

# Queen's

ALUMNI REVIEW

Issue 2, 2017

The magazine of  
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Kingston, Ontario

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The techno-ethicist

The future  
(of coding)  
is female

Nature computes

# LIVING IN THE FUTURE

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**The last word:**  
**Nature computes**  
In which Selim Akl, Head, School of Computing, makes the case that the bit, the smallest unit of information and computation, is the key to unlocking the mysteries of the universe.



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## Living in the future

In the Human Media Lab at Queen's, researchers are creating prototypes for technology that will hit the market decades from now.



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**ON THE COVER**

Prototypes of BitDrones hover around Human Media Lab researchers Calvin Rubens, Roel Vertegaal, Xujing Zhang, and Sean Braley. The creation of BitDrones is the first step toward building interactive self-levitating programmable matter.

PHOTO: BERNARD CLARK

The futuristic Aileron font used on the cover and throughout this issue is designed by Adilson Gonzales de Oliveira Jr. [behance.net/agonz](http://behance.net/agonz)

## Imagine the future...

I recently had the chance to interact with some BitDrones in the Human Media Lab. Imagine a formation of buzzing mini-drones hovering around you. You can pick one up and examine it, then let it go, only to see it move back to its designated spot mid-air. It is easy to imagine the possibilities of future BitDrones, able to change their shape or colour, enabling users to build 3D architectural or molecular models. But before that scenario becomes a reality, innovators like Roel Vertegaal and the graduate students at his lab need to build prototypes to see how they fit in with the human experience.



BERNARD CLARK

User error is a big part of that experience. Case in point: what did I do when a BitDrone came buzzing toward me during the photo shoot? I instinctively swatted it away, sending it spinning off-course into a corner of the room. At that moment, my mind was thinking “very large mosquito in my personal space!” not “innovative building block of the future.” Luckily, the BitDrone was unharmed, and my dignity remained (somewhat) intact. But situations like this help innovators anticipate how humans can use – or abuse – technology.

Looking at human-robot interaction from a different angle, Queen's engineering and philosophy graduate Jason Millar tackles the big ethical questions in technology. This article

started out as a 1500-word assignment, which then grew to 1800 words. When writer Mark Witten presented it to me at 2200 words with the request to trim it as I saw fit, I couldn't do it. This is another great story that explores complex ideas in the world of technology. I think it's worth making space to explore big ideas in this magazine. I hope you agree.

Let me know what you think.

Andrea Gunn  
Editor

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## Paper or digital? **Your choice.**

Until we have flexible phones that combine the tactile reading experience of paper with the efficiencies of a wholly digital platform (another invention dreamed up at the Human Media Lab), we have just two options for your *Review* subscription: paper or digital? Email [review.updates@queensu.ca](mailto:review.updates@queensu.ca) if you want to change your subscription preference or your address. And if you are getting multiple copies of the magazine, or copies addressed to a previous occupant, please let us know that, too.



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Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory.

# letters

TO THE EDITOR

## War-time work

Supplemental to the war-time work of Bea Grant (later Corbett), Arts'44, MA'95, recognized by the *Review* (Issue 1, 2017, p. 36) for her secret WRCNS work at Gordon Head, Vancouver Island, I wish to draw readers' attention to a January 2017 pamphlet, "Canada's Bletchley Park: The Examination Unit in Ottawa's Sandy Hill, 1941 – 1945," researched and written by Diana Pepall.

Diana Pepall is a graduate of the Master of Library Science program at Dalhousie University. (Her husband is historian Cameron Pulsifer, MA'70, PhD'92.) She spent the greater part of her career as a librarian and manager at the Ottawa Public Library (OPL).

This illustrated pamphlet is #100 in the Bytown Pamphlet series published by The Historical Society of Ottawa, P.O. Box 523, Station B, Ottawa, ON, K1P 5P6. It is available from the Society at \$5.00 a copy plus postage. Email: [historicalottawa@gmail.com](mailto:historicalottawa@gmail.com).

**George A. Neville**, Arts'59, MSc'61, PhD'66, past president, The Historical Society of Ottawa

## On Boo Hoo and Boo

I saw the article on Boo Hoo the Bear (*Issue 4, 2016, p. 26*). When I entered Queen's in the fall of 1958, I brought with me a small black teddy bear for which my father had knitted a sweater in Queen's colours. I called him my Boo Bear. During my four years at Queen's, I played the flute and piccolo in the Queen's Bands. On occasion, my Boo Bear rode on the top of the bass drum. Boo Bear has travelled a lot as my husband, Neil Johnstone, Sc'61, was in the military. Boo Bear accompanied us on Neil's postings to England, Germany, and several Canadian provinces. Boo Bear started to show his age and needed some tender loving care. Our son Mike and daughter-in-law Karen took Boo Bear from us at Christmas and sent it to a teddy bear hospital in Vancouver where it got reshuffled and repaired. When it came back from the hospital it was quickly reunited with its Queen's sweater and now has a place of honour in our house.

**Joy (Smith) Johnstone**, Arts'62



*Here's Joy with Boo Bear!*

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# Queen's University Volume III 1961–2004: *Testing Tradition*

By Dr. Duncan McDowall, Arts'72, MA'74, Queen's University Historian  
and recipient of a National Business Book Award.



"The question is: how did this university, where tradition is genetically encoded, dance with the blasts of change that swept through it between 1961 and 2004? Duncan McDowall investigates the challenges Queen's faced during what he would call a 'yeasty' time. I expected *Testing Tradition* to be informative and illuminating. And it was. What I hadn't anticipated was to be so engrossed by it... a hugely engaging and important book."

Shelagh Rogers, O.C., Artsci'77, host of  
CBC's *The Next Chapter* and Chancellor,  
University of Victoria

"Fascinating reading! Duncan McDowall has put together a wonderful mix of history and stories about life on campus at Queen's that are enthralling to read and are evocative of studying at the university."

Former Speaker of the House of Commons  
and Kingston and the Islands MP  
Peter Milliken, Arts'68, LLD'12



Order your copy today from McGill-Queen's University Press.  
Visit [mqup.ca](http://mqup.ca) and search for *Testing Tradition*.

# ADVANCING OUR TECHNOLOGY AGENDA

BY PRINCIPAL DANIEL WOOLF

No one reading this magazine needs a reminder of how technology has changed over the past 30 or 40 years, nor of the many ways in which it has both simplified and complicated life. When I was studying at Queen's four decades ago, the personal computer was in its infancy; no one had heard of the internet or the web; and email was something used only in military circles. Now, there is more computing power in my iPhone than was used to send Apollo 11's astronauts to the moon. And to comment adequately on the place of technology in pedagogy would require a separate column to itself.

Queen's faculty and students have maintained a strong presence in the field of technology for generations. Ours was among the first engineering schools in Canada, for example, and our engineers continue to make advances ranging from Praveen Jain's work on climate-friendly power capture from solar panels to our civil engineering department's literally ground-breaking contributions to geosciences. The booming field of biotechnology involves our medical faculty (both clinical and non-clinical) and rehabilitation therapy and nursing professors. Collaboration is often key to making technological advances. A great example is our Human Mobility Research Centre, which connects surgical, computing, and engineering professors. Over the past 10 years, many of our researchers have co-located with industry at Innovation Park. It is home to CMC Microsystems, Nanofabrication Kingston, the Centre for Advanced Computing, Green Centre Canada, and a variety of other firms whose technology is firmly based in Queen's research.

Outside the STEM disciplines, Queen's humanists and social scientists are also making themselves known, in digital humanities (on which we recently hosted a Matariki Network international workshop); in the analysis of big data in the Scotiabank Centre for Customer Analytics at Smith School of Business; and in the exploration of the role and impact of social media.

Our Dunin-Deshpande Queen's Innovation Centre continues to be a main, though not the only, engine of innovation and entrepreneurship on our campus. The Queen's Partnerships and Innovation group located at Innovation Park incubates almost 50 small to medium enterprises at any one time and translates faculty discoveries into investment or market networks.

The embracing of entrepreneurship and innovation as university-wide bywords has occasioned a rethinking of how we support these activities. At Innovation Park, where Queen's still holds some

undeveloped land, we are exploring possible expansion with our major partner, the City of Kingston, under a recent memorandum of understanding I signed with Mayor Bryan Paterson. Another change is even further advanced. For 30 years, PARTEQ Innovations, an arms-length technology-transfer company created by Queen's, has assisted in the movement of inventions from the lab to the industrial sphere. Its transition this spring from independent firm to a shared service within Queen's proper is an indication of the greater maturity of tech-transfer and the much greater priority that universities across the country are giving to "knowledge translation" which, contrary to some views, is an extension of, not an alternative to, "basic science" or "fundamental research." Predicting the future is always risky, but it is a pretty safe bet that the world economy will become ever more tech-based; for Canada to have its proper place in these developments, leading universities such as Queen's must continue to evolve and innovate.

Finally, I'd like to thank two recently departed senior administrative colleagues, both of whom played significant roles in advancing Queen's technology agenda. Former Vice-Principal (Research) Steven Liss, now occupying the same role at Ryerson University, was a tireless advocate for forming closer partnerships with the city and with industry, and a key mover in bringing PARTEQ Innovations "in-house." Caroline Davis, Vice-Principal (Finance and Administration) until her recent retirement, was a champion of Innovation Park and a keen supporter of our public engagement with the city, quite aside from her exemplary leadership as co-chair of the Aboriginal Council. To both of them, thank you and best wishes for the future. ■



BERNARD CLARK

*“Leading universities such as Queen's must continue to evolve and innovate.”*



GARRETT ELLIOTT

Janice Hill, Director of Four Directions Aboriginal Student Centre, speaks with lecturer Nathan Brinklow during the March 21 event marking the release of the Queen’s Truth and Reconciliation Commission Task Force’s final report.

### IN MEMORIAM

**George Andrew**, former head of PHE program (and head coach of Queen’s golf team, 1967-75), died Jan. 8.

**Marion Meyer**, retired professor (Sociology), died April 26.

**David Kemp**, former head, Department of Drama, associate dean, Faculty of Education (and co-founder of the Artist in Community Education program), died April 26.

**Allison Sherman**, a faculty member in the Department of Art History and director of Queen’s Venice Summer School, died April 26.

*If you have memories of these individuals you would like to share, please email us at [review@queensu.ca](mailto:review@queensu.ca). An obituary for Dr. Andrew is posted in the digital Review.*

## Queen’s TRC Task Force final report

At a special reception to mark the unveiling of the Queen’s Truth and Reconciliation Commission (TRC) Task Force final report, Principal Daniel Woolf told the crowd of students, staff, faculty, alumni, and local Indigenous community members, “Today, our communities come together to change course.”

“By taking steps to ensure that Indigenous histories are shared, by recognizing that we can all benefit from Indigenous knowledge, and by creating culturally validating learning environments, we can begin to reduce barriers to education and create a more welcoming, inclusive, and diverse university,” said Principal Woolf.

The Queen’s task force formed in April 2016 to begin the work of responding to the TRC’s final report on the history and legacy of Canada’s residential school system for Aboriginal children. Composed of Indigenous and non-Indigenous faculty, staff, students, senior administrators, and community members, the task force considered how to respond meaningfully to the TRC’s calls to action.

In the final report, the task force calls for, among other things:

- continued efforts to develop and strengthen relationships with Indigenous communities in the Kingston region;
- the expansion of advancement strategies to increase philanthropic funding for Indigenous initiatives, as well as the development of partnerships to proactively advocate and engage with government for system-wide programs and policies that support Indigenous students;
- the creation of culturally validating spaces by incorporating Indigenous art and languages into public spaces and signage, planting traditional Indigenous plants to honour the traditional territory of the Haudenosaunee and Anishinaabe Peoples, and the creation of Indigenous spaces for ceremonies and events;
- the creation of new bridging and pathway programs to increase access to post-secondary education for Indigenous youth, as well as expanded recruitment and outreach initiatives into Indigenous communities;
- more work to increase the number of Indigenous staff and faculty, as well as to explore ways in which to recognize traditional knowledge as a valid means of scholarly achievement in hiring practices.

Learn more about the Queen’s TRC Task Force and read its final report: [bit.ly/QUTRC2017](http://bit.ly/QUTRC2017)

For more campus news, go to the digital Review: [queensu.ca/alumnireview](http://queensu.ca/alumnireview).



## Racism and diversity report

In April, the Principal's Implementation Committee on Racism, Diversity, and Inclusion (PICRDI) delivered its final report to Principal Woolf. Key recommendations from the report include the creation of a university council on anti-racism and equity and boosting recruitment of black faculty members and faculty from other under-represented groups. The full report is available on the principal's website: [bit.ly/2pZE2SA](http://bit.ly/2pZE2SA). The committee, comprising two faculty members, two staff members, and two students, consulted with members of the Queen's community, including authors of past reports on anti-racism, diversity, and inclusion.

In anticipation of the report, and in light of the recent report from the Queen's Truth and Reconciliation Commission (TRC) Task Force, Provost Benoit-Antoine Bacon earlier announced that \$3 million in funds over the next three years has been earmarked to support existing and launch new initiatives related to equity and diversity on Queen's campus, including but not limited to those outlined in the PICRDI report.

Principal Woolf also announced that Deputy Provost Teri Shearer will assume responsibility for senior leadership on equity and diversity at Queen's. The deputy provost portfolio will be redesigned to bring a diversity and inclusion lens to all aspects of university operations. This will include leading the university's response to the PICRDI and TRC reports, overseeing the newly created Office of Indigenous Initiatives, and making additional changes that support equity-seeking groups more broadly (for example, LGBTQ+ and persons with disabilities).

Making changes to Orientation Week was also addressed, with the principal noting that review of this first week of university will have to be done through extensive consultations with students and other groups and units on campus.

"I believe that fundamental change needs to occur during this important first week of university for students," said Principal Woolf. "We have heard, over the past year, from various stakeholder groups across campus that Orientation Week must be more welcoming, inclusive, and accessible ... I am committed to working with students and others through this consultative process and to expanding the content of Orientation Week to include mechanisms for training and educating students on diversity and inclusion."

## A rare addition to the Queen's collection

In 1482, William Caxton published *Polycronicon*, a "universal history" written by Ranulf Higden, a Benedictine monk. Originally written in Latin, *Polycronicon* was translated into English by John of Trevisa (1387) and later printed by William Caxton. Queen's University acquired a 1482 edition of the Caxton printing, of which only about 50 copies are known to exist worldwide.

The addition of the rare book to the Queen's University library collection was made possible thanks to a donation by philanthropist and entrepreneur Seymour Schulich. Mr. Schulich and Principal Woolf partnered to give their personal collections of rare books to Queen's, with an additional gift from Mr. Schulich for the establishment, growth, and preservation of the collection. In recognition of their generosity and vision, the university established the Schulich-Woolf Rare Book Collection, which resides in Douglas Library, and combines more than 400 volumes from the collections of Mr. Schulich and Principal Woolf.

*The first page in Caxton's Polycronicon. The red initial and other marks were done by hand. This process is called rubrication and is repeated throughout the text.*

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## New eyes on the universe



A new exhibit at the Agnes Etherington Art Centre explores the experiments and discoveries of the SNOLAB underground facility in Sudbury. The interactive exhibit, *New Eyes on the Universe*, features the Nobel Prize-winning research of Dr. Arthur McDonald and his colleagues, who proved that solar neutrinos change their flavour en route to Earth, an important discovery for explaining the nature of matter and the structure of the universe. *New Eyes on the Universe* also explores the ways in which the current SNOLAB facilities and experiments continue to push the frontiers in particle astrophysics.

The exhibit caps off a year of 175th anniversary celebrations at Queen's. "Over the past year, we have reflected on Queen's monumental contributions, while also contemplating what the future holds for the university," says Principal Woolf. "Similarly, this exhibit allows visitors to celebrate Dr. McDonald and his colleagues' outstanding accomplishments and learn about the ways in which Queen's researchers, now and in the future, will play a leading role in unlocking the mysteries of the universe."

*New Eyes on the Universe* is on display in the atrium of the Agnes Etherington Art Centre from May 27 to July 7. Admission to the exhibit and the Agnes is free for everyone.

The *New Eyes on the Universe* exhibit is owned and circulated by SNOLAB. The exhibit debuted on July 1, 2016 at Canada House, Trafalgar Square in London, and it is touring across Canada this year.

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# LIVING IN THE FUTURE

BY MEREDITH DAULT



In the Human Media Lab at Queen's, researchers are creating prototypes for technology that will hit the market decades from now.

**ARRIVING AT JACKSON HALL** is an unremarkable experience. The building's foyer is dreary: it's a space to pass through, but no place to linger. If you take the stairs up, you'll land in another hallway, equally ordinary. If you're paying attention, you'll notice the row of boots and shoes lined up outside the first door at the top of the stairs in this otherwise unadorned space. But short of a modest wooden sign that reads "Human Media Lab," you'll get very few clues that you're about to step into the future. Or at least, a space designed to inspire those dreaming about the future . . .



ago, Dr. Vertegaal and his team – he currently has eight graduate students at different levels and from different disciplines working with him – have captured their share of headlines in the international media, with inventions ranging from the first flexible smartphone and a foldable paper computer, among other organic user interfaces (OUIs or non-flat computer screens), to sophisticated eye input sensors that allow users to interact with devices by looking at them. He has overseen the development of the first “pseudo-holographic 3D cylindrical tele-presence display,” essentially a human-sized cylinder onto which you can project and inter-

**PUSHING THROUGH THAT DOOR** takes you into a different world, one in which all the hard edges have been done away with and every surface – from the floor tiles to the wallpaper – has been re-imagined in colourful, computer-rendered patterns. Designed by Karim Rashid, the internationally acclaimed industrial designer, this is a space that feels more like a futuristic showroom than an academic workspace. A large circular couch in fuchsia anchors the bright space. It has enough seating to accommodate the entire Human Media Lab team at once, making it ideal for brainstorming sessions.

“Because we live in the future in our thoughts, so we need to live in the future physically,” says Director Roel Vertegaal simply, as if it’s the most ordinary thing in the world.

A professor of human-computer interaction, Dr. Vertegaal spends a lot of his time thinking about the future – specifically, about the ways in which humans will interact with technology in the years and decades to come. Although he’s a computer scientist, Dr. Vertegaal, who first came to Queen’s from Leiden 17 years ago, has always been more interested in people than in machines. At the heart of everything he does is a desire to make technology that is better suited to respond to the way in which humans actually think and move, rather than the status quo, which sees us adapting to our devices instead (watch people hunched over their tiny smartphone screens for a vivid example).

“The human is always front and centre in what we do,” says Dr. Vertegaal, “which is not a classic computer science approach.”

Since opening the Human Media Lab 17 years


act with an image of a person from a different space (*Star Trek*, anyone?), and is now fascinated by BitDrones – small quadcopters that function like self-levitating Lego bricks that can be rendered into different shapes in mid-air depending on how they’ve been programmed. Dr. Vertegaal ultimately imagines them as tiny, fly-sized devices capable of locking together to create shape-shifting objects in mid-air.

As he and master’s student Sean Braley send a group of BitDrones up into the air, it’s clear that Dr. Vertegaal is genuinely enchanted by the products he and his students have devised over the years. He bats a Bitdrone playfully with his hand, only to have it rebound to exactly where it’s been programmed to hang in space. “It really makes me amazed by mosquitoes,” Dr. Vertegaal says to the room, his eyes trained on one of the flying devices. “It’s fascinating that they can fly so well, given that they experience air as a viscous substance.” Mr. Braley, who has clearly absorbed some of Dr. Vertegaal’s appetite for inquiry, agrees. “Especially when there’s only so much energy they can store,” he adds, illuminating their own prototype quandaries. “But at least we have laid the groundwork.”

For Dr. Vertegaal, whose brain works nimbly and playfully, nothing – not even a mosquito – is too small to provide inspiration. Unlike many in



*Pseudo-holographic 3D cylinder*



*"The beautiful moments are when you get the idea and then you see the thing work for the first time," says Dr. Vertegaal.*

## AN IDEA MADE REAL

*BitDrone prototypes hover around Calvin Rubens, Roel Vertegaal, Xujing Zhang, and Sean Braley. The creation of BitDrones by the Human Media Lab team is the first step toward building interactive self-levitating programmable matter.*

*The ideal solution is to retain the pleasures of the physical object while embracing the efficiencies of the digital.*

the tech world, Dr. Vertegaal is deeply committed to the physical, in the sense that he envisions a future where specialized technology is adapted to suit and improve life in our existing 360° world, rather than one where humans are expected to live more and more virtually.

"Imagine that you could read the news on your leather purse," he says suddenly, his mind whirring, "but it would also behave like a purse. Or this couch could be a display, and its primary function would be to be pink one day and blue the next, and that could be related to a wristband that could sense your mood and choose the right colour to suit it."

### FINDING FORM FOR NEW IDEAS

While coming up with ideas is clearly never a problem, the challenge is in giving them physical form, whether it's finding a way to make manipulating a flexible screen feel like you're flipping the pages of a book (a very different action from swiping between pages on a flat device), or devising a cylindrically shaped screen you could hold in your hand.

"There has been a drive to move away from the physical to the digital because digital is malleable," he says, citing newspapers, which are expensive and environmentally problematic to produce, as an example. "But there's simply nothing like the tactility of being able to leaf through a paper." For Dr. Vertegaal, the ideal solution is always in finding a way to retain the pleasures of the physical object while embracing the efficiencies of the digital – using, say, an electronic paper you could unfold and read, just as you would a newspaper.



*The current prototype of the flexible phone allows users to see objects on-screen in 3D, without having to wear glasses.*

HUMAN MEDIA LAB

But Dr. Vertegaal is quick to point out that it's hard to come up with new ways of doing things until you really understand what a product's existing limitations are. "If you don't have flying cars, it is difficult to think of new kinds of traffic jams they might cause, because you don't know their properties," he says. "But if someone shows you one, then all of a sudden you can start thinking about completely new ways of organizing highways."

### LOOKING AT THINGS IN REVERSE

The key to coming up with inventive solutions, says Dr. Vertegaal – and this is what his students learn to do as members of his team – is in looking at things in reverse. Until he learned of the existence of flexible screens, for example, it was challenging to imagine how such a thing might be used. As soon as he was able to simulate one through projection, however, everything changed. "Then the problems start dawning on you because before that you were living in Flatland," he says with a laugh. "I realized all software to date was limited to two dimensions. You have to try a prototype, and then you get an intuition for what it can do."

In the case of the flexible phone, Dr. Vertegaal first began experimenting with the technology in 2004. The first iteration was projected on paper. In 2010, he started working with a real four-inch black-and-white display that used e-ink, while the latest boasts a very thin, full-colour touch display. Ultimately, he argues, flexible phones would not only be thinner, less inclined to shatter when dropped, and less expensive to produce, they would be more natural to use, allowing users to bend the display to manipulate on-screen objects – a more ergonomic motion than using a finger to swipe and tap. Current prototypes also allow users to see objects on-screen in 3D, without having to wear glasses. Here, bend is used to point *into* the screen – the third dimension.

But as remarkable as his lab's many inventions have been to date, Dr. Vertegaal admits he will be lucky to see most of them applied in the real world in his lifetime. "For us to be competitive in the research domain, we have to think at least 20 years ahead," he explains. "And we do." In many cases, however, the marketplace simply isn't ready for them yet. "Everything we're using right now is already 40 to 50 years old and has been tested for three decades," he says, laughing.

**Flatland:** an 1884 novella in which two-dimensional characters grapple with the notion of a three-dimensional universe.

## LEARNING TO THINK BIG

When she was looking to continue her education in virtual reality, master's student Xujing Zhang did her research. "I looked up labs all over the world," says the student, who already holds a master's degree in software engineering from Beijing's Peking University. "I liked the projects in this lab."

Standing in front of a large screen at a standing desk in a dark blue room, Ms. Zhang taps away at a keyboard. A few feet away stands the top half of a male mannequin dressed in a sweater (its bottom half, wearing pants, stands forlornly in the front foyer), with three small, high-end cameras turned on it. It is this body that gets the honour of being "beamed" onto a cylinder in the lab's main space. Ms. Zhang, who has studied artificial intelligence, robotics, and augmented reality, is currently fascinated by telepresence and holograms.

Like the other students, Ms. Zhang isn't here simply for another degree. She is passionate about her research and motivated by the chance to learn new things and complete her projects – no matter how long that takes. She has been at Queen's for three years now, and loves Kingston's small size and comfortable pace, which, she says, frees her up for thinking. "What I've learned from this lab is that I need to think big," she says with a smile. "You never know what you can do until you try. If you don't take the first step, the second will never happen."

Her enthusiasm is shared by Dr. Vertegaal. "The beautiful moments are when you get the idea, and then when you see the thing work for the first time," he says. "That's why I do this. Those experiences are out of this world."

### TAKING RISKS

The Human Media Lab, whose reputation for innovation has enabled it to compete with larger institutions for high-calibre students, is entirely oriented toward experimentation and risk-taking.

Students are encouraged to find new ways of doing things, ask each other questions, and help one another explore new ways to solve problems. Dr. Vertegaal sees the group dynamic as "the Socratic method in action," as his students find a common understanding and teach each other, both at formal brainstorming sessions

**Socratic method:**  
the method of teaching in which the teacher asks a sequence of questions, and by answering them the pupil eventually comes to the desired knowledge.

and more spontaneously by asking each other questions.

"Inevitably, two people will get together and start a conversation and then everyone will gravitate toward it," explains Calvin Rubens, who first joined the lab three years ago as an undergraduate summer student but is now pursuing a master's degree in electrical engineering. "Everyone plays off one another. The common places [within the lab] are nice for that, because you can hear people talking and then you get ideas."

Mr. Rubens, who was first drawn to the Human Media Lab because of an interest in drones and has since had the opportunity to help build the BitDrones, describes Dr. Vertegaal as the "visionary" who directs the projects and gives them meaning, while he and the other students do much of the hands-on work, with plenty of room for creativity and autonomy.

"It's exciting work because it's all new stuff," he says, adding that he loves being able to apply what he's learning as an engineering student to coming up with real-world applications. "You get to do the research and have that level of exploration without being a top-level scientist at Microsoft or Google or NASA."

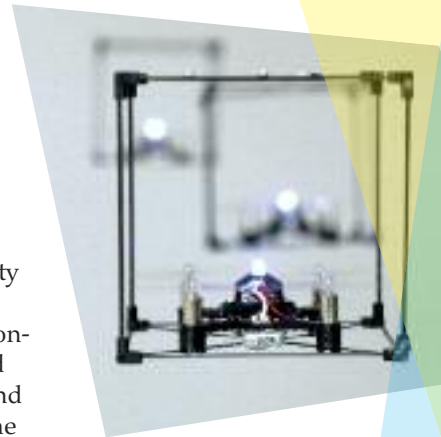
### TURNING ON THE LIGHTS

Indeed, it's training that serves graduates of the Human Media Lab well: many of Dr. Vertegaal's students become so adept at solving complicated problems in new ways that they often end up designing their own jobs, giving them a leg up in the tech industry.

They venture into the world with a future-focus, and an ability to take what they've learned and apply it in new areas, just as Dr. Vertegaal did in setting out to bring his idea for a visionary lab to life.

"It's cool that it has all panned out," he says, "although I never really had any doubt. I had a confidence that I think comes with experience: as you shift fields, you take something you've learned and apply it to that new field. The confidence comes from knowing it already works in another context. Then all you have to do is turn on the lights – and it will work." ■

See the BitDrones and other HML technology in action: [hml.queensu.ca/videos/](http://hml.queensu.ca/videos/).



# DIGITAL DREAMS: empowering women to code

BY KIRSTEEN MACLEOD

Wendy Powley, Artsci'84 (Psychology), Ed'85, MSc'90 (Computer Science), clearly loves her work in computing. "When you solve a problem, there's a programming high, a real endorphin rush," she says. "I live for that feeling!"

Ms. Powley, a continuing adjunct in the School of Computing and a term adjunct in the Faculty of Education, is also a dynamic champion and mentor for women who want to study computer science and pursue careers in technology.

These days, she is excited to notice more women in her classrooms. "In my first-year coding classes, about 45 per cent of the students are female – a phenomenal increase from a few years ago."

A mix of computer science majors and curious upper-year students in other disciplines, these women are learning to create code, or computer programming language. "If I can inspire them to try computing in that first course, many continue on. They get a taste of it, recognize the potential, and say, 'Wow, this is great!'"

Often, she notes, women feel excluded from computing, which is usually portrayed in the media as male-dominated, geeky, and for only the most brilliant. "It's too bad! Women are missing out on very lucrative jobs and fun, diverse careers. And the workforce is missing the diverse population it needs to create the technology of the future."

When Wendy Powley started out, few women chose computing as a career, "mostly because we didn't know about it." Today, she moves in tech-savvy circles, both at work and at home. Husband Gary (Comp'84) retired recently as senior systems specialist in the School of Computing, daughter Rachael is studying computer science at Western University, and son Michael, an engineering student at University of Ottawa, has an interest in computing.

But in her student days, Ms. Powley had no computing mentors to guide her. Originally a math major, she switched to psychology and then

attended teacher's college, before realizing that teaching junior-primary wasn't for her. She took a job at Queen's running a research study in the psychology department, where she had her first experience with programming. "I had to automate data collection and perform calculations on our streaming data using a personal computer – I was fascinated."

This discovery sparked her to take undergraduate computing courses at Queen's. Next, she completed her Master of Computing degree. In 1992, she was hired as a researcher at the Queen's Database Systems Laboratory, and in 1999, she began teaching – and mentoring – other women. "Part of my role is to inspire and motivate others," she says.

At Queen's, efforts to attract more women to computing have been highly successful. Back in 2003, only about 20 per cent of the undergraduates enrolled in computer science were female, better than a North American average of about 11 per cent. Today, that's jumped to 34 per cent at Queen's, compared with about 15 per cent for North America.

What explains the increase in computing women at Queen's? One factor is new programs, such as biomedical computing and cognitive science, that tend to attract more women, she says.

But another factor is the promotion of opportunities for women in computer science. "The way to get more women into the field is to get more women into the field," says Ms. Powley matter-of-factly. An increase toward gender parity results in a culture shift, one that is more cooperative, inclusive, and more inviting to women.

## BUILDING A NETWORK

So she took it upon herself to create new networks for women. Ms. Powley is founder of the Queen's School of Computing ACM-W Chapter, an informal support and social group for students and staff to





Wendy Powley, School of Computing/Faculty of Education

encourage female interest in computer sciences.

"I tell my first-year students, 'Computing will make you cry,'" she says frankly. "It can be frustrating – you have to be very persistent, you have to problem-solve, you keep going back. Sometimes you get into dark places where you don't know the answer and what else to do. So building this network of women who can support one another is important."

Building on this initiative, in 2010, she founded the Ontario Celebration of Women in Computing, which she oversaw for five years. Hosted by various Ontario universities, the annual event "fostered the idea of the need for support for women in universities, and started the conversation."

Last year, the popular conference went national. The second annual Canadian Celebration of Women in Computing conference in Montreal this November is expected to attract 500 attendees, bringing together students, professors, and industry professionals to learn from, and network with, each other.

## A NATIONAL NETWORK GOES GLOBAL

Wendy Powley was also appointed as chair of the ACM-W Celebrations committee, a subgroup of the Association for Computing Machinery, the world's

largest educational and scientific computing society. She will not only coordinate the celebration in Canada but will supervise ACM-W Celebrations that occur annually worldwide.

"Organizing the conference is the best thing I ever did," she says. "There's the Canadian one, and now we have 28 regional conferences across the world. It's great; they keep popping up!"

Wendy Powley's influence continues to ripple out. She is proud of the accomplishments of her students, like Melissa Mangos, Comp'17, who founded Sudo, an organization that creates community through free coding workshops for girls and women in Kingston (*see next page*). "It's a great initiative, and I'm so proud of Melissa," Ms. Powley says. "It's so satisfying to provide experiences that will have a lasting impact on young people."


Learning early is an idea she strongly supports. She thinks computer science should be mandatory from kindergarten through high school, as it is in the United Kingdom.

"Computing teaches problem solving, critical thinking, and how to manipulate data: these are abilities that everyone needs in the modern world," she says. "If we want people to create the next cool app or medical breakthrough or new technology, we need kids to understand what tech can do and how to apply it in our society." ■

# SUDO

(sōō'dō) *n.*

- 1 A powerful Linux command allowing users “super user” access to install, update, and access files on a server.
- 2 A Kingston-based initiative started by Queen’s students with the mission to create a community where women can learn to code together. Through monthly meet-ups and workshops, Sudo strives to build an energetic and welcoming community of programmers to support women in improving their technical skills.



**Annabel Kramer**, Sudo workshop and curriculum developer. “It’s wonderful to present content that you have created, and have the workshop participants see how powerful it can be. There’s no substitute for discovering things for yourself.” An exchange student from the U.K., she plans on working for Sudo remotely when she returns home this summer.

**Karina Kim**, Com’18, Sudo social media marketing coordinator. Karina has brought her business and marketing skills to the Sudo team. She is also inspired to learn new skills from her computer science teammates. “It’s important to step out of your bubble and try new things.”


In January 2016, **Melissa Mangos** attended the Canadian Celebration of Women in Computing conference, inspired by Professor **Wendy Powley**. "It was so cool meeting women from different schools and all the professional women in computing. It was how I came up with Sudo. Talking to a lot of people, I found that other cities like Toronto and Montreal had initiatives for women to learn programming but Kingston didn't have anything like that."

Four months later, she launched Sudo in Kingston, with the help of some Queen's friends.

*Missing from this photo:* Sudo members Daisy Barrette, Cara Falcon, Callum Tomkins-Flanagan, Emily Crawford, Omar Toutounji, and Shubhi Sharma.

**Learn more:**

[sudolabs.ca](http://sudolabs.ca)

 [@sudolabs\\_](https://twitter.com/sudolabs_)



**Jessica Dassanayake**, Comp'20, Sudo workshop developer. "I was looking for an opportunity to get involved in the Kingston community, and not *just* the Queen's community." The Sudo workshops have given the first-year student a unique opportunity to teach a variety of women, ranging from students to retirees.

**Melissa Mangos**, Comp'17, Sudo founder. "We are really pushing this as a community. As well as the free workshops, we host meet-ups where people can come out and network and learn from each other." The Sudo team has a new partnership this summer to reach out to the next generation of female coders. Sudo trainers will be teaching programming to day campers enrolled with Girls Inc. And since not all kids have their own computers, the focus will be on building computational thinking and problem-solving skills.

BERNARD CLARK



# THE TECHNO-ETHICIST

*Exploring moral dilemmas in the  
brave new world of deep learning*

BY MARK WITTEN



ILLUSTRATION BY TINE MODEWEG-HANSEN

*Should your future autonomous car be equipped with a moral compass along with its GPS?*

As machines get smarter and smarter, there is a seductive temptation to give up control to the automated systems that outperform humans. A case in point is the slick, self-driving robot that may soon be rolling into your driveway and taking over your transportation world. Some Amazon and Microsoft tech veterans recently proposed a plan to ban human drivers from a stretch of highway linking Seattle and Vancouver, reserving it for self-driving vehicles. They argued that embracing the technology would save lives and ease congestion, noting that “widespread and universal adoption of autonomous vehicles is inevitable.”

If these tech gurus have their way, future iterations of the self-driving cars now being road-tested by Google, Uber, Tesla, and Mercedes will rule the road and, inevitably, their robot brethren will have free rein over the planet.

Jason Millar, Sc’99 (Engineering Physics), PhD’16 (Philosophy), is a robot ethicist who asks tough questions about how much control we should give up to AI-powered machines that are in many respects more capable than humans. To illustrate the moral dilemmas presented by driverless cars, Dr. Millar created an ethical thought experiment that he published in an academic journal: “Pretend you’re alone in a driverless car on a single-lane road that’s heading into a tunnel. A child suddenly runs across the tunnel’s entrance, trips and falls. You can either hit the child and save yourself or swerve into the tunnel edifice, killing yourself but saving the child.”

Of the people who responded online, 64 per cent said they would save themselves, while 36 per cent felt they would sacrifice themselves for the child. Dr. Millar suggests that from an ethical

perspective, there is no universal right answer. But in such cases, an individual's deep moral commitments could make the difference between going straight or swerving.

But this extreme scenario raises another interesting and key question: "Who gets to decide how the car reacts? With self-driving cars, we're shifting the moral responsibility from a human driver to some programmed algorithm," says Dr. Millar, a post-doctoral research fellow at the University of Ottawa Faculty of Law and researcher at the Center for Automotive Research at Stanford (CARS).

His hypothetical scenario is not far removed from the real-life programming decisions being made, or considered, by the leading manufacturers of self-driving cars today. Do you want to give up the right and responsibility to make moral decisions in life-and-death situations to the programmers and engineers who design the car, or the corporation that directs them?

Before you answer, take a deep breath and consider this.

At the 2016 Paris Motor Show, the manager of driverless safety for Mercedes-Benz told reporters that its future Level 4 and Level 5 autonomous cars will be programmed to save the driver and the car's occupants in each and every situation. So, in another hypothetical scenario, if a crash were unavoidable, the self-driving car – a Mercedes deluxe robot – might veer into a crowd of kids waiting for a bus rather than hit a wall or another vehicle, if that choice were less likely to harm the car's occupants.

## THERE'S CAPABILITY, AND THEN THERE'S WISDOM

Machines may be super-capable, but do they possess the wisdom to choose what you or other humans believe is the right thing to do? How much scope do you want to give self-driving cars, or other autonomous systems, to act and make decisions on your behalf?

As a techno-ethicist, Dr. Millar believes that consumers, regulators, manufacturers, and especially the engineers who design self-driving cars and other autonomous systems need to think hard about the social and ethical impacts of the new technologies emerging. That becomes even more important with advances in deep-learning AI, which enable robots to succeed in highly complex environments – talking, driving, or serving as a soldier – by learning from their own mistakes and improving their performance over time. Deep-learning robots take a more intuitive approach to solving problems, which results in surprising and unpredictable behaviour that is more human-like and less robotic. So we feel

even more pressure and a stronger temptation to relinquish control to autonomous machines.

Dr. Millar argues that creating good technology in the brave new world of deep-learning systems requires that engineers understand and think about the social dimensions of technologies they design. The broader role and ethical responsibility of an engineer is to design solutions that take into account human values and the impact on society: "I use my background in engineering and philosophy to talk about human values and understand how to translate human values into solutions. You're making good technology when it functions well, is efficient and easy to use, and incorporates a layer of ethics; it takes into account human values and it respects the user's autonomy and preferences."

Dr. Millar first started asking questions and thinking about the social impact of technology while working as an engineer in aerospace electronics, after graduating in engineering physics from Queen's. He was helping design electronics assemblies for commercial airliners one week and guided bomb units the next. "As a young engineer, you're not expected to investigate the ethical issues and you don't have the training or the language to figure them out. You don't necessarily have to think about the application of the technology you're designing, and you can't easily say, 'I'd rather not work on the bomb guidance system,'" says Dr. Millar, who returned to academia to study moral philosophy and apply that knowledge to the intersection of ethics, technology, and society.

In his journal article "Technology as Moral Proxy," Dr. Millar argues that there is an ethical requirement for engineers to broaden their professional duties to account for the social consequences of their technologies. Because engineers already function intentionally, or unintentionally, as *de facto* policymakers by introducing new technologies that often have strong social effects – whether they anticipate or think about these effects or not – they should be trained and develop the knowledge to fulfill the duties of a more robust public role.

## LEARNING LESSONS FROM HEALTH CARE

Engineers must change and broaden their approach to robot dilemmas with moral consequences, says Dr. Millar, just as health-care practitioners look at end-of-life or other high-risk health decisions with a moral lens, not just a technical one. To such questions, there often isn't a universal, ethically correct answer. In health care, where moral choices must be made about cancer therapy or high-risk brain surgery, for example, it's standard

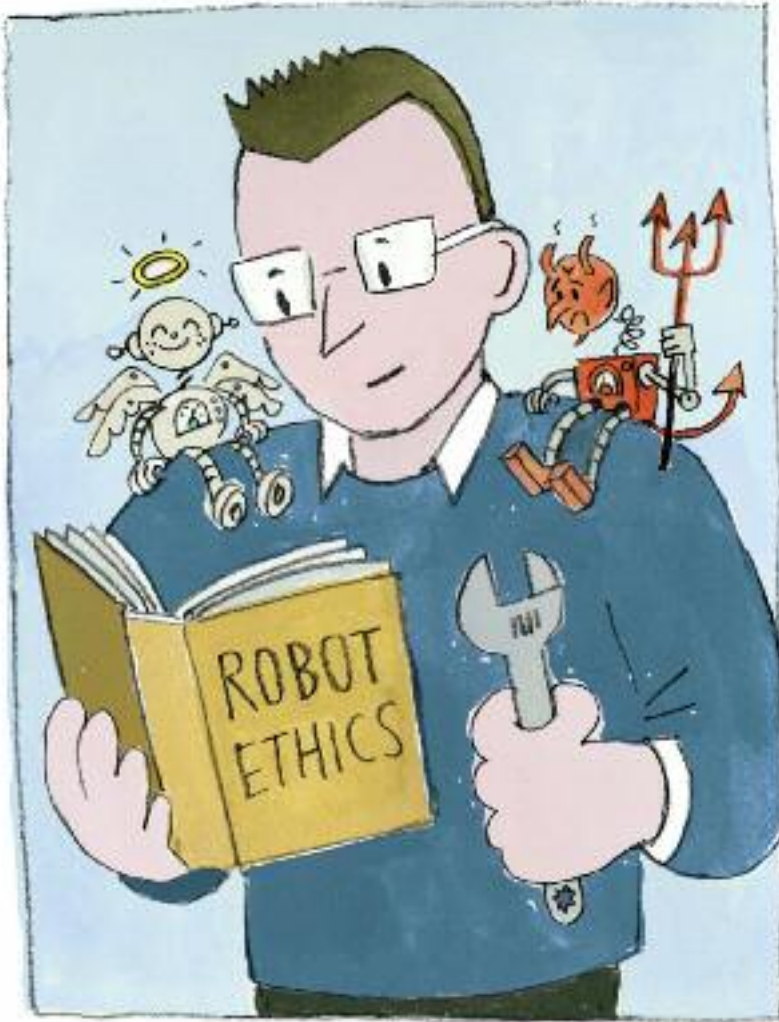


ILLUSTRATION BY TINE MODEWEG-HANSEN

*Young engineers should be trained to explore the social impact of the technologies they design, says Jason Millar.*

practice for medical staff to inform patients of their reasonable treatment options and allow patients to make informed decisions that fit their personal preferences. “This process is based on the ideas that individuals have the right to make decisions about their own bodies,” he says.

Informed consent wasn’t always the standard of practice in health care. “It used to be common for physicians to make important decisions on behalf of patients, often actively deceiving them as part of a treatment plan. Informed consent is now ethically and legally entrenched in health care, such that failing to obtain informed consent exposes a health-care professional to claims of professional negligence,” he says.

## THE EMBEDDED ETHICIST

While doing two clinical bioethics internships at Kingston General Hospital and the Children’s Hospital of Eastern Ontario during his doctoral studies at Queen’s, Dr. Millar saw in-house clinical ethicists in action, educating and consulting

with patients, families, and hospital staff on how to make informed decisions on these difficult bioethical issues.

Embedding ethicists in technology companies as part of their driverless car design processes is an idea that he has proposed to automotive engineers at international conferences. “Embedded ethicists are a way to train young engineers to identify and think about important ethical and social issues arising out of a new technology, so they can design solutions that make the technology more user-friendly in an ethical way,” says Dr. Millar, noting that environmental engineers now play a vital role in many companies to identify issues of concern and work with a team to develop solutions that lead to sustainable practices.

Jason Millar has applied his engineering and moral philosophy training to help address the issue of Lethal Autonomous Weapon Systems (LAWS) in the global military arena. Currently, military drones – sometimes referred to as Remotely Operated Weapons Systems (ROWS) – are remotely operated: the decision to use lethal force remains

a human decision. However, technology is now being developed that would enable military robots to autonomously make the decision to kill without human intervention: “These robots would find a target and decide to kill on their own,” says Dr. Millar. “The question is, do we want to automate the kill decision?”

## THE LINK BETWEEN DESIGN AND MORAL PSYCHOLOGY

In 2015, Dr. Millar was invited to give testimony at an informal meeting of experts on LAWS at the United Nations in Geneva. His presentation was aimed at exploring some challenges that weapons systems designers could face if they try to design for maintaining meaningful control over semi-autonomous weapons. He presented evidence from the field of moral psychology showing how seemingly unimportant situational factors, such as a noisy environment or sitting at a dirty desk, could significantly affect a person’s decision-making. For example, researchers found that if

noise levels were low, 80 per cent of people stopped to help an injured man, but when a power lawnmower was running nearby, only 15 per cent did. Dr. Millar explained that if the particular design features of the automated critical functions of the weapons system create an unintended bias in the human operator, this could result in a loss of meaningful human control in the decision to use lethal force. "So, if we are going to design for meaningful human control, in addition to understanding the effects of automating critical functions, we're going to have to invest time and effort trying to understand the relationship between design features and human moral psychology," he said.

Through the Open Roboethics initiative (ORI), Dr. Millar and colleagues conducted an international survey of people in more than 50 countries to gauge public opinion on the use of LAWS vs. semi-autonomous ROWS. "The majority of our participants indicated that all types of LAWS should be internationally banned. More than 70 per cent said they would rather their country use remotely operated instead of lethal autonomous systems when waging war. The most popular reason cited for rejecting the development and use of LAWS in battlefields was that humans should always be the ones to make life/death decisions," he says.

## SOCIAL FAILURE MODE

International law emphasizes the importance of public engagement in such matters. The Martens Clause, included in the additional protocols of the

Geneva Convention, indicates that the public should have a meaningful say on what is, and is not, permissible in armed conflict, especially where new technologies are concerned.

Similarly, with autonomous, driverless cars, Dr. Millar believes that companies and engineers should engage and seek input from the public on ethical and social issues to inform and influence their design solutions. He uses the concept of "a social failure mode" to identify and describe what happens when robotics or other new technologies

ignore or fail to properly address their impact on users and society. A prime example of a social failure mode in technology is Facebook

failing to meet users' expectations of privacy.

After the Mercedes official was quoted as saying the company's self-driving cars would prioritize the safety of occupants over pedestrians, there was a swift public backlash. Parent company Daimler AG recalibrated and said the official was misquoted: "For Daimler it is clear that neither programmers nor automated systems are entitled to weigh the value of human lives," said Daimler, noting that it would be illegal in Germany and other countries to make a decision in favour of vehicle occupants and that, as a manufacturer, it would implement what is deemed to be socially acceptable.

Dr. Millar views this kind of public airing of ethical issues as a crucial part of the research and development process. He hopes that through such "social acceptance" R&D processes, engineers, manufacturers, and regulators can address and find solutions to the many ethical concerns about self-driving cars, and build trustworthy vehicles that do what people expect them to do, safely. Choice and informed consent are critical components in the public discussion. This means that everyone, from car users to pedestrians to city planners, both have a meaningful say in, and retain some control over, safety decisions. "You build trust in the technology when you anticipate its effects on users and society," says Dr. Millar.

## CHOOSING AN ETHICAL ROUTE FOR YOUR COMMUTE

One way to give people choice and control over their personal moral preferences could be to build reasonable ethical settings into robot cars. Dr. Millar is now doing research at the Center for Automotive Research at Stanford University to explore mapping options for self-driving cars that would allow users to choose their personal ethical preferences. "Does Google always get to decide the best route for you? Your preferred route might be one that uses less fuel or avoids residential streets where there are likely to be small children," he says.

The role of a robot ethicist is not to block or roll back advances in technology, says Dr. Millar, but to enhance the technology by giving users and society at large meaningful choices and control over its use and effects. "I'm a complete technophile, not a technophobe, and the first to buy the next gadget. I want technology to make the world a better place," he says. "Engineers can help do this by making technology more user-friendly in an ethical way that respects the user's autonomy and preferences and takes into account the social impact." ■



Dr. Jason Millar

SUPPLIED PHOTO



# Assistive and adaptive technologies

The term “**assistive technology**” is used for products, software, or equipment used to improve or maintain the functional capabilities of persons with disabilities.

Examples of assistive technology include hearing aids, prosthetic devices, and reading glasses. Assistive devices range from low- to high-tech and can be off-the-shelf products or customized to the individual. They include products that support:

hearing

vision

mobility

memory

writing

typing

pointing

walking

learning

A subset of assistive technology is **adaptive technology**, which adapts *existing* technology specifically to meet the needs of users with disabilities.

Adaptive technologies include:

- **screen enlarger software** that makes text bigger on a computer screen and allows the user to zoom into specific parts of the screen;
- **screen readers** that turn the text on a computer screen into synthesized speech;
- **voice recognition software** that responds to voice commands to create documents, browse online, or open and navigate computer applications.

The Adaptive Technology Centre (ATC) at Queen's provides technology and services that enable students with disabilities to study, research, and access library and course materials. Located on the ground floor of Stauffer Library, the centre contains Library Accessibility Services, an Adaptive Technology Lab, the Technology Support Office, and the Adaptive Office of the Queen's Accessibility Coordinator.

Opened in 1991 with funding from an anonymous donor, the Adaptive Technology Centre has assisted thousands of students in achieving academic success. Library Accessibility Services ensure that students have access to library and research materials, including textbooks in alternate formats, such as large print, mp3, or Braille.

The Adaptive Technology Lab provides equipment and software that enable students with disabilities to access library and course materials. A loan program is available for students registered with the ATC so they can try out adaptive devices in their classes or while studying at home.

Learn more about the ATC: [queensu.ca/atc](http://queensu.ca/atc)

*A future issue of the Review will explore disability and accessibility issues at Queen's in more depth.*

## Elan Mastai explores time travel and the downside of a technological utopia in his new novel.

*Tom Barren lives in the world we were supposed to have. The technological utopia envisioned by the optimistic science fiction of the 1950s ... Yet Tom can't seem to find his place in this perfect utopia and feels like a constant disappointment to his brilliant but distant father. When the girl of his dreams turns his life upside down, Tom does what you do when you're heartbroken and have a time machine – something stupid.*

All the banal functions of daily life are taken care of by technology. There are no grocery stores or gas stations or fast-food joints. Nobody collects garbage from a bin at the curb or fixes your car with, like, tools in a garage. The menial and manual jobs that dominated the global workforce in past eras are now automated and mechanized, and the international conglomerates that maintain

those technologies keep busy tinkering with minor refinements. If your organic waste disposal module malfunctions, you wouldn't call a plumber, even if plumbers still existed, because your building has repair drones at the ready. A lamplighter with a jug of kerosene and a wick on a pole has as much relevance to contemporary life as tailors and janitors and gardeners and carpenters.

Places like bookstores and cafes still exist, but they're specialized niche

businesses aimed at nostalgia fetishists. You can go to an actual restaurant and have a chef prepare your meal by hand. But the waiter who serves you is essentially an actor playing a role on a set in which you're also a performer, an immersive, live-action narrative spooling around you in real time."

~ Excerpt from *All Our Wrong Todays*

**Q:** *There's some fairly persuasive-sounding science in this novel about innovative technology and time travel. How did you tackle the research for the book?*

**A:** Typically, I think about what sorts of inventions or technologies I want to use in the story and then work backward to figure out the current state of the technology, how it might either complement

or contradict existing science, but also at the logistical reasons why it hasn't happened. Once I find out where the holes are, I can start plugging them up with plausible scientific notions, things that are hypothetically possible even if no one has actually proven them yet. Even with something as far out as time travel, it's establishing what we know for sure, what we think we know, and what we're totally clueless about. My approach with research is to do way more than is necessary and then only include the most interesting and entertaining bits for the reader. I never want to lose anyone in arcane technical data. It's a novel. It's supposed to be fun to read.

**Q:** *What's a piece of technology that you couldn't imagine life without? What kind of futuristic technology would you most want to have?*

**A:** I mean, on an essential level, I can't imagine life without books. The printing press, in its day, was as groundbreaking a technological innovation as the smartphones in our pocket or the satellites above our heads. The ability to read the printed words of other people is so embedded in our everyday life that it doesn't even feel like a technology. It's part of what makes us human. The most successful kinds of technology are like that. They become prosthetics.

In terms of futuristic technology, as someone who chronically runs late for things – definitely teleportation. Of course, if I knew I could just teleport wherever I want to go, I'd probably run even later for things. That's the problem with technology. It can solve all sorts of problems, but it can't fix human nature.

### ■ Alison Migneault

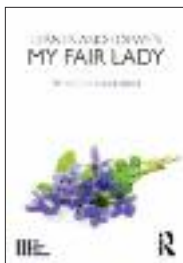
*In the digital Review, Alison Migneault chats further with Elan Mastai about his writing process and how he developed the ideas for All Our Wrong Todays.*



DAVID LEVES

Elan Mastai, Artsci'97, author of *All Our Wrong Todays*

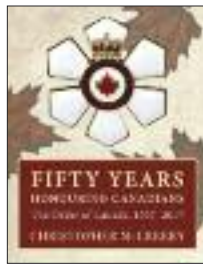
**Dean Curran**, Artsci'02 (Economics, History), PhD'13 (Sociology), is the author of *Risk, Power, and Inequality in the 21st Century*. This book provides a new analysis of the increasingly important relationship between risk and widening inequalities. The massive, and often unequal, impacts of contemporary risks are recognized widely in popular discussions – be it the fallout from the 2008 financial crisis or 2005's Hurricane Katrina – yet there is a distinct neglect in social science of the overall systemic impacts of these risks for increasing inequalities. This book identifies novel intersections of risk and inequalities, showing how key processes associated with risk society – the social production and distribution of risks as side-effects – are intensifying inequalities in fundamental ways. Dr. Curran is assistant professor of sociology at the University of Calgary.



**Keith Garebian**, PhD'73 (English), has a new book out – his 22nd. *Lerner and Loewe's 'My Fair Lady'* is part of Routledge's new Fourth Wall series, which explores some of modern theatre's best-loved works. Dr. Garebian takes a fresh look at the libretto, explores the biographies of Rex Harrison, Julie Andrews, and Moss Hart to discover how their roles intersected with real life, and examines the gender codes in the musical.

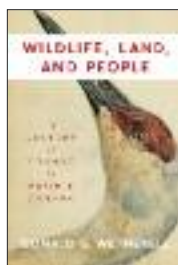


**Faye Kert**, Arts'70 (MA, Carleton, PhD, Leiden), is the author of *Privateering: Patriots and Profits in the War of 1812*. During the War of 1812, most clashes on the high seas involved privately owned merchant ships. Licensed by their home governments and considered key weapons of maritime warfare, these ships were authorized to attack and seize enemy traders. Once the prizes were legally condemned by a prize court, the privateers could sell off ships and cargo and pocket the proceeds. Because only a handful of ship-to-ship engagements occurred between the Royal Navy and the United States Navy, it was really the privateers who fought – and won – the war at sea. Building on two decades of research, Dr. Kert highlights the economic, strategic, social, and political impact of privateering on both sides and explains why its toll on normal shipping helped convince the British that the war had grown too costly. The book won the John Lyman Award for American Maritime History from the North American Society for Oceanic History and the Keith Matthews Book Award from the Canadian Nautical Research Society.



**Chris McCreery**, MA'98, PhD'03, has two new books out marking the 50th anniversary of the Order of Canada. *Fifty Years Honouring Canadians: The Order of Canada, 1967–2017* traces the origins of the Order, from the debate surrounding Canadians accepting peerages and knighthoods that took place during the First World War through to Vincent Massey and Lester Pearson's great desire to see their fellow citizens recognized with a truly Canadian honour. *The Order of Canada: Genesis of an Honours System* (second edition) sheds new light on the development of Canadian honours in the early 1930s, the imposed prohibition on honours from 1946 to 1967, and new details on those who have been removed or resigned from the Order.

**Jessica Polzer**, Artsci'91 (MSc, PhD, U of T), and **Elaine Power** are the editors of *Neoliberal Governance and Health: Duties, Risks, and Vulnerabilities*. Provoking urgent questions about the politics of health in the 21st century, this collection interrogates how neoliberal approaches to governance frame health and risk in ways that promote individual responsibility and the implications of such framings for the well-being of the collective. The essays examine a range of important issues, including childhood obesity, genetic testing, HPV vaccination, Aboriginal health, pandemic preparedness, environmental health, disability policy, aging, and women's access to social services. Dr. Polzer is an associate professor in the Department of Women's Studies and Feminist Research and the School of Health Studies at Western University. Dr. Power is an associate professor in the School of Kinesiology and Health Studies at Queen's.



**Donald G. Wetherell**, PhD'81 (History), is the author of *Wildlife, Land, and People: A Century of Change in Prairie Canada*. Encounters with wild animals are among the most significant interactions between humans and the natural world. Presenting a history of human relationships with wildlife in Alberta, Manitoba, and Saskatchewan between 1870 and 1960, this book examines the confrontations that led to diverse consequences – and finds the roots of these relationships in people's needs for food, sport, security, economic development, personal fulfillment, and identity. Dr. Wetherell is professor emeritus of heritage resources management at Athabasca University. ■

# KEEPING in touch

## News from classmates and friends

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QUEEN'S UNIVERSITY ARCHIVES V102-2-145. WALLACE R. BERRY FONDS

*The Queen's  
Computing  
Centre,  
circa 1968*

**Computing at Queen's** In 1966, Queen's bought its first big mainframe computer, an IBM 360, model 40, and installed it in newly opened Dupuis Hall. John Coleman, head of mathematics, prophetically told Principal Alex Corry that the 360 marked "an extremely important" moment in Queen's history. Computing thus became a centralized university function staffed by highly skilled operators. IBM-trained Mers Kutt, an early director of the computing centre, would, for instance, go on to a distinguished career as a pioneer of the personal computer.

The 1960s brought two new realizations. Computers were quickly recognized as useful facilitators of research. Not only could the IBM mainframe manipulate raw data into variable outcomes, but it could also store that data. The IBM 360, for example, could store up to 128 kilobits of data, less than a fraction of the size of a modern mp3. By the late 1960s, it was common to see professors and students queueing outside Dupuis Hall for processing time. Eighty per cent of the processing on the 360 was done by punch card submission of data.

Read more about the history of computing at Queen's: [queensu.ca/175/computing-queens](http://queensu.ca/175/computing-queens)

Unless otherwise indicated, dates in these notes refer to 2017.

## Up to 1959

### Family news

**Bill, Sc'50, and Pam (Clarke) Lowry, Arts'50,** celebrated their 65th wedding anniversary on Dec. 29, 2016. They still live at the house in Etobicoke they moved into in 1953. They have three sons.

### Notes

**Tom McCavour, Sc'52,** recently published his fifth book, *Me, Myself & I*, a collection of memories about the events in his life, the people he met, and a description of the times over a period of eight decades. The 1950s period records his time at Queen's and how that experience shaped his later life. Tom went on to found his own engineering company. Following retirement, he graduated as a master gardener and pursued his lifelong dream of writing novels.

### Deaths

**Douglas Theodore Arkett, BSc'49,** died peacefully Nov. 23, 2016, aged 92, after living life on his terms. He was predeceased by his wives Joan (Crozier), BA'60, in 1994, and Pearl (Burbank) in 2004. There is a Queen's bursary offered through the Ban Righ Centre in Joan's name. Predeceased by his daughter, Jane Whyte, Doug is survived by his son Ron (Kathy), four grandchildren, and his sister Fay. Doug enlisted in the RCAF in 1942, then came to Queen's in 1945, graduating with a degree in chemical engineering. He had a varied career, working first in industry and then as a high school teacher. He went on to work at McMaster University as assistant registrar before coming back to Queen's, where he worked in administration for 20 years. Doug enjoyed reading, travel, golf and tennis, and meditation.

**Edward Berktyo, BSc'48,** died Oct. 28, 2016, aged 91. From Queen's, Edward went on to graduate from Yale University with a master's in chemical engineering, followed by post-graduate studies in Sweden. His life's work in the pulp and paper industry took him from Quebec and British Columbia to Brazil and Chile, eventually retiring from the position of vice-president, manufacturing, for Crown

Zellerbach in San Francisco. Edward is survived by his wife, Anne, children John, Linda, and Barbara, and their families. Edward's kind words and smile will be greatly missed by his family and friends. The very definition of a compassionate, loving, caring person, Edward was well known for his lifetime enthusiasm for learning, and a boyish inquisitiveness to explore the wonders of our world. In memory of his passing, Edward's family asks that Queen's friends remember him as they plant a tree or garden this spring.

**Shirley Hodgins Brind, BA'49,** died Jan. 9 at home in Canandaigua, N.Y. Shirley grew up in Kingston, the daughter of Marjorie (Murray), BA'26, and W. Charles Hodgins, BA'21. Shirley studied chemistry and biology at Queen's, graduating with first-class honours. Active in sports, she earned her Levana "Q" in swimming. After graduation, she moved to the U.S., working as a research assistant in biology at Brown University before being appointed to the faculty at the Albany Medical College as a research and teaching fellow in physiology. At Albany Medical College, she published eight papers on cardiac research in the *Journal of Circulation Research*. In 1954, Shirley married David Hutchison Brind. They settled in Geneva, N.Y., where Shirley became involved in many community organizations, from the Geneva General Hospital to the local school board to the North Presbyterian Church. She received many awards for her community service. Shirley dedicated her life to her family, her church, and her community with love, intellectual inquiry, and action to benefit others. Her motto was "I always try to do my best." She is survived by David, her loving husband of 63 years, her children Susan Brind Morrow (Lance) and Charles (Nancy), and two granddaughters. She is also survived by her sister-in-law, Nancy Wallace, and cousins John Murray (Sylvia, NSc'59), Barbara Dell, and Jeffery Dell.

**Nancy Elizabeth (Lowe) Clare, BCom'53,** died Jan. 31 in Toronto. She was predeceased by her husband, James, and survived by her children George and Muriel.

**C. Burritt Collins, MD'49,** died in November 2016, aged 93. In Burritt's memory, please commit many random acts of kindness to the unsuspecting.

**C. Ross Green, MD'53,** died Dec. 16, 2016, at home in Thorndale, Ont. Ross was the beloved husband of Shirley (Hitchon) Green for more than 64 years. He is also survived by his five children, nine grandchildren, and three great-grandchildren.

**Margaret (Robinson) Gussow, BA'36,** died Feb. 4 in Ottawa, aged 103. Survived by her sons Christopher and David and their families, Margaret was predeceased by her husband, William Gussow, BSc'33, MSc'35, and her son James. At Queen's, Margaret studied languages, learning French, Spanish, and German. (Later in life, she also studied Russian, Japanese, and Chinese.) She was required to take a science course, so she chose geology. This is how she met William, then a graduate student in geology and a teaching assistant in Margaret's class. They married after her graduation and went to Boston while William completed his PhD at the Massachusetts Institute of Technology. After William finished his doctorate, the couple took 10 months to travel around the world. Later Margaret went on to get her master's degree in library science at the University of Southern California. Margaret was a librarian for many years; she also taught in some of the places they lived. William's geology work took the family to Alberta, California, and Japan before they returned to Ottawa. Both Margaret and William were active with the Ottawa alumni branch. They were members of the Queen's Royal Legacy Society in recognition of their thoughtful planned gift for Queen's.



**Glen Harrison, BSc'46,** died Aug. 20, 2016. Predeceased by his wife, Margaret, he is survived by his children David, Jeffrey, Ted, Anne, and Jeannie and their families. He is

also survived by his brother John and predeceased by his four other brothers, including Ralph, BSc'47.

**Arthur Charles Hubbard**, BSc'51, died Feb. 2. After studying engineering and physics at Queen's, Chuck began his career in electronics engineering. In 1955, he joined Lamont Doherty Geological Observatory at Columbia University, working in marine geophysics. He had many adventures at sea, including measuring magnetic fields at a floating ice island between Point Barrow and the North Pole. In 1957, he met the love of his life at the Metropolitan Museum of Art in New York, while she was visiting from the Netherlands. He is survived by Nel, his wife of 58 years, and extended family.

**Maxwell Russell Jackson**, BSc'50, died March 31, 2016. Max's life was marked by several notable achievements. He joined the Royal Canadian Navy early in the Second World War, serving on the corvette HMCS Port Arthur. He participated in convoy duty in the North Atlantic and English Channel, including on D-Day, June 6, 1944. Max came home determined to utilize what he learned aboard the ship; he enrolled at Queen's, where he earned his degree in mechanical engineering. He held many jobs over the course of his career, eventually becoming plant manager at the Windsor casting plant of the Ford Motor Company. Family was very important to Max. He met his future wife, Margo (Gouthro), at a Queen's football game. It was love at first sight; they were married for 56 years. Max and Margo, who predeceased him in 2005, were very proud of their three children, seven grandchildren, and two great-grandchildren. Volunteer work was also important to both of them. The couple delivered meals for Meals on Wheels, canvassed locally for charities, and instilled their love of community in their children. Max had an eclectic range of hobbies and interests, including teaching, sailing, boating, flying, skeet shooting, repairing antique clocks, and pro bono tax preparation services for older adults in his community. Max was well recognized for his generosity,

honesty, integrity, organizational skills and, last but not least, an engineering approach to many of life's challenges. He left a generous gift to Queen's in his will.



**William Lavrench**, BSc'48½, MSc'50, died March 4, 2016. He is survived by his wife, Ruth, children Catherine and Peter, three grandchildren, and his brother Peter, Arts'55. A physicist, Bill worked at the National Research Council for 38 years.

**Neil F. McLean**, BSc'53, died at home July 19, 2016, in his 88th year. He is survived by Leslie, his wife of 58 years, children Neil Jr., Craig, and Karen, Artsci'88, their spouses, and nine grandchildren. Neil graduated from RMC in 1952, then studied civil engineering at Queen's. He did various engineering and construction jobs before going to McMaster to obtain his MBA, graduating in 1970. He had a successful career with Noranda Sales Ltd., retiring in 1993 as vice-president. Neil's hobbies included the investment business, golf, family life, and volunteer church work. He was always mild-mannered, generous when giving, and thorough when working. He managed to navigate his way through life with grace and dignity, always following the guiding principle to treat others as he would have them treat him. He was always so pleased whenever he met a fellow Queen's graduate.



**John Donald Nixon**, BA'49, died Nov. 12, 2015. Donald was predeceased by his wife, Elizabeth. He is survived by his children Tracy (Wendy),

Jay (Karen) and George (Pia), six grandchildren, and brother Peter, Sc'53 (Dorothy, Arts'53). Donald began his education in a one-room school in West Korah, Ont., and continued on to Sault Collegiate, Queen's, and Osgoode Hall. He practised law for more than 50 years, during which time he was named Queen's Counsel. He served as an officer in the Canadian Army during

the Second World War. Donald is remembered by his clients and friends, with whom he shared a story, a joke, a song, a work of art, a poem, a special memory, a theatre production, a gourmet meal, or a glass of fine wine. Friends and family will particularly remember Donald's love for that special place: his "camp" on Calm Bay at Batchawana.

**William T. Peria**, BSc'48, died Feb. 1. He is survived by his four children, their families, and his sisters. After studying physics at Queen's, he went on to earn his PhD in that field at UBC. As a professor at the University of Minnesota, he led cutting-edge research in surface physics for nearly half a century, enabling the founding, by his PhD students, of Physical Electronics Inc., provider of crucial surface analytical equipment to the semiconductor industry. Widely respected and feared by his undergrads, he convinced legions of them either to learn or to leave electrical engineering. Ever the teacher, in retirement he volunteered to help young students learn to read.



**George Francis (Frank) Roseborough**, MD'55, died Oct. 1, 2016. He was predeceased, just four months earlier, by Nancy Anne (Code),

BNSc'54, his wife of 61 years. Frank is survived by his children Lorne, Kimberlee, Trevor, Gwynneth, Artsci'85, and Glen, Artsci'87 (Shelley Osborne, Artsci'89), and grandchildren Victoria, Alexandra, and Nicholas. Frank studied science at UBC before getting his medical degree from Queen's. While at university, he joined the Canadian Officer Training Corps. In the late 1950s, he served with the Canadian Regular Army as a medical officer for the United Nations Emergency Forces peacekeeping mission during the Suez Canal Crisis. In the Middle East, Frank developed a keen interest in eye diseases. He studied at the Kresge Eye Institute in Michigan and became an ophthalmologist. Frank and Nancy established two ophthalmology practices, in Victoria and Duncan, B.C. For many

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years, they also hosted the send-off for new Queen's students from the Victoria community.



**Gordon James Mark (Jim) Shearn**, BSc'59, IR'60, LLB'67, died Aug. 7, 2016. He is survived by Marjorie, his wife of 52 years, children

Gordon, Artsci'93, and Jennifer, their spouses, and two grandchildren. Jim was a constant presence on the Gaels blueline in the 1950s and '60s, playing as the captain of the hockey team for four years from 1956 to 1960 and returning to the roster from 1964 to 1967. His hockey-playing days continued into his 80th year with weekly games. Jim was also a member of the Gaels defence for the football team during the 1958 and 1959 seasons. After getting his engineering and law degrees, Jim opened his own patent and trademark practice while acting as patent counsel for Borden Ladner Gervais. His travels took him afar, including on skiing, climbing, and sailing trips. Jim was a proud member of Sc'59 and proud supporter of Queen's and the Gaels. At the most recent Paul Stothart Memorial Golf Tournament

for Queen's Hockey, Jim was named the 2016 recipient of the Men's Varsity Hockey Outstanding Gael Award. In his memory, Jim's former teammates have established an endowed athletic award at Queen's.

**George Toller**, BA'49, died Dec. 13, 2016, in Ottawa. George is survived by Ruth, his wife of 54 years, children Susan (Jeff), Carol, Artsci'87 (Chris), and Sheila, and two grandchildren. George was predeceased by his brother, Eric, BA'50, BCom'51. George was a dedicated volunteer at Queen's, holding positions on the Board of Trustees, University Council, and Queen's University Alumni Association. He received the university's Distinguished Service Award in 1985. He was an active member of Arts'49 and was instrumental in the creation of the Arts'49 Principal Wallace Fellowship at Queen's. The fellowship was created at the class's 50th anniversary in honour of Queen's 11th principal, Robert Charles Wallace. George had a fondness for history, canoeing, Robbie Burns poetry, and, most of all, people. He was a warm and generous friend to many. Those who knew George will always remember the twinkle in his eye and his ready smile.

**Arthur Hubert "Hugh" Webster**, BA'53, MA'54, died Nov. 2, 2016. He was the son of Agnes and Arthur A. Webster, BSc 1920. Hugh is survived by his wife, Constance (Anglin), Arts'53, children Arthur, Sc'83, MSc'86, Margaret Devey, Artsci'87, and David, and grandchildren Leah Webster and Clara and Christian Devey. Hugh is also survived by his sisters Heather Humphries, Arts'62, and Monica Webster, Arts'60. He was predeceased by his brothers Charles, BSc'43, and Ian, BSc'57. After graduating with a PhD in metallurgy from UBC in 1957, Hugh spent his working career with CANMET, Department of Energy, Mines and Resources, in Ottawa.

**Shelagh (Dunwoody) Whitaker**, BA'51, died Dec. 20, 2016. She is survived by her four daughters and their families. She was predeceased by her husband, Brigadier General W. Denis Whitaker, with whom she co-wrote four books on Canada's involvement in the Second World War. Beginning in 1967, Shelagh worked as a freelance journalist. Her work was featured in the Toronto daily newspapers and a variety of national magazines. She incorporated her own corporate sports public relation firm and founded two sports magazines. Shelagh's last book was an account of the history of the Royal Hamilton Light Infantry.

## A SESQUICENTENNIAL CIRCUMNAVIGATION

Starting on July 1, **Bob Dengler**, Sc'65, DSc'88, is marking Canada's 150th anniversary in a big way. He and his son Steven are embarking on the world's first Canadian helicopter circumnavigation flight. With fellow pilot Dugal MacDuff, the Denglers will pilot the Canadian-made Bell 429 Global Ranger helicopter



SUPPLIED PHOTO

on a course that will cover 37,000 km, visit more than 100 airports in 14 countries, and make stops in every Canadian province and territory.

Bob started flying helicopters at the age of 66, after he retired from Dynatec Mining Corp., the company he founded. "It is hard to describe how beautiful it is to fly over the countryside in a helicopter," he says. "The scenery is great. I have flown coast to coast in Canada and in the U.S. I have also flown to the Canadian Arctic – all the way to Pond Inlet in Baffin Island! Pictures do not do justice to the views I have seen."

You can follow the C150 Global Odyssey adventure on Facebook, Twitter, and Instagram – just search for "C150GO." Thanks to Steven's wife, Bruna Pace, Sc'95, for letting us know about the father-son adventure. ■

## 1960s

### Family news



Major (RCAF, retired) **George Nishimura**, Arts'67, and his wife, Grace, celebrated their 60th wedding anniversary in July. George and Grace, who live in Mississauga, were feted by family members at the Georgian Bay cottage of their daughter Rosanne Nishimura and son-in-law Dean Smith. They also received a congratulatory letter from HM Queen Elizabeth II on the happy occasion.



George and Grace's grandson Nicholas Smith is in his final year of law at Queen's.

## Deaths

**Paul Amey**, BA'68 (member of Arts'69), died Jan. 17. He is survived by his wife, Michelle, children Christopher and Stefanie, and two grandchildren. Paul started practising law in 1973 and later became a partner of Waterous Holden Amey Hitchon LLP, in Brantford, Ont. He was passionate about golf and was an avid skier. Paul had a great love for jazz music and travelled near and far for jazz festivals.

**Dhonald Welch MacKinnon**, BSc'65, died Feb. 6 in Oakville, Ont. Dhon leaves his wife, Sally (Watters) MacKinnon, NSc'68, son David (Kelly), daughter Nancy (Scott) and 10 cherished grandchildren. Dhon's professional career involved project management for many large Canadian food and beverage industries and, ultimately, private consulting services to Proctor & Gamble. He always enjoyed the challenges of his

work and the camaraderie of his clients and co-workers. At the memorial gathering to honour Dhon's life, Bill Watters, Arts'62 (his brother-in-law), spoke of Dhon's extensive travels worldwide with his family, his infectious laugh, and his ability to focus on the positive aspects of life. Norm Mainland, Sc'65, Dhon's closest friend and best man at his wedding, spoke of their student days as lab partners and their long-term friendship. Norm said of Dhon, "You will never forget someone who gave you so much to remember." Donations in Dhon's memory may be made to the Michele Mainland Memorial Scholarship Fund at Queen's University. Queen's friends can reach Sally at [sally@realizationinc.com](mailto:sally@realizationinc.com).

## 1970s

### Honours

**John F. Bankes**, Arts'73, was among the volunteers with the Royal Life Saving Society honoured at a reception at Buckingham Palace in

November. The reception, hosted by HRH Prince Michael of Kent, celebrated the 125th anniversary of the Royal Life Saving Society. At the reception, John received a special certificate of merit, given to individuals "whose voluntary contribution and achievements have significantly impacted on the Royal Life Saving Society or have represented the Society in an exemplary way, particularly in the fields of sport, youth and drowning prevention." John and his fellow recipients and their guests then attended a reception to celebrate the society's anniversary hosted by Her Majesty Queen Elizabeth II and her husband, the Duke of Edinburgh.

**Marc Hornbeek**, Sc'78, has been honoured by the Institute of Electrical and Electronics Engineers (IEEE). Marc was named 2016 outstanding engineer for region 6, which covers the western United States. The award is given for "outstanding contributions to the field of automation applied to development and testing of networks, systems and protocols, labs and DevOps." Marc is a principal

*"We believe that education can be a game changer," says Catherine. "It can break the cycle of poverty, not just for students, but for their families as well. Our kids were in good shape, so we thought we could help someone else's children. We had an opportunity to do something special... Life is short and this is important."*

**Catherine Purcell, Artsci'78, Ed'85, MEd'98 & Michael Purcell, Sc'75**  
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consultant at Trace3, an IT solutions provider in California.

## Family news



**Carol (Sinclair) Doucette**, Ed'74, shared this family photo with us. Here is Carol with daughter Aimée (Doucette) MacLean, Artsci'06, Ed'07, and Aimée's daughter Gabrielle MacLean (Queen's class of 2035?).

## Notes

**Thomas Cromwell**, Mus'73, Law'76, LLD'10, retired as a justice of the Supreme Court of Canada and deputy of the Governor General in September 2016. He joined Borden Ladner Gervais LLP as counsel to their national litigation practice and can be reached at [tcromwell@blg.com](mailto:tcromwell@blg.com). He is also a 2017 mentor for The Pierre Elliott Trudeau Foundation. The foundation's mentorship program connects highly accomplished and engaged Canadians from the public, private, cultural, and not-for-profit sectors with Trudeau scholars, allowing them to guide the next generation of leaders in the social sciences and humanities.



**Carol Franks**, Arts'71, is the creator of Summit-RUN, a board game that highlights the rich cultures of the Spanish-speaking countries of Latin America. The game offers trivia questions for those just learning Spanish, intermediate learners, advanced learners, and English-only speakers. This is Carol's second educational board game. The first, Verb It, taught Spanish verbs. (Learn more at [verbitgame.com](http://verbitgame.com).) Carol, a retired journalist and innkeeper, divides her time between Canada and Nicaragua. Carol is seen here

with Augusto G. Silva, who illustrated the SummitRun board.



**Nick Gudewill**, Sc'72, did some sightseeing this past winter. Nick writes, "I made a 13,000 km journey on my BMW 1200 Adventure motorcycle from Cape Town to Cairo, travelling through 11 countries. I travelled with a company called Globberiders LLC with 10 other riders. At 68 years of age, I can safely say that it was the most involved, exciting, and intense two months of my life and I am very happy that I am still able to take on such challenges. In 2011, I completed a similar journey on the Silk Road starting in Istanbul, Turkey, and finishing in Xian, China. Early next year, I plan on a third trip with Globberiders travelling from Bogota, Columbia, to Tierra del Fuego." You can read more about Nick's adventures on his blog: [nickgudewill.blogspot.ca](http://nickgudewill.blogspot.ca).

On July 1, as Canada celebrates its 150th anniversary, the president of the British Association for Canadian Studies will be **Alan Hallsworth**, MA'71 (Geography). Dr Hallsworth, Professor Emeritus, Staffordshire University, last held this post in 2000.



**K. Jennifer Ingram**, Meds'74, has been appointed as physician lead for seniors care for the Central East Local Health Integration Network. In this role, she will work with other physician leads, the Ontario-wide Seniors Care Network, regional and local health service providers, and other partners involved in caring for older adults. She will provide leadership to increase the involvement of primary care physicians in supporting seniors, ensuring the use of best practices for seniors care, and

participating in provincial initiatives that focus on seniors care. Dr. Ingram is a specialist in internal and geriatric medicine, practising in Peterborough and surrounding communities. She is the geriatric medicine chair at the Peterborough Regional Health Centre, founder and principal investigator of the Kawartha Regional Memory Clinic, and founding chair of the Peterborough Council on Aging. Dr. Ingram is also the geriatric medicine lead for the College of Physicians and Surgeons of Ontario. In 2016, she was awarded the Irma M. Parhad Award for outstanding contributions to the understanding and treatment of patients suffering from cognitive disorders from the Consortium of Canadian Centres for Clinical Cognitive Research. She also received the Glenn Sawyer Service Award from the Ontario Medical Association for her outstanding contributions to the medical profession and community.

**David Raymont**, Artsci'77, worked with volunteers with Heritage York and the York Pioneer & Historical Association to put into print the unpublished memoirs of Sir William Howland. The only American-born Father of Confederation, Howland grew up near St. Vincent, N.Y., near Wolfe Island and Kingston. Did Howland save Confederation by remaining with the Coalition government after his leader George Brown bolted? Read Howland's memoir, *Dare to do what is right*, and decide for yourself: [yorkpioneers.org](http://yorkpioneers.org).

## Deaths

**George Thomas McCaffrey**, BSc'71, MSc'73, died Nov. 25, 2016, in Ottawa. Partner of Nan Farley, beloved father of Justin and Kathryn, Artsci/PHE'16. George is also greatly missed by his brother Bill, numerous cousins, and his former wife, and good friend, Nadeane McCaffrey. George was predeceased by his daughter Danielle. George served nearly 40 years with J.L. Richards & Associates Ltd. as an engineer and senior executive, the last eight before his retirement as president and CEO, an honour of which he was extremely proud. He was principled,



# Elections 2017

**Vote online\* June 5 to 19**

Alumni are invited to elect, from amongst themselves, ten members to sit on the University Council.

## University Council

Established by statute in 1874, the University Council serves as an advisory body to the University. Members provide advice on issues relating to the prosperity and well-being of Queen's. The Council's responsibilities include the appointment of the Chancellor and the election of six members to the Board of Trustees.

## Questions?

Call the University Secretariat at 613-533-6095 or email [univsec@queensu.ca](mailto:univsec@queensu.ca)

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## UNIVERSITY COUNCIL

### Election of Councillors by alumni for a four-year term (2017-2021)

You may VOTE FOR A **MAXIMUM OF TEN (10)**

Patrick Allin	Michael Kocsis	Jonathan Scarlett
Maya Bielinski	Patrick Lounsbury	Kenneth Sutton
Michael Ceci	Robert Marsh	Neil Wainwright
Marc-André Cyr	Cathy Matthews	Chu Wang
Keith de Bellefeuille Percy	Sean McGrady	Katie Wei
Raymond Enone Ngabe Ejang	Rebecca Finley-Schidlowsky	Jessica Weshler
Greg Frankson	Tka Pinnock	Karen Wianecki
John Frezell	Kathy Pritchard	Kate Wilson
Taylor Hannah-Gunness	Julia Reid	Andrew Witzke
Anjali Helferty	Jennifer Safruk	Tom Woodhall

Jonathan Cescon was acclaimed to a one-year term position (2017-18).

\*Alumni who have not received an email with voting instructions by June 7 are asked to contact the University Secretariat at [univsec@queensu.ca](mailto:univsec@queensu.ca)

pragmatic, and thoroughly professional in his approach to business and with people. He was intensely loyal to his family, friends, firm, and co-workers. A skilled and imaginative building science professional, he leaves behind a legacy of remarkable and enduring works, in Canada and abroad. George was a fierce competitor who loved golf, had a wry wit, and cherished his children and their accomplishments in life. Fittingly, George was given a rousing send-off, complete with irreverent stories, at a well-attended memorial gathering at a Royal Oak pub in Ottawa in December, an event he planned with his family during his last days.



**Judith Patterson**, BSc'77, died peacefully at home on Jan. 27, surrounded by friends and with her beloved German shepherd

by her side. Predeceased by her beloved husband, Jamie Tiller, BA'74, her parents Glen, BSc'41, and Barbara Patterson, and her dear sister Laurie, Judy leaves a large group of friends who will miss her enthusiasm for life. Judy was an associate professor of geology at Concordia University, where she taught in the environmental geoscience program. After studying geology at Queen's, she went on to receive an MSc from the University of Calgary and a PhD from Virginia Polytechnic Institute in Blacksburg, Va. She did her graduate studies in the Baker Lake region of the Northwest Territories and maintained a love of the far north throughout her life. Her recent area of research was modern environments, in particular the impact of fossil fuel combustion on the atmosphere, specifically from the transportation sector. Her work has been published in a variety of journals. Judy was an ardent world traveller; in recent years, she enjoyed trips to the Himalaya Mountains in China, Sikkim, and Nepal. An avid curler during the winter months, Judy cherished her free days in the summer at her cottage on Aylen Lake in the Madawaska Valley of Ontario.

She uplifted people with her intellect, charm, grace, and love of life.

## 1980s

### Honours



**Janice C. Heard**, Artsci/PHE'80, (MD, University of Calgary) was awarded the Order of the University of Calgary at its

convocation on Nov. 10, 2016, in recognition of her significant accomplishments in medicine and public service, both locally and internationally. Janice was honoured by the university for her contributions as a clinical assistant professor, as executive director of Alumni Affairs at the Cumming School of Medicine, by establishing a student bursary, and through one of the university's international projects: improving health care in rural Laos. Her citation read "She serves with humility, compassion, and a belief in pursuing what is possible." Janice and her husband, **Bruce McFarlane**, Artsci/PHE'78, have been in Calgary for 37 years following their graduations from Queen's. Janice continues to practise pediatrics, primarily in the developmental field with children at risk and with vulnerable populations. She also sits on the board of a number of charitable foundations and volunteers her time in Laos twice a year for various projects. Bruce still works in the oil and gas business as a negotiator in the role of V-P business development for RMP Energy Inc. Bruce is the incoming chair of the board of directors for the United Way of Calgary and continues to support all things "Queen's." Bruce and Janice's newest project is being grandparents to Archer and Edison, sons of Erin (McFarlane) Rathwell, Artsci/PHE'04, and her husband, Mark.

### Job news

**Malcolm Bucholtz**, Sc'86, has found a unique way to dust off and apply his old engineering skills. In 2014, he founded a consultancy – amusingly

called Prohibition University – that offers three- and six-day hands-on distillery workshops in Kelowna, B.C., Edmonton, Alta., and Regina, Sask. Workshop participants learn the science behind the fermentation and distillation of whisky, gin, vodka, and liqueur, all while getting hands-on experience in an actual working craft distillery. Malcolm's most recent book on the subject of distilling is *The Recipe: Reviving the Lost Art of Home Distilling*.

**Ken Tamminga**, MPL'86, has been active as both practitioner and scholar in spatial planning and landscape architecture, both in Canada and the U.S. He writes, "I've been on the faculty at Penn State University since 1993 and have just been promoted to distinguished professor of landscape architecture."

### Family news

**Christine (Huck)**, Artsci'82, and **Lanny Reid**, Sc'83, welcome with lots of love their first grandchild, Gregory Joseph Reid, born Dec. 24, 2016. Greg was a wonderful Christmas present for everyone, especially his parents, **Shannon (Bell)** and **Jake Reid**, both Sc'11. In true Queen's style, Gregory already has first tricolour polo shirt and will soon be learning to *Oil Thigh!*

### Notes

**Katherine Crewe**, ICD.D, Sc'81, successfully completed the Institute of Corporate Directors – Directors Education Program in the first cohort in Ottawa. She writes, "One of our esteemed lecturers was Queen's alumnus Rick Powers (Artsci/PHE'78, MBA'83, Law'86). Several of my classmates were also Queen's alumni. In February 2017, I completed the final evaluations of the institute's corporate director's accreditation and can use the ICD.D designation."

After 36 years with conservation authorities in Ontario, mostly with the Cاتاqui Region and the last 12 as general manager, **Steve Knechtel**, Ed'80, has retired. He and his wife, Dawn, also Ed'80, live in Kingston and can be reached at [snetel@kos.net](mailto:snetel@kos.net).

1990s

**Births**



**Caitlin Jenney**, Artsci'99, and her spouse, Josh Griesbach, who live in Denver, welcomed Hudson James Kingston Griesbach at Kingston General Hospital

Nov. 9, 2016. Hudson surprised his parents by arriving at 28 weeks, following Caitlin's baby shower on Amherst Island. The couple is thrilled that Hudson wasn't born on the ferry (although it was close) and that he was able to be airlifted back to Denver after nearly six weeks in the KGH NICU. Hudson was released from Children's Hospital Colorado's NICU on Jan. 31, a day after his due date. The threesome will make frequent visits back to Caitlin and Hudson's birth country, specifically Kingston, to visit friends and family including the wonderful nurses, doctors, and staff at KGH – Hudson's honorary aunts and uncles.

**Commitments**

**Thierry del Prado**, Artsci'94, married Christian Duc on Sept. 28, 2016, in North Hatley, QC. Among the attendants were best men Jason Desroches and Fabien Nanchen as well as Thierry's brother, Gregory. Thierry works as a human rights lawyer at the United Nations Office of the High Commissioner for Human Rights in Geneva, Switzerland, and Christian is the director of the tax department at Berney and Associates.

**Honours**



**Wayne Batchelor**, Meds'90, received the 2017 Outstanding Physician Award from the Capital Medical Society in Tallahassee, Fla. He was

chosen by his peers for the award in recognition of his leadership within the profession, his clinical excellence, and his contribution to the education of future medical professionals.

Wayne joined Southern Medical Group (SMG) in 2002. His primary expertise is in structural/valvular heart disease, coronary and peripheral arterial disease, carotid artery disease, and clinical research in interventional cardiology. He has a particular interest in radial artery access coronary interventions and has performed more than 4,000 radial procedures. He was instrumental in starting the structural/valvular heart program at Tallahassee Memorial Hospital in 2011 and currently serves as the chair of the Interventional Cardiology Council at Tallahassee Memorial Hospital. He is also currently president of the Tallahassee Research institute and has overseen and/or participated in more than 140 clinical studies in cardiovascular medicine, being principal investigator in more than 40 studies. Active in his community, he mentors health science students from Florida A&M University interested in careers in medicine. In 2013, he served on the Tallahassee Mayor's Summit on Healthcare Disparities and through his lifetime



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membership and support of the Association of Black Cardiologists and membership in the National Medical Association, he has continued to advocate for minority health issues.

### Job news

**Brett House**, Artsci'94, was appointed deputy chief economist at Scotiabank in November. He looks forward to re-connecting with Queen's friends in southern Ontario and across Canada. He can be contacted at [bretthouse@gmail.com](mailto:bretthouse@gmail.com).

**Karen Krull**, Artsci'95, is now vice-president of people and culture at Mayfair. She lives in Calgary with her husband and two daughters.

## 2000s

### Births



**Laura (Herdman)**, BISC'08 and '09, Artsci'11, and **Bram Bontje**, Artsci'07, Sc'10, welcomed Julia

Alice on Oct. 8, 2016, in London, Ont. Bram and Laura met in 2009 at the Queen's Swing Dance Club and were married in 2014. They look forward to visiting both the Kingston and Herstonceux campuses with Julia in the future.



**Elizabeth (Lee)**, Artsci'04, Ed'05, and **David Crausen**, Ed'05, wel-

comed Benjamin Lee on Jan. 5 in Toronto. Ben's sister Alyssa Belle thrilled to have a new baby in the house. Elizabeth comes from a family of 16 Queen's alumni originally from Kingston.

**Shannon Knights**, Artsci'04, Meds'08, and Sunir Shah welcomed daughter Priya Opal on Dec. 22, 2016, in Toronto, a sister for Maya and Kieran.

**Kevin du Manoir**, Artsci'04, Artsci'12, and **Laura Seliske**, MSC'07, PhD'12, welcomed Emma Jean du Manoir to the world on Dec. 15, 2016, in Toronto. Baby Emma has

been wearing her tricolour socks with pride and loves visiting with grandparents Michael du Manoir (Sc'74, MBA'76) and Janet Gow (Meds'75) and FaceTiming with Auntie Margot du Manoir (Artsci'08).

### Honours

In March, **Paul Finkelstein**, Artsci/Ed'01, received the Meritorious Service Medal (Civil Division) from the Governor General of Canada. Paul's MSM citation says, "With his organic gardens and experiential teaching approach, Paul Finkelstein is the backbone of the Screaming Avocado Café. This alternative, student-run cafeteria, located inside Stratford Northwestern Secondary School, teaches students the ins and outs of running a business as they develop healthy eating habits."

### Notes

**Daniel Dutton**, Artsci'06, and **Brendan Knapman**, Sc'06, recently completed watching the *Lord of the Rings* extended edition trilogy. With three children between them (not together), this was no mean feat. It only took them two months to find the time to finish these masterpieces.

**Paul Kehs**, Artsci'09, received his Master of Science in Nursing from University of Maryland Baltimore. Paul is now in an operating room nursing fellowship program at University of Maryland Medical Center/Shock Trauma Center.

## 2010s

### Commitments



**KC Williams**, NSc'12, and **David Zagrodny**, Sc'12, were married

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Feb. 1 in the Dominican Republic. They first met at Queen's at Clark Hall Pub's Ritual. Joining them to celebrate were fellow Queen's grads including the bride's mom, Nan Williams, Sc'74, and the groom's

parents, Lesley Patterson, Artsci'84, and Tom Zagrodney, Sc'84 (who also started dating at Queen's), and many other friends from their time at Queen's. KC and David now live in Calgary.



**Colin Moore**, MSc'11 (Anatomical Sciences), married **Vickie Ming**, MSc'10 (Occupational Therapy), on Aug. 20, 2016, in Toronto. They were

joined by family, friends, and many Queen's alumni in celebration of their big day. Vickie works in Toronto as an occupational therapist specializing in stroke rehabilitation. Colin is currently completing his PhD in kinesiology at Western, specializing in neuromuscular physiology.

### Job news

**Emir Beriker**, Sc'13, attended Dartmouth College for his MSc before working at PwC in New York. Emir recently moved to San Francisco for a new role at Simon-Kucher & Partners, a German strategy consulting firm. Students interested in career opportunities at Simon-Kucher should contact him: [emir.beriker@simon-kucher.com](mailto:emir.beriker@simon-kucher.com).

## ENGAGEMENT NEWS (FROM THE FORMER QUAALLBB)



RACHEL PETERS PHOTOGRAPHY

**Victoria Versteeg**, MPA'13, and **William Brooke**, MA'14, MPA'14, recently became engaged. William writes, "We completely missed each other during our time on campus and did not meet until we both found ourselves working in a government office in the small and isolated hamlet of Lac La Biche in northern Alberta. We were very surprised to find fellow Queen's MPA grads in the same small town and we became friends after a few meetings of the impromptu 'QUAALLBB,' as we called it, or the Queen's University Alumni Association Lac La Biche Branch! I proposed to her in a Queen's rugby sweater, and we had a set of engagement photos taken in our tricolour garb outside of the Lieutenant Governor's residence in Charlottetown, PEI."

Victoria and William now live in Nova Scotia's beautiful Annapolis Valley and work in government. ■

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LARRY HARRIS

## Queen's innovation in California

Queen's Provost Benoit-Antoine Bacon joined Greg Bavington, Sc'85, and Sidneyeve Matrix of the Dunin-Deshpande Queen's Innovation Centre, and alumni in Santa Monica and San Francisco to talk innovation. The centre is launching regional alumni nodes in Los Angeles and San Francisco and is asking alumni to help support student ventures, connect with students, and support online curriculum. If you would like to get involved with one of these nodes, email [innovation.centre@queensu.ca](mailto:innovation.centre@queensu.ca).

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## Upcoming events [queensu.ca/alumni/events](http://queensu.ca/alumni/events) [facebook.com/queensualumni](https://facebook.com/queensualumni)

### Kingston

#### June 1 – Padre Laverty and Jim Bennett awards dinner

Join the Kingston Branch to celebrate the achievements of local alumni David M.C. Walker, Meds'71, Steven Koopman, Artsci'98, and Cristiano Vilela, Artsci'04, at a special reception and dinner. Dr. Walker is receiving the Padre Laverty Award for his outstanding volunteer leadership of Queen's 175th celebrations and of mental health and wellness on campus. Mr. Koopman (former media relations officer, Kingston Police) and Mr. Vilela (creator of Make It Home YGK) are receiving the Jim Bennett Award for their thoughtful service and innovative collaboration through social media that help keep our communities safe.

### Montreal

#### June 14 – John B. Stirling Montreal Medal cocktail dîatoire

Join the Montreal Branch to celebrate Greg David, Com'89, and Neil Rossy, Artsci'92, Montreal business leaders who have delivered transformational change to the student experience at Queen's through their development and support of initiatives aimed at improving mental health awareness on campus.

### Calgary

#### June 15 – Calgary Branch annual dinner

The Calgary Branch invites you to this special annual tradition hosted at the home of Kim Sturgess, Sc'77, DSc'16. Wear Queen's tricolour or your cowboy gear and join us for an evening of fun and celebration.

### Toronto

#### June 22 – Big Data 175

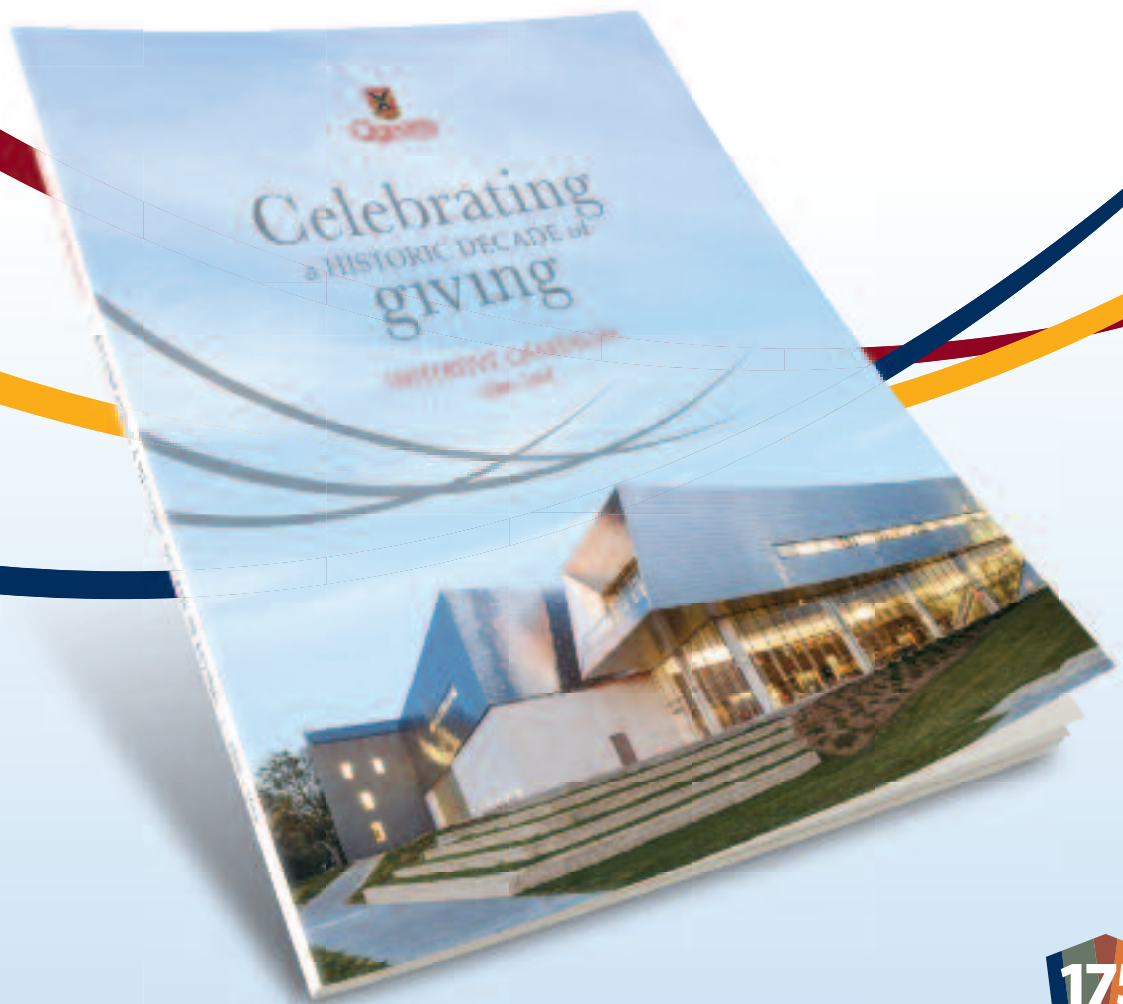
Join the Toronto Branch at a screening of *Citizenfour*, the Academy Award-winning documentary about Edward Snowden, who helped expose the depth of big data and its many uses in society. After the screening, there will be a discussion and Q&A on the "Big Brother" topic led by David Lyon, Director, Queen's Surveillance Studies Centre/ Principal Investigator of the "Big Data Surveillance" team project, 2015–2020.



# A Historic Decade in Review

A year following the celebration of the *Initiative Campaign*, Queen's invites you to read the stories of the dedicated volunteers and donors who have set Queen's people, spaces, and ideas on a new trajectory for the future.

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# Connect, learn, celebrate

Connect. Learn. Celebrate. These are just a few of the key elements of the annual Alumni Volunteer Summit, a weekend of professional development for Queen's alumni volunteers held on April 8. We were delighted to have volunteers from across our communities, including reunion planners, branch volunteers, the QUAA Board of Directors, and members of University Council, to name a few. We "welcomed home" alumni from across Canada and the U.S. and as far away as Hong Kong, London, and Honduras. It was a fantastic day of connecting with alumni peers as we examined the role of change in volunteer organizations.

That evening we held the Alumni Awards Gala to celebrate achievements of alumni and students, as well as this year's recipient of the QUAA's Excellence in Teaching Award. The nominations for the 2018 awards are now open and we would love to hear from you if you know a graduate, student, or teacher who deserves to be recognized by the association. A list of the awards and the terms can be found on our website at [queensu.ca/alumni/awards](http://queensu.ca/alumni/awards). For more information, please email me at [QUAA.President@queensu.ca](mailto:QUAA.President@queensu.ca).

The annual general meeting of the association was also held during that weekend. It gives me great pleasure to introduce you to our 2017–18 board of directors. I am very fortunate to be able to work with these outstanding and dedicated volunteers.

- **Dave Babin**, Artsci'07, MA'09, director, marketing and communications
- **Johanne Blansche**, NSc'88, director at large, reunion coordinators
- **Rico Garcia**, Artsci'14, director, Alumni Volunteer Summit
- **Lisa Hood**, Artsci'04, director, alumni giving

- **Stacy Kelly**, Artsci'93, director, global branch network
- **Colin McLeod**, Artsci'10, director at large, young alumni
- **Jeremy Mosher**, Artsci'08, executive vice-president, recruitment and recognition
- **Zahra Valani**, Artsci'03, Ed'04, executive vice-president, operations

We had two board members retire and I would like to say thank you to **Josephine Tsang**, PhD'06, and **Iain Reeve**, MA'09, PhD'14, for their outstanding service to the board, the association, and Queen's.

I'd also like to thank another member of the QUAA board, **Judith Brown**. Judith has served in Advancement since 1993, and as associate vice-principal (Advancement) and executive director (Alumni Relations and Annual Giving) since 2008; she is retiring at the end of May. Judith has been instrumental to the success of the QUAA and the board of directors, and an incredible mentor and guide for eight QUAA presidents and their boards. The alumni association and the QUAA board have strengthened, matured, and grown throughout Judith's tenure. In recognition of her service to the association, a donation has been made to the Ban Righ Centre's Judith Brown Bursary. Established by Drs. Alfred and Isabel Bader in honour of Judith, this bursary is awarded to female students who have experienced an interruption in their formal education and who are registered in any faculty or school at Queen's.

At the QUAA, we celebrate the spirit of giving and this is evident in many of our volunteer communities. At the board level, we are proud to have achieved 100 per cent participation in annual giving for the seventh year in a row, and our sister organization, the Queen's Student Alumni Association (QSAA), also achieved 100 per cent participation with its ambassador team. This last Homecoming, we had 44 classes organize class gifts in support of the university. Our branch network is also committed to giving with five branches – Calgary, Guelph, Kingston, Ottawa, and Toronto – each supporting a bursary for a student from their local community to attend Queen's. And of course, to all the individual alumni donors, thank you for your continued support of Queen's.

*Cha Gheill!*

- **Sue Bates**, Artsci'91  
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# Nature computes

BY SELIM G. AKL

In our never-ending quest to understand the workings of Nature, we humans began with the biological cell as a good first place to look for clues. Later, we went down to the molecule, and then further down to the atom, in hopes of unravelling the mysteries of Nature.

Today, however, a growing number of scientists are suggesting that the most essential constituent of the universe is the bit, the unit of information and computation. Not the cell, not the molecule, not the atom, but the bit may very well be the ultimate key to reading Nature's mind.

Does Nature compute? Indeed, we can model all the processes of Nature as information processes. For example, cell multiplication and DNA replication are seen as instances of text processing.

A chemical reaction is simply an exchange of electrons, that is, an exchange of information between two molecules. The spin of an atom, whether it spins up or spins down, is a binary process, the answer to a "yes or no" question. Information and computation are present in all

natural occurrences, from the simplest to the most complex. From reproduction in ciliates to quorum sensing in bacterial colonies, from respiration and photosynthesis in plants to the migration of birds and butterflies, and from morphogenesis to foraging for food, all the way to human cognition, Nature appears to be continually processing information.

Computer scientists study information and computation in Nature in order to:

1. better understand natural phenomena. We endeavour to show that the computational paradigm is capable of modelling Nature's work with great precision. Thus, when viewed as computations, the processes of Nature may be better explained and better understood at their most basic state.
2. exhibit examples of natural algorithms whose features are sufficiently attractive, so as to inspire effective algorithms for conventional computers. Nature's algorithms may be more efficient than conventional ones and may lead to better answers in a variety of computational situations.

3. identify problems where natural processes themselves are the only viable approach toward a solution. Such computational problems may occur in environments where conventional computers are inept, in particular when living organisms, including the human body itself, are the subject of the computation.
4. obtain a more general definition of what it means "to compute." For example, is there more to computing than arithmetic and logic? Natural phenomena involve receiving information from, and producing information to, the external physical environment – are these computations?

The motto of the Queen's School of Computing is "Sum ergo computo," which means "I am, therefore I compute." The motto speaks at different levels. At one level, it expresses our identity. The motto says that we are computer scientists. Computing is what we do. Our professional reason for

*The bit may be the ultimate key to reading Nature's mind.*

being is the theory and practice of computing. It also says that virtually every activity in the world in which we live is run by a computer, in our homes, our offices, our factories, our hospitals, our places

of entertainment and education, our means of transportation and communication. Just by virtue of living in this society, we are always computing.

At a deeper level, the motto asserts that "Being is computing." Computing permeates the universe and drives it: every atom, every molecule, every cell, everything, everywhere, at every moment, is performing a computation. To be is to compute.

Today, more than ever, it is great to be a computer scientist. Never before has there been a more exciting period in the history of computing. Not only is our field shaping all aspects of today's society, but information and computation are being recognized as fundamental to life itself! ■

*Selim G. Akl is a professor at the Queen's School of Computing, where he leads the Parallel and Unconventional Computation Group. His research interests are primarily in the area of algorithm design and analysis, in particular for problems in parallel computing and unconventional computation. He completes his term as director of the School of Computing in June of this year.*



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