to live in, a vision of society we want to live in." Vic put Frye's words into action in early April, launching "Imagination Unbound" – a $60-million fundraising campaign – at a ceremony at the Isabel Bader Theatre. With the initiative, Vic will reaffirm its founding liberal arts mission, enhance the student experience beyond the classroom and establish a Muslim Studies program, the first of its kind in Canada. The campaign has raised 70 per cent of its goal, thanks in part to lead gifts from Blake Goldring (BA 1981 VIC) and Judy Goldring (BA 1987 VIC) for the new Goldring Student Centre, a much-needed hub for student activity on campus.

The **Faculty of Arts and Science** recently launched a $250-million fundraising effort as part of the university's larger Boundless campaign. Meric Gertler, dean of Arts and Science, announced the initiative at an event at Hart House in late March. He noted that new funds will support first-year learning communities, international learning experiences and research opportunities, and undergraduate programs that promote interdisciplinary thinking. The faculty, which has reached 60 per cent of its fundraising goal, will also seek to bolster its endowed scholarships for both domestic and international students. "This new support will strengthen our efforts to ensure that all qualified candidates, regardless of their financial means, can pursue their academic dreams here," Gertler said.

By 2040, neurodegenerative diseases could surpass cancer as the second-leading cause of death among Canadians. U of T's **Tanz Centre** aims to understand the causes and progression of Alzheimer's, Parkinson's and other brain diseases, and, ultimately, to develop effective treatments. Under the direction of fundraising co-chairs Mark Tanz (BA 1952 UC) and Lionel Schipper (JD 1956), the centre is seeking to raise $31 million.

For more information about U of T's historic $2-billion fundraising campaign, visit boundless.utoronto.ca.

PHOTO: STEVE FROST

The "walking piano" is a musical instrument invented in 1976 by Philadelphia artist and inventor Remo Saraceni. It was used in the movie *Big*, starring Tom Hanks

Spark Club's Hubert Ka with the Eiffel Tower, featured on *Daily Planet*

A Spark of Genius

It may lack the exotic scenic views of Paris, but the U of T Spark Design Club's nine-foot rendition of the Eiffel Tower was still an impressive feat.

The engineering club accepted a challenge by Discovery Channel's *Daily Planet* to build a mega-structure out of cards – part of the science show's Gigantic Week in March.

About 20 students attended workshops to design the tower and do test runs – and dealt with several collapses along the way. "You don't think it, but when the cards start piling on top of each other, it gets pretty heavy," says Anmol Kaur, Spark president and a third-year electrical and computer engineering student. The team figured out that using structurally sound shapes along the base – triangles and arcs – provided a winning formula. On the morning of the airing, six team members spent six hours building the tower on stage.

Spark, which started a year ago, hosts monthly workshops during which students come up with unusual ideas for what to build around campus. One past work is the Piano Floor – a giant keyboard on the ground that people could step on and play – which was in Bahen Centre's main lobby in January. For the next project, Kaur is considering a giant pinball machine. – **STACEY GIBSON**

SOUND BITES

Bottled water is no longer sold on U of T campuses. What should the university's next big "green" initiative be?

Composting wouldn't be easy, but it is possible. How about closing off a couple more streets?
@DanWeaver_

PowerPoint slides should be made into PDFs and restricted from being printed. People now type notes anyway.
@hchungy

Whole foods plant-based diet! Maybe a few more rooftop vegetable gardens.
@newellND

Retrofitting old buildings to improve their energy efficiency, reusable plates and cutlery at cafeterias (such as Sid Smith and the Medical Sciences building).
@samanthazy

Join the conversation at twitter.com/uoftmagazine.

Poll | Do you agree with Toronto City Council's decision to invest in LRT rather than subways?

56%
Pro LRT

44%
Against LRT

Ah, transit. The debate between subway expansion and Light Rail Transit (LRT) certainly gets Torontonians talking – and U of T students are no exception. Their arguments pro and con cited everything from the city's budget constraints to a simple dislike of Mayor Rob Ford. However, the majority of students feel that LRT is the better plan.

Yolen Bollo-kamara – a third-year student at St. Mike's – argued in favour of city council's decision to invest in LRT, stating, "The plans, funding and infrastructure are already in place. Subways are too expensive and not realistic."

Budget and city planning issues aside, third-year New College student Eva Ahmed is pro-LRT because the vehicles run above ground and are Internet-friendly. "I need to stay connected at all times," she said, excusing herself to answer her phone. – **SUZANNA CHANG**

This highly unscientific poll of 100 students was conducted on St. George Campus.

PHOTO: COURTESY OF VINCENT LEE

Since Hart House opened in 1919, the building's wardens have welcomed many notable guests, including King George VI, Queen Elizabeth II, John F. Kennedy, Henry Moore and Octavio Paz

Popular Scientist

Eugenia Duodu wins award for her research into targeting cancerous cells, and for teaching kids science

"I ALWAYS LIKED PUZZLES, and building things," says Eugenia Duodu, a second-year PhD student in medicinal chemistry at the University of Toronto at Mississauga. These days, she combines both skills – at the molecular level – to better understand how cancer spreads.

Cells are constantly buzzing with activity, Duodu explains, with proteins and other chemicals colliding and reacting. In cancer cells, that process runs wildly out of control, which is what produces tumours. Duodu's research is about designing molecules that act like a nano-scale monkey wrench thrown into the gears of a cancerous cell. Jam that cellular machinery, and the cell can't divide, slowing the advance of the tumour. Research such as Duodu's could one day lead to drugs that, unlike chemotherapy or radiation, are capable of targeting cancerous cells while leaving healthy ones alone. That means more effective treatment – with fewer dangerous side-effects.

It's that research, as well as her involvement in groups such as Visions of Science – a community science literacy project – that recently prompted the Black Business and Professional Association to award Duodu the Harry Jerome CIBC Academics Award.

At Visions of Science, university students hold free science clubs for children and youth in low-income communities. In the past, Duodu led a weekly workshop or experiment – ranging from a "creepy-crawly" session about insect biology, to engineering a miniature balloon-powered car. She now helps run the organization. "I think the way you learn science is by seeing it, doing it and getting your hands dirty. If you don't do that, you can't learn properly," she says. Duodu delivers the message that a career in science is possible for young people who don't hear that a lot. "We're trying to give the kids an opportunity to even think of science as an option."

Duodu knows first-hand the difference that even a small push can make. She grew up in a Toronto Community Housing complex in Etobicoke (where she still lives), and found that, even as a bright and hard-working student, some learning opportunities hovered frustratingly just out of reach. "There were clubs and some online programs I wanted to join, but they cost, say, $350 for a week, and I couldn't afford that."

A turning point came when she joined the the U of T Faculty of Medicine's summer mentorship program, an intensive four-week introduction to health sciences. "I remember I was in a research lab rotation for one day, and I was like, 'This is really cool,'" says Duodu.

Opportunities like that are key, she says, as is improving general science education in earlier grades. "The science curriculum *will* be beefed up," she says, adding with mock seriousness, "If *I* have anything to do with it." – **GRAHAM F. SCOTT**

People

The Hon. Michael H. Wilson has been elected chancellor of U of T. Wilson (BCom 1959 TRIN) was formerly a Canadian ambassador to the U.S. and a federal minister of finance. He is currently chairman of Barclays Capital Canada Inc. Wilson volunteers with many organizations, and is a champion for mental health awareness and research. He will succeed Chancellor David Peterson as of July 1.

Prof. Bruce Kidd has been appointed warden of Hart House. Kidd is a former dean of the Faculty of Kinesiology and Physical Education, and most recently served as interim warden of Hart House.

Prof. Stephen Lye has been named the executive director and **Prof. Marla Sokolowski** the academic director of U of T's new Institute for Human Development. Lye is a professor and vice-chair of research in the department of obstetrics and gynecology, and holds cross-appointments in physiology and medicine. Sokolowski is a University Professor in UTM's department of biology.

Prof. Franco Vaccarino has been reappointed as vice-president, U of T, and principal, U of T Scarborough, for a five-year term. Also reappointed is **Prof. Paul Young,** who will serve another term as vice-president (research) for the university.

University Professor **Geoffrey Hinton,** one of the world's leading researchers in machine learning and artificial intelligence, is the winner of one of five 2012 Killam Prizes. The $100,000 prize recognizes outstanding career achievement by scholars.

Dr. Janet Smylie has received a National Aboriginal Achievement Award for her work in indigenous health. Smylie is a professor of public health sciences at U of T and was one of the first Métis doctors in Canada.

Prof. Shana Kelley of the Leslie Dan Faculty of Pharmacy has won the 2011 Steacie Prize for outstanding research in science and engineering. Kelley has developed nanomaterial-based detection systems that can identify cancer and infectious disease.

PHOTO: NICOLLE WAHL

The Mobile Scholar

As students and faculty snap up smartphones, U of T aims to make Wi-Fi fast and ubiquitous

"Unable to connect to network": It's a message that every student dreads, but many were receiving last year – particularly at U of T's largest library – as the growing use of smartphones and tablet computers caused demand for campus wireless access to soar.

In the past several months, however, improvements to the network have caused service complaints to mostly evaporate. Since fall 2010, the university's information technology department has launched two rounds of upgrades, resulting in expanded Wi-Fi coverage on all three campuses and vastly improved connection speeds.

The second phase – to be completed this fall – will extend coverage to popular outdoor spaces, such as Willcocks Common and the Sid Smith patio.

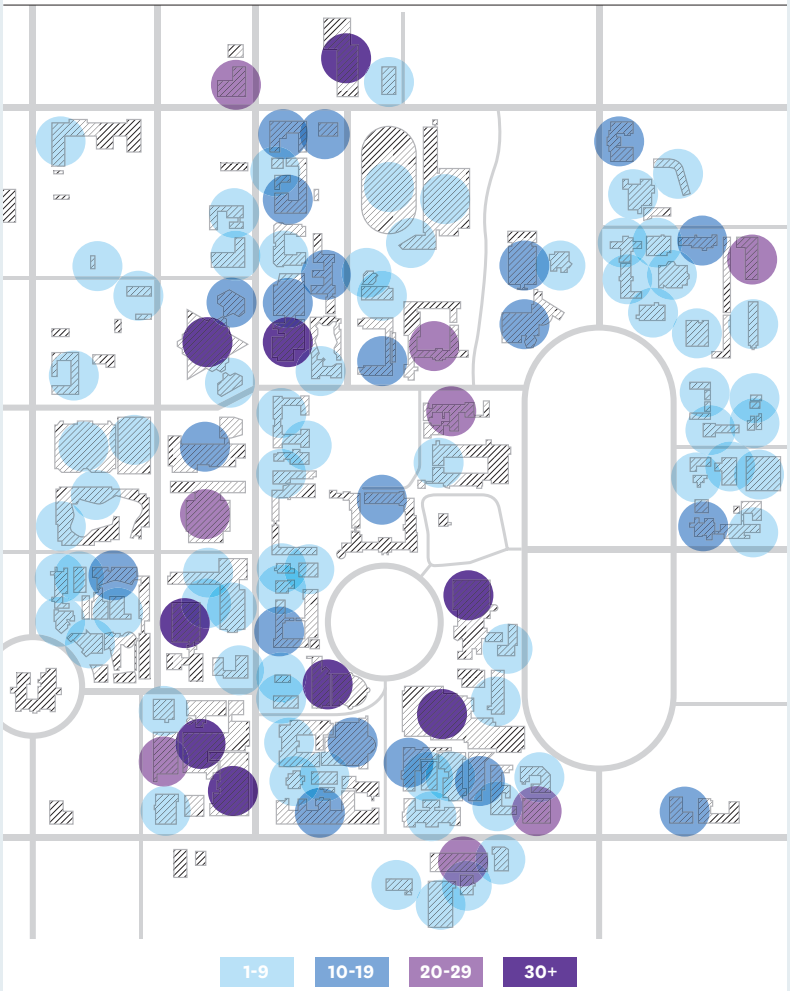
The university has also simplified what many users complained was an overly complex login procedure. Whereas users previously had to authenticate themselves twice and log in anytime their connection was dropped, the new system requires just a single authentication and remembers users anywhere on the three campuses. This means that for each device they own, students and faculty only ever have to log in once. "It makes it easy to roam from building to building and from campus to campus and stay connected," says Patrick Hopewell, director of enterprise infrastructure solutions. A third round of improvement, to be launched next year, will "saturate" coverage on all three campuses, he adds.

Prior to the upgrades, inconsistent service acted as a lightning rod for student dissatisfaction, says Hopewell.

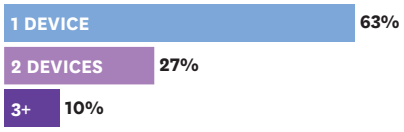
With the recent improvements, the number of complaints has dropped significantly, observes James Lawson, the help services manager at Robart's Library's Information Commons. "There are some specific devices that have trouble connecting, but the overall experience has moved from a high volume of complaints that we couldn't do anything about to very infrequent ones."

– SCOTT ANDERSON

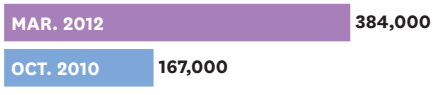
Number of Wireless Access Points on the St. George Campus



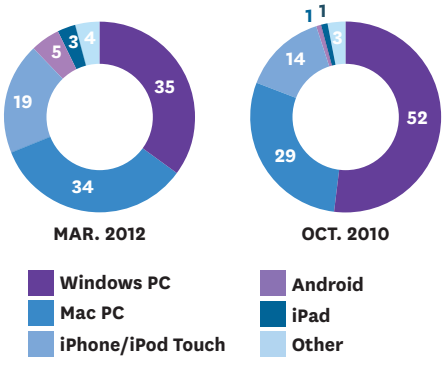
Number of Devices Per User (2012)



Number of Wireless Sessions Per Week



Devices Used to Access Wireless Internet Services (%)



All figures for the St. George campus

The Rabbi Brickner scholarship is named for Barnett R. Brickner, rabbi of the Holy Blossom Temple in Toronto from 1920–25

Intelligent Fellows

Mellon Foundation grant will bring leading post-doctoral scholars to U of T's Jackman Humanities Institute

Robert Gibbs, director of the Jackman Humanities Institute

A PROGRAM TO BRING young, cutting-edge scholars from around the world to U of T's Jackman Humanities Institute received a $1.5-million boost recently from the Andrew W. Mellon Foundation in New York City.

The gift, one of many the foundation has made to U of T over the years, will fund post-doctoral fellows to conduct research at the institute and teach for two-year periods. "These fellows will explore the leading edge of humanities research and make connections among a wide range of disciplines," says Robert Gibbs, a philosophy professor and the institute's director.

Bradley Rogers, a post-doctoral fellow from the University of California, Berkeley, was appointed a fellow of the institute and received a $50,000 Mellon grant under an earlier round of funding. Rogers, 30, has devoted the past two years to conducting research and teaching four undergraduate courses in theatre studies and literary theory. His groundbreaking scholarship has focused on exploring the cultural implications of artists who first made the transition from theatre to movies generations ago.

According to Kimberley Yates, the institute's associate director, these fellows will make a profound and lasting contribution to the university by sharing their knowledge with undergraduates in small, seminar-like classes. "The fellowship program provides the university with a chance to attract fresh, bright scholars who can bring their unique blend of training, teaching and insight not only to the institute, but to lucky undergraduate students," Yates says.

The Jackman Humanities Institute was designed to act primarily as a portal where undergraduate and graduate students, professors and post-doctoral fellows from a variety of faculties and academic disciplines meet, share and cultivate ideas around an annual prescribed theme. (The theme this past academic year was "Location/Dislocation.")

For Rogers, who will be soon taking a faculty fellowship at Duke University in Durham, North Carolina, and admits to leaving U of T with a "leaden heart," the institute has offered a hospitable place to pursue his research. "I can't speak highly enough about my time at the institute," he says. "Bringing all these ideas and people together in one place is something that I will dearly miss."

– ANDREW MITROVICA

Why I Give

Lorie Shekter-Wolfson (BA 1973 New, MSW 1975)

With her siblings and father, Lorie created the Dorothy Shekter Scholarship in honour of her mother. The scholarship is awarded to students in the Factor-Inwentash Faculty of Social Work focusing on health and mental health.

Dorothy Shekter

"My mother earned a BA in economics from McMaster University in the 1930s. She was one of about 10 women in her class. Her professors often asked her what she was doing in school and then told her she should vacate her seat for a man. But she persevered and graduated with honours.

Mom didn't know what she wanted to do after receiving her degree, but she knew she enjoyed working with people. Continuing her education did not seem to be an option. Her family had no money – she had five brothers and her father had died.

On a whim, she applied for the Rabbi Brickner Scholarship, offered by the Faculty of Social Work at U of T. She was accepted and moved to Toronto, where she stayed with a relative. There was no way she could have done this without the scholarship. It set her on a path that she never would have followed otherwise – and she did some amazing things during her career as a social worker. After she had kids, she helped Jewish refugees arriving in Hamilton after the war to find jobs, and later did frontline work with the Hamilton branch of the Addiction and Drug Research Foundation, where she held the position of interim director for a time. She was also involved with the development of the province's first family court clinic.

Creating a scholarship in her name was a way of honouring her legacy. I think she would have been very proud of it."

As told to Scott Anderson

PHOTO: LEFT, MARTIN LIPMAN/SSHRC; RIGHT: COURTESY OF LORIE SHEKTER-WOLFSON

A group of engineering students established Graditude in 1983 to address a deficiency in student club funding. Other U of T faculties and colleges soon followed suit

Doris McCarthy

An Artist's Legacy

Doris McCarthy's life's work finds a permanent home at U of T Scarborough

FOR MORE THAN 70 YEARS, CANADIAN ARTIST DORIS McCARTHY celebrated Canada's diverse and rugged wilderness with her bold and spirited works of art. Now, her creations will be celebrated by University of Toronto Scarborough, the recent recipient of her life's work.

More than 200 paintings and more than 6,000 pieces of memorabilia – one of the largest gifts-in-kind ever made to the campus – were donated from the estate of McCarthy, who died in 2010 at age 100. The collection will allow U of T Scarborough, where McCarthy completed a BA in English in 1989, to enhance studio and art-history instruction and expand its public art programs. "This important gift enables us to integrate McCarthy's artistic production more fully into our academic mission," says Ann MacDonald, director and curator of the Doris McCarthy Gallery and a visual and performing-arts lecturer.

The paintings, created between 1924 and 2006, feature McCarthy's well-known representational and abstract Canadian landscapes – including her famous depictions of Arctic icebergs. Some of the pieces were exhibited at the gallery in 2010 to mark her centennial birthday. Other donated items include sketches, letters and even diaries.

McCarthy, who taught art for 40 years at Central Technical School in Toronto, was an Order of Canada member whose paintings reside in collections across the country, including at the National Art Gallery and the Art Gallery of Ontario.

The landmark donation provides new momentum to U of T Scarborough's expansion plans, part of which involves building a new and bigger art gallery to showcase the work of McCarthy and other contemporary artists. "This gift has created an infusion of excitement that sets us on a path to fulfil our mandate of becoming an intellectual and cultural hub in the GTA," says Georgette Zinaty, executive director of development and alumni relations at U of T Scarborough. "It sets us apart in the community as a place to enjoy art." **– SHARON ASCHAIEK**

Going the Extra Mile

Graduating engineering students raise thousands for their faculty

AFTER THEY'VE SPENT FOUR YEARS and tens of thousands of dollars earning a degree, you might think persuading departing students to donate money back to their faculty would be a tough sell. But not for U of T's engineering class of 2012, whose graduating members have raised almost $10,000 to support the students coming up behind them.

The program is called Graditude, and while many faculties and departments run their own versions, the Faculty of Applied Science and Engineering has always boasted the highest participation rates, with nearly one in three graduating students pitching in. (A donation of $20.12 earns a commemorative lapel pin.)

"This campaign is to give back to student clubs, so I'm all for it," says Kathryn Tang, who is graduating this year from mechanical engineering. She says she gained a lot from her involvement with extracurricular activities such as the Skule Orchestra and *The Cannon*, the more serious of the two engineering student newspapers. "It's an important part of the school spirit that we have these organizations," she says.

Another secret to the campaign's success is Bill Daniel (BASc 1947, LLD *Hon*. 1980), a former president of Shell Canada, who offered to match the students' donations dollar for dollar. In his final academic year, Daniel received a $100 "Second Mile" graduation scholarship from U of T, recognizing his exceptional academic and extracurricular achievements.

Today, he describes going that proverbial extra mile, whether on the job or as a philanthropist and volunteer, as "a major part of the philosophy of my life." Supporting Graditude allows him to pass that message on: "We're teaching these young people to go the second mile." **– GRAHAM F. SCOTT**

PHOTO: KEN JONES

Mengqi Wang (left) and Rozita Abdoli

Engineering a Cure

Undergraduate students design their own experiments to address important medical questions

NOT MANY UNDERGRADUATES can say they've worked on finding a cure for cancer. But that's exactly what two upper-year students at the Institute of Biomaterials and Biomedical Engineering did recently as part of an experiment they designed and executed themselves.

The project, by Rozita Abdoli, a chemical engineering major, and Mengqi Wang, a specialist in electrical and computer engineering, examined "HeLa" or cervical cancer cells under stress. Their goal? To find new ways to tackle the disease at the cellular level. In the end, the study didn't reveal as much as the students had initially hoped, but it provided them with a better understanding of the HeLa cell line, Wang observes.

The study was one of several that third- and fourth-year undergrads at the institute shared recently with the public.

Biomedical engineering majors Tara Stratton and Andrea Pagotto looked at ways to amplify and tag DNA sequences of E. coli bacteria to find an easier way for scientists to test for the deadly organism in freshwater samples. The methods used showed promise, they say.

Richard Gao and Om Bhatt, engineering science specialists, studied the adverse effects of electrical fields on two different stem cell lines. Their study found that many stem cells die when exposed to an amplified electrical field.

Unlike courses where the right answer is the only answer, courses that include major design projects allow students to learn through trial and error – like real scientists do. "Theory is best learned when our students have the opportunity to apply their classroom knowledge to real-world engineering challenges that have the potential to make an impact," says Prof. Paul Santerre, the institute's director. "That's what our students have aspired to in this course."

– **ERIN VOLLICK**

PHOTO: ERIN VOLLICK

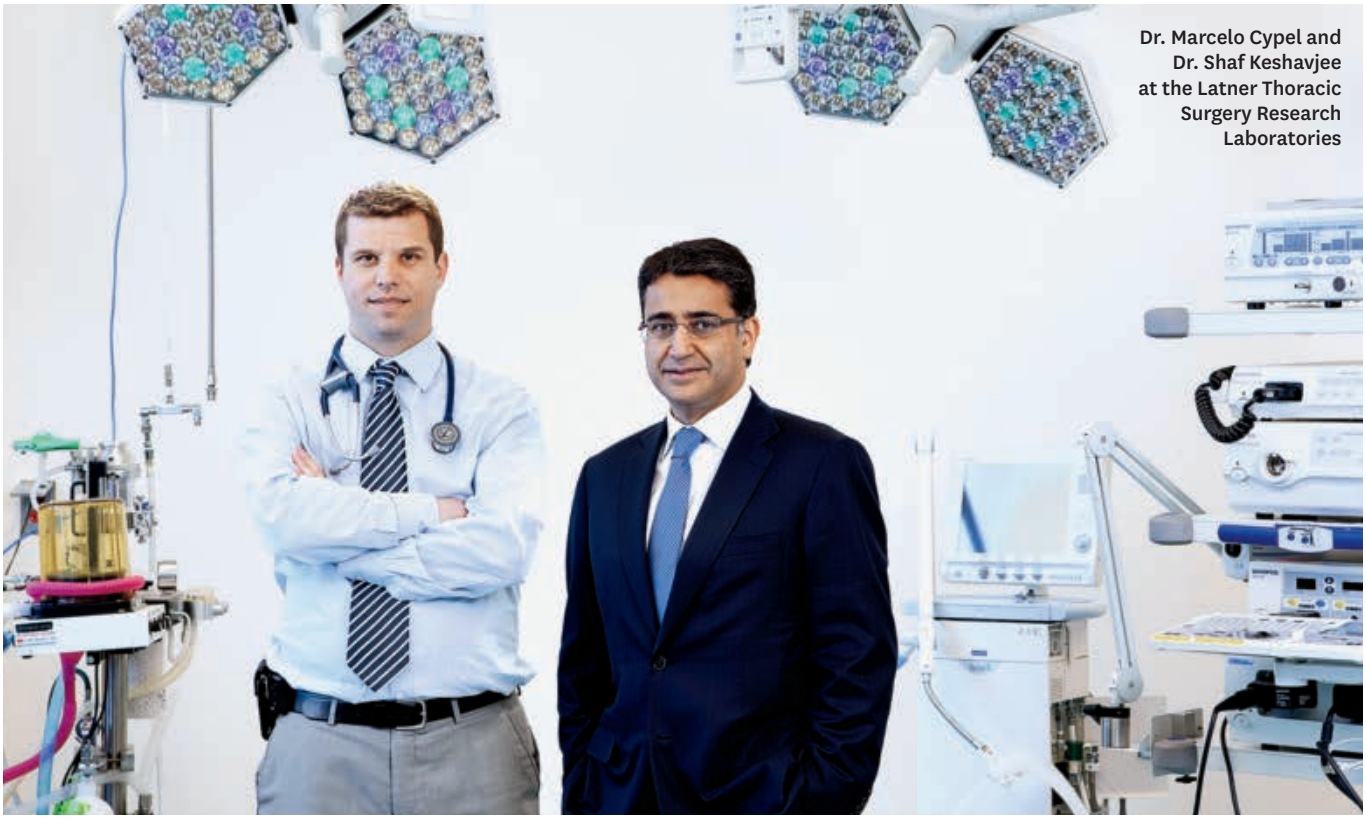

BOUNDLESS LEGACY
"Law school is a full-time commitment. The Ivy Maynier scholarship lets me give it my full-time attention."
AMAN DHILLON
JD Candidate, 2013
LEAVE A GIFT IN YOUR WILL AND HELP CHANGE A STUDENT'S LIFE.
Join the campaign for the University of Toronto by including U of T in your will. It's one way to help nurture the boundless potential of determined students like Aman.
To find out more, contact michelle.osborne@utoronto.ca, 416-978-3846 or give.utoronto.ca
UNIVERSITY OF TORONTO
FACULTY OF LAW

Leading Edge

If he does qualify for the Olympics, this destroys the concept of disability

Phys-ed prof Greg Wells on Oscar Pistorius, who runs using two prosthetic legs

p. 23



Dr. Marcelo Cypel and Dr. Shaf Keshavjee at the Latner Thoracic Surgery Research Laboratories

A Cut Above

U of T researchers have devised a way to refurbish donor lungs before they're transplanted

JUST LIKE OLD CARS, used and slightly damaged human organs can now be refurbished before they are passed on to new owners.

Every year in Toronto, some 300 sets of lungs become available for transplant, but only about 100 of them are used. The rest are deemed too injured – they have water inside them or carry hospital infections – so they are discarded.

But what if you could take a damaged lung from a donor and fix it outside the body before transplanting it?

Dr. Marcelo Cypel and Dr. Shaf Keshavjee, both thoracic surgeons with the Toronto Lung Transplant Program, have done exactly that.

Typically, when a lung becomes available, it is chilled and then transplanted as quickly as possible, usually within a few hours. Cypel and Keshavjee, however, using their "Toronto technique," keep the lung at body temperature. They place it under a protective dome and perfuse it with a bloodless solution of oxygen, nutrients and antibiotics, among other things. A lung can last at least 12 hours under these conditions.

The technique offers two clear advantages over chilling. First, as they watch the lung breathe and measure its function, the surgeons can carefully assess its quality – something that can't be done while it's preserved on ice and dormant. Some lungs that look good on visual inspection end up performing poorly; others that look bad perform well. The other advantage is that at least some damaged lungs can be rehabilitated: fluid-filled lungs can be dried out and infected ones can ›

PHOTO: LORNE BRIDGMAN

The Asian long-horned beetle, another invasive insect pest, is moving north from New York State, posing a threat to Ontario's maple trees – and its maple syrup industry

be treated with antibiotics. Without the rest of the body to worry about, the treatments can be more intense.

Last year, 23 lungs that otherwise would have been discarded were treated and transplanted into patients (with their knowledge and consent). These patients fared no worse than the ones who got the usual donor lungs. Cypel thinks that soon, 100 extra pairs of lungs a year could be salvaged for transplant in Toronto, doubling the number of transplants possible here.

There are currently around 80 people waiting for lung transplants in Ontario. About a third of the people waiting for lungs will die before they get them, says Cypel. This technique could significantly shrink that waiting list.

The ex-vivo lung perfusion costs $8,000 per set of lungs – about what it costs a hospital to keep a patient in intensive care for just one day. This raises the question of whether just damaged lungs or all lungs should be evaluated before transplant, given that proper assessment could dramatically improve recovery times and outcomes. "It's probably the way to go," says Cypel, who is conducting a cost-benefit analysis on the topic. The researchers published their overview earlier this year.

The concept is set to be used with other organs, too. Last October, a group in the U.K. published a report of the first kidney that, like the lungs, had been preserved at near body-temperature and perfused with a special solution. That kidney was successfully transplanted into a recipient – and it compared favourably to its twin kidney, which had been kept in cold storage and transplanted into someone else. Livers will almost certainly be next, and there's reason to believe that thyroids, ovaries and even hearts could one day benefit as well.

– ALISON MOTLUK

Debugging

A forestry prof believes a local parasite could save Ontario's ash trees from a deadly invader

OVER THE PAST DECADE, TENS OF MILLIONS of ash trees across North America have died because of a hungry green beetle named the emerald ash borer. "It's a tsunami," says Prof. Sandy Smith, who estimates that most of Toronto's ash trees will be gone within five to 10 years.

Smith, dean of the Faculty of Forestry, is a forest entomologist who specializes in finding native, natural enemies of insect pests. She and PhD student Lucas Roscoe have identified a little-known, local parasite that feeds off – and kills – the emerald ash borer.

In collaboration with Canadian Forest Service researchers, Smith and Roscoe have gathered new data on the parasite, which could be used to protect areas with ash trees where the beetle has not yet arrived. Native to Asia, the emerald ash borer kills ash trees by laying its eggs under the bark. The hatched larvae then feed off the inner tissue of the tree, depriving it of water and nutrients. The ash borer has moved so quickly through the landscape that it will take some time before its natural predators catch up. In the meantime, "there will be a lot less ash," says Smith.

Long-range planning is urgently needed, she says – both to diversify the province's tree stock and manage the enormous costs of disposing of dead and dying trees. U of T has provided funding for two students in the Master of Forest Conservation program to collaborate with the Harbord Village Residents' Association in downtown Toronto on an emerald ash borer management plan for the St. George campus. "We would be naive to think this kind of epidemic won't happen again," says Smith. "We need to use this as a tool to plan ahead for a more diversified and resilient urban forest." **– ALLYSON ROWLEY**

LINGO

hashtag activism

During the unrest that rocked Iran a few years ago, protesters used Twitter, text messages and blogs to communicate with each other – and the world. Some pundits heralded the arrival of a social media-inspired revolution. Others were not so sure. Using Twitter to coordinate street protests is one thing; using it to state your opposition – how revolutionary is that?

Stefania Milan, a post-doctoral fellow at U of T's Citizen Lab, says "hashtag activism" performs important functions during protests: it creates solidarity among activists, raises awareness among foreign supporters and allows protesters to tell their own stories.

At the same time, Milan adds, the media's celebration of hashtag activism may serve to downplay or even criminalize street protests and occupations. "It's like telling the people that you can change the world by tweeting, so why bother going out into the streets?"

PHOTO: PENNSYLVANIA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES - FORESTRY ARCHIVE

T.S. Eliot's original title for *The Waste Land* was "He Do the Police in Different Voices," a line from a Charles Dickens novel

THE BIG IDEA

Words, by the Numbers

What can a computer reveal about a work of fiction?

PEOPLE HAVE BEEN ANALYZING WRITTEN TEXTS for over a thousand years, dissecting sentences to reveal the hidden truths beneath. But while human readers are terrific at uncovering complex and subtle meanings, they read slowly and have relatively short attention spans. Not so computers, which are increasingly being used to find interesting new patterns in texts undetected by mere mortals.

By counting recurring word and phrase types, algorithms such as the "Gender Genie" purport to determine whether a given text was written by a male or female author. Computers have helped historians sort out questions of authorship in the Bible. And the work of U of T English professor Ian Lancashire and computer scientist Graeme Hirst suggests that mystery writer Agatha Christie may have suffered from an undiagnosed case of Alzheimer's disease. By comparing her earlier volumes with later ones, their research showed that the author's vocabulary decreased significantly in her last two books.

"That's not to say the computer is 'right.' Works of literature are so human and none has a single correct interpretation"

Now, in a course called "The Digital Text," English instructor Adam Hammond is using computers to undertake literary analysis; his work differs from the aforementioned projects in that he's more interested in what a text is saying than in determining attributes of the author.

Last fall, Hammond began using computers to tease out the mystery behind T.S. Eliot's *The Waste Land*. The poem is surely among the 20th century's most famous – it's the one that begins by telling us that "April is the cruellest month." But with its welter of disconnected voices, obscure allusions and steep plunges into Latin, German and Sanskrit, many readers find the poem itself to be cruel.

"Eliot wrote *The Waste Land* in 1922," says Hammond. "From that point on he was actively trying to become a playwright; he actually did not want to be a poet anymore." Consequently, Hammond believes the poem's arbitrarily shifting lines make more sense if you think of them as spoken by cast members in a play – albeit one lacking in stage directions or character names.

To help the reader determine where one "character" ends and another begins, Hammond and the students spent last fall going through the 434-line work and manually tagging significant features of the text (such as parts of speech, alliterations and foreign phrases). Hammond then delivered the heavily annotated result to U of T computer scientist Julian Brooke, who has generated a computer algorithm that will help future readers find the vocal switches within seconds.

Human scholars have hit on this "vocal switching" theory before (in fact, you can hear Eliot himself "acting" out the poem on a new app for *The Waste Land*). But the computer identifies the voices much faster – not that it's any more accurate, says Hammond. But then, literary analysis always has been an imperfect science. "It's exciting to see how a computer reader differs from a human reader, but that's not to say the computer is 'right.' Works of literature are so human and none has a single 'correct' interpretation."

Even though he's a newly minted PhD specializing in the modernist movement of a century ago (in which Eliot was a key figure), Hammond sees clear links between the 100-year-old literature he loves and the challenging, technologically inspired work of today. "Modernist literature is relevant today because modernists faced so many of the same issues we're facing. Just like us, they were trying to come to grips with a world reshaped by rapid technological change. And just like us, they were bravely attempting to use new technologies – the same ones that had made the world so unfamiliar – to understand their new reality." – **CYNTHIA MACDONALD**

ILLUSTRATION: ISABEL FOO

Around 500 BCE, the ancient Greek historian Herodotus wrote of a prisoner who escaped from his chains by cutting off his foot, which he later replaced with a wooden substitute

PROTOTYPE

The $100 Artificial Leg

The simple, inexpensive device matches the function of far more costly technology

Prof. Jan Andrysek

FOR MOST PEOPLE, THE CHEAPEST WAY to get from here to there is to walk. But for millions around the world who have lost a leg, a high-quality prosthetic limb costs more than they can afford. The ability to walk is simply out of their price range.

This situation is changing, though, thanks to a prototype for a low-cost prosthesis that not only matches the functions of more expensive technologies, but also is more robust and versatile.

The leg's developer, Jan Andrysek, is a professor at the Institute of Biomaterials and Biomedical Engineering. While current state-of-the-art limbs cost more than $3,000, Andrysek predicts his will cost $100 or even less when it goes into widespread production. His innovation is a patented knee-joint mechanism that automatically locks when the owner rests weight on it, and unlocks with forward movement. It acts much like a biological knee. This simple, inexpensive device matches many of the functionalities of high-end limbs that are packed with hydraulics, robotics and other costly technologies.

"There's always an engineering solution to a technical problem if you make it complex enough," Andrysek says. "But there are millions of people in low- and medium-income countries, and the technologies that are accessible to them haven't really changed much over the last 50 years. So why not look to see if we can improve the simple technologies as well?"

Simplicity not only makes the prosthesis more affordable, it also makes it more versatile. Andrysek's technology can weather the elements in ways existing limbs cannot. He is working with the International Committee of the Red Cross to test the leg in several countries, including Tanzania and Chile, but he also sees a market for his invention in wealthier countries.

"[In developed nations] people usually get their primary prosthesis funded. But if they need a secondary one, then it's out of their own pocket," he says. "And you may need a secondary leg for activities where your leg gets wet or dirty. The technologies that are out there don't do very well under those circumstances. Our technology is designed to be quite robust in water and dirt. There is a potential application as a 'recreational leg' that many amputees can use."

Andrysek believes the technology could be adapted for children as well

Nobody takes to water and dirt more than children, and Andrysek believes the technology could be adapted for them as well. "It's a bit of work to miniaturize the mechanism," he says. "But the pediatric focus is definitely a direction we're taking. It's a need we've identified – to have a stable little knee that the kids don't have to worry about destroying so easily. They can get it wet in a puddle and not worry about it." – **PATCHEN BARSS**

Findings

Rehab Robot

An intelligent, affordable tabletop robot, designed by Alex Mihailidis of occupational science and occupational therapy, will help stroke patients continue rehabilitation at home. Mihailidis knows the speed and intensity at which stroke patients begin rehabilitation exercises greatly increases the brain's ability to heal. But patients often neglect rehab exercises at home, either because those exercises are boring or because attendants and rehab machines are needed to oversee the exercises.

With his research team, Mihailidis designed a robot that costs about one-tenth of the rehab robots currently available. It learns about the user, adapts its exercises accordingly and tracks a patient's progress. It adjusts the difficulty of the exercises according to the user's needs and fatigue level, while a camera system – also a unique characteristic – records the patient's posture and movements.

Mihailidis hopes to distribute the robot by early autumn. – **ERIN VOLLICK**

First Light

Humans used fire 300,000 years earlier than previous thought, according to a research team led by U of T, Boston University and Hebrew University. The team found microscopic traces of wood ash alongside animal bones and stone tools in a layer of excavation dated to one million years ago at the Wonderwerk Cave in South Africa.

Analysis of sediment revealed ash plant remains and charred bone fragments, both of which appear to have been burned locally rather than carried into the cave by wind or water.

"The control of fire would have been a major turning point in human evolution," said Michael Chazan, a U of T anthropologist and co-director of the project. "Socializing around a campfire might be an essential aspect of what makes us human." – **KIM LUKE**

PHOTO: RICK EGLINTON/GETSTOCK.COM

The philosopher Plato (427–347 BCE) competed in the ancient Olympics, and was a two-time winner of the *pankration* – a blend of boxing and wrestling

Q&A

Faster, Higher, Stronger

You don't need an Olympic training regimen to get healthy through exercise

Competing in the London Olympics this summer are Tobias Oriwol (left) and Colin Russell (BSc 2010)

Most of the athletes competing at the Olympic Games this summer will have spent years training to get their shot at a medal. **Greg Wells,** a professor in the Faculty of Kinesiology and Physical Education, studies high-performance athletes. He spoke recently with *U of T Magazine* about how they train – and the health lessons for the rest of us.

What has changed in recent years about how high-performance athletes train? Previously, the focus was on fitting in as much training as possible. Recovery was not an issue. The focus now has shifted to achieving higher levels of performance during practice. For example, Canadian kayaker Adam van Koeverden broke the world record in practice on several occasions before winning a gold medal in Athens. We're pushing people to do higher-quality training more often, while also allowing more time for rest and recovery.

You recently worked with an athlete who was running two marathons a day through the Andes Mountains. What did you learn about how the body adapts under such tough conditions? The athlete, Ray Zahab, has the unusual ability to recover very quickly. We measured his blood glucose levels in the morning, afternoon and evening. By the evening, after a strenuous day, his blood glucose levels were extremely low, bordering on diabetic. But by the next morning they would be normal again. An average athlete might be expected to take several days to recover from that level of exertion. Ray is also able to operate at very close to his maximum capacity for up to an hour without having his body produce waste products, such as lactic acid. Average athletes can perform at this level for only a few minutes.

Is this a result of training, or is it genetic? Ray, who is in his early 40s, was a two-pack-a-day smoker not very long ago. He quit smoking, started running and became very successful at it, so he seems to have a genetic predisposition to athletic success. But he also runs and trains almost every single day.

Does Ray's experience offer any lessons for how to approach exercise as we age? We used to believe that our bodies inevitably deteriorate. But the thinking now is that people deteriorate mainly because they become inactive. Studies have demonstrated that you can change the way your body ages by incorporating exercise and great nutrition into your life. One recent study provided a specific example of how exercise protects DNA. On the end of DNA strands are telomeres, which act like shoelace caps to stop DNA from fraying. Exercise seems to protect these telomeres. That's why the DNA of someone who's been exercising for 30 years is very similar to a young person's, whereas people who don't exercise exhibit greater damage to their DNA.

Over time, exercise itself can put a strain on the body. What's the best way to protect yourself against injury and ensure that you can keep exercising as you get older? It comes down to leading a healthy lifestyle. This means exercising every day – ideally for up to six hours a week – and doing different *kinds* of exercise: cardiovascular training, such as running, cycling or swimming; flexibility training, such as yoga; and strength training. And it means supporting all of these by eating foods that are high in nutrients and low in calories.

Any predictions for the London Games? We may see the first Paralympian to complete in the Olympics. Oscar Pistorius from South Africa is very close to qualifying for the 400-metre event, despite the fact that he runs on prostheses. If he does qualify, this destroys the concept of disability. There are also some great young Canadians who may do well, such as Mark Oldershaw, in canoeing, and Tera VanBeilen, who is second in the world in the 200-metre breaststroke right now.

Greg Wells is the author of *Superbodies: Peak Performance Tips from the World's Best Athletes*. Read a longer version of this interview at www.magazine.utoronto.ca.

According to comScore, a web measurement company, Canadians spend more days a month and minutes a day on Internet dating sites than users in the U.S., U.K., France and Germany

Labour Days

Work can mean many things to many people – a source of income and individual pride, for example – but for the Communist party in China in the 1960s, a hard day's labour was also something to be celebrated. It was an act of patriotism and nation-building – as a collection of propaganda posters from the eve of the Cultural Revolution so visibly demonstrates.

In this image, the central female figure, a local party leader, is using *kuai ban* ("hand-clappers") to lead farmers in a song – probably honouring the harvest, says Elizabeth Parke, a PhD candidate in art history who curated an exhibition of the posters recently at the U of T Art Centre. Songs were often used to educate workers at that time because many people were unable to read or write.

For her dissertation, Parke is interested in relating the posters to how contemporary artists portray workers in the "world's factory." "We don't often consider the physical bodies of the people doing the work to create all the goods we consume," she says.

Parke culled the exhibited pieces from nearly 200 boxes of manuscripts, photographs, posters and badges donated to U of T by journalist Mark Gayn. It's possibly the second- or third-largest collection of propaganda posters in North America. – **SCOTT ANDERSON**

Computer Says No

The challenge to improve online dating

ONE DAY, LAURENT CHARLIN HOPES COMPUTERS will be as good as your friends at suggesting a book, movie or person you might like. But at the moment, he'd just like them to be a little more practical, quicker and – if this isn't too anthropomorphic – intuitive, able to make solid recommendations based on very limited information. Working in the subset of artificial intelligence known as machine learning and recommendation systems, the PhD student and his colleagues are trying to get computers to recognize real-world constraints – such as humans' limited time and energy.

Take the fevered world of online dating. There's no way even the most avid lovebird can fully evaluate every reasonable candidate, let alone meet all of them. "Even the most popular person in Toronto can't go on 10 dates a night," observes Charlin. So he and his team are building a system that gleans your preferences from a very limited number of questions, learning as it goes. It then matches you with someone or something that meets your criteria, while ensuring that you also meet their criteria. People have been researching this sort of active learning – where the computer gains a better and better sense of your preferences as it goes along – for some time. The wrinkle with Charlin's system is that the learning is intimately linked to the goal of making a good match, something it does much faster and, over time, better than existing algorithms.

One version of the software is already in use at academic conferences where it's being used to match proposed papers with appropriate reviewers. Seven or eight conferences have used the system, and feedback so far has been good. The dating application hasn't yet been released into "the wild," but according to Charlin, the initial experiments have been promising. – **BRENT LEDGER**

PHOTO: COURTESY OF THOMAS FISHER RARE BOOK LIBRARY

Perfect Harmony

A new U of T research centre will investigate the curative power of music

BY ALISON MOTLUK ILLUSTRATION BY PUI YAN FONG

ELIAS GEFEN WAS 87 YEARS OLD when he first tried playing an electronic drum set. He had never had music lessons in his life. He was in pretty good shape for his age – he used an electric wheelchair but could still walk when needed and was independent enough to come to some sessions on his own. His mind was still sharp, but since suffering a stroke four years earlier, he hadn't had the full use of his left arm or leg. So when Takako Fujioka, a neuroscientist, asked him to play the drum set using his bad arm as well as his good, Gefen was skeptical. But he gave it a go.

That first day, his entire body had to move toward the eight-piece drum set to bang out a sound with the bad arm. Fujioka had to find pillows to support his elbow, but he kept at it for the whole 30-minute session. By the third session, the pillows were no longer needed. By the eighth session, he could reach all the drums, even the one in the middle that required a 30-centimetre reach. Soon, he was beating out complex sound sequences, alternating between good and bad arms and among drums. "I couldn't stop him sometimes," recalls Fujioka. "He was really into the groove."

By the end of the 15th and final session, Gefen was able to move the damaged arm around the full circle of drums with precision. What's more, it felt stronger, he told Fujioka, and he was able to do more on his own at home.

Gefen was taking part in a pilot project at Baycrest, a University of Toronto–affiliated research facility that focuses on aging and brain health. The researchers, Fujioka and fellow neuroscientist Bernhard Ross, who is also a professor of medical biophysics at U of T, were looking into whether simple musical training could help bring limbs damaged by stroke back into use. They worked with three patients, all of whom improved. While Gefen worked with the drums, another patient worked with drums plus keyboard and a third with keyboard alone.

Music can sometimes be the perfect medicine. Not only is it fun and motivating, says Ross, but it requires patients to be precise in their movements and to apply the right force with exact timing. It provides immediate acoustic feedback so they know right away how they're doing. And it turns out that in the act of producing it, patients can reshape their brains – even when they are pushing 90.

Ross and Fujioka are part of a growing trend in research that is exploring how music can be used in health care. Sometimes, as in this pilot project, music-making is the treatment. Other researchers are experimenting with listening to music as a means to alter brainwaves in order to ease pain or fatigue. Still others are testing whether sound vibrations absorbed through the body can ease the symptoms of Parkinson's disease. Soon these researchers and others will work together under the umbrella of the new U of T Music and Health Research Collaboratory, which will open its doors in July and be in full swing by September. The centre's headquarters will be at the Faculty of Music, but it will operate mostly as a virtual institute, with collaborators continuing to work from their established labs.

Humans have experienced the mood-altering power of music for eons. Lullabies soothe children. National anthems stir collective pride. But one of the primary goals of the new centre will be to investigate how music and sound affect people's health. The researchers will try to understand the mechanisms behind the body's specific responses to music and sound, says Lee Bartel, the faculty's associate dean of research, who in many ways has been the driving force behind the new facility.

In all, the centre will have four overlapping areas of inquiry. These include music as therapy and medicine, the importance of music to the connection between body, brain and mind, the role of music in keeping societies and cultures healthy, and the health and science behind teaching, learning and performing music. U of T will offer Canada's first doctoral program in music and health, and the first research-oriented master's degree in the field. One of the centre's key strengths is that it will bring together scientists doing research with clinicians able to apply it. Too often these people work in isolation, says Bartel. "Very little of the neuroscience in this area has led to clinical treatment," he notes.

Ross and Fujioka received a grant in January from the Canadian Institutes of Health Research to take their pilot study further, and they are now recruiting 60 patients for a full study. The team, which also includes Baycrest senior scientist Deirdre Dawson, will be testing an intriguing hypothesis: that the auditory system can be enlisted to help get the motor system going again.

Many stroke patients suffer damage to the brain's motor system, but the auditory system is usually left intact, says Ross. So while the connections between a hand and the parts of the brain that control its movement may be disrupted, there may be another pathway running between auditory and motor areas. "If you synchronize auditory input with the movement of the hand, you might be able to employ this second pathway," he says. So, just as a metronome helps you master timing, and a soundtrack helps you keep in tune, the sound of a drum may make stroke patients better able to control movements of a once-errant limb. These meaningful inputs can help the brain change.

Results from the pilot project support that idea. As part of that study, the researchers used a brain-imaging technique called magnetoencephalography, or MEG, to compare the sensorimotor maps in healthy people's brains with the brains of their three patients. In healthy people, applying a stimulus to each finger lights up an area in the brain very close to the areas lit up by the stimulus on the other fingers. In the stroke patients, this was not the case. Finger activations were sometimes out of order in the brain, for instance, or in the wrong spot altogether.

Remarkably, though, after 15 sessions of musical training, even years after the initial stroke damage, the brain begins to

right itself: the activations more closely resembled what happens in healthy people. "They were closer to normal after the training," says Ross. The researchers' work will be published in the *Annals of the New York Academy of Sciences*.

Patients who make music or sounds seem to recover better, but those who "feel" sound vibrate through their body might also improve. This is a line of inquiry being pursued by Heidi Ahonen, a psychotherapist and professor of music therapy at Wilfrid Laurier University in Waterloo, Ontario, who will also be affiliated with U of T's Music and Health Research Collaboratory.

Ahonen has been working with a special "physioacoustic" chair, designed and first used in her native Finland. At first glance, it looks like an ordinary recliner. But it's fitted with six loudspeakers, one behind each knee, two in the lower back area and two in the shoulder area, which work together to circulate vibrations evenly around the body. The speakers are hooked up to a computer and software, which allows Ahonen to choose the exact frequency she wants, usually around 30 Hz – a very low-frequency sound that's barely audible. It is believed that the vibrations can be made to resonate with the muscle or tissue that the practitioner is trying to treat.

The physioacoustic chair so far has not been approved for medical use in Canada, but the U.S. Food and Drug Administration has sanctioned it for three treatments: reducing pain, improving blood circulation and relaxing muscles. Elsewhere in the world the chair is used for stress relief, drug rehab and psychotherapy, among other things. Many of Ahonen's own private clients from a previous practice in Finland came to see her about pain – post-surgical pain, for instance, or fibromyalgia – but some also seek relief for other ailments, such as Alzheimer's disease and the damage caused by stroke. So Ahonen was enthusiastic when Quincy Almeida, a neuroscientist at Wilfrid Laurier University interested in Parkinson's disease, approached her to collaborate in a study on whether the chair could improve the disease's symptoms.

Parkinson's disease is a neurological disorder caused when brain cells that produce dopamine are slowly destroyed. This results in tremors, as well as difficulties with walking, movement and co-ordination. Scientists don't know exactly why the chair might help relieve these symptoms but some have theorized that certain frequencies of vibration might be stimulating part of the brain involved in Parkinson's.

Forty Parkinson's patients participated in Ahonen and Almeida's study. It compared the effectiveness of treatment versus just relaxing in the chair. Each participant did both; half rested first, and half had the treatment first. For the treatment, Ahonen exposed the patients to the low-frequency 30Hz vibration for one minute, followed by a one-minute break, in alternation for a total of just 10 minutes. For the rest phase, the patients sat comfortably in the chair, relaxing.

They were assessed in three ways. First, the patients were videotaped and rated for tremor, finger-tapping, leg agility, posture and their ability to stand up from a seated position. They were also asked to walk in a straight line at a normal pace down a carpet that could measure step speed and length. Finally, they were timed while inserting and removing special keyed pegs from a board. They were assessed at three time points: at baseline, after treatment and after resting.

Ratings of both rigidity and tremors improved significantly after the vibration treatment, the researchers found. So did step length. They also got pegs into the board more quickly – taking an average of just 170 seconds to do so, compared to 210 seconds before the treatment. The researchers published the work in the journal *NeuroRehabilitation*. "It was encouraging to see changes after so short a time," says Ahonen, "but we don't know if it lasted. We need to do a long-term study."

How Music Gets Inside

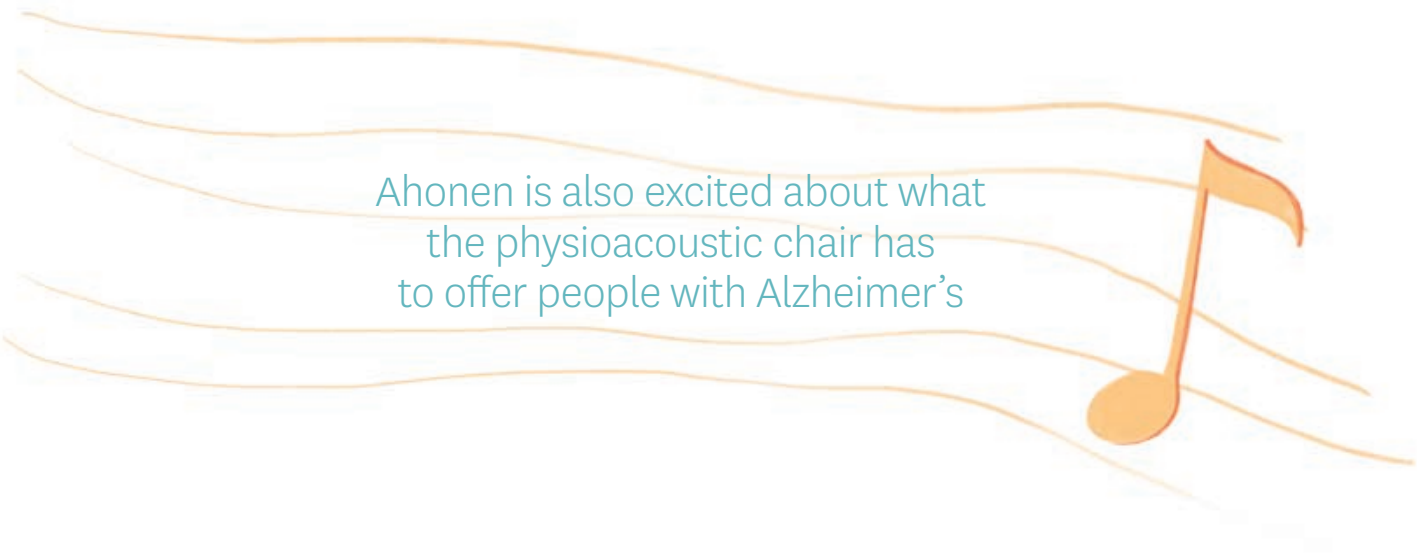
At its simplest, music is just sound. And sound is just vibration. So how does it get inside us, and influence us?

Through cultivated ears...
Mostly when we think of music, we think of listening to it. We think of music we like and don't like; music that settles us down or pumps us up. This way of being affected by music is known as a "learned cognitive response." It has a cultural component, but there's no doubt the groundwork is laid in the womb. A baby hears a mother's heartbeat, and learns early on that there's a connection between arousal and an increased rhythmic pulse. Hormone release, oxygenation and mood can all be affected.

The back roads of our minds...
Alzheimer's patients, who can't recognize their own children, can sometimes remember and sing along to hymns they learned as kids. People who stutter in normal conversation can sometimes sing seamlessly. Music, it appears, offers a secondary route within the brain, accessing language and memory areas using back roads, when the primary route is blocked.

The beat goes in...
Ever find yourself tapping in time to the music? Walking in step with an industrial hammer? Rhythms like these can drive neural firing, a process sometimes called "entrainment." Once captured by the rhythm, it can potentially alter our brainwaves.

Our cells listen, too...
The human body has several receptors sensitive to sound: auditory hairs in our ears, mechanoreceptors in our skin and sound-interested neurons scattered throughout our brains. All of these areas need more study, but a growing field is vibroacoustic therapy, where low-frequency sound is applied to the body in order to heal it. **– ALISON MOTLUK**



Ahonen is also excited about what the physioacoustic chair has to offer people with Alzheimer's

A more in-depth study on the chair's effect on Parkinson's is one of the aims of U of T's new centre. "What if we did it three times a week?" asks Almeida. "Or for an hour instead of just five minutes?" He admits he was a skeptic at first, but is now curious to see if tailored use of the chair can help patients overcome some of their symptoms without the need of so much medication.

Ahonen is also excited about what the chair might have to offer people with Alzheimer's. One incident in particular stands out for her. A female client was in the chair, receiving vibrations at 40 Hz. Ahonen noticed that the woman's husband was speaking intensely with her and at one point was crying. Afterwards, he told Ahonen that his wife had just recognized him for the first time in years. She had also remembered the names of their children and the couple was able to talk about how the children were doing.

"Maybe it's possible to recreate this," Ahonen says. She has since learned that 40Hz may affect a region of the brain called the thalamus, which is reduced in size in Alzheimer's patients. She hopes that, by working through the Music and Health Research Collaboratory with a team of neuroscientists interested in the effects of music and sound on the brain, she can explore how the chair is affecting Alzheimer's patients and how it can be used to greatest effect.

Listening to music in more conventional ways may also hold promise – in relief for patients with fibromyalgia, a poorly understood disorder. Its hallmark symptoms are pain, fatigue and disturbed sleep. Once believed to be a disorder of the connective tissue, some doctors, such as Larry Picard, a neurologist at the Wasser Pain Management Centre at Mount Sinai Hospital and an instructor in U of T's department of medicine, now believe it to be related to the central nervous system. "Increasingly, data support the view that fibromyalgia is a condition of disturbed or disordered pain processing in the central nervous system," he says. "Why it happens is unclear."

"The current treatments are all less than adequate," adds Picard. These include medication, exercise and psychological support. "We're trying to look at other ways to help these people."

Picard surmises that the sleep deprivation and the pain might be feeding into one another, and creating a vicious cycle. "If people are deprived of sleep, they will feel more pain," he says. "If they feel more pain, they can't sleep." So he has teamed up with Bartel to try to tackle the sleep side of the equation first.

For some years, Bartel has been designing music that can influence a person's brainwave activity. The music, which is commercially available on the Solitudes label, typically combines sounds recorded in nature with soothing instrumentals. The music is affordable, painless and drug-free – and, according to EEG evidence that Bartel collects for each new CD, it significantly increases the brainwave activity associated with sleep.

In a pilot study on fibromyalgia, which just got the go-ahead this spring, 20 patients will use the music at night for a month to try to improve their sleep. They will document when they use it and will fill out a questionnaire at the beginning and end of the study, in an attempt to measure music use, pain levels, sleep success and whether there are any correlations. There will be no brainwave analysis at this point and no placebo-controlled arm to the study. But if they find it helps, the researchers intend to take it further.

Traditionally, music research has been more art than science, says Bartel. Now, the Music and Health Research Collaboratory promises to put some scientific heft behind that wealth of observation, examining not just *what* music does to the human body and psyche – but *how* it does it.

Alison Motluk (BA 1989 Trinity) is a journalist in Toronto.

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UNIVERSITY OF TORONTO

A feminist rally at Nathan Phillips Square, Aug. 26, 1970

REVOLUTIONARY ROAD

Forty years ago, an intrepid group of professors and students paved the way for a new program dedicated to the study of gender – and sparked progress for women across the university

BY MARGARET WEBB

IT STARTED WITH A SIMPLE QUESTION.

In the 1960s, Jill Ker Conway, who went on to co-found one of the first women's studies courses at U of T, wondered why women, who'd had access to education for more than 130 years in North America, had "so little to show for it in terms of roles in the professions, politics and the academy." The question inspired Conway's Harvard doctoral thesis.

In 1970 at U of T, activists in the women's liberation movement took that same concern to a meeting of the new Interdisciplinary Studies Department: Why were women still largely absent from curriculum and textbooks and barely present in faculty ranks 85 long years after the first female students graduated from the university? The activists suggested a women's course would help remedy the situation.

Remarkably, two such courses would appear on the academic calendar the following year, and attract full enrolment. In fact, the courses were so successful that they led to the founding of what has become Canada's oldest and most prestigious women's studies program – celebrating its 40th anniversary this fall. The courses also asserted gender equality as a key value at U of T.

But it didn't happen without a fight.

Women's studies grew out of the great "ferment" on campuses in the late '60s, recalls Professor Natalie Zemon Davis,

PHOTO: REG INNELL/GETSTOCK.COM

who helped establish one of the first such courses at U of T. Though 83, she looks a spry 60-something, bounding up the stairs of her Victorian home in Toronto to retrieve documents from that course. Her eyes glow as she recounts those stormy years. As young academics, she and her husband, math professor Chandler Davis, had their U.S. passports revoked during the Red Scare. They took up teaching positions at U of T, where they were active in the anti-Vietnam war protests that saw students rise up and question institutionalized power. At U of T, the student protest focused on democratizing the university and giving students a stake in how it was run, through raucous occupations of the president's office and teach-ins at Simcoe Hall.

Women – both students and faculty – were as active fighting for their rights, but, for them, true democracy required equality. The burgeoning women's movement on campus led to one of the university's first sit-ins, in 1970, with protesters advocating for campus daycare. They petitioned for reproductive rights and the decriminalization of abortion. Female undergrads repeatedly tried to gain access to Hart House student centre, which barred their entry until 1972. A women's committee was organized within the Students' Administrative Council, and members called out the rampant misogyny of the engineering newspaper *Toike Oike* and distributed free birth-control handbooks.

Amidst this fervour, two brilliant young women professors, Davis and Conway, began meeting for lunch. Davis, an expert in 16th-century European history, and Conway, in 18th-century to modern American history, talked about new ways of looking at history, "how to include marginal perspectives and voices left out, capture the texture and description of everyday life"– all pioneering ideas of social history. They also discussed personal challenges of being women in a male-dominated department. Davis remembers a male colleague referring to the men as "professor" and her as "Mrs."

Determined to make academic life better for female graduate students, especially those with children, Davis sent a questionnaire to some and took their "very sensible" suggestions (such as campus daycare and flexible library hours) to the administration. They "just laughed and dismissed the concerns," recalls Davis, who would prevail in the fight for a staff daycare. When Conway was passed over for promotion, while the cohort of male colleagues she was hired with were appointed to associate professor, she could come up with but one answer to that oft-asked question of why: she felt that on the basis of performance, the decision was discriminatory. She talked to the department chair, who wouldn't reconsider, so she raised her case with the dean – who reversed the decision and promoted her. Conway then sent out a letter to female faculty, asking if others had experienced discrimination in pay and promotion. "They had horror stories way worse than mine," she says. The group took the complaints to the then male-dominated faculty association. "They said, there's really no discrimination here, and all you'll do is reduce everyone's salary." Conway's coterie persisted. "We decided to be very scholarly [in our approach], drawing on everyone's expertise to do very thorough research." They presented their findings to the Ontario ministry responsible for university education, leading to a model for pay equity and promotion that would be used across Canada. Still, a group of women faculty and librarians were still left out of U of T's salary review process as late as 1989; the women successfully launched a lawsuit against the university that was finally settled in their favour, in 2002.

As their activist and intellectual friendship deepened, Conway and Davis discussed ways of bringing their interests together in one of the first women's courses – "Society and the Sexes in Early Modern Europe and the United States" – which they taught in 1971/72. "Oh, we had so much fun," says Davis. "This was a new history we were doing, on a subject that no one knew anything about."

Many of their colleagues in the field scoffed at the venture, claiming there were no sources and that gender history was not a proper intellectual discipline, dismissing it as political and personal. Conway and Davis responded by scouring rare-book libraries for primary sources to load the academic canon. "We decided to make [the syllabus] so scholarly it would shame anyone who criticized it because their reading list would not stand up [to comparison]," says Conway. The course proved hugely popular: The lectures attracted other faculty, including many men, and students not even enrolled. Conway and Davis shared the syllabus freely with professors at other universities. It spread like wildfire and was used to help establish women's studies courses across North America. Says Davis: "We looked at themes that had never been studied before – legal, religious and medical constructions of gender and self; range of sexual experience; relationship of family structures, marriage strategies and welfare in relation to state power; challenges of reading and authorship. Studying gender opened up all sorts of ways of looking at how societies evolved. It brought subjects together – literary studies and philosophy, anthropology and history – introducing an interdisciplinary consciousness to scholarship. It opened up multiple points of view and approaches that nourished other fields."

But that glorious year would be the only time the two would teach the course together. The next year, Davis left to teach at Berkeley. She helped establish a women's studies program there and at Princeton and Oxford during subsequent teaching stints. Davis also went on to write several seminal history texts, including *The Return of Martin Guerre*, which became a feature film. She has been hailed as "one of the greatest" living historians. Conway was appointed U of T's first female vice-president in 1973, but continued teaching the course until she left to become president of Smith College in Massachusetts in 1975. Between them, they have been awarded some 80 honorary degrees.

Improbably, another group of women launched a women's studies course at U of T in 1971 – one that was even more contentious. Ceta Ramkhalawansingh was only a second-year undergrad representative on the Interdisciplinary Studies committee when a women's course was proposed in 1970. Yet she and graduate student Kay Armatage ran with the suggestion, organizing a teaching collective composed of some 15 students and women from the movement. They met weekly over the summer to develop a syllabus. "We proposed texts from our various disciplines, read intensely and became one another's teachers," says Ramkhalawansingh. In addition to making the course interdisciplinary and cross-cultural, they were determined to break down the traditional teacher/student hierarchical structure. Rather than formal lectures, there would be student-led discussions. They wanted students to question what and how they were taught and evaluated. The head of Interdisciplinary Studies, Professor Geoffrey Payzant, was supportive, but could not approve the course until a faculty member joined the teaching collective. (He taught philosophy.) It was no easy task given there were so few female professors and fewer still in a position to risk careers on such a radical venture. They finally found an ally in Professor Barbara Martineau at Scarborough College, and "FSW 200: Women in the Twentieth Century" was launched.

DAVIS REMEMBERS A MALE COLLEAGUE REFERRING TO THE MEN AS "PROFESSOR" AND HER AS "MRS."

Some 200 women and a few men signed up. They were taught in seminars of 20 people each by teams of two from the teaching collective – which was composed of graduate students, women from the movement who weren't even students at U of T and Ramkhalawansingh, though she was just in her third year. Their ambition to foster change was huge.

"Our focus was shining a light on inequality," she says. "Our approach was very experimental. We were thumbing our nose a bit at the university." The collective also ran a weekly lecture series that was open to the public, drawing some 300 to 500 people to hear noted feminists such as journalist June Callwood, writer Margaret Atwood (BA 1961 Victoria), and lawyer and now Supreme Court judge Rosalie Abella (BA 1967 University College).

Writer Myrna Kostash (MA 1968) wrote a detailed diary-style account of that first year in women's studies for *Miss Chatelaine* magazine (to read the article, visit magazine.utoronto.ca). While the collective designed the course to be scholarly and substantive, they *intended* it to be personal and political, and invited students to relate their own experiences to the material. "It was a new way of getting people to learn," wrote Kostash. While students eagerly attended class, it wasn't until nearly halfway through that many dared speak up. Noted Kostash: "The Women's Course is probably the most vital thing we could do at university and all we do is listen politely and nod about how oppressed we all are." But, she wrote that when the floodgates finally opened, discussions turned into near "screaming matches" as women uncovered their own "shitty attitudes" toward other women and began questioning everything – how they had been socialized to think and behave according to patriarchal norms and even accept their own oppression.

The next year, the teaching collective cheekily pushed the university to establish a women's studies program by producing an unofficial calendar, highlighting existing courses that might complement such a program as well as sexist terms from official university documents. They cut, pasted, photocopied and distributed the "brochure" around campus, bringing considerable embarrassment to the administration. "We were told that this was not the way things were done," says Ramkhalawansingh, "that a committee must be struck to look at the question." A committee was struck, and it recommended a women's studies program, which was officially launched in 1974/75 with a minor. Major and specialist degrees were added in 1980/81.

Ramkhalawansingh taught in the program while she did graduate work then joined the City of Toronto to develop its equity and diversity programs. She also helped establish City of Toronto scholarships for U of T's women's studies program. Armatage stayed at the university to help build the program, a monumental challenge given she and many of her colleagues did not have tenure in those early years, and the program had no departmental status to appoint faculty.

"The administration remained deeply suspicious of us for at least a decade," according to Armatage.

There were so few tenured female faculty at U of T then, that a male professor, Ronnie de Sousa, served as one of the early program directors. Says de Sousa: "It was thought that women suffered from not being taken seriously, and that I might be able to get more out of the administration in those early times. I regard myself as a feminist, and I was glad to help out." Indeed, he continues to teach in the program.

Other early directors included Lorna Marsden, who would become president of Wilfrid Laurier University then York University, and Chaviva Hošek, later president of the National Action Committee on the Status of Women and director of policy for the federal Liberals during the Chrétien years. Says Hošek: "People like Kay were the real heroes for the guts they had. They had heavy teaching loads and short-term contracts, little research time, and they had to convince other departments to hire faculty who could also teach women's studies courses, and they did it in a very fragile job situation with no tenure."

Armatage eventually became a professor appointed to the cinema studies and women's studies programs, and took a series of leadership roles in the latter, helping it become the Institute for Women & Gender Studies. It earned departmental status in 2005.

The Feminist Revolution at U of T

Milestones over more than a century

1885 The first five women graduate from U of T, including Margaret and Catherine Brown (daughters of *The Globe* newspaper founder, George Brown), who both earned BAs in modern languages.

1906 The university's first female associate professors are named within the School of Household Science: Principal Annie Laird and chemist Clara Benson. Both were named the first female full professors in 1920.

1921 The U of T Varsity Blues women's hockey team hits the ice for the first time. The following year, they win the first women's intercollegiate hockey championship.

1970s Thanks to student activists, U of T's first on-site child-care facility, Campus Community Co-op Daycare Centre, is created.

1971 Two women's studies courses are established, leading to the launch of a women's studies program in 1974.

1972 Women are admitted to Hart House, a male-only facility since its opening in 1919. (This is followed by Massey College's admission of women in 1974.)

1973 Jill Ker Conway is named vice-president at the university – making her the first woman in an academic leadership position at U of T.

1984 The Status of Women Office, which works toward full gender equity at U of T for students, staff and faculty, is established.

2005 Dr. Catharine Whiteside is appointed the first female dean of medicine at U of T. The following year, Prof. Mayo Moran is named the first female dean of law and Prof. Cristina Amon the first female dean of applied science and engineering.

Clockwise from top: Women grads from the early 1900s; Principal Annie Laird; early women hockey players; Dr. Catharine Whiteside; women's studies class, 1975; Jill Ker Conway

Instructors, tutorial assistants and students from those early courses went on to become major players in the women's liberation movement, taking leadership roles in women's studies programs across Canada and championing equity and diversity in government, community organizations and business. Lyba Spring, a member of the teaching collective, helped establish the Toronto Women's Health Network and became a sexual health educator with Toronto Public Health. "The effect that feminism had on me was like scales falling from my eyes," says Spring. "Students [in that course] began looking at the world in a totally different way, and understanding the self in relation to power and gender dynamics. Expectations for what women would do were very clear – you grew up and got married and had children – but we began to re-evaluate where we could end up."

Monika Simon, one of the first students in the program, ended up in the president's office of a major business trade organization after working her way up through the male-dominated beer industry, having a family and earning an MBA. She says taking women's studies "helped me stand my ground as a woman in [the business] world that wasn't quite prepared for my gender. The course made you realize you were not different from your male counterparts in terms of learning and education. It empowered you to take on anything and accomplish anything you wanted."

One of the first recipients of the City of Toronto women's studies scholarships, in 1988, was Amanda Dale. She says the women's studies program required students to gain practical experience working in community agencies on issues of poverty, discrimination, violence and women's health – invaluable preparation for her current role as executive director of Toronto's Barbra Schlifer Commemorative Clinic, which offers legal counselling, advocacy and support for women survivors of violence – some 4,000 a year. "These were not theoretical constructs for us," says Dale. "This field required you to engage." She says simply taking degrees that train people technically "misses a very important set of core ethical values you need to guide an agency whose goal is to improve the lives of people. I learned that in women's studies, and it serves me each and every day."

Yet, women's studies programs – still small and thinly staffed – remain highly vulnerable to being cut in this era of scarce resources. U of T's is still expanding, albeit on a shoestring budget, according to acting director Michelle Murphy. It began granting MA degrees in 2007 and, this fall, will accept its first PhD students. The Institute for Women & Gender Studies now offers 21 undergraduate courses, collaborates with some 27 departments that offer cross-appointed courses and has developed a strong interdisciplinary and transnational research focus – looking at how sex, gender, race and class construct identities, citizenship and institutions by also considering the histories shaping the world and the multiple nations that make up Toronto and Canada. Murphy says the students drive that focus, arriving at U of T from all over the world, with multiple experiences and perspectives on gender. "Our students are incredible," she says. "They're politicized, engaged, creative, active. With the Arab Spring and the Occupy Movements, this is an exciting moment for young people. They feel like they can make the changes they want to see, that they can change history."

Women's studies and the feminist movement have certainly had a profound impact on the university. Women now comprise about 40 per cent of long-term faculty. In the last decade, Cristina Amon was appointed the dean of engineering, Catharine Whiteside the dean of medicine and Mayo Moran the dean of law – the first women to hold these positions at U of T.

Professor Njoki Wane, Status of Women officer at U of T, is blunt in her assertion that despite considerable progress made, sexism has not come to an end on campus. "Just like race relations departments have not ended racism, there is still sexism and we still need to be vigilant," she says. "I get calls from students and more from female colleagues, usually about a sexist comment or behaviour. They're usually in shock that this would still happen in 2012, that these comments are still being made, and they're still being looked down on because they're women. They want to know how to deal with it, maybe get literature or courses to introduce to a department. At the time, there's pain. It feels like a crisis. Sometimes they feel disempowered. After a conversation, they decide, 'this cannot limit me.' My sense is that women are very determined to get what they want and they won't put up with being put down."

And for all that significant achievement, the founders of women's studies at U of T believe there is as much need as ever for the program. "Women's studies courses were a way of feeding a body of knowledge and literature into mainstream courses so they might not need to continue," notes Davis, "but they have not nourished scholarship as much as they should have. We still need the focused perspective to affect the mainstream."

Hošek concurs. "[Women's studies] has redefined what scholarship is. The last 40 years have been revolutionary in terms of cultural history, institutional history, biology and understanding the variability of gender, economics, medicine, literature, you name it. Scholarship has been hugely expanded and enriched by not leaving out half the human race.

"There's been progress, but until the life chances of someone born female are as open to her as the life chances of someone born male in the same place, there's going to be a ton of work to do. You can't close your eyes and just wait for equality to happen. I thought we would have gotten past certain issues [such as leadership roles in business and government, pay equity, reproductive rights, access to education in developing countries and violence against women], but you can see things going backwards.... It tells me there's lots of work left to do."

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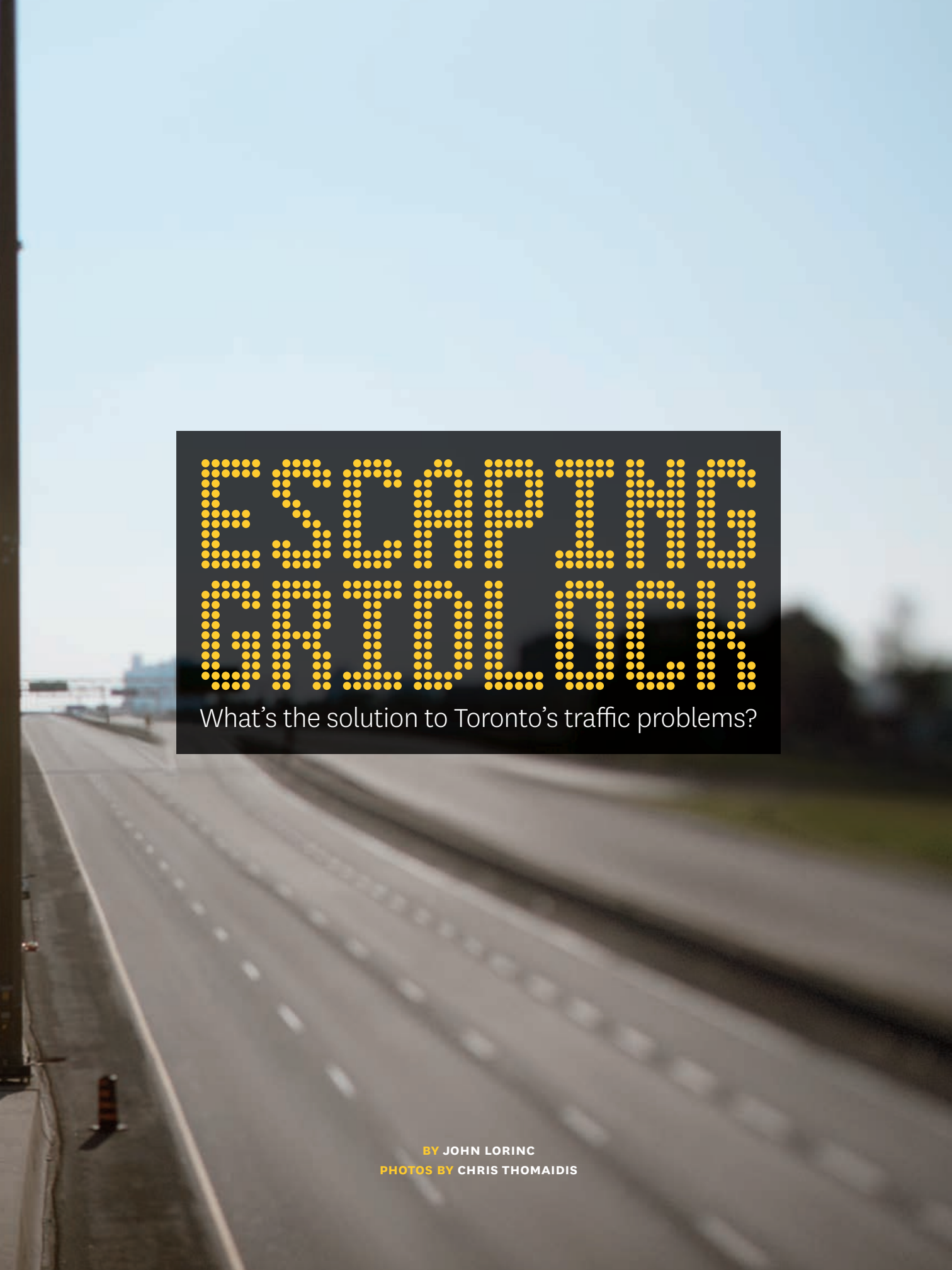

ESCAPING GRIDLOCK

What's the solution to Toronto's traffic problems?

BY JOHN LORINC
PHOTOS BY CHRIS THOMAIDIS

FOR YEARS, JIM YATES, A VETERAN LOBLAWS EXECUTIVE, had an almost effortless trip to work: just 20 minutes from his west-end home to the food giant's midtown head office. He usually drove, but in good weather he often rode his bike. All that changed when his department moved into the company's new corporate complex in Brampton. Now, says Yates, he leaves his home an hour earlier and has to drive at least an hour each way. Poor weather and dense afternoon traffic can draw out the return trip to well over 90 minutes. He tries to makes productive use of the time but acknowledges that the journeys take their toll: "It's way more tiring," he says.

Yates, of course, is not alone; just the opposite, in fact. Across the Greater Toronto Area, hundreds of thousands of commuters take to the region's highways every day because they feel public transit is not an option for them. The situation inside the city proper isn't much better. Encumbered by decades of under-investment, the Toronto Transit Commission's subway network is woefully small and increasingly overcrowded.

Governments have begun to take heed, committing billions to extending the Spadina subway to Vaughan, expanding GO Transit service and building four new light-rapid transit (LRT) routes to connect Toronto's inner suburbs. Those four lines, which will cost Queen's Park $8.4 billion, were approved following a gut-wrenching fight at Toronto City Hall this spring. That showdown pitted Mayor Rob Ford, an ardent proponent of subways, against a broad coalition of city councillors who argued that the city's inner suburbs didn't have the population to justify the huge cost. Ford lost.

While these investments represent the largest expansion of rapid transit in Toronto in more than a generation, tough questions remain – especially for commuters who live and work in the outer suburbs. Gridlock costs the region an estimated $6 billion a year in lost productivity. Toronto's air quality, though improved in recent years, continues to suffer because of excess smog. And with average commute times now in the 80-minute range, travelling across the GTA is a daunting task – one that will only become worse as three million people settle in the region over the next two decades. As a new Pembina Institute survey found, two-thirds of drivers experience stress on their daily odyssey. "Until transit becomes a convenient solution in the entire region," says U of T geographer André Sorensen, who studies land use in the GTA, "we're not going to solve our congestion problems. That's the dilemma."

To correct that deficit, Metrolinx, the regional transportation agency established in 2006, has developed a $50-billion, 25-year strategy known as "The Big Move" to build a network of high-occupancy vehicle lanes, LRT lines, bus rapid transit corridors, and subways in the GTA and Hamilton. It also wants to transform GO rail from a rush-hour service focused on getting commuters to Union Station in the morning and back home to the suburbs after work into a system that can be used all day, in any direction. But the agency and its Liberal masters have yet to reveal to voters how they plan to pay for all these transit projects. What's more, some critics wonder whether Metrolinx's plan will deliver the goods or merely dent the GTA's grinding commute times. This much is clear: the region is now in the thick of an historic debate about its own future. The LRT train, it would seem, has left the station.

Rob Prichard, by his own account, has had the good fortune to spend much of his career perched atop three institutions with uniquely expansive perspectives on the city: U of T (as president), the *Toronto Star* (he ran Torstar), and now Metrolinx. Three years ago, when Ontario Premier Dalton McGuinty tapped him to serve as chair of the new regional transportation agency, the 63-year-old former law school dean agreed because McGuinty assured him that the GTA's gridlock problem was high on his to-do list.

The urban file was hardly new to Prichard: in 1995, he sat on Anne Golden's Greater Toronto Taskforce, which anticipated the region's hyper-growth and recommended a regional council to help manage, among other things, mounting transportation-related problems. Seventeen years later, the heightened public interest in transit is great news, says Prichard. "We have to seize that moment."

As Prichard well knows, Metrolinx's most formidable challenge is figuring out how to deliver transit in the City of Toronto's rapidly growing suburbs where sprawling development has militated against efficient and convenient transit service. Indeed, the Canadian Urban Institute recently reported that the GTA now contains more than 200 million square feet of office space, making it one of just four such regions in North America. Thirty years ago, almost two-thirds of the GTA's offices were on subway lines. By 2010, however, less than half of region's office space was anywhere near a rapid transit stop.

GO Transit has certainly ameliorated the tidal wave of traffic. The system of buses and trains serving communities outside of Toronto now carries 57 million passengers annually. But transit trips in the outer suburbs, Sorensen says, still pale in comparison to the TTC's yearly ridership of about 500 million. Consequently, Toronto-area highways experience high volumes most of the day, and tough "reverse commutes," as people drive out from the city to office parks in Markham and Mississauga. Indeed, it's no surprise, then, that a U.S. Department of Transportation study concluded that Highway 401 through Toronto is officially the busiest stretch of freeway anywhere in North America.

In recent years, Queen's Park and Metrolinx have begun work on several major projects meant to ease congestion. The province has carved out high-occupancy vehicle lanes on some of the GTA's highways and is promoting carpooling. An 18-kilometre dedicated "busway" is under construction along Highway 403. But Toronto City Council's dramatic

Transforming the GO Transit rail network into an all-day service in all directions is "the future of GO," says Metrolinx chair Rob Prichard. "The whole issue is, 'how fast can we do it?'"

fight this spring – over whether to build subways or LRT lines with $8.4 billion from the province – did more to shine a spotlight on the agency's long-term strategy than anything else it has undertaken.

As he followed the overheated debate, Amer Shalaby, a professor of civil engineering and the chair of U of T's Urban Transportation Research and Advancement Centre, was struck by the glaring absence of a key piece of the puzzle: how the proposed LRT lines would fit into the big picture. "We need to look at the network perspective," he says. In an emotionally charged fight rife with misinformation, there was scant analysis of how or if these new transit routes would ease the GTA's congestion woes or mesh with Metrolinx's other long-term plans. City-regions with more integrated transit systems, Shalaby points out, tend to use a combination of commuter rail, subway, light-rail or bus rapid transit, and surface transit operating in mixed traffic. Toronto's transit grid, for historic reasons, is built around a small subway system and extensive bus and streetcar routes tied closely to subway stops. The city needs to have intermediate level service (LRT or bus rapid transit routes) for corridors with medium demand, says Shalaby. "In the GTA, we don't really have this hierarchy."

Nor, he adds, has Metrolinx subjected its Big Move plan to the sort of detailed computer modelling that would have tested the viability of its transit network against other alternatives using current and projected population and economic and other data. The agency, he says, "didn't come to us. When you look at the final product, the scenarios they came up with were…not very thorough." (Metrolinx is currently refining the Big Move strategy, and will release version 2.0 at some point in the next year.)

This kind of due diligence seems relevant, given that employment projections, prepared by Metro Toronto planners in the 1980s to justify the construction of subways on Eglinton West and Sheppard East, proved to be wildly off the mark. Why? Sorensen cites three reasons: the exodus of manufacturing jobs in the wake of the 1989 free trade agreement; changes to the planning process that permitted more companies to set up shop in the outer suburbs; and the fact that gas was so cheap employers didn't think twice about locating further afield. He also points to research by Danish economist Bent Flyvbjerg, who has documented how government agencies promoting large infrastructure projects routinely overestimate revenues and lowball costs.

Metro's flawed 1980s projections figured largely in the 2012 subway-versus-LRT debate, as critics of the mayor pointed out that even with significant intensification along Sheppard, the line won't attract enough riders to justify the cost. "What's the point of putting in a subway and exhausting all our resources on a single line," Shalaby says. "Put in the subway where it's warranted."

Indeed, in the run-up to the final decision, council asked an expert panel – involving Eric Miller, a professor of civil engineering and director of U of T's Cities Centre – to look at the relative merits of an LRT line and a subway for Sheppard. An expert in transit demand and transportation modelling, Miller, along with the panel, devised a scoring system to objectively evaluate three possible options for Sheppard: an LRT line, a subway, or a combination of the two. The panel

recommended the LRT, which garnered significantly higher ratings than the other two, and after two days of intense debate, council voted 24 to 19 for the LRT option. Ford, for his part, flatly rejected the panel's findings, insisting that Torontonians want subways, not LRT.

Dressed in a crisp navy suit with an Ontario legislature lapel pin, John Tory strides into O&B Canteen, the stylish eatery in the TIFF Bell Lightbox, and bangs out a quick text on his smartphone before settling in to discuss transit politics. Despite a bit more grey hair and a post-politics gig on talk radio, Tory (BA Trinity 1975) is every bit as engaged in public life as he was when he ran for mayor, in 2003, and then led the Ontario Progressive Conservatives, from 2004 to 2009. These days, he's using his platform as chair of CivicAction, a Toronto lobby group, to convince the McGuinty government to establish a long-term revenue source to finance The Big Move.

The strategy involves assembling a GTA-wide coalition of labour, business, not-for-profit and institutional leaders who are willing to back policies that will likely involve asking the region's residents to pay more to alleviate traffic snarls. The PR campaign, expected to be in full swing by the fall, won't include new transportation studies; nor does Tory intend to get into the policy weeds. "The people of the region are desperate to see actions taken to create a viable transit system," he says. They know there's been little progress "whether they're driving their car or waiting for four trains to go by to get on the Yonge subway." But to solve the worsening gridlock issues, he adds, "they're going to have to pick their poison."

Metrolinx is working on a plan to underwrite the Big Move, which means finding ways to raise about $2 billion a year. Lessons from other cities have helped advance the debate. In recent months, U of T's Institute on Municipal Finance and Governance invited key figures from other cities that have cracked the funding problem. Among the speakers was Richard Katz, a former California assemblyman who helped Los Angeles mayor Antonio Villaraigosa sell voters on a plan to raise $40 billion over 30 years by adding half a per cent to the L.A. County sales tax.

The tax, approved by plebiscite in 2008, is earmarked for more than a dozen major transit and transportation projects, as well as smaller improvements. "People have a sense that their tax dollars are getting into the local community for something they can see," says Enid Slack, director of the municipal finance institute. "The 'aha moment' is that even in a time of fiscal restraint and a time of people wanting lower taxes, [L.A. residents] could agree to be taxed for things they can see and benefit from."

Yet an L.A.-style retail sales tax – seen as acceptable by between half and three-quarters of the GTA's population, according to various polls – isn't a complete solution because it doesn't encourage drivers to use transit. One approach used in other cities is a regional parking levy. Studies have shown that higher parking fees and fewer spaces downtown encourage people to use transit. But in suburban areas, where drivers have long been accustomed to free parking in malls and office complexes, the impact is more difficult to predict because transit isn't yet a viable alternative for most people.

Such chicken-and-egg dilemmas bedevil the debate about transit expansion. People need travel options besides cars, says Miller, who suggests "demand management" tools such as gas taxes, road tolls on the 400-series highways or congestion charges, like those used in downtown London to dissuade people from driving into the city core at certain times of the day. "Managing the use of the roads is important," he says (though he adds he doesn't think London's congestion charge would translate well to Toronto).

While he acknowledges that road pricing is often seen as the third rail of local politics, Miller feels the issue is often framed incorrectly: "We typically ask the wrong question. It's always viewed as a tax for which there is no benefit." In fact, experience elsewhere shows some drivers are willing to pay more to reach their destination more quickly because the benefit they receive is immediate.

The riddle is that there is no GTA-wide political body, like L.A. County, that can formally levy these taxes and then be held accountable for their use. Nor is it clear how the region's residents would express their views on such proposals. "We don't do referenda here in Ontario, but there's still a question of how do you get public support," Slack observes, adding that she's not opposed to the province giving local municipalities the right to use a range of levies but then letting each council decide if they wish to impose one.

Tory, for his part, believes that it would be possible to hold and win a referendum, but he feels that the decision should be made at Queen's Park. On the latter point, Prichard agrees: "The ultimate decider is the legislature of Ontario." He doesn't think that it's possible to achieve consensus by putting these questions to each of the GTA and Hamilton's 31 municipalities. "It seems to me it has to be a region-wide initiative."

Even if the provincial Liberals take Metrolinx's forthcoming advice and impose various taxes, levies and fees on GTA residents to pay for the Big Move, the issue of how and when to spend those dollars remains something of an open question.

Transit watchers are eagerly awaiting next year's release of a refined version of the Big Move. But experts remain divided about how the agency should target its investments. U of T economist Gilles Duranton argues that new revenues should be invested in high-speed bus service, using comfortable, state-of-the-art vehicles, because subways and LRT lines only make sense in areas with high population densities. "The idea that you build subways and then buildings will go up is just so fanciful."

André Sorensen, however, argues that Metrolinx remains overly focused on expanding GO bus service, particularly to Union Station. "It doesn't really create a regional transit

system," he says. "It just puts [more] people on the 400-series highways."

Both Sorensen and Miller feel the real opportunity is to transform the GO rail network into an all-day service in all directions. Prichard says the McGuinty Liberals made just such a promise in the 2010 provincial election. "That's the future of GO," he states. "The whole issue is, 'how fast can we do it?' That's both a financial question and a physical question."

Sorensen argues that the way to get there is by converting the GO system from diesel trains to electric vehicles that can start and stop quickly, thus allowing Metrolinx to put both local and commuter service on the GO rail tracks. The agency has conducted an electrification study for its planned Union Station-Pearson shuttle service and has pledged to make the transition incrementally, but the major shifts won't happen until after 2020.

By moving to a combination of commuter and local service on the GO rail corridors, Metrolinx could bring relatively inexpensive rapid transit to suburban areas. Such a solution could also solve a major problem on the TTC's increasingly overtaxed subway network, especially the Yonge line. Transit experts have long advocated for a "downtown relief line" that would create another U-shaped route between the Bloor-Danforth subway and downtown, possibly from Pape Station in the east, through Union, to Dundas West, as a means of diverting riders from the Yonge-University line. The project, estimated in 2009 to cost $3 billion, is part of Metrolinx's long-term plan, and has been endorsed by Toronto city council. But it will take over a decade to complete and the funding remains a question mark.

From his perch at Torys LLP, in the southernmost TD Bank tower, Prichard has an unbeatable ringside view of the waterfront and, in particular, Union Station, which remains the focus of much of the region's transit planning. These days, the construction on the GO platforms is clearly visible, and the stylish glass-and-steel roof that will cover the tracks is taking shape.

The station's revitalization, years in the making, will go down in history as one of Toronto's most formidably complicated infrastructure projects, with myriad moving parts, technical challenges and competing interests. It's a microcosm of Metrolinx's own mandate in the GTA. With the agency poised to ignite a historic debate about how to finance billions in transit improvements, Prichard realizes Metrolinx may find itself arrayed against a tax-averse mayor and skeptical voters. Nonetheless, he revels in the challenge, and feels optimistic that a consensus will emerge. "Do I think the GTA and Hamilton, with its complexity, can get this issue right?" Prichard says, his voice rising. "Absolutely."

Journalist and author John Lorinc (BSc 1987) writes about urban affairs for the *Globe and Mail* and *Spacing Magazine*.

Connecting the GTA

Metrolinx officials expect GO Transit's ridership to reach 75 million by 2016, almost a third higher than today. Other agencies, including the TTC, Mississauga Transit and York Region Transit, are also seeing big increases in customers. The growing demand has prompted significant investment in major transit projects besides the four new LRT routes planned for Toronto:

1. Spadina subway expansion to Vaughan Metro Centre
   COST: **$2.6 billion** COMPLETION DATE: **2015**
2. York Region Viva bus rapid transit (five corridors)
   COST: **$1.4 billion** COMPLETION DATE: **2014–20**
3. Georgetown South (additional GO tracks)
   COST: **$1.2 billion** COMPLETION DATE: **2015**
4. Union Station Go Transit revitalization
   COST: **$1.1 billion** COMPLETION DATE: **2015–16**
5. Air Rail Link (Union Station to Pearson International)
   COST: **$129 million** COMPLETION DATE: **2015**
6. Mississauga bus rapid transit corridor
   COST: **$249 million** COMPLETION DATE: **2013**
7. Union Station subway station revitalization
   COST: **$90 million** COMPLETION DATE: **2012**

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In recent issues, we've featured stories about scientists investigating the genetic underpinnings of autism, a U of T lab that's harnessing technology to make life better as we age, and Canada's changing international reputation, as well as profiles of bestselling novelist Tom Rachman, the late pioneering media theorist Marshall McLuhan, and human rights observer Samer Muscati.

Inside each issue, you'll find coverage of the university's latest research findings, events on campus, notable alumni and the big ideas that make U of T such a fascinating place.

In the past three years, the Canadian Council for the Advancement of Education and the U.S.-based Council for Support and Advancement of Education have recognized *U of T Magazine* for excellence in writing and design with 15 awards, including two for "best magazine."

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UNIVERSITY OF TORONTO

All About Alumni

It is possible to end a day with your eyelids swollen shut and blood trickling from your ears

Charlotte Gill on her life as a tree planter

p. 49

Muhammad Lila at Cummer Park in Toronto

Clear and Present Danger

For ABC correspondent Muhammad Lila, risk-taking is part of the job

RIOTING IN THE STREETS. GUNFIRE. NUCLEAR STANDOFF. Most people, confronted with these events, sensibly head in the opposite direction. Muhammad Lila isn't most people.

As the new digital correspondent for ABC News in Pakistan and Afghanistan, Lila (BA 2002 University College) is responsible for diving in when news breaks in one of the most tumultuous parts of the world. "I thrive on it," Lila says. "I want to be the person on the scene; I want to be that guy who gets the call at 2 a.m. It's an honour."

Since he began the job in January, the calls have come thick and fast: in February, violent protests swept Afghanistan after U.S. troops burned copies of the Qur'an at the Bagram airbase north of Kabul; in March, an American soldier was accused of gunning down 16 Afghan civilians in the Panjwai district of Kandahar. Lila was on the scene in both cases, filing reports for all of ABC's news divisions – the catch-all "digital correspondent" title means he reports on TV, on radio and online.

"I think the next year or two will be the most pivotal in that region in the last 10 years," he says. As NATO forces continue to withdraw from Afghanistan, the Taliban is increasing its activity; the internal politics of Pakistan – a nuclear-armed nation – are heating up; and there's talk of Western strikes against Iran over its purported nuclear program. "So you've got all these fascinating things – from a journalistic ›

PHOTO: DEREK SHAPTON

As recently as the 1940s, North Americans grew almost half of their own vegetables, according to Fresh City Farms

Urban Farmer

Ran Goel is leading an agricultural revolution

IF RAN GOEL (JD 2007) HAS HIS WAY, every backyard in Toronto will become an organic micro-farm."If we can make farming ubiquitous here, it would be a win-win-win situation for our environment, our communities and our health," says Goel, co-founder of Fresh City Farms, which focuses on commercial urban agriculture.

Sound radical? Consider Goel's path to urban farming activist – until recently, he was an investment lawyer in New York. But Goel, 32, has always had a green streak: he researched corporate environmental issues at York University and at the London School of Economics and Political Science. His environmentalism blossomed further at U of T's Faculty of Law, where, as a student rep on Governing Council, he advocated for more ecologically and socially responsible investments.

In 2011, Goel returned to Toronto and teamed up with his brother and other urban farming enthusiasts – including U of T alumni Abra Snider (BA 2007 UC) and Damian Adjodha (BSc 2000 UTSC) – to form Fresh City. Its goal is a more eco-friendly, healthy and food-secure city through citizen-led farming. At their two-acre farm and 3,000-sq.-ft. greenhouse at Downsview Park, the team teaches aspiring commercial and hobby farmers about growing vegetables naturally. These "member farmers" then cultivate the yards of willing homeowners. The result is mini-farms, which are large organic vegetable gardens with longer growing seasons. So far, about a dozen have sprouted up across the GTA.

Fresh City sells the harvested produce locally, delivering about 250 boxes a week. Members get 50¢ on the retail food dollar – far more than the 20 cents a typical farmer makes. "We're trying to bring the makers and eaters of food together," Goel says. "The more people get involved in producing their own food, the better it is for people and the planet." – **SHARON ASCHAIEK**

OVERHEARD

> I never thought I would learn how to swim. I didn't think I would drive. I never thought I would pursue writing. But with each challenge I gave myself, I kept going. I'll always have a fear of failing. But I tell myself that's not justification enough for me to not give it a try.

Rupinder Gill (BA 2001 TRIN), talking about her book, *On the Outside Looking Indian: How My Second Childhood Saved My Life*, from a video interview on Indigo's non-fiction blog

standpoint – going on in the region. And I get to be right in the heart of it."

Born in Toronto to east African immigrant parents, Lila is fluent in English and Gujarati, can get by in Urdu and is learning Arabic. With his undergraduate degree in history and philosophy from U of T and a master of science in journalism from Columbia University, Lila quickly climbed the ranks in Canadian broadcasting – from Citytv to CBC News, where he became one of the youngest people ever to anchor *The National*. (He was also a producer for CBC and CTV prior to his on-air career.)

Lila has proved to be a versatile reporter, straddling print, television and digital media – in 2010 he live-Tweeted the annual hajj pilgrimage to Mecca. Now, as a Muslim Canadian working for an American company in South and Central Asia, he feels he's in a position to increase understanding between an East and West that are often at odds. "If I can stand in the middle and be part of the solution and get everyone to understand each other, I have to try," he says. "I've lived my life on that bridge."

The life of a foreign correspondent, however, isn't non-stop action. A surprising amount of his time is spent at embassies trying to get travel visas – in countries not famous for the co-operativeness of their bureaucrats. But it pays off in frequent-flyer miles, he says with a laugh. "My goal is to have gold-tier status by the end of the year." – **GRAHAM F. SCOTT**

PHOTO: LEFT, COURTESY OF RAN GOEL; RIGHT, ANNA LISA SANG

Parenting 101

In Katrina Onstad's new novel, a couple gets a crash course in raising a child

KATRINA ONSTAD (MA 1999) MIGHT BE BEST KNOWN for her national newspaper and magazine columns, but her 2006 debut novel *How Happy to Be* was celebrated for its satire, wit, and examination of loving and working in the 21st century. In her new novel, *Everybody Has Everything*, Onstad takes a similar approach, once again considering the isolating aspects of contemporary urban life. Through her characters James and Ana, she uses the perspective of a long-childless couple to take a provocative look at modern parenthood, illuminating the absurdity of a culture that has turned "parent" into a verb.

Onstad's novel dares to pose the still-controversial question: Is every woman meant to be a mother?

James and Ana are summoned to parenthood by a text message and a phone call. A tragic car accident has occurred, and they are shocked to find themselves entrusted with care of their friends' two-year-old son, Finn. The boy's arrival in their home rocks James and Ana's relationship to the core, their untraditional path to parenthood bringing not only unique challenges but also those typical to many families – balancing child care, dealing with tantrums and finding time for romance. Onstad has broadened the narrative of family life to include several new realities. After years of invasive fertility treatments and miscarriages, Ana has only recently made peace with the fact that she is unlikely to have a biological child of her own. Once she becomes Finn's guardian, she is forced to juggle impossible competing expectations from home, in her work as a successful lawyer and in her responsibility to care for her ailing mother.

For James, underemployment has him questioning notions of manhood and his role as husband and provider. Long a purveyor of anti-sentimentality, he is also surprised and overwhelmed by the force of his feelings for Finn, by the connection between them that makes him feel like an adult for the first time in his life.

Ana's connection to Finn is less straightforward. When he arrives, the maternal feelings fail to. Onstad's novel dares to pose the still-controversial questions: What is parenthood beyond the biological connection? And is every woman really meant to be a mother? – **KERRY CLARE**

From Stage to Screen

Measha Brueggergosman hits gold with a new album, a TV show and an opera

Juno Award-winning soprano Measha Brueggergosman (BMus 1999) considers time the most important currency – though she's never had much of it. This past year, she released a new album and took a role on a TV show.

Her new album, *I've Got a Crush On You*, is a collection of covers – from Gershwin's "Embraceable You" to Ron Sexsmith's "Secret Heart." It's also Brueggergosman's first non-classical recording. The songs were recorded in familiar haunts in Halifax and in her hometown of Fredericton, and the label, Kelp Records, is run by a childhood friend. "The album is an amalgam of the people, places and repertoire that have gone into my history," she says.

Part of that history includes an addiction to reality TV developed while Brueggergosman lived in Germany. So when *Canada's Got Talent* approached her to be a judge, it was an easy sell. The first season recently concluded, and Brueggergosman is hoping for a second. She'll also be performing in *Porgy and Bess* with the Cincinnati Opera this summer.

For Brueggergosman and her husband, the last year started with tragedy when they lost a pregnancy. She has found healing through more time with her family and her return to work. "I took the time to grieve properly, but I'm also a doer and I wanted to be busy," she says. "In a way, I feel like my husband and I have been blessed in ways we couldn't have predicted." – **SARAH TRELEAVEN**

PHOTO: TOP, JULIAN BAULD; BOTTOM, MAT DUNLAP

THE TWO OF US

Mehreen and Arsalan Rashid

The heart wants what the heart wants, but Mehreen (BA 2006 UC) and Arsalan Rashid (BCom 2006 UC) offer a lesson in the virtues of patience

MEHREEN: When I met Arsalan at the UTM Library, we talked about our love of reading comic books and watching cricket. There was something about Arsalan that I immediately connected with; it was during a conversation about superpowers we'd like to have that I realized he is as wacky as me. After I graduated, I went back home to Singapore because my parents wanted me there. Both Arsalan and I are Pakistani, and we're very close to our families, so he understood. We had a five-year long-distance relationship, mostly over Skype. I came to Toronto, and he came to Singapore but the smallest gap we had between visits was a year. We were in each other's lives, but solely through conversation. You could probably do a study about us and how the Internet helps long-distance relationships.

ARSALAN: What drew me to Mehreen was her quirky sense of humour; she has a constant smile and is a very positive, happy person to be around. When she went back to Singapore, I realized how much Mehreen meant to me. I was just a bum fresh out of university and I couldn't go to her parents and ask them to send their daughter to the other side of the world. So I studied and got some work experience to ask for their daughter's hand. Calling was absolutely nerve-racking. I've been working as a foreign exchange trader so I've been involved with many tough calls. But this was...holy crap. I've never been so jittery. They didn't say yes right away. They made me wait a couple of days because they wanted to make sure this was what Mehreen wanted. After they agreed, Mehreen and I met in London, where she was visiting her sister. I got down on one knee right next to the Millennium Bridge. We got married in Karachi, Pakistan, in April, then went on our honeymoon to Greece and then Mehreen flew home with me to Toronto. We expected an adjustment period after so many years apart, but it really just felt so natural. We stepped right back into being together.

Peaceful Pursuits

Jothi Shanmugam, a fourth-year student in criminology and peace and conflict studies, is devoted to bringing together communities for change. Through the Young Canadians' Peace Dialogue, she has worked with Sinhalese, Tamil and Muslim Sri Lankans to promote peace in Sri Lanka. Shanmugan helped write a policy paper on Sri Lankan development and peace initiatives, which she presented last summer in Colombo, Sri Lanka, to government representatives from such countries as Canada, the U.K. and Switzerland.

For her work, Shanmugam earned a Gordon Cressy Student Leadership Award – which was given to 183 graduating U of T students for improving the world around them. She is also this year's recipient of the Dean's Student Leadership Award in the Faculty of Arts and Science.

Shanmugam helped create BuildChange in which Sinhalese, Tamil and Muslim students raised $25,000 to build wells in the war-affected northern regions of Sri Lanka.

As part of Students for International Development, Shanmugam spent four months in Maragoli, Kenya, where she ran public-health and HIV-AIDS workshops. Upon learning that the village couldn't afford to pay for glaucoma and cataract treatments, she started a network between the Sabatia Eye Hospital and Ministry of Health to create "eye camps" – which have provided eye care to more than 1,000 Kenyans.

The Trinity College student was born in Sri Lanka and came to Canada as a refugee when she was seven. Shanmugam grew up with identity issues about being an immigrant, and her curiosity about why her life had to be uprooted led her to peace and conflict studies. "I wanted to learn why conflicts unfold in ways that leave behind animosity and rip communities apart. I had too many unanswered questions about conflict resolution, because it is close to my heart, it's part of my identity."

– JESSICA LEWIS

To read about all the Gordon Cressy award winners, visit alumni.utoronto.ca/cressy.

PHOTO: TOP, COURTESY OF MEHREEN HASAN RASHID; BOTTOM, HENRY FEATHER

The largest clearcut in the world is in Bowron River Valley, B.C. It extends over 50,000 hectares

Charlotte Gill

FIRST PERSON

Forest Warrior

Charlotte Gill reminisces about life as a professional tree planter

For 20 years, writer Charlotte Gill (BA 1996 Innis) worked as a tree planter in the forests of Canada. Her latest book, Eating Dirt*, is a memoir of that time. Below is an adaptation, which begins with details about one day in the lives of planters who, like Gill, make a full-time living in the reforestation business.*

Our trucks climb the nameless mountains the way airplanes ascend, nosing up at the sky. We switch up and back along steep, cobbled surfaces – flattened shards of white rock chiselled from the slope. Before long, we find ourselves in the middle of a clearcut.

We tumble out of our trucks like clothes from a dryer. Fog clings to the warp and weft of our tatters, the fine hairs on our cheekbones. We slide our feet down into tall leather boots with spiked soles. Loggers' boots, made for walking on bark and slick logs. We slip our hands into heavy-duty gloves. We're tree planters, gearing up for the daily grind.

Over time, the work has the bodily effect of a car crash in extreme slow motion

We chortle darkly, rubbing our palms together. There is nowhere to hide from the cold. A box of seedlings is ripped open. A paper bag torn. Bundles of plastic-wrapped seedlings tumble out. The stems are as long as a forearm, the roots grown in Styrofoam tubules to fit in the palms of our hands. Tree planters: little trees plus human beings, two nouns that don't seem to want to come apart.

We throw down our tree-planting bags and kneel next to them and cram them with trees. Then we abandon the scene, an explosion of brown paper and Saran Wrap snaking around on the road. We stomp out in every direction, right and left, up and down the mountain. An inaudible gun goes off over our heads, and the day begins. Somewhere behind the clouds the sun is our pace clock in the sky.

I'm not too bad at planting trees, if only because of the practice. I have climbed the flanks of a hundred mountains and hoisted my limbs over countless logs and stumps. I've stuck a million seedlings in the ground. I don't mind reading bush maps or flying around in helicopters or driving big pickup trucks. I hardly ever get cold in the rain. But I am not a natural tree planter. I have the hands of a typist. Being filthy and clammy makes me hate myself. And most of all I'd rather plant a pretty tree than a fast one. Which is one thing a tree planter should never do if she intends to earn a living.

Planting trees isn't hard. As any veteran will tell you, it isn't the act of sowing itself but the ambient complications. It comes with snow pellets. Or clouds of biting insects so thick and furious it is possible to end a day with your eyelids swollen shut and blood trickling from your ears. There are swaying fields of venomous plants like devil's club and stinging nettle. There are sunburns and hornets. There are leeches and ticks, bears and cougars. There are infections and chafe and boils and trench foot. It's possible to be so cold you feel dreamily warm and so hot you fall into shivers. Over time the work has the bodily effect of a car crash in extreme slow motion. Besides that, the task itself is thankless and boring, which is to say it is plain and silent. It is also one of the dirtiest jobs left in the modern world.

What could compel a person to make a career of such a thing? Some people think planting trees is as boring and crazy-making as stuffing envelopes or climbing a StairMaster. I love my job for exactly the opposite reason, because it is so full of things. There are so many living creatures to touch and smell and look at in the field that it's often a little intoxicating. A setting so full of all-enveloping sensations that it just sweeps you up and spirits you away, like Vegas does to gamblers or Mount Everest to climbers. It has a way of filling up a life with verbs that push into one another, with no idle space in between. So that you just can't believe all the things you saw or all the living beings that brushed past your skin.

***Eating Dirt* is published by Greystone Books in association with the David Suzuki Foundation.**

PHOTO: COURTESY OF CHARLOTTE GILL

60 SECONDS WITH

Murray Foster

A Cocksure Lad

WHILE STUDYING ENGLISH AT U OF T, Murray Foster (BA 1990 UC) also played bass in the folk-pop group Moxy Früvous. Post-Früvous, Foster is now in two bands, one that's real – he's the bass player in Great Big Sea – and one that's fake...well, sort of. **Lisa Bryn Rundle** uncovers the story of his British '60s band, the Cocksure Lads – which is becoming more authentic every day, with a "best of" album out, regular live performances and a film in the works.

How did the Cocksure Lads come to be? The "band" started about 20 years ago when myself and Mike Ford of Moxy Früvous started writing early '60s twitty Britpop songs just to make each other laugh. Fast forward to 2010, we had 25 Cocksure Lads songs just sitting around, so we recorded *The Greatest Hits of the Cocksure Lads, 1963-1968,* naturally.

The Lads have a whole back story – can you give me some of the highlights? They met in 1961 in Newcastle when the guitar player, Reg Topping, was doing an open-mic blues jam. Dusty Fosterboard was in the crowd insulting the band so Reg jumped off stage and started to beat the crap out of him. Then they decided to form a band.

You're Dusty. But you're not going to give this interview in character... No, but if his spirit enters my body, he'll speak.

I guess it's hard to capture a fake British accent in print, though. And for me in person, as well.

You've written a movie that's about to start shooting. Why a movie? We had the characters, we had the back story, we had the songs. We started talking about shooting a video for the CD, and that morphed into let's do a short film like *A Hard Day's Night*. And that turned into let's do a long film like *A Hard Day's Night*.

***A Hard Day's Night* – not *This is Spinal Tap*?** It's not a mockumentary. I feel like that genre is a bit used up. Partly because *Spinal Tap* did it so well. They covered 85 per cent of the possible jokes. There is nothing else to do. This movie is more like *That Thing You Do!* combined with *Mamma Mia!* – because they keep breaking into song.

What's been your truly coolest rock 'n' roll moment? Opening for They Might Be Giants. As well as Dylan. Playing Live 8 with Great Big Sea. But for me it's less about the big rock-and-roll moment and more about the small creative moments.

You're coming off so...humble. You know as I was saying that, I was like: That sounds so saccharin.

It sounds heartfelt! But literally as I was saying that I was thinking if I read that, I would put the magazine down.

Look for a new Great Big Sea album July 13, and watch for the Cocksure Lads movie to hit festivals in spring. Updates can be found at www.facebook.com/cocksurelads.

Milestones

Andrew N. Forde (MSE 2011), a materials science and engineering alumnus, has received the 2012 Harry Jerome Young Entrepreneur Award from the Black Business and Professional Association. Forde started Sommerfeld Solutions, which specializes in mining, information technology and health care. One of its top accomplishments is the Electronic Chart, a product designed to streamline charting, logistics and patient care in the health-care industry. He also established the Forde Institute, a non-profit global centre for research, which focuses on technological innovations and their impact on humanity.

Two U of T alumni have been awarded YWCA Women of Distinction Awards for improving the lives of women and girls. **Soteira Hortop** (BEd 2010 OISE) has worked with such groups as the Kingston Interval House women's shelter, Canada World Youth and the Toronto Rape Crisis Centre. She now works at the Linden School, organizing a speakers' series to foster female leadership and workshops for senior students on intimate partner violence and healthy relationships. Hortop also volunteers with Peacebuilders where she works with young offenders using the Aboriginal Peacemaking Circle. **Anne Sado** (BASc 1977, MBA 1981) is the first woman president of George Brown College, and has been a mentor for women and girls throughout her career. She also supported the establishment of a Community Partnerships Office, through which George Brown and 60 organizations work together to provide community-based programming. Many of the programs are designed to meet the needs of women, including immigrant women and women who have experienced abuse.

Donald R. Sadoway (BASc 1972, MASc 1973, PhD 1977) has been named one of *Time* magazine's 100 Most Influential People in the World for 2012. He is one of the world's foremost researchers in the area of materials engineering for energy-storage technologies. He is also the John F. Elliott Professor of Materials Chemistry at Massachusetts Institute of Technology.

PHOTO: COURTESY OF MURRAY FOSTER

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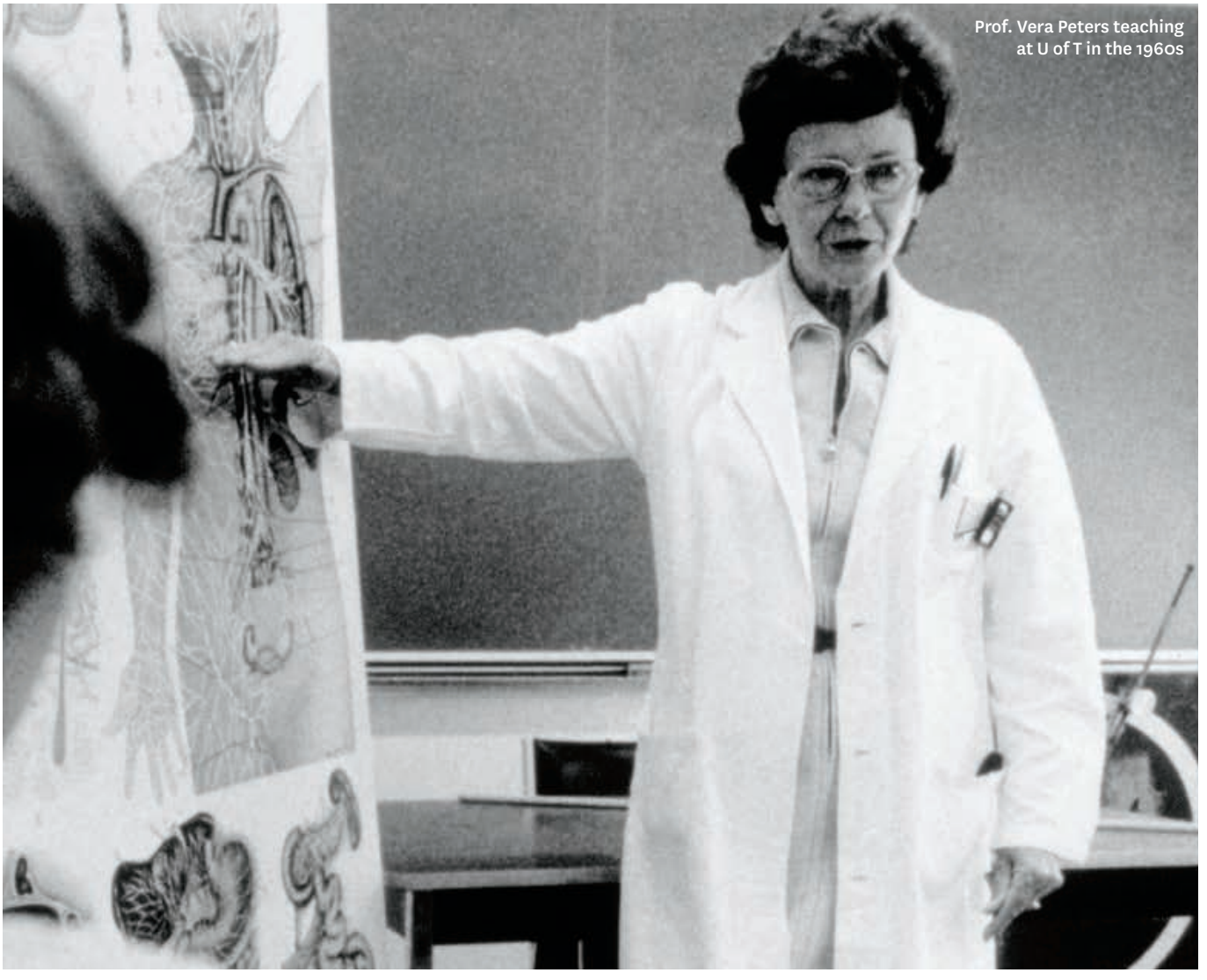

Prof. Vera Peters teaching at U of T in the 1960s

MEDICAL PIONEER

1960s

Dr. Vera Peters saved lives with her treatments for breast cancer and Hodgkin's lymphoma

Open U of T's 1934 yearbook, and you'll find photos of 115 graduating medical students – only 10 of whom are women. Among them is (Mildred) Vera Peters, who went on to revolutionize how Hodgkin's lymphoma and breast cancer are treated.

As a radiation oncologist at Toronto General Hospital, Dr. Peters learned that many patients wouldn't go to the doctor if they suspected they had cancer. In the 1930s, being diagnosed with Hodgkin's was like being handed a death sentence. By 1950, though, Peters and colleagues had determined that high-dose radiation could cure this lymphatic cancer if caught early. She began a lifetime crusade to encourage patients to seek prompt treatment and overcome what she coined "cancer phobia."

Women who found a breast lump were also afraid to seek medical attention: the standard treatment for breast cancer was a radical mastectomy, in which the surgeon removed the entire breast. But with early-stage breast cancer, Peters excised only the tumour. In the mid-1970s, Peters, who was a professor of radiotherapy and medical biophysics at U of T, published a retrospective study of the 8,000 breast cancer patients she had treated. It showed that treating the cancer in its early stage with a lumpectomy and radiation produced the same survival rate as a radical mastectomy.

"I was refuted and shunned by most of the outstanding surgeons in the States," Peters told the Oakville Medical Society in the early 1980s. She remained steadfast and as more studies found the same results, she optimistically wrote, "Mastectomy in early breast cancer may become as old-fashioned as bloodletting."

– **SUSAN PEDWELL**

PHOTO: U OF T ARCHIVES B1996-0019/001(07)

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Spring 2012 Convocation

Over the course of a few weeks this June, some 10,000 U of T students converged on Convocation Hall, where they were officially welcomed into the university's alumni community. Joining this year's new grads as they celebrated this milestone were 11 distinguished honorary graduates, listed at right.

Earlier this year, President David Naylor noted that U of T is "privileged once again to recognize a group of individuals whose accomplishments are of such excellence that they provide, through example, inspiration and leadership to the graduates of the university."

As custom dictates, each honorary degree recipient addressed their convocation. Webcasts of these presentations are available at:

www.convocation.utoronto.ca/webcast.htm.

Honorary Degree Recipients

W. (William) Edmund Clark (BA 1969 UC)
Group president and CEO of TD Bank Group, and a volunteer and philanthropist

John H. Dirks
President and scientific director of the Gairdner Foundation, a senior fellow at Massey College and a leading nephrologist

Avis Glaze (MEd 1975, EdD 1980)
An international leader in education, and Ontario's first Chief Student Achievement Officer

Paul M. Hoffert
Founding member of the Canadian band Lighthouse, an award-winning composer and a digital visionary

Sheldon Inwentash (BCom 1978 NEW) and Lynn Factor
Inwentash, a Bay Street financier, and Factor, a social worker, are philanthropists who have made landmark contributions to the Faculty of Social Work

Michael Kirby
A former senator, and chair of Partners for Mental Health, an organization he created to mobilize support for better mental health services

David R. Olson
A University Professor emeritus at OISE specializing in language, literacy and cognition

Pierre Rivard (MEng 1994)
President and CEO of TUGLIQ Energy Co., which aims to reduce the carbon intensity of Northern mines using renewable energy and hydrogen systems

Phillip (Rocky) Simmons (BASc 1964, MASc 1965, PhD 1968)
President and CEO of Eco-Tec, which specializes in purifying, recovering and recycling industrial waste water

Lawrence M. Tanenbaum
Chairman and CEO of investment company Kilmer Van Nostrand Co., chairman of Maple Leaf Sports and Entertainment and a leading philanthropist for healthcare and educational institutions