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contents

“We are somewhere between the hydrocarbon age and the age of electricity. And one is supporting the other.”

▲
LARRY KOSTIUK, '85 MSC



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A Community of the 'Kind People'

ITS STEEL BODY WAS A CRISP SKY BLUE. The bright-red tow arm fit my tiny fingers perfectly as I pushed the toy effortlessly around our family's apartment, bashing into walls, my lips sputtering like an old diesel engine.

I loved my Tonka truck.

And even though the downstairs neighbours complained daily about the noise, I didn't care. I was happy. I was safe.

It was 1972 and my mother, father, younger brother and I had just arrived in Brantford, Ont., having been kicked out of our home country of Uganda by its ruthless dictator, Idi Amin. I remember many visitors — “the kind people,” my parents called them — stopping by with food and to teach us the finer points of Canadian life: how to turn on the stove, how to make phone calls and to remind my mom that bar soap was for the shower, not washing clothes.

One of those people also dropped off an old Tonka truck that gave a young kid hours of fun and the feeling that this was his home.

We had lost everything in Uganda — our home, the family business, all our possessions — but the kind people showered us with abundance. Without the worry of where to get our next meal, my parents could focus on building a new life.

I was only four years old, but I think often about the kindness of that community and the joy and opportunity their simple gifts brought my family. As my two years as Alumni Association president comes to an end, I think about how our alumni community, too, steps forward to help others.

In January 2017, a pilot program started by two university professors called Grocery Run needed help. For the previous year, the program had been helping to feed dozens of refugee families by providing them with food

“rescued” from grocery stores that was blemished or in damaged packaging and would otherwise be thrown out. The program was only a pilot and needed volunteers to keep going. U of A alumni stepped forward in a big way. Working with the Community-University Partnership, alumni lined up partnerships with grocery stores, obtained insurance and worked as drivers to get food to those in need. Last year, volunteers — 72 per cent of whom are alumni — gave 716 hours to Grocery Run and supported 115 families a week.

Our university calls on us to “uplift the whole people.” Projects like Grocery Run demonstrate the power of our alumni community to deliver on this promise.

As a refugee, I know the difference “the kind people” can make. Kindness lifted my family beyond mere survival, paving the way for me to go to university. By studying at the University of Alberta, many doors have been opened for me and it's a privilege to give back as a volunteer.

I'm filled with gratitude and pride, but also confidence that our grads will always be there to help those in need. You can help by checking out volunteer opportunities wherever you live at uab.ca/volunteer.



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We would like to hear your comments about the magazine. Send us your letters by post or email to the addresses on page 4. Letters may be edited for length or clarity.



▲ **Back:** Alex McCalla, '61 BSc(Ag), '63 MA, '14 LLD (Honorary); Daniel Hays, '62 BA **Front:** Barbara (Thomson) Moore, '61 Dip(RM); Faye (MacKenzie) Naples, '61 Dip(RM); Carol (Weber) Morse, '61 Dip(RM); Joann (Ellis) Day, '61 Dip(RM); F. Ann Hayes, '61 Dip(RM), '68 MD; Joanne (Prockter) Watson, '61 Dip(RM)

Cancan You Remember?

Our Winter 2018 issue featured a historical tidbit about how kick lines were a popular part of student political campaigns on campus in the 1950s and 1960s ("Did You Know?" page 44). We were happy to hear your stories!

Some of the physio class of 1961 were the kick line for Alex McCalla's 1961 campaign. Alex was elected the president of the student body that year, with retired Canadian senator Dan Hays as his campaign manager. It was such fun being a part of the campaign, so the girls in the picture and I thought it would be fun to share it with you.

—Barbara (Thomson) Moore, '61 Dip(RM), Delta, B.C.

The kick lines in those days were such a spectacle that their songs and routines were often better than the candidates' speeches! My campaign to be Coordinator of Student Activities in 1966 was so underfunded that all we had was a piper and a Coke crate (which I still have). But we still managed to beat the candidate who had an impressive kick line, made up of a group of well-trained cheerleaders in navy costumes. I still remember how my campaign manager at the time, **Don Sorochan**, '66 BA, introduced me at the opening rally at old Convocation Hall: "Our opponent may have the navy but we are going to "Sinc" the ship!"

—Glenn "Sinc" Sinclair, '66 BA, '68 BEd, '70 MEd, '78 PhD, Penticton, B.C.

Yes, In My Backyard!

The two articles on urban wildlife, "Are Coyotes Getting Bolder" (page 15) and "How to Protect Yourself From Urban Prowlers" (page 30), in our Winter 2018 issue prompted several responses. We share one here.

I read the two articles on urban wildlife with much dismay and frustration. All wildlife today is faced with two choices: adaptation or extinction. We generally think adaptation is a good thing but apparently not in the case of coyotes or other urban wildlife. Instead we choose the word "exploitation," as the article did, with its negative connotations, to describe animals' survival skills. I deplore the prevalent "not in my backyard" attitude to urban wildlife. Of course, the irony is that we are, in fact, in their backyard. Yes, I am unabashedly on the side of the few species brave and smart enough to see that the one and only path to survival lies on the paved streets of our urban centres.

—Jane Calvert, '82 BSc(Spec), Edmonton

@teasin: Flipping through the @UALbertaAlumni mag and found they don't like the @goop pseudoscience either. Excellent. @DrJenGunter

—Genifer Thiessen, '11 BScN(Hons), Victoria, B.C., in response to "How Not to Fall for Pseudoscience" (Winter 2018, page 34)



CORRECTION

In the Winter 2018 issue (page 41), we incorrectly categorized the memoir *Six Weeks on the Throne: The Tale of a Stowaway* by **Rick Frey**, '78 PhD, as fiction. We apologize for the error.

Purposeful Retirement

For years I told students, "Embrace a purpose in life." A sense of purpose is critical in retirement, too. I have written and researched extensively since retiring in Saskatchewan. I self-published three Second World War veterans' biographies and had a weekly column about veterans of that war. I now spend my time researching multiple sclerosis. If you attended the University of Alberta and are retired, you have unique skills, knowledge and abilities. Don't waste them! Research something important to you and others.

Richard Dowson, '72 BEd, '82 Dip(Ed), '91 MEd, Moose Jaw, Sask.

MORE ONLINE

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“Great things come from individual acts of service. By sharing the knowledge and expertise each of us has gained, together our alumni community can change the world.”

— **Heather Raymond**,
'82 BEd, '86 Dip[Ed], '95 MEd, '02 PhD



The University of Alberta is proud to welcome Heather as incoming Alumni Association president. Congratulations!

To learn more, visit
uab.ca/AlmPres



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The University of Alberta respectfully acknowledges that we are situated on Treaty 6 territory, traditional lands of First Nations and Métis people.

notes

WHAT'S NEW AND NOTEWORTHY



Bee the Cure

Students genetically engineer a solution for a deadly honeybee parasite

A CROSS-CAMPUS TEAM of undergrads has created a buzz in Alberta's honeybee industry with a genetically engineered probiotic that targets a common but deadly fungal infection. APIS, short for antifungal porphyrin-based intervention system, can help honeybees ward off *Nosema ceranae*, a parasite infecting bees around the world. The fungus poses a big challenge in Alberta, where its damaging effect can be worsened by the cold. The product won in its category at 2018's International Genetically Engineered Machine (iGEM) Competition — and couldn't have come at a better time, as the previous treatment is no longer available. The students would like to bring APIS to market as soon as possible, with the help of Alberta beekeepers who are eager to start field trials. —ANDREW LYLE, '11 BSC(ELECENG)

HEALTH

A Saliva Test Could Identify Alzheimer's Disease Earlier

Promising early findings could point to earlier intervention, most effective treatments

COULD A SIMPLE SALIVA TEST provide an early warning of Alzheimer's?

It's a new possibility after researchers analyzed saliva samples from three sets of patients and discovered three biomarkers that detect mild cognitive impairment and Alzheimer's.

The number of Canadians living with dementia is rising dramatically; it costs \$10.4 billion per year to care for them, according to the Alzheimer Society of

Canada. But we currently don't know how to prevent or treat the disease. Early diagnosis can help.

To this end, chemistry professor Liang Li and psychology professor Roger Dixon examined saliva samples from patients with Alzheimer's disease, people with mild cognitive impairment and individuals with normal cognition. The pair examined more than 6,000 metabolites—compounds

that are part of our body's metabolic processes—to identify any differences between groups.

"We found three metabolites that can be used to differentiate between these three groups," says Li.

The results show promise but, because the sample size was so small, more investigation is needed. "If we can use a larger set of samples, we can validate our findings and develop a saliva test of Alzheimer's disease," Li adds.

A saliva test would prove useful in clinical settings for its ease and non-invasive nature. It also has the potential to detect neurodegenerative diseases sooner, allowing for early intervention.

"So far, no disease-altering interventions for Alzheimer's disease have been successful," says Dixon. "Researchers are aiming to discover the earliest signals of the disease so that prevention protocols can be implemented."

The biomarkers could be used in testing to determine what types of treatments are most effective, such as diet, drugs and physical activity.—KATIE

WILLIS, '13 BA, '18 MA

NUMBERS

2.1 billion

The number of years ago that complex life with mobility may have appeared on Earth—1.5 billion years earlier than scientists once believed. Researchers who took a closer look at ancient fossils found that the tiny, slug-like beings, once thought to be immobile, were squirming about in the mud.

GASSY COWS

BREEDING BOVINES TO REDUCE EMISSIONS

Can we breed cows to burp less? The agriculture industry aims to cut down on methane emissions, and bovine burps could play an even bigger part than their much-maligned farts.

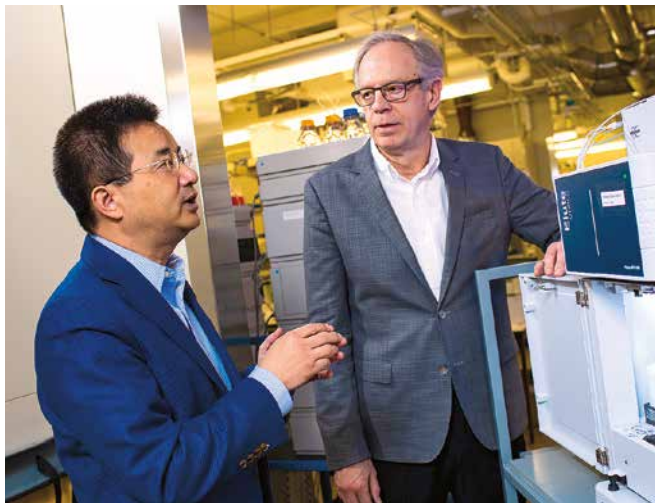
Researchers from the U of A and elsewhere are studying cow genetics to figure out how to breed cows to make more practical and efficient use of their feed and produce less methane,

in an international project managed by Mary De Pauw from the Faculty of Agricultural, Life & Environmental Sciences. The Efficient Dairy Genome Project measures, among other traits, how much cows eat, how much milk they produce and how much gas they emit.

The purpose is twofold: cows producing less methane will have a reduced impact on the environment, while cows needing less feed will save farmers money. Improvements could reduce feed costs by \$108 per cow per year and decrease methane emissions by up to 26 per cent.

"I think we have a very good chance of taking the tools that we produce in this project and getting it out into the industry," says De Pauw.—CBC

For more on these and other great U of A research stories, visit folio.ca.



“The new self-driving car technology ... promises many benefits for society, including people with disabilities, but the cars are being designed for drivers with normal competency levels.”

▼ **Megan Strickfaden, '89 BA(Spec), '02 MDes, U of A design anthropologist and co-author of a study that suggests the designers of driverless cars aren't considering features that could address the needs of people with disabilities.**



LESSEN THE STRESS OF LEAVING A groundbreaking study is shedding light on the stresses experienced by Indigenous communities ordered to flee to safety during a wildfire. The study, led by Tara McGee, a science professor with expertise in the human dimensions of wildfire, looked at the 2011 evacuation of the Mishkeegogamang Ojibway Nation in northwestern Ontario. Many left when ordered to do so, but some were reluctant to depart even as the smoke and fire threatened their homes. Evacuations often send residents to larger centres where there may be language barriers or few cultural supports. Options such as helping them seek safety in nearby Indigenous communities are recommended instead to make the process less disruptive. Pictured above, evacuees returning home after the 2011 fire. —KATIE WILLIS, '13 BA, '18 MA

EXPERT ADVICE

SOME TIPS FOR SAFER RX

Do you wonder if the expired drugs in your medicine cabinet are safe? Or how to get rid of them? Pharmacists are a wealth of information; all you have to do is ask. For example, a 2003 study in the U.S. concluded that about 90 per cent of meds are fine long after the expiration date—but some may become toxic over time while others lose effectiveness, says **Jill Hall**, '01 BSc(Pharm), '01 BSc(Spec). The latter could be a serious gamble when it comes to emergency meds like EpiPens or nitroglycerine. Here are some other pieces of pharmacy wisdom. —MICHAEL BROWN

IS GRAPEFRUIT REALLY A RISK?

Grapefruit disrupts an enzyme in the body that affects how some drugs are processed, which affects drug levels in the bloodstream. Some experts say to avoid grapefruit when taking certain drugs, but Hall offers a more moderate view. If you're not at risk for side-effects, the occasional grapefruit isn't going to be harmful.

I HAVE A COLD. WHAT SHOULD I TAKE?

The cold-and-flu aisle can be confusing, but Hall says differences between medications offering the same types of relief are negligible. The important thing is to treat the symptoms you have. "If you don't have headaches or muscle pain, don't get something with acetaminophen or ibuprofen in it."

SHOULD I JUST THROW IT OUT?

When you have expired medications you aren't going to use anymore—whether an inhaler, tablets or cream—bring them back to the pharmacy to be incinerated. "It prevents them from getting into our landfills and water supply, and exposing people to chemicals they don't need to be exposed to," says Hall.

Footnotes

A brief look at what's new at the U

U of A President to Step Down Next Year

The search for the university's next president will soon begin. In March, David Turpin announced he would not seek renewal when his five-year term ends on June 30, 2020. Under Turpin's leadership, the U of A launched its strategic plan and had two of its best fundraising years. He says a priority over the next 15 months is continuing to build a provincial coalition of post-secondary presidents and institutions to advocate for growth across the sector.

Phair Reappointed as Board Chair

Michael Phair will lead the U of A's Board of Governors for a second term after being reappointed as chair. The board guides the institution's future and ensures the university uses public funds appropriately.

AI Funding Supports U of A, Industry

Alberta Machine Intelligence Institute will receive \$27 million from the provincial government over five years, helping boost support for companies building in-house AI capacity, and allowing it to expand operations into Calgary. Meanwhile, \$2.5 million in federal funding helped create AI-Hub, an open-source facility to help smaller businesses access AI and computing expertise.

MEAT CUTE

It's a Hare Eat Hare World

A new study reveals hares' surprising eating habits, especially in the winter

DESPERATE TIMES CALL FOR desperate measures—even for snowshoe hares, which have been documented eating the carcasses of friend and foe when faced with months of sub-zero temperatures.

The normal winter diet of a hare is woody plants, but a study over more than two years showed that they turn into carnivores—even cannibals—that feast on carcasses in what appears to

be an effort to supplement their diet with more protein.

"We have documented them scavenging other hare carcasses, grouse and even lynx, their main predator," says Michael Peers, PhD candidate in the Department of Biological Sciences.

The photos suggest that hares aren't all that picky, showing them eating a variety of species among the 161 carcasses in the study. Weirdly, it also discovered

that they'd even eat feathers, a behaviour rarely seen in mammals.

Scavenging in hares has been previously reported, but this is the first study to detail the frequency and diversity, says Peers.

The study found scavenging was more common during the winter, giving rise to the theory about food or nutrient limitations. It also has researchers wondering if there's not such a hard line between the herbivores and carnivores.

"Researchers are beginning to suspect that the occurrence or frequency of scavenging is higher than previously suspected, by species not often considered scavengers," says Peers. —ANDREW LYLE, '11 BSC(ELECENG)

QUOTED

"Parents may observe more energy in their kids after eating sugar, but it's one of those self-fulfilling notions."

Elizabeth Rosolowsky, a U of A pediatric endocrinologist who says the sugar high kids seem to get from overindulging in candy is likely caused by related excitement, such as trick-or-treating, rather than the candy itself.

IMMIGRATION

AN EQUAL START FOR ALL NEWCOMERS

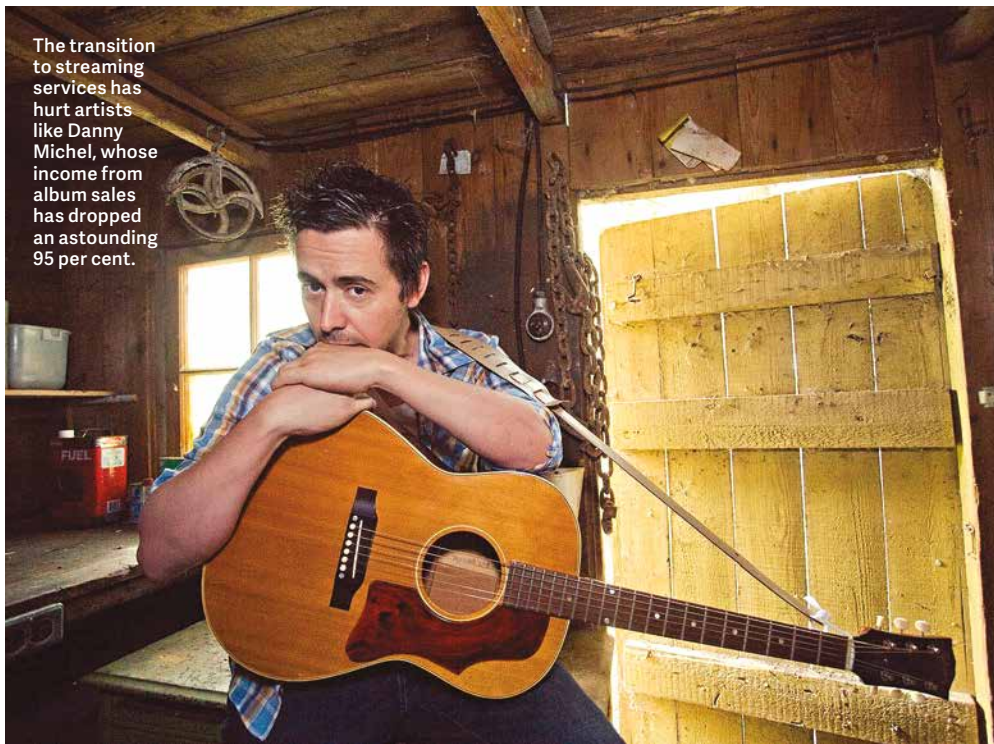
Some Syrian refugees in Canada experienced a tougher time than others due to varying levels of sponsor commitment.

Refugees sponsored by well-resourced agencies—church groups, for example—received extensive support settling into their new home, says Sandeep Agrawal, a professor whose research focuses on ethnic communities and the effects of immigration.

However, some refugees received only the minimum legally required support, while others were abandoned by their sponsors altogether. "[Those sponsors] did not have the means or the time to adequately support their matched refugees," says Agrawal, who interviewed 84 Syrian newcomers to Edmonton, along with private sponsors, volunteers and agency representatives.

Refugees who came through the blended program, in which a private sponsor and the federal government share the cost and responsibility of settling the family, had the best experiences. "We should also consider the blended program as possibly a better way forward," says Agrawal. "This composite approach could offset the deficits inherent in each single approach." —KATIE WILLIS, '13 BA, '18 MA





The transition to streaming services has hurt artists like Danny Michel, whose income from album sales has dropped an astounding 95 per cent.

ARTS

Copyright Killed the Radio Star

Existing Canadian copyright laws benefit music companies but hurt independent artists

DESPITE WHAT MANY OF us think, copyright in the music industry limits innovation and does a poor job of ensuring musicians earn a living, says a U of A researcher. In fact, many musicians end up not holding rights to their own work and the law works against them.

Hoping to win a better deal for Canadian artists, Brian Fauteux, an assistant professor of popular music, leaped into the copyright fray. In late 2018, he was part of a multi-university team that presented to the federal committee reviewing the Copyright Act.

The team's report cited an imbalance of power between creators and big business, and proposed substantial changes to how creators earn money from their

work — changes that would help musicians like Danny Michel, a Juno- and Polaris Prize-nominated singer-songwriter from Ontario.

Michel has recorded 25 albums in the last 13 years,

**SPOTIFY
OFTEN PAYS
AN ARTIST
\$0.0038
PER PLAY.**

managing, for the most part, to earn a comfortable living without ever producing a hit song. But by 2018, his income from album sales had dropped an astounding 95 per cent due, in part, to an industry transition to streaming services, says Fauteux.

Spotify, for example, often pays an artist \$0.0038 per play.

"Michel is now wondering how long he can remain a musician," says Fauteux. "He is not alone."

With sound recordings accounting for about six per cent of an artist's income, Michel and many others are trying to make up the shortfall with live performances. That, in turn, creates problems of artists vying for limited venue space and reducing the time they need to create new work.

"A lot of what the industry has been talking about, in terms of the changes they want to see, are more about protecting the industry, and aren't as much about

the artist and creator themselves," says Fauteux.

Here are some calls-to-action from the report:

1. MORE PUBLIC FUNDING FOR ARTISTS

In North America, three companies — Universal, Sony and Warner — control 86 per cent of the recording and publishing market, says Fauteux. The result is that the top one per cent of artists take home 77 per cent of all music income. The report recommends increasing public funding dedicated to smaller creators who are more likely to be squeezed out by market consolidation.

2. RETURN COPYRIGHT TO ARTISTS SOONER

The report also suggests returning music rights to artists well before the current term of 50 years after their death. This would allow artists to either reissue their work or reinvent it in creative new ways while still alive. They recommend a copyright term of 25 years after a company first acquires the rights.

3. LESS ENFORCEMENT, NOT MORE

People are less likely to produce new, creative works out of fear of copyright infringement, according to Fauteux and his team. The report calls for the need for more liberal "fair play" rules, so both creators and listeners have less-fettered access to audio recordings. Having more works in the public domain helps encourage cultural sharing, appreciation and innovation of music.

The standing committee's final report, which will be used to revise the Copyright Act, is expected later this year. —GEOFF MCMASTER

Learning doesn't end when you accept your degree. We are all lifelong learners, whether we pursue lessons in a class or a lecture hall—or these lessons pursue us. **Curtis Gillespie**, '85 BA(Spec), reflects on the continuing opportunities for education that life throws our way, sometimes when we least expect them.



by Curtis Gillespie



It's Your Call

BECOMING A SQUASH REF WAS LIKE LOOKING AT MY OWN STRENGTHS AND FAULTS IN HIGH-DEF, ON A BIG SCREEN

One thing that unites people in sports is their universal antipathy to referees. In baseball, managers get into nose-to-nose shouting matches with the umpire, which usually end with the manager getting tossed. In soccer, some refs need security escorts to make it out of the stadium. In tennis, Serena Williams directed her abundant anger at Carlos Ramos in the U.S. Open last year. It's not just the pros, either; after a recent minor hockey game in Lloydminster, fans physically assaulted two refs. For decades, as an athlete, I had wondered who these people were, these refs and umpires and judges, these masochists who willingly placed themselves in the crosshairs of everyone's rage. Why would anyone subject themselves to that?

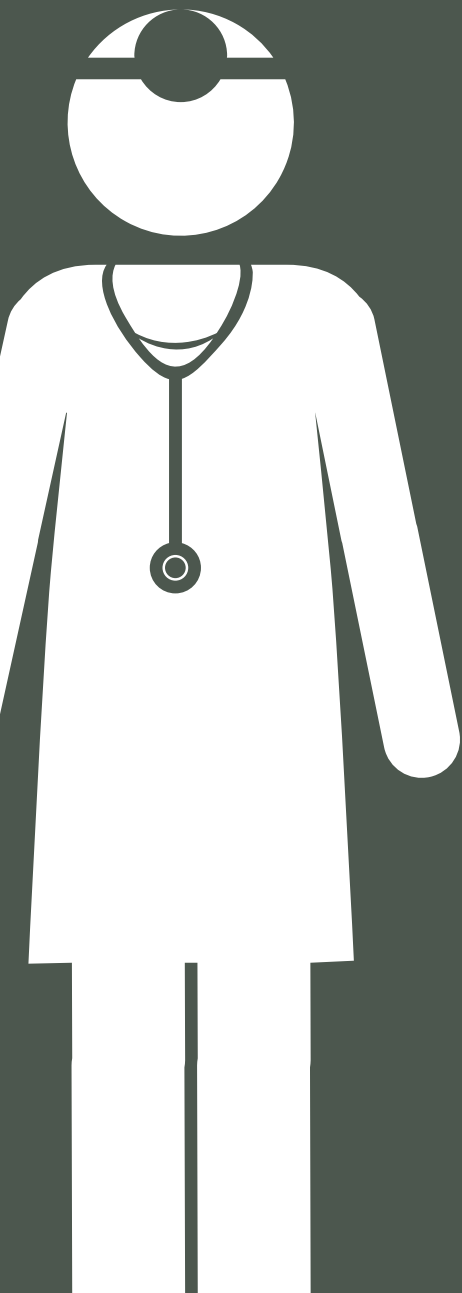
Turns out I'm the wrong guy to ask. When the Egyptian squash player Yathreb Adel, ranked 17th in the world, was upset with me in Chicago in late February during the Professional Squash Association World Championships with fans, coaches and other players watching—and the world's top ref, John Massarella, assessing

me—I began to wonder what had possessed me to become a squash referee in the first place. Adel was up against the sixth-ranked player in the world, England's Sarah Jane Perry, and neither of them was moving that smoothly. I made a couple of tough calls and, after one, Adel looked at me and said, witheringly, so that everyone could hear, "What are you doing?"

I explained my call with stoic detachment and told her to play on, but if I'd had the cheek to say what I was really thinking, I'd have said, "Fair question, let me get back to you on that." Over the last few years, my hobby has subjected me to the kind of pressure and scrutiny normally reserved for criminals on trial. Many of my friends and peers use their free time to hang out on golf courses and beside pools,



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sipping icy cold ones, while for some reason I've chosen to explore fresh avenues of potential embarrassment and mortification.

My interest in reffing squash began with playing the game. People play squash the world over and Egyptians are currently the dominant world power. The sport combines athleticism, psychology and emotional control like no other sport I've ever played or witnessed. *Forbes* magazine once called it the world's best sport and if you play it, if you ever get the chance to watch the world's best players close up, it's hard to disagree.

But playing squash bears about the same relation to reffing it as making french fries does to farming potatoes—they're related but being good at one doesn't make you good at the other. Which was how I got started in reffing. I was playing at a reasonably high level, but no one, me included, seemed to understand the rules. Refing in our league was fraught with anxiety. I figured I might as well learn the rules, since no one else knew them. That's how I got hooked. There are elements to reffing squash that make it addictive, impossible to fully understand and open to wide interpretation. Kind of like watching *Game of Thrones* or parenting teenagers.

And once you get to the pro level, well, reffing is a challenge on a whole new scale.

There are so many moving parts, especially when you're on the glass show court, which has seating for about 1,000 people and is televised. You've got an earbud in one ear attached to a mic to address the crowd and players, and a different wire in the other ear that links you to the video referee in case one of the players decides they don't like your call and wants to challenge it. This happens with unnerving frequency. You have to communicate with the crowd, the players and the video ref simultaneously. On your lap is an iPad, with approximately 80 different commands and functions to track the game. On top of that, you have to actually oversee the play, which is tough at any level, let alone

the professional level. Played right, squash's speed and athleticism make understanding its movement patterns so difficult that you have to perceive and process them nearly simultaneously. There's no time to filter them through a conscious decision-making process.

Oh, and for added fun, the ref sits in the middle of the crowd, so that when the aforementioned insulted player challenges your original call, you are part of the viewing audience that watches the replay on numerous screens. At the recent Worlds in Chicago, the entire front wall of the court morphed into a giant, high-def screen during a video challenge, all the better to highlight the call you just blew. It is a setting in which the opportunities for open derision come around with gut-churning regularity.

So why do it?

They say life is a journey. I suppose that might be true for some people. But I've never thought that was quite accurate, in that a journey typically begins with a destination in mind and a sense of what route to take. But that's not the way my life has gone. If my life has been a journey, there has been no one at the wheel and the dog ate the map. My life has often felt more like a big pot of spaghetti. I throw a handful of noodles at the wall and whatever sticks is what I keep doing. Not the kind of life advice you'd pass on to your children, but luckily mine are mostly grown and even found a few strands of spaghetti still stuck to the wall that I claimed was fatherly guidance.

But one thing I believe is that, through some sort of alchemical magic that none of us truly controls, we find ourselves in pursuits or professions that are less about conscious choice and more about tacking toward those things that tap into our character, our essence, our best and sometimes our less-than-best selves. Maybe it's neither surprising nor positive. Some people may find their truest selves affirmed by becoming, say, white-collar criminals.

Many of us end up in unpleasant situations while on boards, or working

as volunteers, or helping out a problematic friend or family member. In the back of our minds, usually during a rough patch, we ask what we did to find ourselves there. That's looking at it the wrong way around. We didn't find the situation, the situation found us. Usually because the situation needed something and we could bring it.

When it comes to stumbling into being a squash ref, it turns out the demands of the role actually suit my personality, amplify my better qualities and highlight (hopefully for remediation) my weaker attributes. More importantly, the pressure is forging a clearer sense of who I am. There are some good parts and some that need work, but they are all me. And, if I am learning one thing working these tournaments, it's that the best refs in the business are the ones who know themselves.

In the last year or so, as people have vented at me in at least 15 languages, I have come to understand that dealing with pressure is less about granular correction and more about placing my imperfections within a broader context of striving for fairness and equity. The best players can tell when you're making mistakes of ego as opposed to errors of good faith. Those are two very different vibes. Once they know that you are of the second camp, they are more accepting of the occasional error (emphasis on occasional).

Not that I'm advocating we all take up hobbies that give us ulcers and sleepless nights. I have nothing against more benign pursuits and I have been known to indulge easier pastimes. But there's value in scaring the jeppers out of yourself every now and then. Clarifying your strengths and weaknesses is never a bad thing.

Though I'd think twice about doing it in front of an audience. ■

Curtis Gillespie has written five books and earned seven National Magazine Awards. His New Trail article "A Hard Walk" won gold for best article of 2018 from CASE, an international post-secondary association.

thesis

DIVING DEEP INTO ONE IDEA

ABOUT
SPACE



Space and the City

Our buildings, our neighbourhoods and the grasslands at the edges of town have built-in value for city dwellers. Do our policies recognize that inherent worth?

THE SKYLINES OF NORTH AMERICA'S CITIES are studded with lumbering, box-like silhouettes, marked by precast concrete and the ungainly proportions of mid-20th-century building stock. Make no mistake, there are lovely structures dating from this time, but lovely and unlovely, they're getting old. Architect **Vivian Manasc**, '82 MBA, spends a lot of time thinking about our aging buildings and the best ways to renovate and beautify those old gronks sustainably. "The greenest build is the one

that already exists' is an oft-repeated quote," Manasc says. "And it makes sense because there's so much embodied energy in our buildings."

Embodied energy is the total energy required for the extraction, processing, manufacture and delivery of building materials, and architects and engineers can assign a dollar value to it. Manasc says it's more efficient to renovate a building than to knock it down and start over. "Why would we redirect those resources to a landfill?" she asks. She'd love to see policies that encourage us to reimagine those structures instead. Manasc says that to use our existing city space better, we should think about densification and renovation.

Our cities change, gentrifying here, falling into neglect there. But neighbourhoods don't go from junky to funky organically. Journalist Peter Moskowitz says that change isn't the product of consumer choice, rather of policy "crafted in the offices of real estate moguls and in the halls of city governments." In his 2017 book, *How to Kill a City*, he says seeing gentrification as mercurial blinds us to its consequences, including displacement of lower-income families and "decreased affordability of life for everyone."

Meanwhile, new neighbourhoods with tony names pop up at the edges of town, pressuring a finite tax base to provide new infrastructure. The policies that push city boundaries ever outward also devalue our older neighbourhoods. Grocery stores and other amenities move farther out and older neighbourhoods in the vast middle go underserved. New, far-flung schools open, while older ones close.

The new neighbourhoods are built on former farmland and grasslands, the loss of which worries Brent Swallow, a professor in the Faculty of Agricultural, Life & Environmental Sciences. "The best agricultural land is that which is disappearing at the highest rate," he says.

This space at the edge of town is valuable not solely for its potential food output, Swallow says, but also because native grasslands and wetlands in this landscape are part of what he calls our green infrastructure. "When we convert this land, it loses its ability to produce ecosystem goods and services," he says. By this he means what we consume directly (food, water and wood) and what we benefit from (water filtration, temperature regulation and wildlife habitat). Grasslands improve the quality of air and water in a city and punch above their weight as habitat for an array of creatures and plants. It's a kind of embodied energy. Why redirect it?

And grasslands sequester 30 per cent of the world's carbon. The U of A's Rangeland Research Institute values the carbon stored in Alberta's grasslands at \$9 billion, **Yangzhe Cao**, '18 MAg, writes in her master's thesis. On an individual scale, Cao demonstrates that homeowners will pay more for property near greenspaces.

Before we knock down a building, advocates want to see if we can reimagine that space. And before we plow a greenfield, they challenge us to find an alternative. When we craft our policies, it's useful to consider the concept of embodied energy and apply it not just to buildings but to other spaces inside and around the city.

—MIFI PURVIS, '93 BA

For such a small package (30 x 10 x 10 cm and just 2.64 kg) student-built satellite Ex-Alpha 1 (shown here with a few bragging points) was such a success the group is at it again, building Ex-Alpha 2.

PAYLOAD PERFECTION

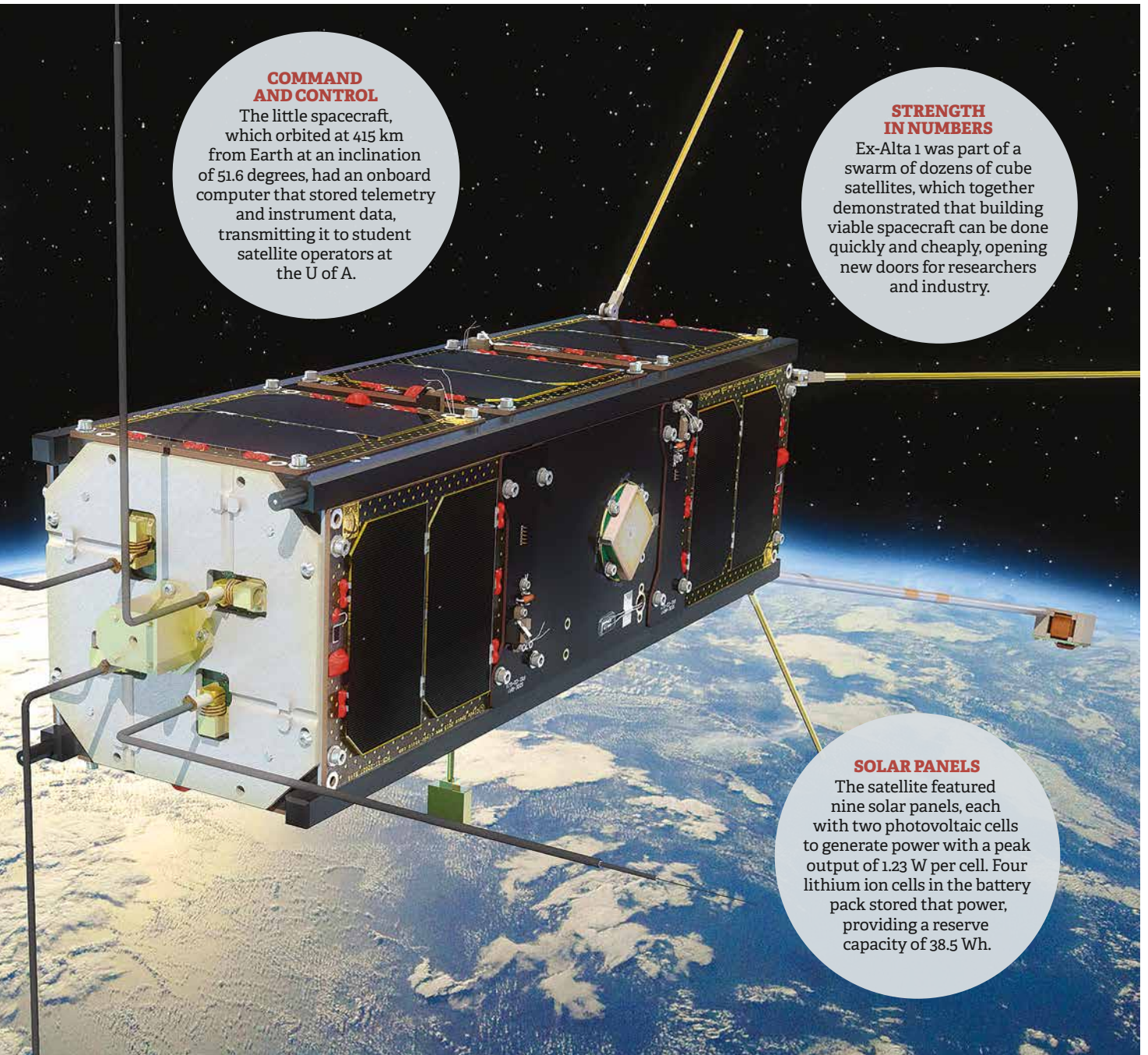
No bigger than a loaf of bread, the satellite called Ex-Alpha 1 packed such specialized equipment as a fluxgate magnetometer, a multi-needle Langmuir probe and a radiation dosimeter to monitor space weather.

YOUR NAME IN SPACE

U of A's nanoFAB etched a tiny silicon chip with the names of all the donors whose contributions helped launch the satellite. The CubeSat (and the names) travelled around the world about 8,000 times before a scheduled plunge into the atmosphere.

The Life and Death of a Very Good Satellite

There's no such thing as a free orbit



COMMAND AND CONTROL

The little spacecraft, which orbited at 415 km from Earth at an inclination of 51.6 degrees, had an onboard computer that stored telemetry and instrument data, transmitting it to student satellite operators at the U of A.

STRENGTH IN NUMBERS

Ex-Altia 1 was part of a swarm of dozens of cube satellites, which together demonstrated that building viable spacecraft can be done quickly and cheaply, opening new doors for researchers and industry.

SOLAR PANELS

The satellite featured nine solar panels, each with two photovoltaic cells to generate power with a peak output of 1.23 W per cell. Four lithium ion cells in the battery pack stored that power, providing a reserve capacity of 38.5 Wh.

ESCAPING THE SURLY BONDS OF EARTH takes so much money and energy that some denizens of the International Space Station drink recycled urine to limit the water that needs to be hauled up. The cost of sending astronaut Kjell Lindgren's bagpipes to the ISS, for example, has been estimated at \$259,000. (Science can't explain why we'd do this.)

So why would AlbertaSat, the university's donor-funded, student-led aerospace club, traffic in disposable satellites? In 2017, the club's Ex-Altia 1 satellite became the first Alberta satellite to reach orbit.

Eighteen months later, and by design, it burned to a crisp as it re-entered Earth's atmosphere.

Certain kinds of space science are best done from low orbit, around 400 km above sea level. Objects orbiting at that height, like the International Space Station, periodically need a boost or they'll slow down and burn up entering the atmosphere. But no such boosts come for CubeSats, the loaf-sized satellites like this one designed and built by AlbertaSat.

For its brief life, Ex-Altia 1 collected information about the Earth's magnetosphere, helping researchers

understand space weather and potentially crippling geomagnetic storms. Ex-Altia 2, due for launch in 2021, will use multispectral photos to track wildfires. (It will also pioneer open-source CubeSat design practices.) Then it, too, will burn up in the atmosphere.

AlbertaSat team members don't feel too sad. "If you spend years doing something and it accomplishes a goal, it's a success," says engineering student Erik Halliwell, who leads the design of the power systems of Ex-Altia 2. "It doesn't matter how long it takes to accomplish those goals and then burn up." —LEWIS KELLY



Tiny Gets Real

‘We have everything we need and nothing more, and somehow that makes everything simpler’

When **Melissa Zerbin**, '13 BA, **Kenton Zerbin**, '09, BEd, '11 Dip(Ed), and their cat moved into a 34.18-square-metre home on a farmer's field near Edmonton two years ago, she said she was going to hate it for three months. “And then I'd make my assessment on

whether I was going to keep hating it,” she told Kenton.

But she loves their house. The couple designed every square centimetre — all 341,800 of them — from the solar panels on the roof to an extra-wide interior so they don't have to “shimmy past each other.” They sleep in the loft above the kitchen and overnight guests stay in the smaller loft above the bathroom. There's a couch and a fold-out table for games nights with (no more than five) friends. “We use up a lot of storage with our board game collection,” Melissa admits.

There can be tension over who gets to sleep on which side of the bed, but there's nowhere to storm off to. “My wife and I work hard on our interpersonal skills and we don't get into many arguments,” Kenton says. They just figure things out, like Melissa's growing wardrobe. Doing her master's in occupational



therapy, she needed spiffier clothes for practicums. So Kenton rolls up his clothes and stores them in a hollow in the bathroom wall, near the drying rack, washing machine, shower (they truck in water) and composting toilet (not as bad as you may think.)

Kenton gives workshops about tiny houses and the Zerbins are thrilled with their small environmental and financial footprints.

(They pay for their water and rent their spot by undertaking some significant yearly farm chores.) More municipalities are making room in their bylaws for tiny houses as more people invest the \$40,000 to \$120,000 it takes to build one. "It feels like a shoe that fits," Melissa says of their home. Speaking of shoes, those not in season live in the shed.

—JENNIFER ALLFORD, '84 BA



INNER SPACE

An interdisciplinary centre allows you to virtually venture where you couldn't before

IT'S HARD TO IMAGINE A three-dimensional space based on a flat illustration, especially when the space is microscopic—think the inside of a cell. Cognitive Projections aims to change all that. It's an interdisciplinary lab that uses virtual and augmented reality in teaching and learning. Now you can put on a headset and take a virtual tour inside a cell, even manipulating the Golgi bodies and mitochondria if you like.

"This technology is driven by gamers," says **Nathanial Maeda**, '12 BSc(MechEng), '18 PhD, director of operations. The centre has programming expertise, an artist on staff and access to digital 3D libraries.

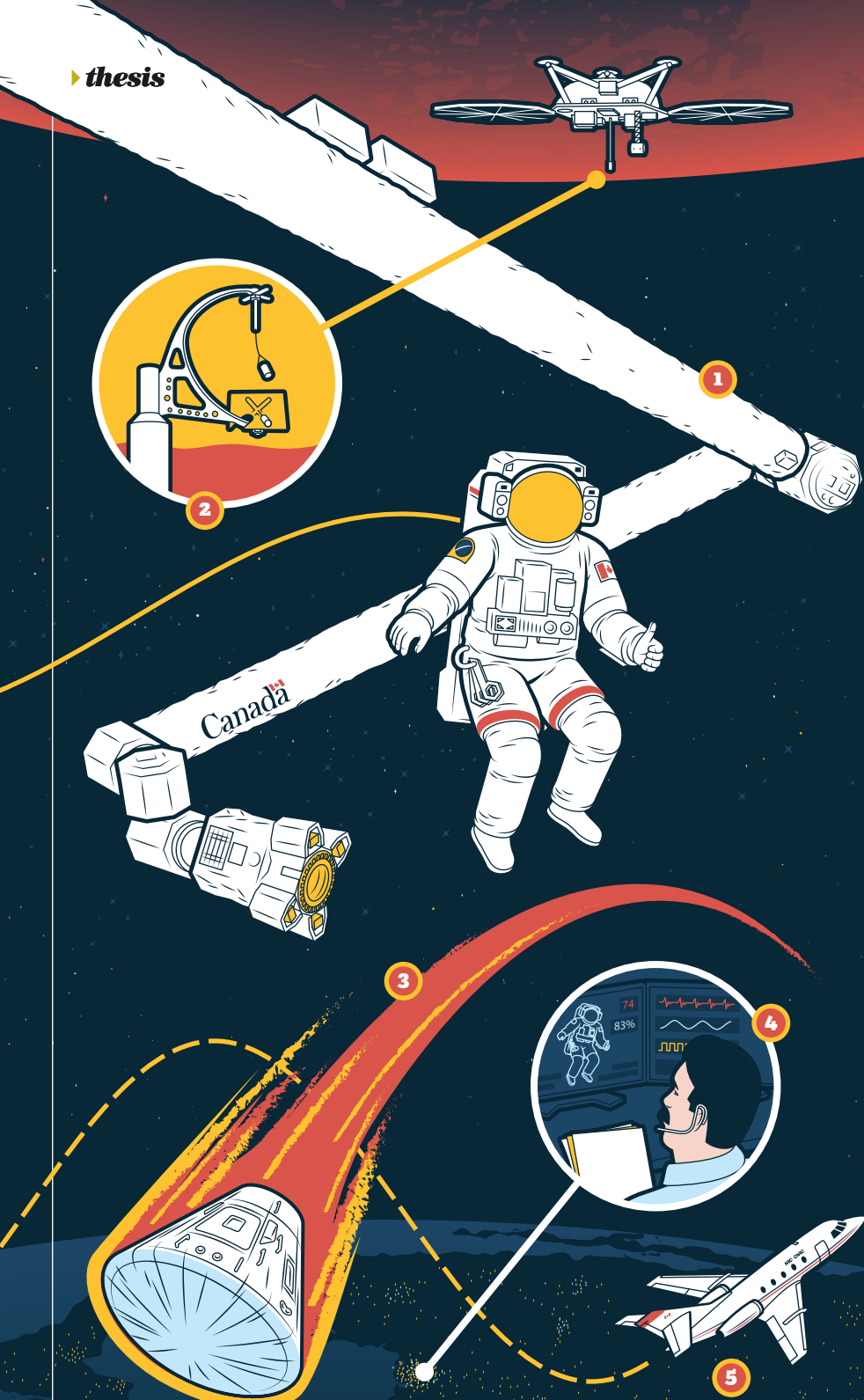
Zoom out: students can perform their first head-and-neck dissections virtually, getting an in-depth understanding of the bones, the various tissues and their functions before they ever get close to a cadaveric dissection.

Zoom out further: students can practise clinical skills on virtual patients, so by the time they meet a real one, they have exercised that muscle well. "Currently, examiners end up testing students' ability to stay cool," Maeda says. "VR practice can remove anxiety from the equation so it's students' clinical knowledge that is getting tested."

Now make that space bigger: an immersive VR experience inside a room-sized cube allows patients working with experts at the Institute for Stuttering Treatment and Research to practise speaking in front of virtual crowds. Maeda plans for the centre to work with veterans with PTSD to provide immersive therapy to help them master their trigger experiences.

"We have content experts from across campus and we're hoping to garner industry partners," says Maeda. "There are so many possibilities."

—MIFI PURVIS, '93 BA



THE SPACE OVERHEAD

Our ability to tinker is allowing us to travel farther than ever

OUR CREATIVITY AND ABILITY to make and fix things turned humans into space voyagers. And 2019 is the 50th anniversary of the Apollo 11 mission, when a person first set foot on the moon. So next time you look up, take a break from connecting the dots of Aquarius and contemplate a constellation of shining achievements.

1. Raise an Arm

For 30 years, the 15-metre Canadarm did all kinds of heavy lifting for NASA's space shuttle program: fixing satellites, positioning astronauts and moving cargo. Development of the remote-controlled mechanical arm at the National Research Council was led by **Garry Lindberg**, '60 BSc(EngPhys), '12 DSc (Honorary).

2. Ride the (Martian) Wind

A little instrument was a huge help measuring wind speed and direction for the Phoenix Lander on Mars in 2008. The Telltale, designed in part by U of A mechanical engineering professor Carlos Lange, was a device to measure wind conditions so the Rover knew when to take samples. Rover (and Telltale) operated for five months before Martian winter disabled them.

3. Chill Under Pressure

The old tin can gets pretty hot. A spaceship re-enters Earth's atmosphere at a steady clip of 40,000 kilometres an hour and the heat it generates had to be overcome before space flight was viable. **Bryan Erb**, '52 BSc(CivEng) MSc '55, '90 DSc (Honorary), was a big part of the team behind designing the heat shields that let astronauts return home safely.

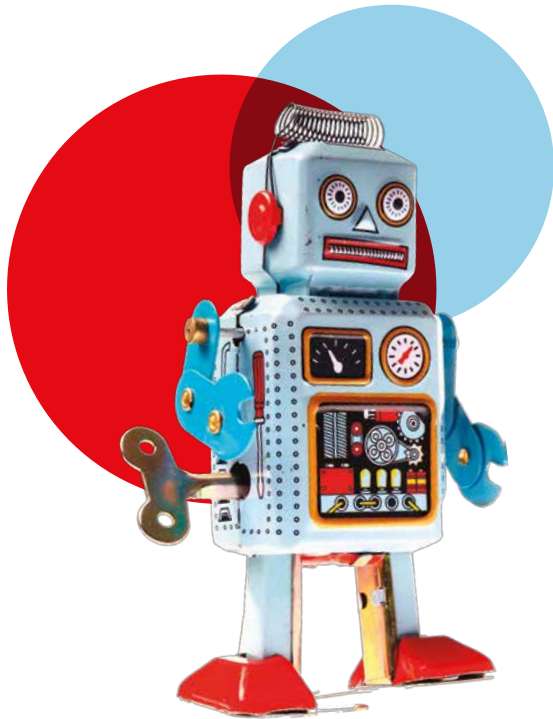
4. See the Doctor

As a NASA flight surgeon in 2009, engineer and physician **Doug Hamilton**, '80 BSc(ElecEng), '84 MSc, kept an eye on patient Robert Thirsk, who was hurtling through space at eight kilometres per second onboard the International Space Station. He monitored the astronaut's health from Johnson Space Center on Earth. Hamilton also recognized and mitigated the risk of electric shock to spacewalking astronauts, for which NASA awarded him a medal.

5. Board the Puke Plane

In 2017, **Ryan Baily**, '16 BSc(MechEng), and PhD student Farhad Ismail hitched a ride on the National Research Council's Falcon 20 — the puke plane — travelling in a sweeping arc to create near-zero gravity. They were testing how droplets form in microgravity as part of research into how 3D printers will work in space. If you're on a trip to Mars and a crucial piece breaks, you can't send out for spare parts. — JENNIFER ALLFORD, '84 BA

ILLUSTRATION BY JAMES PROVOST



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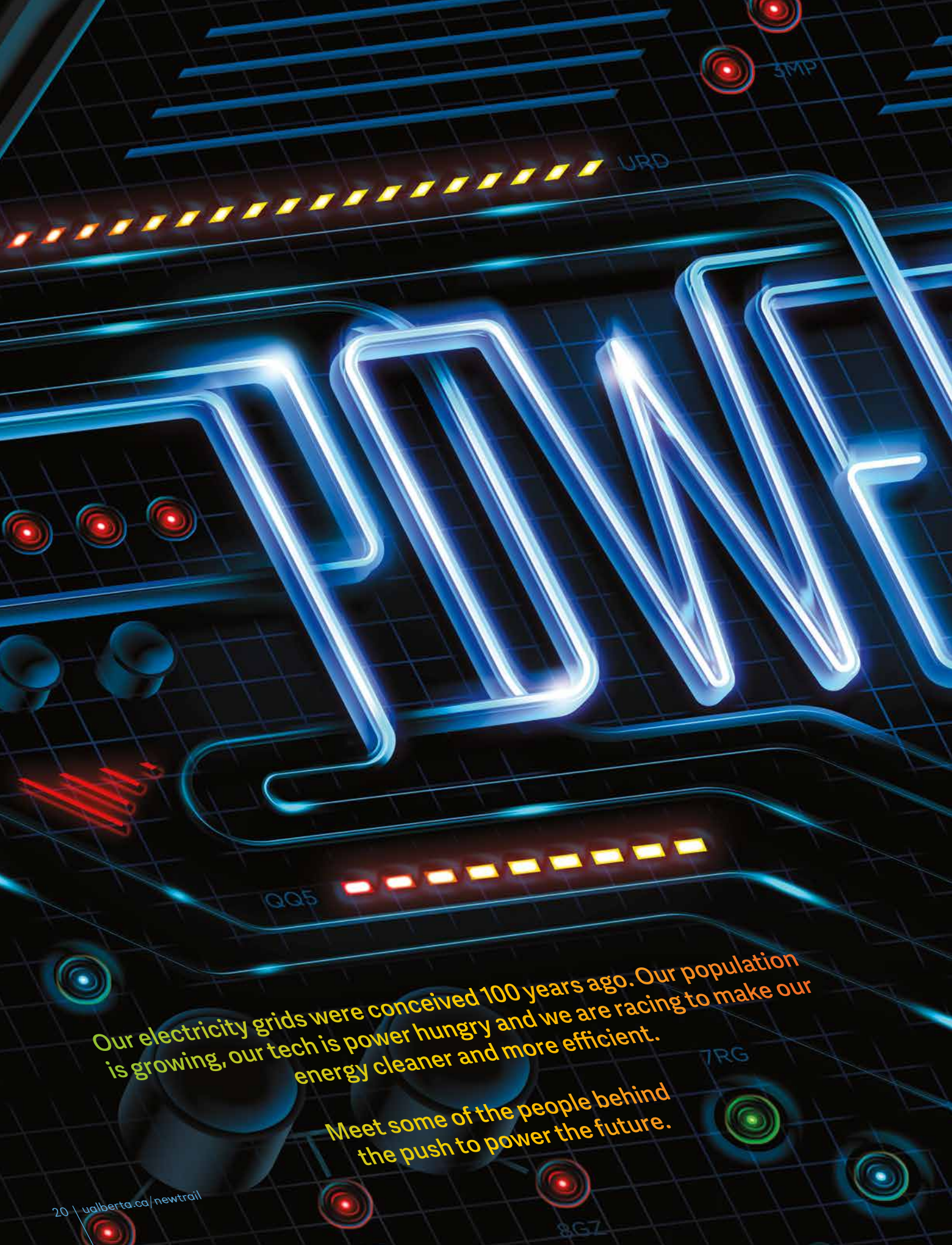
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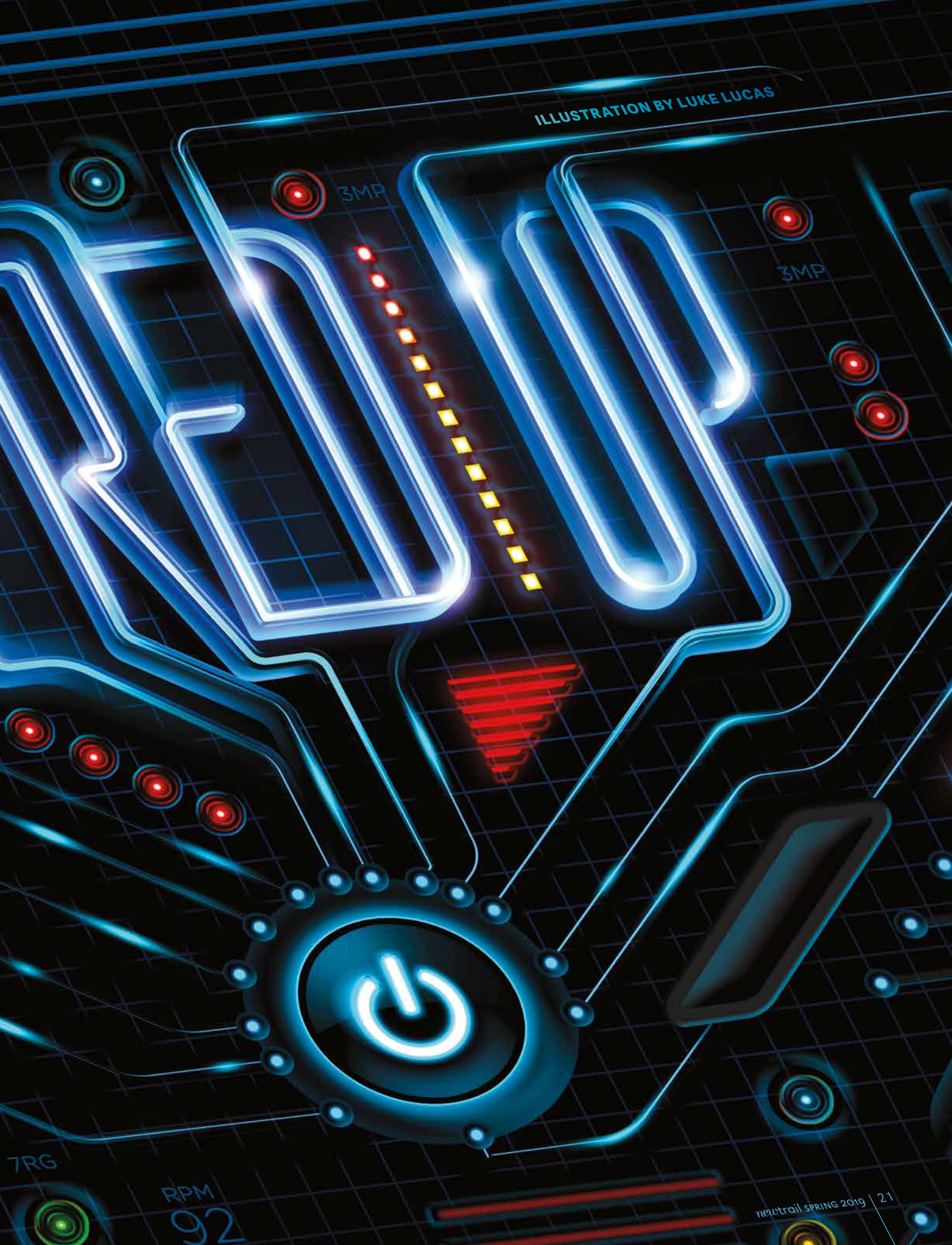




Our electricity grids were conceived 100 years ago. Our population is growing, our tech is power hungry and we are racing to make our energy cleaner and more efficient.

Meet some of the people behind the push to power the future.

ILLUSTRATION BY LUKE LUCAS



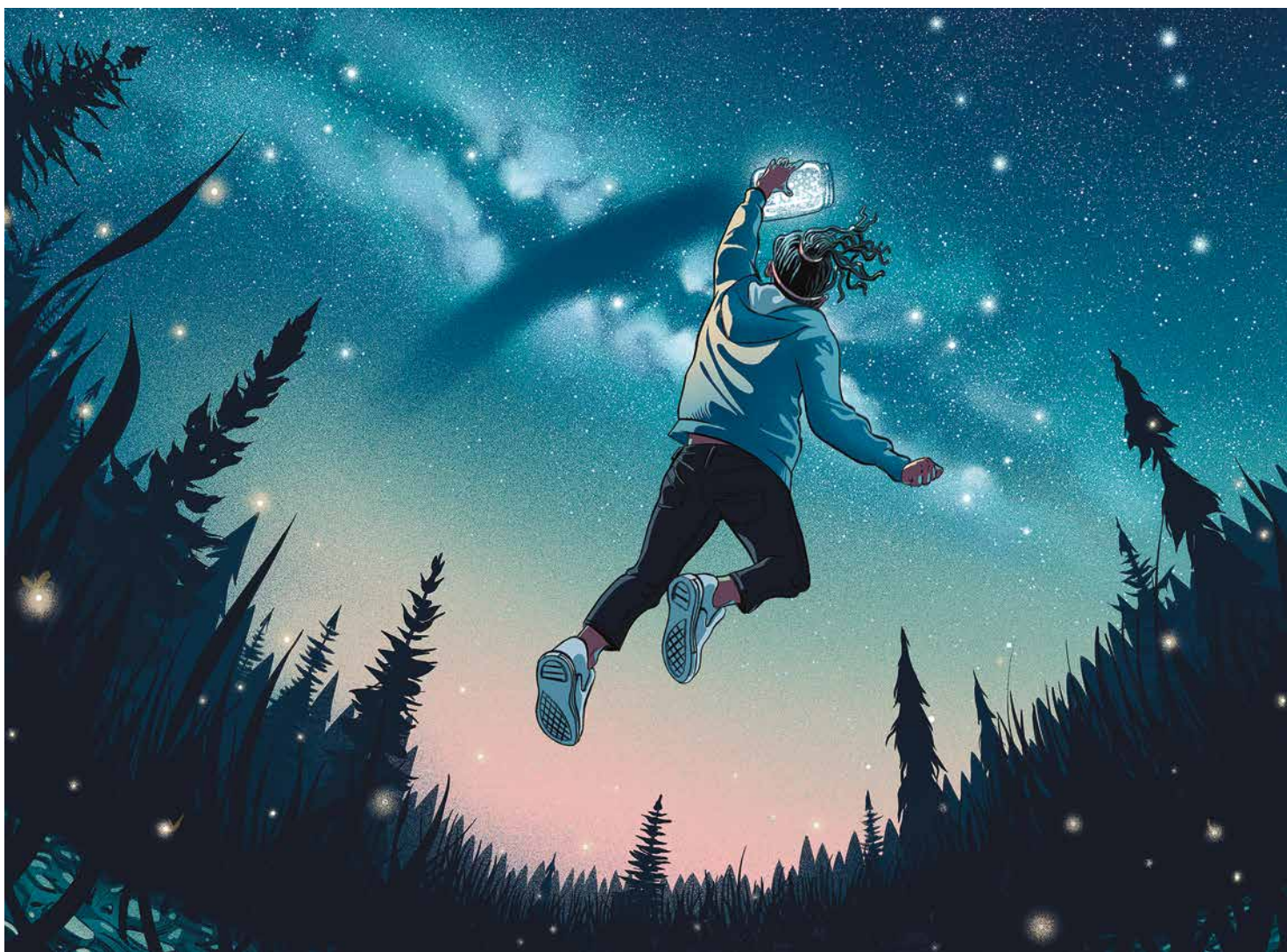
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92



HOW TO CATCH FIRE

Since we first burned wood, humans have sought new and better sources to meet our energy demands **BY THERESE KEHLER**



The kingdom of Queen Elizabeth I was humming along quite nicely when, around the mid-1500s, Her Majesty caught wind of an environmental crisis in the offing. The forests were disappearing.

Wood was the first energy source and had been so for millennia. But kilns of industry and hearths of homes had been eating up the English forests at an alarming rate and it became evident all this building and burning might leave the nation without

enough for another critical product: its warships.

The monarchy declared that coal shall be burned and the kingdom made it so.

Not easily, of course. There were fears and protests and new challenges. Someone had to figure out how to get the coal into the cities. Homeowners had to maintain their chimneys—an added expense. And there were health risks, too. Coal mine explosions, choking smoke in the air and a nightmare-inducing malady called soot warts, a type of cancer caused by the accumulation of ash in the undergarments of chimney sweeps.

But people adapted, even flourished. Within 300 years, the switch to coal set the stage for electricity and an improved quality of life. Today, Canadians have light at the flip of a switch, life-supporting medical equipment and everyday comforts that we have come to rely on—cold beer and Netflix, anyone?—all indirectly brought to us by a 16th-century monarch.

But what is the long-term effect of our standard of living?

CANADIANS ARE VORACIOUS energy consumers, and every year we're using more. Between 1990 and 2015, the nation's energy consumption grew by 30 per cent—and we're not alone. Globally, consumption increased by 2.1 per cent in 2017.

Wonder if the trend will continue? Look around. Population growth is an obvious factor; the United Nations estimates Canada's population will



increase by 21 per cent to 45 million by 2050. Economic growth is also key, especially in countries like China and India where energy use is skyrocketing. And don't discount the impact of our beloved gadgets: data centres and data transmission networks each account for about 1 per cent of global electricity demand. And what about a future that includes electric vehicles charging in every driveway?

It's not sustainable.

All that burning — coal, now joined by oil and gas — has fired up another environmental situation. Call it greenhouse gases, CO₂ emissions or climate change, this time it's the atmosphere at risk, and the next energy transition lies in reducing our reliance on fossil fuels for energy. Not because we're going to run out of fossil fuels; our time to address the effects of climate change will run out before the hydrocarbons do, says **Larry Kostiuk**,

'85 MSc, inaugural director of the university's Future Energy Systems research initiative. "The Stone Age didn't come to an end because we ran out of stones. The hydrocarbon age is not going to end with running out of hydrocarbons."

The conundrum is clear. We need cleaner energy sources but the supply, so crucial to our lives and economy, mustn't be disrupted in the process.

This is what drives the more than 800 U of A researchers and thousands of students working to solve energy challenges. They are making solar and wind power easier to store. Cleaner processes for the oil and gas industry. Computers that use less energy. An electrical grid that isn't so leaky. Each small project creates a bigger picture: a future where energy is produced sustainably, reliably and efficiently.

CHANGE IS HARD. Burning hydrocarbons might not be good for the environment but at least we know how it works. The future, though, is a work in progress, a confusing mishmash of energy sources. Hard, yes. And a bit scary, too.

"What are the problems? What are the issues? How am I going to actually learn all these things that I need to learn?" says **Anne Naeth**, '76 BSc, '85 MSc, '88 PhD, reeling off the reactions of average folk. People really want to understand what will happen. But if they don't, that's when they get anxious.

Naeth, a land reclamation scientist, succeeded Kostiuk in August as director of Future Energy Systems, the \$75-million, seven-year, cross-campus research initiative, federally funded by the Canada First Research Excellence Fund. The group's mandate is to develop the energy technologies of the near future and figure out how to integrate them into today's social, economic and infrastructure realities.

The university has further stepped up to the challenge, naming energy one of its official signature areas of research and teaching, with Naeth as the director. After all, the U of A has long had a focus on energy research — perhaps most notably in the 1920s when researcher Karl Clark dumped oily sand, hot water and caustic soda into an old-fashioned washing machine. His experiments

eventually unlocked Alberta's oilsands.

So, what does the future of energy look like to the woman at its forefront? "You'll get some of your energy from solar and you'll get some of your energy from wind," Naeth says. "But the sun doesn't always shine and the wind doesn't always blow. We're going to have to have better storage batteries. We're going to have to have a better grid through which we can move this energy."

Underpinning it all, like the safety net to a secure supply, will be fossil fuels.

"Oil and gas are going to have a future. But that's not the question we should be asking," says **Peter Tertzakian**, '82 BSc(Spec), an economist, author and public speaker on future energy issues. "We get too hung up in trying to predict [whether] we're going to use 100 million barrels a day, or 90, or 80. It doesn't matter. It's just a huge amount. It's a ridiculously unsustainable problem when it comes to emissions. The better question is ... who is going to be the most efficient supplier?"

Then he lobs the ball into another court. "And how are we going to use it more efficiently?"

WHEN LARRY KOSTIUK launches into his narrative about the history of energy, he starts at the beginning. It quickly becomes clear that this is a story he has told often — and one that he needs people to hear.

In his telling, this is not just a story of wood and coal, steam and horses. It's a story of curiosity, innovation, comfort and desire. It's a story of people as energy consumers. The first human need, he says, is warmth. The second is light. The third? "The innate laziness of mankind," says Kostiuk with a mischievous grin.

Tertzakian observes the same human propensity, if not for laziness, at least for making life easier. Consider how far removed we now are from our energy. Once upon a time, heating our homes meant finding the wood, chopping the wood, getting it into the stove and lighting it. Now we adjust the thermostat. No wonder we take energy for granted. Even a few years ago, we would have at least had to write a cheque to the utility company. How can we be aware of our environmental impact, Tertzakian

wonders, if we don't even go through the motions of paying the bill?

If we were paying attention, though, we might notice that things have been getting cheaper over the last decade.

The energy industry is in what Tertzakian calls an era of abundance; oil and gas companies are more efficient at getting products out of the ground. Lower prices, as anyone in Alberta can tell you, can hurt the economy. The drop in oil prices has contributed to a dramatic increase in the length of unemployment in the province, which has tripled in the last 10 years.

Tertzakian points to another effect of this abundance: consumer trends. Seventy per cent of all vehicles purchased in Canada are trucks or SUVs, which emit significantly more CO₂ than a small Toyota car. "And not even a hybrid one," he emphasizes. "This is a social issue. This is based on consumer behaviour. But who is going to implement policy ... that says you can't buy a pickup truck? Politicians, they're not going to touch it. Because if they do, they're going to get voted out."

If consumers aren't changing, it becomes even more vital to ensure the energy we use is cleaner and more efficient. Solving these challenges will require people, research and fresh perspectives.

ANNE NAETH DEALS WITH A LOT OF POINTED QUESTIONS. Will people lose jobs? Will everyone need an electric car? Will the old appliances still work? Will this affect my life?

And those are just the ones from her mom.

Mary Naeth is 86 and lives on a farm near Paradise Hill, Sask., a village of roughly 500 people just northeast of Lloydminster. It's also a place where the power, too often, is out.

In answering this barrage of questions, Naeth would tell her mom about localized power sources like wind or solar or geothermal, and super-duper batteries that will store energy until needed. She paints a picture of a world with fewer centralized power plants and fewer electricity outages due to a downed transmission line kilometres from her mom's farm. It all sounded very familiar to Mary. "And she said, 'Oh, so it's just kind of like back when we got the generator,'" Naeth says with a smile. "So we've gone full circle. And my mom made that connection."

We're all going to need to use our imaginations when it comes to how society will change along with the energy sources. In five, 10 or 20 years, we won't have centralized systems in which the energy flows in one direction, but multiple systems in which individuals are both consuming and producing energy. Will this mean that urban downtowns densify? Or will the prospect of reliable, localized energy encourage the proliferation of smaller, remote communities? Will everyone have a car? Or will ride-hailing become the norm?

"Our communities might need to be organized in entirely new ways, around social and environmental sustainability, instead of around the easy flow of traffic and consumer goods," says **Sheena Wilson**, '98 BA, '06 PhD, a co-lead of the energy humanities theme of Future Energy Systems. "We can ask ourselves all sorts of questions about why we live the way we live, and if changing the way we access energy will change everything."

In other words, by looking ahead and envisioning future challenges, we can start now to figure out the best way to address them.

At the centre of this energy transition is knowledge, or the lack of it. For researchers and thinkers at the U of A, it's a matter of tackling those questions one project at a time.

Perhaps the true future of energy, says Kostiuk, lies with the 1,000 grad students who will work in Future Energy Systems and beyond. Mechanical engineers talking to land reclamation practitioners. Mining engineers talking to political scientists. Assuming each student goes on to a 40-year career in energy, that adds up to 40,000 total years of work that will stem from the university's investment in energy.

"That will leave a mark," Kostiuk says with a smile. ■

1800

Invention of the first battery



1698

Coal-burning steam engines launch the Industrial Revolution



~100 AD

The first mention of a wind wheel



~200 BC

First references to coal extraction in China



~300 BC

Water mills are used around the world

1858
Humans drill the first oil well (in Ontario)



1886
The first gasoline-powered car hits the road



1949
U of A professor Karl Clark perfects a technique to extract oil out of sands



1954
Nuclear power goes mainstream



1956
Solar cells begin powering toys and space satellites



2004
U of A researcher David Bressler discovers how to convert fat into fuel



2013
Jillian Buriak, '96 BSc(Hons), '01 PhD, creates cheap, sprayable solar cells



2017
A floating solar plant in China creates enough energy to power 15,000 homes



2018
A self-powered electric plane takes flight



~3,000 BC
Horses domesticated

~400,000 BC
First evidence of humans using fire

ENERGY MILESTONES

For millenniums, humans have sought out new energy sources to meet our growing and changing needs. Here's how we got from the first fire to mega-floating solar plants.

BY KATE BLACK, '16 BA

LOST IN TRANSMISSION

Solving the challenges behind the system that keeps the lights on

BY THERESE KEHLER

LIGHT UP A ROOM. Charge a phone. Refrigerate the milk. The electrical grid that allows us to have all of this at our fingertips is considered a critical piece of North American infrastructure. But it was conceived in the time of Edison — how does it hold up to today's power needs?

The short answer? Not very well, and one reason for that comes down to a pair of commonly used (but not necessarily well understood) abbreviations: AC and DC.

The very first power systems were DC, or direct current. DC moves like a steady stream of water from a hose but is only good for very short distances. In the 1880s, power companies adopted the idea of AC technology. Alternating current, or AC, is an electric current that reverses direction at fixed intervals — in North America, it switches 60 times every second, known as a frequency of 60 hertz.

It all sounds very technical but the reasoning was purely pragmatic: AC could be delivered to users who were many, many miles away with low transmission losses, so that meant building few power plants. The system that developed at that time is the one still used today: centralized generating plants creating 60-hertz AC electricity, transformers to step up its voltage before high-voltage transmission and step it back down before it enters your home, and thousands of kilometres of AC-friendly transmission and distribution lines.

But the AC grid of yesteryear isn't keeping up with DC demands of today. Renewable energy sources produce DC power.

The AC grid of yesteryear isn't keeping up with the DC demands of today.

LED lights and consumer electronics need DC power. The power system always leaked like a sieve, but every time electricity is converted between AC and DC, it wastes a little bit more.

"There's a huge amount of power generated each day around the world and lots of energy consumption. If you're able to save just one per cent of these losses in the system, that's a huge amount," says engineering professor Yunwei (Ryan) Li, who leads a team of researchers and grad students studying technologies to improve the grid.

That buzzing you sometimes hear near transmission lines? That's a sign of energy being lost. So is the heat you feel in those ubiquitous converter boxes used in charging your phone or laptop. Reduce the number of conversions (remember that in some cases it must convert from DC to AC and back to DC again before it reaches your devices) and you improve efficiency, says Li. "Eventually it makes sense that [we] have DC-based energy storage, DC-based power generation, then you may just have DC grids. So that structure of the grids will probably need to change."

Part of the answer lies in something called a smart grid — a seemingly all-purpose term but what is really just the gradual morphing of the existing grid into something that connects more seamlessly with digital technology and renewable energy sources.

The term smart grid covers a number of concepts. One is the notion of two-way electricity flow — for example, instead of the grid simply being a one-way electricity delivery system, it would also accept surplus power generated by solar panels on your roof. A smart grid could be something that responds automatically to an outage in west Edmonton by calling for power from the U of A micro-grid. A smart grid could predict an intense storm heading toward a wind farm and take it offline to prevent a damaging power surge. It could instruct your refrigerator to go into low-power mode to offset high demand. These are the types of scenarios researchers are investigating in several projects at the U of A — and while all have long-term ramifications, the ones that focus on reliability and efficiency are, in Li's opinion, paramount.

The integration of wind energy

into the electrical grid is an example of an area that falls under both of those parameters, Li says. There are times when its power quality—that is, the electricity's voltage, frequency and waveform—doesn't match the grid's requirement for 60-hertz AC power.

"You have to store that energy somewhere because, otherwise, the voltage could go up or the frequency won't be 60 hertz anymore. And then you have problems with power quality or system stability," he says.

This includes an issue called tripping the load, which leads to power interruptions and blackouts.

One of Li's projects is to improve the supply of renewably sourced power. "You improve the power quality of the systems so that we ensure your load is always connected and running properly."

And returning to the AC/DC dilemma, storing energy sourced from wind and solar requires a battery and batteries produce DC. It brings us right back to the challenge of converting energy to send it to the grid.

All of this does not mean that transmission lines (26,000 kilometres in Alberta alone) will need to be replaced overnight with DC or hybrid AC/DC lines. The transition, he says, will be gradual.

Indeed, changes are already happening. In 2015, two DC transmission lines stretching for a total of 835 kilometres were completed between the Calgary and Edmonton areas at a combined cost of \$3.5 billion.

Bit by bit, the grid is getting smarter and the process will continue for decades to come, says Li. ■

THE CHALLENGE:

How can we reduce the amount of methane, a heat-trapping gas, that human activity is putting into the atmosphere?

THE RESEARCH:

Harness a natural phenomenon, methane-eating bacteria, to deal with industrial production of the gas

THE PLAYERS:

Catherine Tays, '13 BSc, a PhD student in microbiology and chemical engineering, working with chemical engineering researcher Dominic Sauvageau and biological sciences researcher Lisa Stein

This Bacteria Eats Gas For Breakfast

Sometimes nature provides a solution to our manufactured problems. Researchers just need to find a way to make that natural solution work for us. Bonus points: in solving one problem, these researchers have also found a useful byproduct. **BY MIFI PURVIS, '93 BA**

What's better than solving a problem?

Solving the problem and discovering a new and useful non-toxic byproduct in the process.

What's the problem anyway?

Methane is a greenhouse gas, the byproduct of natural and industrial processes. It gets talked about less than CO₂, but emissions of methane are rising at a higher rate and, compared with CO₂, it traps more heat. About 60 per cent of methane emissions are caused by human activity. (Researchers are working to address at least one other cause. Read more on page 6.)

You can't 'solve' methane!

Nature already has. Methane-eating bacteria exist and **Catherine Tays**, '13 BSc, is working on ways to harness the phenomenon on an industrial scale. Optimizing the

process would let the bacteria deal with methane at the source, for example, in oilsands wastewater treatment plants, pulp and paper mills, and even landfills.

So what's the useful byproduct?

These hungry methane eaters (called methanotrophs) digest the delicious methane and, when they do, they produce compounds called metabolites. "Then we collect the metabolites to make stuff," she says. The aim is to make biodegradable plastics and biofuels out of them, she says. "We need to grow the bacteria better, persuade them to do what we want them to do." Tays, who has been supported by a donor-funded scholarship, says commercial production is the big goal.

What attracted her to working with bugs that eat gas?

Since she was a child, she wanted to help solve climate change, Tays says. "Every little girl wants to save the planet." ■

THE CHALLENGE:

Is it possible to harness low-temperature geothermal energy?

THE RESEARCH:

Adapt a traditional Stirling engine so that it can be powered by temperatures not much hotter than a cup of tea

THE PLAYERS:

Graduate students **David Miller**, '16 BSc(MechEng), **Jason Michaud**, '16 BSc(MechEng) and **Calynn Stumpf**, '16 BSc(MechEng), working under David Nobes, professor of mechanical engineering

OLD TECH, NEW TRICKS

Grad students are adapting centuries-old engine designs to capitalize on abundant geothermal energy

THE POTENTIAL for geothermal energy surrounds us. “Geophysicists tell us there’s more geothermal energy under the ground than there is hydrocarbon energy in Alberta,” says grad student **Calynn Stumpf**, '16 BSc(MechEng). But it turns

out that not all geothermal energy is equal. “The problem is, here it’s all below 100 degrees Celsius,” he says. It’s difficult to harness such low temperatures to create electricity, but now a team is adapting a two-century-old engine design to help solve a modern challenge.

Stumpf is part of a team of grad students — which includes **David Miller**, '16 BSc(MechEng) and **Jason Michaud**, '16 BSc(MechEng) — working to adapt a traditional Stirling engine to harness energy at these less-than-100 C temperatures. The Stirling engine is not the same as the internal combustion engine in your car, but it is similar in some key ways.

“Engines turn over because of a pressure difference,” says Miller. “In a Stirling engine, it’s hotter on one side of the engine and colder on the other side.” As gas inside the engine moves from one side to the other, it is heated or cooled. This leads to pressure cycles that force the piston to move, he explains. The motion of the piston turns a shaft, and it’s the power from this rotation that can be harnessed for things like locomotion or electricity.

In your car, the heat comes from burning fuel and the temperatures can reach several thousand degrees.

But, unlike the ones in our cars, Stirling engines can convert heat from any source into electricity. Since the heat doesn’t have to come from the burning of hydrocarbon fuels, the engines can generate electricity without carbon dioxide emissions.


The team’s Stirling engine taps into an “ultra-low” temperature source. In other words, these engines can run when the hot side of

the cylinder is 95 degrees Celsius — hot enough to make some ramen or a decent cup of tea — and the cold side just above freezing. Suddenly, the low-temperature geothermal energy that is abundant in Alberta is a viable source of power. But a larger temperature differential generates even more power and that’s where Alberta’s bone-chilling winters can be a plus, explains Michaud.

This group of Alberta-born students — Miller is from St. Paul, Stumpf from Lacombe and Michaud from Sherwood Park — can easily picture massive Stirling engines dotting the landscape, taking advantage of the province’s low-grade geothermal heat.

They aren’t there yet, though. They’ve built lab-bench-scale Stirling engines, but you’d need more than 10 of them to power a single 60-watt light bulb. The team is currently reworking designs to maximize the power output. They will be using the data from this work to design a bigger engine — and one that’s cost-effective. “It becomes more expensive to build a bigger engine,” says Michaud. “It’s important that we are able to predict the power output of these engines before we start committing those resources.” The three students graduate this year, so a new team of students will carry their work forward. —WITH FILES

FROM KENNETH TAM



Unlike the engines in our cars, Stirling engines are based on a design that converts heat from any source into electricity.

Friction Is a Drag

BY THERESE KEHLER

> It's a fossil-fuelled world and society isn't quitting hydrocarbons any time soon. Which is why some researchers are applying their expertise to improving how hydrocarbons are produced, consumed and—in this case—transported.

"It is a fact that the standard of living of Canadians is high because we use a lot of energy. So, we can't just

stop that right away to fight climate change, to reduce emissions," says Arman Hemmati, an assistant professor of mechanical engineering. "What we have to do, however, is make a responsible use of those resources."

One way is to make the transportation of fossil fuels more efficient. To that end, Hemmati's team is targeting two invisible enemies: friction and drag.

Better Pipelines

Pipelines work by pushing fluid forward, using pressure introduced from above-ground pumping stations. As the fluid loses acceleration, the next pumping station delivers another shot of pressure.

But that process gets a lot stickier, so to speak, when the substance is bitumen.

Even when diluted, the viscous substance is filled with silica sand and clay particles, which create friction that slowly wears down the pipeline, especially along the bottom. Regular (and expensive) cleaning and maintenance are required to prevent pipeline failure—and leaks.

Hemmati's team is looking at a process that could push bitumen off the walls of the pipe and force it to the middle, where it could flow more freely. Versions of this concept, called vortex generators, are currently in use but they are costly and corrode easily. Hemmati's idea involves adding internal cross-sections to the pipes with projections that almost look like teeth. These ridges would shape the fluid so most

THE CHALLENGE:

How can we make the transport of petroleum products safer and more efficient?

THE RESEARCH:

Reduce friction in pipelines, drag on transport trucks

THE PLAYERS:

Arman Hemmati, assistant professor in mechanical engineering, and Arash Zargar, master's student in engineering

of it spirals through the middle, reducing the impact—and wear—on the walls.

Reduced friction means pumping stations won't have to work as hard, which in turn means they'll use less energy and limit corrosion damage. The result would be less maintenance and a reduced risk of leaks. Hemmati has received a \$100,000 Alberta government grant to continue the research. "I think that would be one of the ways that we are going to change the view of pipelines. And that will have implications not only in Alberta, not only in Canada, but worldwide," he says.

Reducing Truck Emissions

The same broad principles are being applied to an above-ground challenge that can be a real drag when it comes to transporting fuel by truck: the wind.

Gusts hitting the broadside of a semi-trailer truck create a corresponding low-pressure dead zone on the other side, which in turn creates a stability problem, says Arash Zargar, a grad student working with Hemmati. The driver responds by wrestling the vehicle to keep control, which uses more fuel. Says Hemmati: "If we can reduce the drag, we can reduce the amount of emissions." Heavy-duty diesel vehicles are responsible for about five per cent of greenhouse gas emissions in Canada.

The concept is straightforward: install simple modifications on the trailer, such as flaps or teeth, to deflect the wind and increase stability. The challenge is to develop a computer simulation method that effectively and efficiently predicts the impact of wind flow when the modifications are introduced, says Zargar.

In the end, any modifications must be affordable to install and proven to reduce a business's operating costs, says Hemmati. A reduction in emissions is just icing on the cake. —WITH FILES FROM KENNETH TAM

THE CHALLENGE:

How do we address water contamination from energy production?

THE RESEARCH:

Use chicken feathers to remove contaminants from water

THE PLAYERS:

Post-doctoral fellow Muhammad Arshad and PhD student Irum Zahara working under Tariq Siddique, associate professor in renewable resources and Aman Ullah, associate professor agricultural food and nutritional science

Decontaminate Water With Chicken Feathers

NO MATTER HOW YOU DO IT, it seems that producing energy affects water. In Alberta, there are tailings ponds around oilsands production facilities. In the United States, the Electric Power Research Institute suggested that some types of decommissioned solar panels be stored until recycling processes become available, to ensure toxic chemicals used in their construction never leach

into groundwater. In Newfoundland and Labrador, concerns have been raised that hydroelectric projects might increase levels of methylmercury in nearby water. Renewable energy technologies promise to eliminate carbon emissions but their impacts on water still aren't fully understood.

How It Works:

Feathers are more than 90 per cent keratin protein, made of a variety of amino acids. Feathers are strong because this protein is "cross-linked," but when you break those cross-links in the lab you create unravelled biopolymers with a high surface area that can adsorb, or stick to (rather than absorb, or take in) particles such as heavy metals.

Researchers wash the feathers, grind them into powder and treat them with

WANT MORE ENERGY?

Coming in May: two opportunities to go deeper on the topic

- ▶ Keep your eyes open for the U of A's Energy Week, May 6-10. The week celebrates the naming of Energy Systems as one of the university's signature areas of research and teaching. Learn more about Energy Week events at ualberta.ca/energy-systems.
- ▶ Catch the *Powering Up Alberta's Energy Future* panel at Calgary's Central Library, May 22. Come hear from experts including **Peter Tertzakian**, '82 BSc(Spec) (page 23), Maggie Cascadden (page 33), Steve Bergens and **John Parkins**, '97 MSc, '04 PhD. ualberta.ca/alumni/events





modifying agents. Then they mix the powdery keratin biopolymer into industrial water, where it adsorbs contaminants. Then they remove the dirty biopolymer, leaving cleansed water.

Why It's a Good Solution:

Until now, adsorbents have been too expensive. "There are many adsorbents that can be used to remove contaminants," says Muhammad Arshad. He's a post-doc in the Faculty of Agricultural, Life & Environmental Sciences. "Few are as cost-effective as chicken feathers."

The Canadian poultry industry produces 1.2 billion kilograms of chicken meat a year. Along with that comes about 100,000 tonnes of feathers, Arshad says. "Most are landfilled or burnt, but we could use them." As the team continues to research, they could also find opportunities to recycle the contaminants caught in the feather biopolymer.

How Close Is It?

Ready to roll. A team was able to extract arsenic from contaminated groundwater this way. After refinements, the adsorbents can now remove more than 85 per cent — in some cases nearly 100 per cent — of certain contaminants.

Next Steps:

The team will test keratin biopolymers on water collected from the field, then refine them to take on new contaminants from other energy sectors. "If we develop cost-effective methods for decontaminating water before new technologies are adopted, we can prevent environmental impacts before there's a risk of them occurring," Zahara says.

—WITH FILES FROM KENNETH TAM

NEW POWER TOOLS

Our myriad devices, vehicles and appliances require more energy all the time. These research breakthroughs are poised to lessen the rate at which we burn energy, improving how we generate and store power. **BY THERESE KEHLER**

THE NEED



Devices that are faster, stronger and won't burst into flames.

Computers aren't improving, because their circuits use a lot of power and throw a lot of heat. Atom-scale devices could be the solution.

THE CHALLENGE

► Computers work on internal transistors that constantly switch from binary 0 to binary 1 and each switch creates heat, explains **Taleana Huff**, '15 MSc, a physics grad research fellow working with Faculty of Science professor Robert Wolkow. More switches equal more power, generating more heat. "Your whole laptop is going to melt if you try to make it better or faster."

Ergo, faster computers need a smaller, energy-efficient on-off switch, which will also help with another big problem. By the year 2040, experts predict the energy our computers need could exceed the amount produced worldwide.

THE BREAKTHROUGH

► Huff uses a specialized scanning probe microscope with the world's sharpest tip. (Wolkow has the Guinness World Record.) The team believes it has reached the ultimate limit for smallness: it's just one atom wide at the business end. The tool allows Huff and the others to make bits that represent binary information out of just two atoms—a fraction of the size that would be required using conventional seven- or 14-nanometre transistors.

"We're using individual atoms where you would normally have a very large transistor. When a transistor does that operation, it's using tons of energy," she says. The atomic switch uses "almost a negligible amount."



A better, portable power generation system.

Remember the self-winding watch? Well, consider this: thanks to a lab accident, you could eventually charge your smartphone just by walking around.

► Triboelectric nanogenerators are devices that convert external energy into electricity—think of dragging your feet along a carpet—but they produce a low-quality, alternating current that no one could improve. At least until **Jun Liu**, '18 PhD, working with chemical engineering professor Thomas Thundat, saw something unexpected.

► One day, Liu was using a specialized atomic microscope that uses a tiny cantilever to "feel" objects to create images. He hadn't yet pushed the button to apply electricity to the sample, so he was puzzled when he saw a current. Turns out, the cantilever's movement was generating electricity that was flowing in a steady, strong direct current: a tiny generator.

Liu and Thundat have since created a prototype device, with a provisional patent, that paves the way for future electronic devices to contain nanoscale generators that will harvest energy from the tiniest movements—the swish of your clothes, engine vibrations, even a heartbeat.



Better batteries.

From electronics to vehicles to household electricity, batteries are key to unplugging—or, at least, plugging in less often.

► Energy is stored inside battery chemicals, then used over a specific cycle—maybe driving a Tesla 600 kilometres or working 20 hours on a MacBook. Hezhen (Andrew) Xie, a PhD student in chemistry professor Jillian Buriak's lab, is seeking to improve a chemical battery's energy density, making it last longer. A separate challenge is to create desperately needed technology that can better store renewable electricity for when the sun don't shine and the wind don't blow.

► A recent success for Xie involved replacing the graphite inside a lithium battery with silicon nanoparticles and a highly conductive graphene aerogel. The research determined size and shapes that would keep the silicon from breaking down during repeated charging and discharging. Xie is also researching sodium as a cheap, plentiful replacement for lithium, which could be a breakthrough for large-scale "batteries"—or storage systems—for renewably sourced energy.

His breakthrough means energy could be stored in a sodium-ion battery and devices with these improved batteries would last longer and go farther.

QUOTED

► Says Huff:

"My adviser had been dreaming of testing these circuits for, like, 10 years before we actually managed to do it using this tool. Moving individual atoms is a little bit harder than you would think it is."

► Says Liu:

"We've just built a bridge between science in the lab with a real application. We've bridged the gap."

► Says Xie:

"There are so many cars in the world. If we use electrical vehicles based on clean energy, there will be much less emissions and pollution."



People-Friendly Energy Projects

BY CAILYNN KLINGBEIL

> What comes to mind when you think of "energy"? Maybe wind turbines, a pumpjack or turning on a light switch? To one PhD student in the School of Business, her first thought is of people. "The whole point of getting energy is to make people's lives better," says Maggie Cascadden. But sometimes the way energy is produced can have a negative effect on people living nearby. Cascadden wants to change that by finding ways to make our energy projects more people-friendly.

THE CHALLENGE:

What's the best way to involve communities living near energy developments in the decision-making process?

THE RESEARCH:

Develop a framework that planners can use to engage nearby communities to ensure they see benefits from the projects

THE PLAYERS:

PhD students Maggie Cascadden and Kylie Heales, working under business professor Dev Jennings

Cascadden's background is in best practices for Impact Benefit Agreements. These negotiated contracts, usually between First Nations communities and resource developers, are meant to ensure communities receive tangible and, hopefully, long-term benefits from nearby resource development, rather than just incurring the costs.

In such an agreement, a community affected by a mining project, for example, could gain infrastructure, skills and jobs at all points of the project, Cascadden explains. Best-practice criteria include empowerment, respecting local land and culture, and communication and understanding.

Though Impact Benefit Agreements have been around for years, some are stronger than others. A framework for community consultation would make the process smoother and ensure communities negotiating such an agreement for the first time have a full picture of the possibilities.

"It's really important

we figure out a way to adequately and appropriately involve the people who are next to big development projects," Cascadden says, "so, even though they happen to be next to it, they're not doing worse off than the people who are far away."

Currently, Cascadden, alongside PhD student Kylie Heales, is working under business professor Dev Jennings to determine how to ensure the people and communities near constructed wetlands are involved in the development and reclamation process.

Constructed wetlands are systems that simulate the properties of natural wetlands, nature's water decontamination system. Researchers in Alberta are researching constructed wetlands to reclaim tailings ponds. Heales' and Cascadden's project, in the early stages with a pilot study rolling out later this year, could lead to fresh ways of doing business—and not just for companies reclaiming tailings ponds.

The framework for consultation will provide them a guide to involve communities effectively for this project and, with some adjustments, to many types of future projects that affect local communities.

"I'm excited because I think the results of this project will help make our energy systems more people-friendly throughout the process, not just [at] the end point of having energy to power our lives," Cascadden says. ■

FROM RESEARCH TO REALITY

Turn your windows into solar panels, plus more ingenuity from U of A spinoff companies

BY MICHAEL BROWN

WHAT IF EVERY WINDOW on a downtown skyscraper was its own little solar panel, collecting the sun's energy and creating electricity?

The idea isn't new. But one company has taken a big step toward making this a reality with the help of tiny silicon dots that have the power to create, well, power, and revolutionize urban spaces in the process.

Applied Quantum Materials, a U of A spinoff founded by chemistry professor Jonathan Veinot and **David Antoniuk**, '78 BSc(ElecEng), '83 PhD, is already conducting commercial tests of its luminescent solar concentrator technology.

Luminescent solar concentrators have long shown promise in the quest to retrofit buildings. The silicon-based film showcases a specialty of Veinot's U of A chemistry lab: quantum dots and nanomaterials. The

film collects sunlight—both direct and diffuse—and channels it to photovoltaic cells inside window frames.

In January, AQM received \$420,000 in clean technology development funding from Alberta Innovates, an organization that speeds research to market.

While still a few years from being ready for market, the product creates solar potential for downtown towers that have a lot of glass and small rooftops. The company is working with partners All Weather Windows and PCL Construction to conduct the tests.

"We hope to demonstrate that our technology will revolutionize the building industry," says Antoniuk.

U of A research has spawned other energy-related companies. Here is a look at a few of them.—WITH

FILES FROM **MARA SIMMONDS**, '89 BA, '90 BA(SPECCERT)

TURNING WASTE INTO FUEL

Forge Hydrocarbons

David Bressler, '96 BSc(Hons), '01 PhD, professor of agricultural food and nutrition sciences

Forge Hydrocarbons transforms waste fats and industrial oils into hydrocarbons such as diesel, gas and jet fuel. This technology uses pressure and temperature, like the geological conditions that created crude oil—except in a matter of hours, not millions of years. Forge plans to open a demonstration plant in Sombra, Ont., that is projected to produce 19 million litres per year of renewable liquid hydrocarbon. forgehc.com

DELIVER ELECTRICITY THROUGH A SINGLE WIRE

WiDyne Technologies

Pedram Mousavi, engineering professor, **Adam Maunder**, '12 BSc(EngPhys), '13 MSc, and **Telnaz Zarifi**, '16 MSc

After developing technology to transfer electricity through a single wire (rather than the double wires currently used), the researchers behind WiDyne have teamed up with Edmonton-based Landmark Homes and Leven Electronics (which also began at the U of A) to save money on home construction.

WASTES NO MORE

AdvEn Industries

Weixing Chen, professor in chemical and materials engineering

AdvEn Industries provides materials for making electrodes such as supercapacitors or lithium-sulphur batteries using Alberta oilsands wastes, agricultural wastes, recycled plastics and biochar (a type of charcoal produced from organic waste matter). In particular, the company provides high-end specialty activated carbons, which are highly porous, for applications such as energy storage and gas adsorption. It has completed pilot trials of three to five tons per year and is now waiting for funding to build a 100-ton-per-year demo plant in Edmonton. adv-en-industries.com

FASTER, CHEAPER, SMALLER COMPUTING

Quantum Silicon

Robert Walkow, physics professor

Quantum Silicon uses atomic level science and "quantum dot" technology to create the same binary state used by computers (1s and 0s)—but using only a fraction of the physical space and only one-thousandth of the electricity. (More on page 32.) Past partners have included U.S. technology giant Lockheed Martin, which provided funding through an agreement with the Alberta government. quantumsilicon.com

Indigenous Workers Tell Their Stories

Social sciences and humanities help us examine the challenges of energy systems **BY MIFI PURVIS, '93 BA**

As our methods of generating and consuming power change, we need to look at the big picture. More than asking technical questions, it will take thoughtful research from all fields of study. Angele Alook, '02 BA, '05 MA, spends a lot of time thinking about the social, economic, labour and gendered aspects of our energy use. She co-wrote a report for the Parkland Institute—a donor-supported, non-partisan research institute — that examined the experience of Indigenous people working in oil and gas. She shared some insights.

How do social sciences and the humanities fit into energy research?

Literature and art reflect society around us, and right now we're witnessing a transition in our energy systems. In the past 200 years, society has become dependent on fossil fuel consumption. Social sciences and humanities examine the impacts of this and help us imagine a future in which this isn't the only source of energy. They let us look at what that means for our economy, our relationships, what it means for men and women, for Indigenous Peoples who are stewards of the land and settler people who want to mitigate climate change. Social sciences also help us articulate the stories we tell about resource extraction.

What prompted you to interview Indigenous oil and gas workers about their experiences? There's emerging research into educational barriers that Indigenous Peoples face finding work in oil and gas but we didn't know much about their experiences once they were at work in the industry. For this project, I asked 16 Indigenous workers from Wabasca, employed in a range of oilfield occupations, to tell me their stories. (Over three energy futures projects, I completed 50 such interviews.) I also relied on Indigenous knowledge systems to guide my research, complementing my sociological approach.

What did you find? Four primary qualitative themes emerged: career mobility, effects on families, the boom-and-bust nature of the industry, and the ramifications of living in a region dominated by resource extraction. Sound familiar?

Yes, those are the same kinds of concerns you'd find among all oil workers. How did the group in Wabasca differ? Our research indicated that these workers have extra layers of concern, including fewer opportunities for promotion. "It was harder for me to move up," said one Indigenous worker. "Even if I was better than someone else, they'd move up faster ... usually the white guys."

At the same time, the workers we interviewed live in the area, they have homes and extended families nearby, whereas workers from outside live in camps far from their homes. We found that these connections to home helped Indigenous workers counter some of the negatives.

What about people working for Indigenous-owned companies?

People in these companies experienced less discrimination and had more avenues to advance their careers. But Indigenous-owned companies that sell goods and services to oilfield companies had to overcome stereotypes. One man from Wabasca said, "We'd have to really sell our people." Respondents

said these companies have to counter discrimination not faced by other businesses. Also, Indigenous-owned companies have imported a system of capitalism that threatens to entrench an imbalance into small communities, moving them away from Indigenous social systems focused on the collective good and family networks.

There must be a way forward. It is a complex and nuanced relationship between the industry and these workers. The main issues we have to face are related to our colonial history and lie in Indigenous Peoples' relationship to the land. Despite being residents in the area and most closely affected

by industry, the Indigenous people we interviewed were aware of the sharp irony that they are not the primary beneficiaries of the industry — rather companies and governments are. They report feeling cut off from the land, that it has been taken from them. I believe solutions lie in looking to our treaties, taking to heart the UN Declaration on the Rights of Indigenous Peoples, and creating conditions for better self-governance and nation-to-nation negotiation. It's complicated, with no one formula to solve it. Research based in social science is key to developing better policies as industry changes. ■

Angele Alook specializes in labour market analysis, paid and unpaid labour and social policy. From the Bigstone Cree Nation, she's part of the Corporate Mapping Project team at the Parkland Institute, and Just Powers, a group of feminist scholars studying how energy generation and use shapes society.

THE CHALLENGE:

How does the experience of rural Indigenous oilfield workers, on and off reserve, differ from that of other workers?

THE RESEARCH:

For the Parkland Institute, Angele Alook interviewed Indigenous people at work in oil and gas. Social science researchers wanted to fill a knowledge gap about the experiences of these workers.

THE PLAYERS:

Angele Alook, '02 BA, '05 MA, researcher
Ian Hussey, and
Department of
Sociology grad
student Nicole Hill

WONDER WHEEL

Could an old technology answer some modern problems?

BY MIFI PURVIS, '93 BA



ENERGY IS ALL AROUND US—it can be harvested from sources such as wind, sun and moving water—but it's still difficult to store effectively. Working under the supervision of Pierre Mertiny, researchers are chipping away at the challenges and high costs of energy storage. One possibility is the new use of an old technology: the flywheel.

You know, almost intuitively, how the mechanical energy storage system called a flywheel works. Think of a foot-operated sewing machine or a spinning top. Both collect and store kinetic energy in the flywheel, and release it when needed, typically over a short time.

Mertiny's team is using flywheel technology to build a mechanical battery that stores surplus energy from any source to ensure it's available for high demand or acute energy needs, such as during peak electrical consumption or sudden power outages.

Flywheels are energy dense, meaning they're ready to supply power in quick bursts to deal with those spikes in use. "Flywheels are good at providing high power—a lot of energy in a short time," says grad student Miles Skinner. They are also great in low temperatures, a limiting factor for chemical batteries, as anyone trying to use a smartphone outdoors in winter can attest. Plus, chemical batteries can contain materials that are hazardous to the environment.

A body in motion will stay in motion unless something is acting on it to slow it down. In a flywheel that something is friction, which reduces the kinetic energy storage and results in energy loss. The team has worked to address the friction problem, including designing a vacuum enclosure and employing low friction bearings to limit losses. Skinner is working on a different aspect of this problem: the buildup of force.

The flywheels that the team is working on rotate fast, around 20,000 to 40,000 revolutions per

THE CHALLENGE:

How do we create better storage for renewable energy?

THE RESEARCH:

Adapt a centuries-old technology to meet today's energy storage needs

THE PLAYERS:

Graduate students Miles Skinner, '17 MSc, and Balakrishnan Nagarajan, working under Pierre Mertiny, '05 PhD, and Ahmed Qureshi, professors of mechanical engineering

minute in some prototypes. “An electrical engineer might be concerned with how to add or take out energy,” Skinner says. As a mechanical engineer, he explains his concern is with the force that builds up in the rotating flywheel. “The forces are enormous. It can tear itself apart,” he says. He is studying the behaviour of flywheels over their service life, stress and strain buildup in a flywheel, and how to use the information to improve the next generation of flywheel energy storage systems.

Flywheels are already in use in some European trains, where they collect, store and release kinetic energy from the vehicles’ braking systems. Another big potential application for a flywheel is in energy utility grids.

Utility companies can use stored kinetic energy as a buffer, stabilizing the frequency of their grid, mitigating power fluctuations, blackouts and spikes in demand. While only certain parts of current flywheel systems are recyclable, Skinner believes that challenge can be overcome. In the meantime, they have an exceptionally long life, 20-plus years, he says.

Mertiny’s group, which started in 2006, is making prototype energy-storing flywheels. Their next challenges include extending energy storage time from minutes, which would be useful when operating a train or a bus, to hours or days, which would be useful in energy grids. And they need to make it cost effective. The team did some initial work to design flywheels for residential solar installations to collect solar energy and store it to power homes through times the sun isn’t out or when the home is hungry for more energy that the installation can give.

The winning formula will come from interactions among multiple energy sources and the ways we integrate the new ones into our energy infrastructure. The magic of how we power ourselves in the future is at this point of interplay.

“Energy storage and generation will be multi-faceted,” Skinner predicts. “We have to ask how can we maximize the benefits to get the most of various sources. No single one is the best, but all of them will have their place.” —WITH FILES

FROM RICH CAIRNEY

What’s Coming on the Energy Horizon?

We asked some alumni working in the energy sector to tell us what they see as the biggest challenges in the next five to 10 years. Here’s what they had to say.

”

“Society’s expectations of the industry are changing rapidly, including the expectations the next generation of workers have of employers. Companies will need to recruit and manage people differently to attract top talent if they want to make the technological advancements that are required to continue moving the industry forward.”

Mavis Ure, ‘03 BSc(ChemEng), director of tailings operations and chair of the Women’s Leadership Development Network, Suncor

“We need to think about it as a two-part challenge. First, our economy is critically tied to Alberta’s oil and gas sector being globally competitive on both cost and carbon. The value this sector generates will allow Alberta to transition to more diversified energy offerings with opportunities to export our technologies and expertise worldwide. This lets us address the second part: transitioning the consumption of energy in Alberta to low-carbon emissions solutions.”

Candice Paton, ‘06 BSc(MechEng), executive director of clean technology, Alberta Innovates

“Alberta’s largest challenge will be how we carve our niche in a rapidly changing global energy system. We are global energy superpowers, but have yet to shift our focus to the changing landscape in this global system. Our collective expertise needs to spend significantly more time thinking through how we generate profits and deliver value in a world that is moving toward electrification and decarbonization.”

Sean Collins, ‘09 BCom, president, Terrapin Geothermics

“One of the biggest challenges is finding ways to produce our energy in a sustainable and environmentally responsible way. One way to tackle this is with automation and new technologies to improve the processes that already exist.”

Nicolas Olmedo, ‘10 BSc(MechEng), president and founder, Copperstone Technologies

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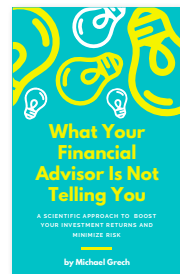
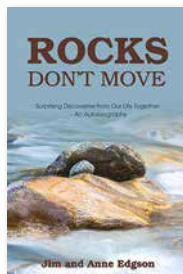
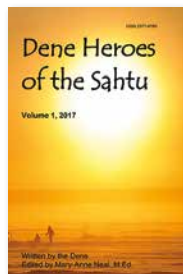
trails



John William Gow Logan was a 29-year-old U of A law student when he was killed in France on the last day of the Battle of the Somme in 1916. Logan and 36 other law students killed in battle were admitted to the bar by the Law Society of Alberta in November 2018, to mark the 100th anniversary of the end of the First World War. Gow's name appears on the Vimy Memorial in Pas-de-Calais, France.

PHOTO COURTESY OF GOW LOGAN'S FAMILY

Books



U of A alumni share their new books, including nature-themed word searches, investment advice and inspirational essays by people of Dene descent.

Compiled by *Kate Black*, '16 BA

▼
ESSAY
Dene Heroes of the Sahtu
edited by *Mary-Anne Neal*, '76 BEd, self-published

Indigenous youth and other community members share stories of inspirational people of Dene descent.

▼
RELIGION
An Islamic Jihad of Nonviolence
by *Salih Sayilgan*, '12 MA, Wipf and Stock, wipfandstock.com

Sayilgan challenges misconceptions of jihad by exploring late Muslim theologian Said Nursi's jihad of non-violence.

▼
MEMOIR
Rocks Don't Move: Surprising discoveries from our life together
by *Jim Edgson*, '66 BSc, and *Anne Edgson*, Word Alive Press, wordalivepress.ca

The Edgsons share stories and lessons learned from more than 50 years of marriage.

▼
FICTION
Just This
by *Katrin Horowitz*, '73 BLS, Quadra Books, quadrabooks.com

Follows two childhood friends—one a poet, the other a right-wing journalist—through

six decades of growing divisions in America.

▼
BUSINESS
Headquarters Economy: Managers, mobility, and migration
by *J. Myles Shaver*, '88 BCom, Oxford University Press, oup.com

Shaver examines how managerial talent allows some regions to develop vibrant headquarters economies.

▼
POETRY
Rape and Ruin—the Untelling of Medusa
by *Grant J. Venables*, '91 BEd, self-published

A retelling of the Greek myth through a feminist lens in long-poem form.

▼
SELF-HELP
Growing Forward When You Can't Go Back
by *Laurie Pawlik*, '94 BA, '01 BEd, Baker Publishing Group, bakerpublishinggroup.com

Pawlik draws on her own experience to give faith-based advice on how to flourish after suffering loss.

▼
POETRY
Opus (In Six Suites)
by *Richard Davies*, '71 BA,

'72 Dip(Ed), '79 Dip(Ed), self-published

Davies explores the deep connections between poetry and music in this harmonic collection of 69 poems.

▼
HISTORY
Going Down of the Sun
by *Philip G. Winkelaar*, '63 BSc, '68 MD, self-published

Life stories of nine Ottawa Knox Presbyterian Church members who served during the First World War but died before the 1918 armistice.

▼
SCIENCE FICTION
Death for the Ageless
by *Dawna Gilchrist*, '72 BSc, '79 BSc(SpecCert), '83 MD, self-published

Ageless physician Alys Grenell is faced with a confrontation from one of her own kind.

▼
SCIENCE FICTION
The Youthful One
by *Dawna Gilchrist*, '72 BSc, '79 BSc(SpecCert), '83 MD, self-published

The first in a series following an ageless physician warrior's galaxy battles against threats to civilization.

▼
SELF-HELP
Let's Be Curious: Ask the right questions, get better answers, create what you want
by *Debra Kasowski*, '95 BScN(Hons), self-published

Tips to hone your critical-thinking skills, ask insightful

questions and make decision-making easier than before.

▼
MEMOIR
More Than I Can Bear If Not for God
by *Philemon Topas (Stephen Braimah)*, '85 PhD, WestBow Press, westbowpress.com

The author shares the value of leaning on his faith through challenges of immigration, health and academia.

▼
FINANCE
What Your Financial Advisor Is Not Telling You: A scientific approach to boost your investment returns and minimize risk
by *Michael Grech*, '98 MSc, self-published

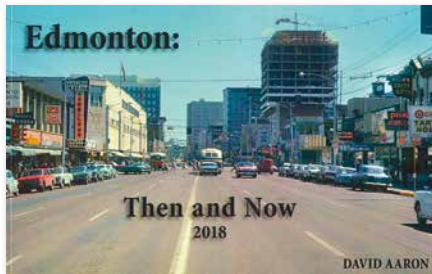
Quantitative trader and investor Grech shows how using technology and statistics can breathe life into conventional investing wisdom.

▼
WORD SEARCH
Awesome A-Z Nature Word Searches
by *Patricia "P.A." Lin*, '97 BSc, self-published

A collection of more than 100 nature-themed word searches.

▼
EDUCATION
Assessment Strategies for Online Learning
by *Dianne Conrad*, '87 Dip(Ed), '91 MEd, '02 PhD, and *Jason Openo*, Athabasca University Press, aupress.ca

An investigation of online assessment methods and



learning approaches centred on authenticity and engagement.

HEALTH

Confessions of a Former Cosmetic Dentist

by Michael Y. Zuk, '84 BSc(Dent), '86 DDS, self-published, confessionsofaformercosmeticdentist.com

A former dentist lifts the veil on what he sees as predatory practices in the industry.

MEMOIR

We Were Children

by Inge D. Hess, '75 BEd, self-published

The author documents her childhood in Nazi-dominated Germany, covering events from 1936 to 1948.

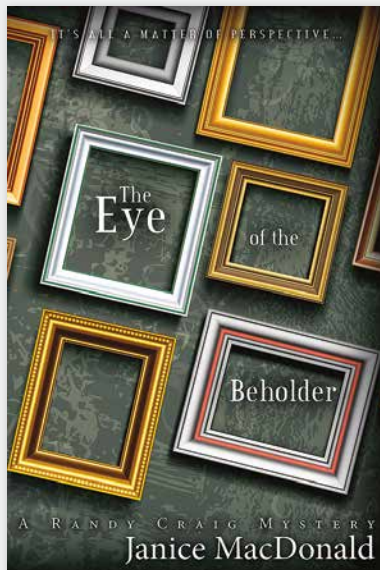
HISTORY

Edmonton: Then and Now

by David Aaron, '96 BEd, PageMaster Publication Services Inc., edmontonscenes.com

A pictorial journey into Edmonton's past comparing historic photographs from Aaron's collection with recently taken matching images.

Tell us about your recent publication. Mail your write-up and book to New Trail Books, Office of Advancement, Third Floor, Enterprise Square, 3-501, 10230 Jasper Ave. NW, Edmonton, AB, T5J 4P6. Or email a write-up with a high-resolution cover image to alumni@ualberta.ca. Inclusion on this list does not denote endorsement by New Trail.



MYSTERY

The Eye of the Beholder

by Janice MacDonald, '81 BA(Hons), '87 MA, Turnstone Press, turnstonepress.com

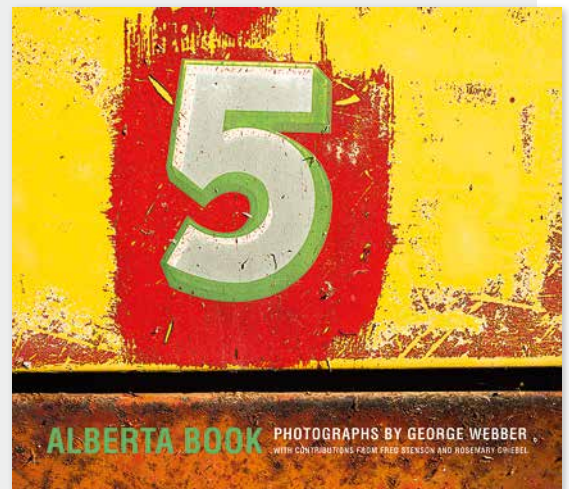
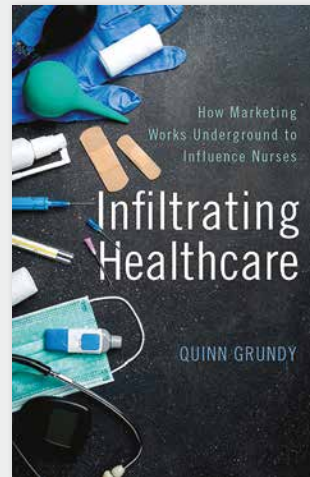
In the seventh book of the Randy Craig mystery series, a murder puts Randy's Puerto Vallarta honeymoon on hold.

CULTURE

Steampunk FAQ: All that's left to know about the world of goggles, airships, and time travel

by Mike Perschon, '08 MA, '12 PhD, Backbeat, halleonardbooks.com

A celebration and historical exploration of the iconic esthetic's literary and cinematic origins.



HEALTH

Infiltrating Healthcare: How marketing works underground to influence nurses

by Quinn Grundy, '10 BScN(Hons), Johns Hopkins University Press, press.jhu.edu

Grundy brings awareness to pharmaceutical and medical device companies' increasing influence on nurses.

PHOTOGRAPHY

Alberta Book

by George Webber, '73 BA, Rocky Mountain Books, rmbooks.com

A collection of 200 colour photographs spanning the architecture, abandoned townscapes and fading commercial signs from 1950s and 1960s rural Alberta.

We'd love to hear what you're doing. Tell us about your new baby or your new job. Celebrate a personal accomplishment or a volunteer activity or share your favourite campus memories. Submit a class note at uab.ca/classnotes or email alumni@ualberta.ca. Notes will be edited for length, clarity and style.

Class Notes

1960s

'68 **Wynn Payne**, BCom, wrote in with an update on what was a busy summer and fall, winning the Canadian small-bore rifle championships, and competing in the world championships in Changwon, South Korea, and the Shooting Confederation of the Americas games in Mexico as part of a three-man silver medal team. Payne was the oldest competitor at all three events, proving that, as he says, "shooting is a lifetime sport."

'69 **Terrance Nord**, BSc(MechEng), recently received an Ontario Professional Engineers Award for his longtime leadership in the airline and cargo industry. Over his 50-year career, Nord helped lead the creation of Canadian Airlines in Canada's first major airline merger, served as director and CEO of global cargo air network for DHL Express Aviation, and helmed the plan to develop Toronto

Pearson International Airport into one of the world's "mega hub" airports.

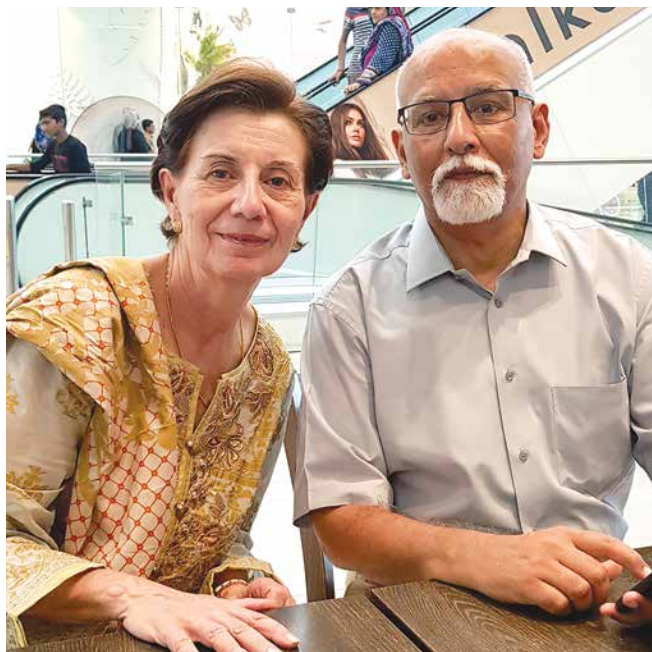
1970s

'70 **Reg Moncrieff**, BA, organized the 30th annual New York alumni chapter skating party and dinner. Moncrieff started the event as a way to bring his kids skating with other alumni families.



▲ The reunion of the 1977 nursing class

Helen Khan and her husband, Asif, in Lahore, Pakistan



Now his kids are all grown up and have kids of their own!

'73 **Helen Khan**, BA, '00 Dip(Ed), retired in 2008 after working at the University of Alberta for 27 years. She and her husband have since moved to Pakistan, where, she notes, "retirement takes many shapes." For the first few years they volunteered at NGO hospitals before Khan began work recruiting

international students to the U of A. "This has been a rewarding, challenging and enjoyable experience," Khan writes. "And it's nice to be 'back in the saddle' with my alma mater and employer. We still live in Pakistan and are still involved in community life in addition to my work."

'77 **Sharon Laskiwski**, Dip(Nu), '82 BScN, '89 MN,

wrote in with details from the 1977 U of A nursing 40-year class reunion. The three-day event included a four-course cooking class, a trip over the High Level Bridge Streetcar, tea at the Fairmont Hotel Macdonald and a stroll through their former residence and the U of A campus. "It was a wonderful time spent together and it was great to see one another. I look forward to our next reunion," Laskiwski writes. She encourages any November '77 classmates who wish to reconnect to contact Sandie Nixon at slnixon@shaw.ca.

1980s

'83 **Simon Eassom**, MA, has been appointed group executive general manager for member education of the CPA Australia, the world's third-largest professional members' association for certified accountants. This follows Eassom's 13-year stint with IBM, most recently as the strategy and solutions leader for IBM's global education industry. After leaving Alberta, Eassom spent 22 years as a teacher and university professor in the United Kingdom before moving to corporate education in 2005. In his new role, he will use his experience with artificial intelligence and cloud computing to transform lifelong learning for the accounting profession.

'85 **Kelly Klapstein**, BEd, author of "The Art of Brush

Shana Wilson with her portraits celebrating courage



Lettering," has a collection of calligraphy pens available in stores and on her website kellycreates.ca. Klapstein teaches lettering workshops around the world, including in United Arab Emirates, Mexico and Chile.

'86 **Deanna Britton**, BEd, '94 Dip(Ed), will be completing a doctorate in school psychology from Philadelphia College of Osteopathic Medicine in July 2019. She is currently completing an internship in southern Idaho.

'87 **Ehtisham Mahmud**, BSc(Med), '89 MD, was appointed president of the Society for Cardiovascular Angiography and Interventions for 2019-20. Mahmud is professor of medicine at the University of California, San Diego, and director of interventional cardiology and the cardiovascular catheterization laboratory at UCSD Medical Center.

'88 **Shana Wilson**, BCom, wrote in with an update:

"I recently co-organized our 30-year reunion (which was awesome—so much fun to reconnect). My classmates suggested I contact the U of A because my professional story is rather unique. I was the executive producer of *Diablo*, the biggest Hollywood movie ever owned by Albertans and filmed in Alberta. It starred Scott Eastwood (yes, that Eastwood), Walton Goggins and Danny Glover.

I am also an artist and can no longer paint quietly. These five-foot-tall tribute portraits

celebrate the courage of the inspirational Anita Hill and Christine Blasey Ford. Twenty-seven years ago, Hill stood up for all women. Twenty-seven years later, Blasey Ford did the same. Nothing has changed in 27 years. This is so very wrong. We must each do what we can in the name of equality and inclusivity. Speak, march, write, vote, support, intervene, donate. Loudly. For me, it is to paint." See more of Wilson's work on Instagram @shanawilsonartist and at shanawilsonartist.com.



DID YOU KNOW?

The first U of A fraternity began as a social club called the Rocky Mountain Goat Society, formed in 1927 by young men working summer jobs in Banff. The university allowed a campus chapter because the fraternity had no secret oaths or rituals.

1990s

'90 **Mitch Panciuk**, BA, was elected mayor of Belleville, Ont., in October 2018 after serving one term as a Belleville city councillor. Panciuk and his family moved to Belleville in 2001.

2000s

'06 **Kailan Rubinoff**, PhD, Aaron Allen and proud big brother Taliesin are delighted to welcome Teyrnon Emil Allen-Rubinoff, who was born at Greensboro Women's Hospital on Aug. 21, 2018. Rubinoff and Allen are associate professors of musicology at the University of North Carolina at Greensboro.

2010s

'12 **Breanna Mroczek**, MA, was recently named the Alberta Magazine



lovestory IN THE STARS

'08 **Tamara Janes**, BSc(Spec), '10 MSc, wrote in to share quite the cosmic U of A love story

“ I met my husband, **Martin Veasey**, '10 MSc, during an astrophysics class in 2007. I was completing my bachelor of science degree with a specialization in astrophysics, and Martin was doing a year abroad at U of A during his degree at the University of Leeds. We were first introduced at a study session where I was too engrossed in my studies and apparently showed very little interest in him!

Thankfully, we spent

the remaining few months of the winter term getting to know each other and quickly fell in love. Sadly, at the end of the academic term, Martin returned to the U.K. to finish his degree while I remained in Edmonton to finish mine.

After spending a year apart and travelling between Canada and the U.K. as much as possible, we finished our undergraduate degrees and were both accepted

to postgraduate studies at the U of A. We successfully graduated with master's degrees in 2010—mine in earth and atmospheric sciences, Martin's in physics. Feeling ready to “take the plunge” and apply our scientific skills, we emigrated to the U.K. and are now both working at the United Kingdom's national weather service in Exeter. I am a climate scientist for international development and Martin is a scientific manager for defence applications. We have welcomed two beautiful daughters into our lives (Maddie, three years, and Lila, 16 months), as well as a gregarious cat named Whiskey.

It's amazing to think that, had we not met by chance during ASTRO 322, or had Martin chosen anywhere else in the world to do his year abroad, we wouldn't be where we are today. I may not remember exactly what was taught in that particular class, but I don't know where I would be without it!”

Submit your own love story at newtrail@ualberta.ca.

Publishers Association Volunteer of the Year. Mroczek has volunteered with *Glass Buffalo*, a literary magazine that highlights emerging writers at the University of Alberta, since 2014. She also sat on the AMPA board for more than two years and volunteers as social media co-ordinator for The Local Good. She received the award at the annual Alberta Magazines Conference in April.

'18 **Roxane Noël**, MA, received a Gates Cambridge

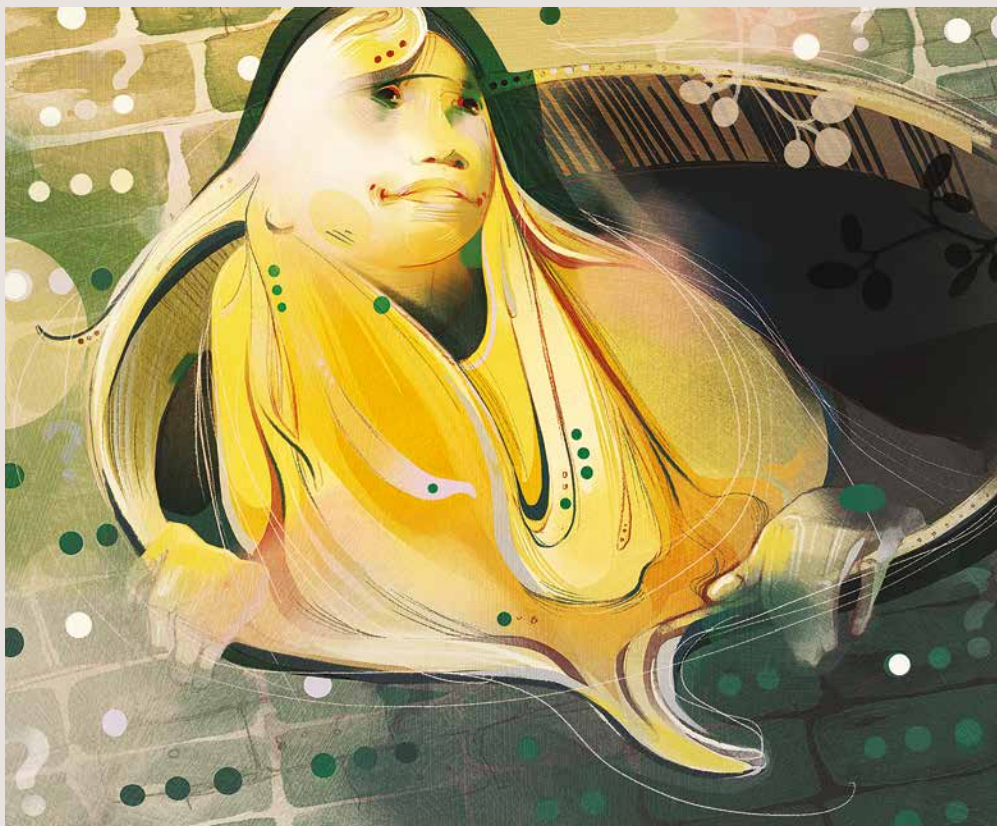
Scholarship, the University of Cambridge's most prestigious international postgraduate scholarship. Noël is pursuing a PhD in

medieval philosophy and hopes to open the world of medieval thought, a topic often dismissed as arcane, to a larger audience. ■

DID YOU KNOW?

In January 1970, a female undergrad was upbraided by the U of A's dean of women because her hair was too long and her skirt too short. That undergrad eventually chaired the sociology department.





How I Learned to Ask for Help

IT TOOK ME THREE TRIES TO FIND THE RIGHT COUNSELLOR. I'M GLAD I DIDN'T GIVE UP

No one ever told me that one day my greatest enemy might be my own biochemistry. There's little preparation for the realization you may be living with a mental illness.

Since I was 16, my daily moods were marred by cycles of exuberant laughter, unbearable sadness, hasty and unhealthy all-nighters, and days of listless recuperation. Living with a mood disorder is a constant battle to regulate these extremes. At university, this behaviour exacerbated my stress well into my second year.

My first visit to campus counselling services was the result of a spiralling depression. As my latest mood swing became prolonged, I cut

myself off from every friend who tried to help. Finally, one day I skipped classes to wait in psychological intake.

The counsellor who saw me consulted three textbooks before giving up without answers. I left feeling like a lost cause. I would return a year later, encouraged by a close friend. My second psychologist was stern and promising, but shortly after moved her practice without warning. Again, I felt discarded.

Eventually, my mania reached a new peak—risk-seeking, rapidly pulsing behaviour that saw me wandering the back streets of Whyte Avenue at 4 in the morning. This prompted my

third reluctant visit to the campus clinic. I landed in a room with a khaki-wearing, bike-riding psychiatrist who reminded me of Owen Wilson, the movie star. He casually inquired into the reason for my visit.

"I think I'm bipolar," I blurted out. It was something I'd only said out loud once before.

"That sounds serious," he replied, and then added: "What do you want to do about it?"

I had never been asked anything like that. My previous counsellors had given up and I realized that a part of me had always given up with them.

"I want to get better," I said finally. He smiled.

Owen diagnosed a mood disorder and started me on a light medication that acted as a barometer of what I would need. Every session with him reminded me that I was in control of my treatment, that how I felt was real. Owen started to convince me that I had made the right decision to seek help.

Eventually he had an idea to start me on a relatively new therapy. A risk, of course, but it was ultimately up to me.

"Well," I said, "isn't living like this worse than any side-effect?"

That night, I broke the seal on the first blister pack of a new drug. When I woke, I felt more conscious than ever before. There was no painful undercurrent of suicidal ideation, no body-bind of lethargy, no dead-end restlessness. My mind felt strangely and wonderfully wide.

By the time I made it back to Owen's office, I felt like a first time in my life. With his help I learned to make choices that weren't rooted in self-hatred—choices that could potentially make me feel something I had only coveted: happiness. When I graduated, I also left Owen's care but his lessons remain—I still ask for help when I need it, and I am no less of a person for doing so. ■

In September 2017, the Government of Alberta announced \$1 million in mental health funding for the U of A, which bolsters ongoing mental health programs that support students. If you or someone you know needs help now, visit uab.ca/needhelp or call 780-492-4773.



Nisha Patel, '15 BCom, '15 Cert(Leader), is an Indo-Canadian poet and artist, and a recipient of the 2018 Edmonton Artists' Trust Fund. You can find out more about her at nishapatel.ca.



greatgrads

By Amie Filkow

WHEN JERRY PASCHEN WROTE IN

to say that his wife, Betty, has a lot of passions, he wasn't kidding. A farm girl from Condor, Alta., **Betty (Jennings) Paschen**, '52 Dip(Ed), '55 BEd, '82 Dip(Ed), '83 MEd, came to the U of A to become a teacher. She chose household economics as her teaching field and quickly proved to be plucky and resourceful. A house blueprint she created in class was so well done, Betty's professor encouraged her to find an architect. So she did! Today Betty and Jerry still live in the house built from that design. The Paschens, who celebrated their 58th anniversary in December, have had many adventures together mountaineering, hostelling and organizing political movements and sustainable energy initiatives. (Betty was the first president of the Alberta Green Party.) In 1972 the couple took a six-week canoe trip from Fort McMurray to Inuvik with their three school-age kids. As Betty wrote in her published account of the family's journey, "experience is our best textbook." The couple still loves to take walks through campus and attend events, because, they say, it fills their cup. "For Betty and me, the curiosity and learning never ends," says Jerry. *Editor's note: We were saddened to learn that Betty died shortly before New Trail went to press. Our condolences to the family.*

Do you know a grad you want to brag about? Email newtrail@ualberta.ca.



IN THE NEWS

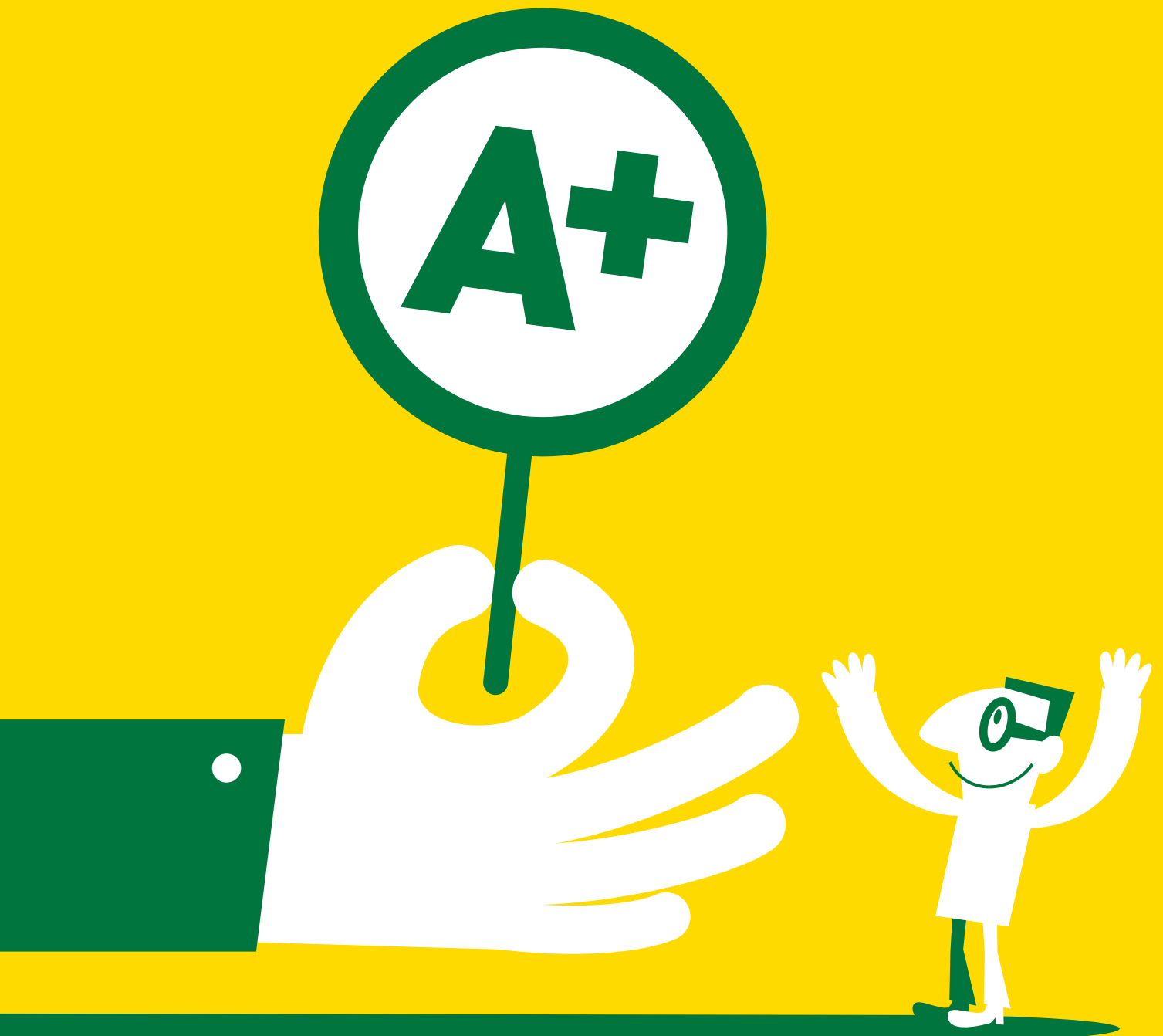
Trombonist Snags Top Music Prize

Trombonist, composer and bandleader **Audrey Ochoa**, '09 BEd, '09 BMus, was awarded the \$10,000 Edmonton Music Prize in recognition of her latest album, *Afterthought*, and her contributions to the local arts scene. Ochoa has toured the Latin-dance groove collection across Canada and the United States. Her win came from the most competitive year yet, with 28 artists and groups vying for the prize. —EDMONTON JOURNAL

Two Presidents, One U of A Connection

The Society of Petroleum Engineers International has U of A alumni serving as its outgoing and incoming presidents. **Darcy Spady**, '86 BSc(PetEng), will pass the torch to **Shauna Noonan**, '93 BSc(PetEng), in September. The society is one of the world's largest professional associations with 156,109 members in 154 countries.





WE THINK YOU'RE U OF A+

Know of a grad (maybe it's you!) who is making a difference in the community? Tell us about them! We'll send them an exclusive A+ pin as a thank you for representing their alma mater in a positive way.

Learn more at uab.ca/HonRoll

MEET YOUR NEW ALUMNI PRESIDENT

The new Alumni Association president begins her two-year term in June. We caught up with **Heather Raymond**, '82 BEd, '86 Dip(Ed), '95 MEd, '02 PhD, a retired teacher and principal, to find out what keeps her energized as a volunteer.

By *Scott Rollans*, '82 BA

What do you like most about retirement? The pace. I can actually get up and read the paper and drink my tea before I go to my desk — which I never used to do.

That sounds nice. So what would make you say yes to a new volunteer gig like this one? I had been a passive alumni member, to be quite honest, but when I became part of Alumni Council, my commitment escalated. I saw the quality of activity and started to really understand what it was all about. Alumni Council allows you to take your best skills and apply them. The [Alumni Relations] office creates that environment — they're building on the best skills their volunteers bring to the table.

You've worked with children with disabilities, communities living with poverty and recent immigrants. What draws you to advocate for marginalized people? Through my journey, I came to realize that I wanted to stand beside families who are marginalized. My first administrative position, at McCauley School, was one of the most exhilarating experiences I ever had. When I started at the school, we had no parental engagement. By the time I left, between myself and the principal, we were able to get 200 families to show up at events. It wasn't that families didn't care about their children before then; it was the way we invited them.

This sweater is a one-of-a-kind knit by Raymond, herself!



To learn more about the University of Alberta Alumni Association, visit ualberta.ca/alumni.

You were among the first administrators to send kids to U School, which connects students from socially vulnerable communities to the U of A. Why is U School important to you? So often we say to young people, “You should go to university,” but they have no experience base. Many students that live on Edmonton’s north side don’t even travel to the south side. Some of the kids at Norwood or McCauley didn’t know the university exists. And that persists today. U School provides kids with a concrete, lived experience of what university would look like. It’s touching the lives of a lot of children — and changing their outcomes.

A lot of people hesitate to volunteer, especially if they can’t spare the time. How do you convince those people they can still make a difference? I think back to my time at Norwood School as a principal. Every offer was valuable. It could be someone giving me a basket full of school supplies or it could be someone giving me \$10,000. Each of them contributed. One of the things that drew me to Alumni Council, and keeps me committed, is the number of alumni we have. If each of us makes a small contribution, what’s the cumulative impact of that? It’s huge. ■

This interview has been edited and condensed.



IN THE NEWS

National Nod for BioWare Founders

Ray Muzyka, '90 BMedSc, '92 MD, (above, right) and Greg Zeschuk, '90 BMedSc, '92 MD, are among the 103 Canadians appointed to the Order of Canada in December. Muzyka and Zeschuk were recognized for founding the video-game software company BioWare in 1995. The two are active in Edmonton’s business and non-profit community — Muzyka is the founding chair of the University of Alberta’s Venture Mentoring Service and Zeschuk owns the local Blind Enthusiasm Brewing Co. and Biera gastropub. —CBC EDMONTON

DID YOU KNOW?

In one of the odder research projects of the Second World War, U of A engineers were involved in Operation Habbakuk, an idea from an eccentric British professor to build immense warships out of ice.





IN THE NEWS

Local Foodie Remembered

The late Gail Hall, '85 BA, is hailed as one of Edmonton's first foodies. *Maps, Markets and Matzo Ball Soup: The inspiring life of Chef Gail Hall*, written by restaurant reviewer Twyla Campbell and published by Hall's husband, Jon, spans Gail's multi-decade career as a Red Seal chef, award-winning caterer, entrepreneur, broadcaster, food writer, educator and international culinary tour guide.—CBC EDMONTON

ALUMNI ADVICE



NEW FOOD LABELS WILL HELP YOU CHOOSE

Clean up your grocery cart with these tips

By Emily Senger

Sugar. Saturated fat. Sodium. These are the three bad guys of public health—meaning your health. Consuming too much of them increases your risk of diabetes, stroke, heart attack and even some cancers. You already know this, but it can be hard to track how much of the dangerous triad you're getting.

Knowing how to read a nutrition label is a good start—and that's about to get easier, according to **William Yan**, '82 BSc, '83 BSc(SpecCert), '86 MSc, '90 PhD. He is overseeing the nutrition label revamp as the director of the Bureau of Nutritional Sciences Food Directorate at Health Canada.

By 2021 manufacturers will have to include new nutrition labels and ingredient lists. Health Canada has also proposed a front-of-package nutrition symbol to help you quickly and easily identify foods high in sugars, sodium or

New Provincial Judges

Melanie Hayes-Richards, '98 LLB, and **Cheryl Arcand-Kootenay**, '87 BA, '92 LLB, are two of Alberta's three new judicial appointments to the provincial court. Hayes-Richards has practised criminal law as a Crown prosecutor and as legal counsel for the Alberta Court of Appeal, and Arcand-Kootenay has practised for 25 years in family and Aboriginal law.

saturated fat. The new labels are designed to help us choose in a more deliberate way.

Here's what you should know before you hit the grocery store:

1) Sodium

"Canadians consume way more sodium than they need for healthy body function," Yan says. You need only 1,500 mg of sodium from all food sources over the course of a day. For perspective, one teaspoon of table salt has more than 2,300 mg of sodium. Too much causes high blood pressure, which can lead to heart disease and stroke. Look for the "% Daily Value" column and choose foods with five per cent or less in one serving.

2) Saturated fat

A small amount of this is fine but overconsumption is linked to heart disease and stroke. When comparing products, choose the one with as little saturated fat as possible, ideally five per cent or less daily value. Saturated fats are found in meat, lard, palm oil and butter, but only in insignificant amounts in canola, olive or sunflower oil.

3) Sugar

"Sugar doesn't directly lead to a specific disease, but it does lead to empty calories," Yan says. Empty calories factor into obesity, which is linked to diabetes and other chronic diseases. Health Canada says a well-rounded eating plan includes about 100 grams of sugar per day (equalling about half a cup). To put this in perspective, a can of cola has 39 grams of sugar with no appreciable nutritional value. Yan recommends that you get most of your sugars from fruit, vegetables and unsweetened dairy products such as plain milk or yogurt. Check the sugar content and avoid anything with 15 per cent or more daily value of sugar per serving. ■

The Alumni Association notes with sorrow the passing of the following graduates (based on information received between October 2018 and January 2019).

In Memoriam

1940s

'40 **Frances Alberta Woywitka (Gust)**, BA, of Edmonton, AB, in November 2018

'42 **Claudia Ada Bain (Barker)**, BA, of Burnaby, BC, in November 2018

'43 **Doris Marie Jewell (Thompson)**, BCom, of Red Deer, AB, in October 2018

'44 **Elsie Margaret Rimmer**, BEd, in October 2018

'45 **Margery McLean Blayne (Frazer)**, BSc, '49 MD, of High River, AB, in September 2018

'45 **Annie Pauline Hughes (Gould)**, BSc, '48 MD, of Burnaby, BC, in October 2018

'46 **Allen Easter Dixon**, BSc, '48 MD, of High River, AB, in January 2018

'46 **Rosemary Theresa Lyons**, BEd, of Calgary, AB, in October 2018

'46 **Roger Norman Paton**, BSc, of Penticton, BC, in February 2018

'46 **Audrey Adele Tetarenko**, Dip(Nu), '83 BEd, of Okotoks, AB, in December 2018

'47 **William Douglas Baines**, BSc(EngPhys), of Manotick, ON, in August 2018

'47 **Keith Wilfred Dixon**, BSc(Pharm), '55 MD, of Victoria, BC, in December 2018

'47 **George James Gibson**, BSc, '49 MD,

of Yellowknife, NT, in November 2018

'47 **Jack Gus Peck**, BSc, '49 MD, in July 2018

'48 **Russell A. Dixon**, BSc, '51 LLB, of Calgary, AB, in December 2018

'48 **Gordon Allen Heck**, BSc, in September 2018

'48 **Frederick MacEnko**, BSc(ElecEng), of Calgary, AB, in November 2018

'48 **Arthur Richard J. Stephenson**, MSc, in September 2018

'48 **Shirley Anne Ungard (Tournay)**, BA, of Huntsville, ON, in February 2018

'48 **Margaret Oddny Williams (Marlatt)**, Dip(Nu), '49 Dip(Nu), '50 BScN, in November 2018

'49 **Tillie Beamer**, Dip(Nu), of Lamont, AB, in September 2018

'49 **Benjamin Alfred Greenfield**, BSc, of Calgary, AB, in September 2018

'49 **August Klovan**, BCom, of Nepean, ON, in March 2018

'49 **Morton Lionel Libin**, BSc, '51 MSc, of Encinitas, CA, in August 2018

'49 **Amelia Margaret Pal (Randle)**, BSc(HEC), of Victoria, BC, in September 2018

'49 **Bruce Allen Powe**, BA, '51 MA, of Toronto, ON, in November 2018

'49 **William Harold Seager**, BSc(ElecEng), of Calgary, AB, in November 2018

'49 **Wilfred Ronald Vernon**, BSc(ElecEng), of Edmonton, AB, in September 2018

'49 **Stephen Hart Wood**, BA, '50 LLB, of Victoria, BC, in August 2018

1950s

'50 **Norma Marion Bannerman (Fledderjohn)**, BSc(HEC), of Calgary, AB, in October 2018

'50 **Harvey Allen Buckmaster**, BSc, of Victoria, BC, in November 2018

'50 **Murray Charles Colwell**, BSc, '54 MD, of Calgary, AB, in October 2018

'50 **Frederick William M. Dalby**, BSc, in May 2018

'50 **James "Jim" Frederick Hole**, BSc(CivEng), '05 LLD (Honorary), of Edmonton, AB, in November 2018

'50 **Joseph Herbert Treleven**, MD, of Salem, OR, in October 2018

'50 **Faye J.E. Watkins**, BCom, of Calgary, AB, in January 2019

'51 **Alfred James Armstrong**, BSc(Pharm), of Edmonton, AB, in September 2018

'51 **David Layton Barss**, BSc, of Calgary, AB, in July 2018

'51 **Heather Belle Dowling (Singer)**, BA, in January 2019

'51 **Jay Dahl Salmon**, BA, '54 LLB, of Calgary, AB, in September 2018

'51 **Frederick Roy Schneider**, BSc, '53 DDS, of Vulcan, AB, in May 2018

'51 **William Slemko**, BSc(MiningEng), of Calgary, AB, in August 2018

'51 **Peter R. Young**, BSc, '68 BEd, of Edmonton, AB, in December 2018

'52 **Mary Macrae Alloway (Tocher)**, Dip(Nu), '72 BScN, of Edmonton, AB, in September 2018

'52 **Philip Norman Garrison**, BSc, of Beauharnois, QC, in March 2018

'52 **John Ross Higgin**, BSc, '56 MD, of Calgary, AB, in November 2018

'52 **William Alfred Johnson**, BA, '53 LLB, of Nanaimo, BC, in December 2018

'52 **Lois Lucile McGhee**, BSc, '60 BEd, of Red Deer, AB, in October 2018

'52 **Boris A. Nahornick**, BSc, '56 MD, of Drumheller, AB, in September 2018

'52 **Paul Alexander Puhach**, BSc, '53 MSc, of Kingston, ON, in May 2018

'53 **John Lewis Loughlin**, BSc, '57 DDS, in April 2018

'54 **Donald James Alexander Cross**, BCom, of Calgary, AB, in October 2018

'54 **Louis Dombowsky**, DDS, of Mill Village, NS, in October 2018

'54 **Gordon Kay Greene**, BA, '55 BEd, '62 MA, of Waterloo, ON, in September 2018

'54 **Thora Lenore Kjosness (Bolstad)**, Dip(Ed), in January 2019

'54 **Malcolm Ewen McLeod**, BSc, in December 2018

'54 **Wayne Ewing Moore**, BSc, '59 MSc, of Calgary, AB, in November 2018

'55 **Glenda Jean Benson (Johnson)**, Dip(Ed), '79 BEd, of Devon, AB, in September 2018

'55 **John O. Cuthbertson**, BCom, of Edmonton, AB, in September 2018

'55 **James Andrew Nicas**, BSc, '57 MD, of Edmonton, AB, in December 2018

'55 **Craig Wilbur Norstrom**, MD, of Kerrville, TX, in September 2018

'55 **Raymond Keith Pringle**, BSc(Pharm), of Lake Worth, FL, in December 2018

'55 **Donald James Taylor**, BCom, in December 2018

'55 **John Frederick Whitworth**, BCom, of Canmore, AB, in November 2018

'56 **Cecil Douglas Burton**, BSc(CivEng), of Edmonton, AB, in December 2018

'56 **Peter Mario Caffaro**, BA, '57 LLB, of Edmonton, AB, in November 2018

'56 **Gwendolyn Joan Hnatiuk**, BEd, of Edmonton, AB, in August 2018

'56 **Donald Herbert Laverty**, BSc(Ag), '61 MSc, in October 2018

'56 **Laura Doreen McNaughton (Lancaster)**, BEd, of Red Deer, AB, in November 2018

'56 **Orville Murray Wenstob**, BPE, '59 BDiv, of Swan River, MB, in December 2018

'57 **Annafred Marion Bell (Fraser)**, Dip(Nu), of Vernon, BC, in December 2018

'57 **Charles J. Dibble**, BEd, '60 BSc, of Calgary, AB, in January 2018

'57 **John Hawrelko**, BEd, '62 MEd, in January 2019

'57 **Cynthia Louise Kramser**, Dip(Nu), of Plantation, FL, in June 2018

'57 **Donald Michael Lemiski**, DDS, of Vernon, AB, in November 2018

'58 **Donald Varcoe Currie**, BSc, '69 MSc, in October 2018

'58 **Douglas Edward Longley**, BSc(CivEng), in January 2018

'58 **Mary-Lou Louise Rose (Duncan)**, BEd, of Red Deer, AB, in September 2018

'59 **Wallace Harold Dibble**, BSc, of Calgary, AB, in February 2018

'59 **Verne Charles Jones**, BSc(CivEng), '62 MSc, of Edmonton, AB, in July 2018

'59 **Joanne Donna King (McRae)**, BSc, of Winnipeg, MB, in June 2018

'59 **Philip "Bud" Keith Francis McEwen**, BSc(ElecEng), in November 2018

'59 **Donald Cameron Munro**, BPE, '62 BEd, '66 Dip(Ed), in October 2018

'59 **Ellen Louise Paulsen (Bayly)**, BSc, of Coquitlam, BC, in May 2018

'59 **Robert Kazuo Teshima**, BSc(EngPhys), '60 MSc, in August 2018

1960s

'60 **Kathleen Annis Dier**, BSc(Nu), of Edmonton, AB, in October 2018

'60 **Arleen Marie Nicholls (Parnett)**, Dip(RM), of Victoria, BC, in November 2018

'61 **Ronald Alfred Lant**, BA, in September 2018

'61 **George Laverty**, BSc, of Victoria, BC, in June 2018

'61 **Mary Alice Lorraine Stever (Likuski)**, BEd, in October 2018

'61 **Wilma Marie Losing**, BSc(HEc), in April 2018

'61 **Harry Edward Ripley**, BSc(PetEng), '67 MSc, of Calgary, AB, in September 2018

'62 **Abram G. Konrad**, MEd, of Edmonton, AB, in November 2018

'62 **Robert Glen Lammie**, BSc(ElecEng), of Edmonton, AB, in September 2018

'62 **John Leniuk**, BEd, of Calgary, AB, in January 2019

'62 **Alexander Oleg Mycyk**, BSc, of Salt Spring Island, BC, in February 2018

'63 **Arthur Aubrey Brown**, MSc, in November 2018

'63 **Bruce T. Dippie**, BSc(ElecEng), '66 MSc, of Kirkland, WA, in October 2018

'63 **Harold Melvin Fisher**, BEd, '67 Dip(Ed), in April 2018

'63 **Douglas N. Youngstrom**, BSc, of Penticton, BC, in October 2018

'64 **Boris Fyk**, BPE, '69 BEd, of Kelowna, BC, in October 2018

'64 **Brian Adair Glanfield**, BSc, '70 BEd, of Enderby, BC, in May 2018

'64 **Robert Maclean Glasgow**, MD, of Spruce Grove, AB, in January 2019

'64 **Kathryn Elizabeth Hurlburt**, BA, in November 2018

'64 **Roger Allan More**, BSc(ChemEng), of London, ON, in October 2018

'64 **Margaret Ellen Pedersen**, Dip(RM), of Moose Lake, AB, in July 2018

'65 **Verna Jean Covlin**, BEd, of Edmonton, AB, in October 2018

'65 **Sam S. Dookie**, BEd, '72 Dip(Ed), in November 2018

'65 **Morne Pier Duplessis**, PhD, of Calgary, AB, in October 2018

'65 **Robert Piercy Plaxton**, MEd, '69 PhD, in December 2018

'65 **Masa Yoneda**, BA, of Edmonton, AB, in November 2018

'66 **Richmond Man-Ching Cheng**, DDS, of West Vancouver, BC, in July 2018

'66 **Milton Albert Halvarson**, BEd, '67 MEd, in January 2019

'66 **Frank Martin Vas**, BSc(Ag), '69 MSc, of Red Deer, AB, in October 2018

'67 **Gary Stuart Boon**, BSc(MechEng), of Calgary, AB, in January 2019

'67 **Robin Ernest Chemago**, BSc, '69 BEd, of Port Alice, BC, in September 2018

'67 **Sidney Allan Gurevitch**, BCom, of Barrhead, AB, in September 2018

'67 **Peter Frederick Kostawich**, BSc(CivEng), of Brigadoon, Western Australia, in December 2018

'67 **Michael Peter Kuly**, BA, '70 BEd, of Edmonton, AB, in November 2018

'67 **Brenda D. Wroot**, Dip(Nu), '72 Cert(AdvObst), of Victoria, BC, in October 2018

'68 **Catherine H. Black (Herbut)**, BPE, of Orem, UT, in January 2019

'68 **Alvin George Gottschling**, DDS, of Shuswap Lake, BC, in May 2018

'68 **William Crichton Jackson**, BSc, '72 MSc, of Victoria, BC, in October 2018

'68 **Beverley Lois Lewis**, BA, '76 BEd, '79 LLB, in November 2018

'68 **Anne Orlecky**, BEd, in January 2019

'68 **Gene Zwozdesky**, BA, '76 BEd, of Edmonton, AB, in January 2019

'69 **Gordon Charles Dunn**, BSc(MechEng), of Blairmore, AB, in September 2018

'69 **Lionel John Gordon Jago**, BPE, '71 BEd, in August 2018

'69 **Patricia Edith Larsen**, BEd, in January 2019

'69 **Judy Thelma McDanal (Oman)**, MD, of Birmingham, AL, in December 2018

'69 **Gordon Joseph McLeod**, BSc(MechEng), of Edmonton, AB, in July 2018

'69 **Donald John Nazimek**, BSc, '70 DDS, of Camrose, AB, in June 2018

'69 **Beverly Rachwalski**, Dip(RM), '79 BSc(OT), '85 MHSA, in March 2018

'69 **Steve A. Wawrykow**, BEd, of Nanaimo, BC, in January 2019

'69 **Josephine Marian Emmett (Wilson)**, BSc, '70 MD, of Canmore, AB, in August 2018

'69 **Carl Michael Young**, BSc(ElecEng), of Edmonton, AB, in June 2018

1970s

'70 **Keith Washington Currie**, MEng, of Edmonton, AB, in August 2018

'70 **Robert Ralph Morrison**, BSc(CivEng), of Edmonton, AB, in June 2018

'70 **Jean Bouma Ruth**, PhD, of Edmonton, in January 2019

'70 **Kenneth James Tyler**, BA(Hons), '79 MA, of Surrey, BC, in September 2018

'71 **Patrick Joseph Adams**, BSc, of Edmonton, AB, in July 2018

'71 **Gordon Wayne English**, MSc, of Edmonton, AB, in December 2018

'71 **Donald Samuel Rencz**, BEd, '75 MEd, of Winnipeg, MB, in October 2018

'71 **Sophie Sadowsky**, BEd, of Edmonton, AB, in July 2018

'71 **Gordon Theodore Schaus**, Dip(Ed), in December 2018

'71 **Andrew Woudstra**, BA, '73 BCom, in December 2018

'72 **Donna Cheryl Agar (Fearey)**, BEd, of Cold Lake, AB, in September 2018

'72 **Gail Marie Alty (Kennedy)**, BA, of East Sooke, BC, in December 2018

'72 **Annette Eileen Anderson**, BA, of Calgary, AB, in August 2018

'72 **Dennis Edward Eshpeter**, BSc(ChemEng), of Calgary, AB, in September 2018

'72 **Wayne Harvey Flanagan**, BSc(Med), '74 MD, in February 2018

'72 **Joan Mary MacNeil**, BSc(Nu), in December 2018

'72 **Claudette Marie Mastrovito**, BSc(Pharm), in December 2018

'72 **David Michael Nonay**, BSc(MechEng), in December 2018

'72 **Montgomery Wild**, LLB, of Innisfail, AB, in November 2018

'73 **Edith Lane Lenko**, BEd, of Calgary, AB, in January 2019

'73 **Shirley Alice Lewis**, BA, in December 2018

'74 **David Henry Edey**, BA(Hons), of Edmonton, AB, in January 2019

'74 **G. Bruce Hay**, BCom, of Edmonton, AB, in December 2018

'74 **Ross George Kobayashi**, BSc(Spec), '77 MBA, of Calgary, AB, in October 2018

'74 **Catherine Anne Main-Freeman**, BA, '88 MSc, in September 2018

'74 **Rudolph Gerald Mazer**, BEd, of St. Albert, AB, in December 2018

'74 **Lois Reeder McLatchie**, BA, of Quarryville, PA, in August 2018

'74 **Susan Dell Muirhead (Routly)**, Dip(RM), '77 BSc(PT), of Nanaimo, BC, in January 2019

'74 **Patricia Shirley Parnell**, BLS, of Saskatoon, SK, in October 2018

'74 **Lawrence J. Worobetz**, BSc, of Kelowna, BC, in December 2018

'75 **Liesbeth Bakker**, BSc, in November 2018

'75 **Bruce Gary Frankish**, BSc, of Edmonton, AB, in October 2018

'75 **Ottmar Friedrich Hoch**, BSc(ElecEng), '76 MBA, of Calgary, AB, in September 2018

'75 **John Derek Hope**, BA(Spec), in September 2018

'75 **Patricia Elizabeth Knoll**, BEd, of Edmonton, AB, in January 2019

'75 **Theresa Marie Pond**, BEd, '82 Dip(Ed), of Edmonton, in August 2018

'76 **Gerald Byron**, BEd, of Edmonton, AB, in November 2018

'76 **Richard Neil Fedorak**, BMedSc, '78 MD, of Edmonton, AB, in November 2018

'76 **Sharon Lorraine Jones**, BSc(HEc), of Edmonton, AB, in November 2018

'76 **Cheryl Maureen Knebel**, BCom, of Edmonton, AB, in October 2018

'76 **Cassie Kulmatycki**, BEd, of Red Deer, AB, in November 2018

'76 **Patricia Jean Rigby**, Dip(RM), in October 2018

'76 **Gloria White (Yee)**, BSc(Pharm), of Calgary, AB, in August 2018

'77 **John Gustave Frank**, BSc(Forest), of Robb, AB, in January 2019

'78 **Leigh Francis Gower**, BSc, in October 2018

'78 **John Peter Harms**, BSc(Ag), '84 MBA, in January 2019

'78 **Paul Antelaus Lafortune**, BEd, of Edmonton, AB, in October 2018

'78 **Andrew Borys Makuch**, BA(Hons), '83 MA, in January 2019

'78 **Joanne Marie Overguard (Smith)**, Dip(Nu), of Sundre, AB, in July 2018

'79 **Victoria Ellen Ballard**, BEd, of Grande Prairie, AB, in February 2018

'79 **Karl Heinz Hartig**, BEd, in September 2018

'79 **Gerald William Sack**, BSc(ElecEng), of Edmonton, AB, in May 2018

'79 **Lorna Mae Stutchbury**, BEd, of Winterhaven, CA, in October 2018

1980s

'80 **Maria Teresa Zappone**, BA, in May 2018

'81 **William Francis Bauer**, MBA, of Calgary, AB, in May 2018

'81 **John Peter Caldwell**, MSc, of Almonte, ON, in September 2018

'81 **Julie Anne Ince (Pfeiffer)**, BEd,

of Calgary, AB, in October 2018

'82 **Dean David Bell**, BMedSc, '84 MD, in December 2017

'82 **Terrance Harry Gibson**, MA, '98 PhD, of St. Albert, AB, in August 2018

'82 **Neil Gerard Kutyn**, BSc, in January 2019

'83 **Norma Annesia Barnett**, BSc(Nu), '93 Dip(Ed), in April 2018

'83 **Gordon Grant Clover**, MVA, of Victoria, BC, in October 2018

'83 **Lorie Ann Kuchera (Aucoin)**, BEd, in October 2018

'84 **Shawna Dee Low (Luce)**, BSc(ChemEng), of Ponoka, AB, in January 2019

'84 **Douglas Kurt Monsma**, BEd, of Edmonton, AB, in October 2018

'86 **Desmond Haldane Brown**, PhD, in December 2018

'87 **Roberta Marie Stinson**, BSc(HEc), of Albany, OR, in December 2018

'88 **Jacqueline Marie Breault**, BCom, '00 MBA, of Edmonton, AB, in September 2018

'88 **Massimo V. Rossetti**, BSc(Ag), of Edmonton, AB, in October 2018

1990s

'90 **William Cleveland Mills**, MA, in November 2018

'90 **Katherine Gay Anne Pisesky**, BSc, '97 BSc(Nu), of Forrestville, CA, in January 2019

'90 **John Elgin Yule**, MSc, of Edmonton, AB, in January 2019

'91 **Nelson Chi Choy**, BSc(Pharm), of Edmonton, AB, in November 2018

'91 **Terry Alan Stagg**, BSc(MechEng), in July 2018

'94 **Elaine Marie Rhyason**, BEd, of Hinton, AB, in July 2018

'95 **Ryan Victor Bischoff**, BSc(MechEng), of Calgary, AB, in July 2018

'95 **James Roy Hunter**, BA, of Camrose, AB, in October 2018

'95 **Elaine Chris Warwick**, BEd, of St. Albert, AB, in September 2018

'96 **Robert Murdoch Laurie**, BSc(Spec), in August 2018

'98 **Martin Mudryk**, BSc(Forest), '15 MBA, of Fort Saskatchewan, AB, in November 2018

2000s

'03 **Rhea Rochelle Pollosco (Par)**, BA, in January 2018

'06 **Tshitende Kasongo**, PhD, of Edmonton, AB, in February 2018

'06 **David Matthew Semeniuk**, BSc(Spec), in January 2019

'08 **Shane Dermot Roche**, BCom, of Medicine Hat, AB, in February 2018

'09 **Sara Elizabeth Nielsen**, BEd, in December 2018

2010s

'11 **Karen Lynn Cryderman**, BEd, in September 2018

'13 **Andrew Raymond Tang**, BMedSc, '14 MD, of Calgary, AB, in October 2018

'18 **Melissa Jolynn Meulenbelt**, BEd, in January 2019

If you've lost a loved one who is a University of Alberta alumnus, contact alumni records at alumrec@ualberta.ca, 780-492-3471 or 1-866-492-7516.

thehub

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SPEAKER'S CORNER

FOUR TIPS TO UNCOVER THE MYSTERIES OF ANCIENT ROME

By Carissa Halton

It's hard to imagine your Ikea Poäng chair as a valuable research object. Ancient Romans might have been similarly stunned by our curiosity about their oil lamps and water jugs. Yet the most mundane artifacts can provide information about the societies they come from. **Jeremy Rossiter**, '77 MA, '86 PhD, a professor of history and classics, has spent decades travelling from Turkey to Tunisia to study the material culture of antiquity. While few of us will ever have the chance to unearth a gold coin from ancient ruins, we can access these pieces in museums all over the globe.

To get the most out of your next museum visit, Rossiter offers these tips:

ART IS POLITICAL: Look carefully at the way the Romans decorated their homes and household objects. You might see animal fights, gladiators and chariot races. This served in part to remind



Late Roman ceramic oil lamp from Carthage, North Africa (5th-6th century)

DON'T MISS OUT Keep current on upcoming alumni activities, discounts and perks with *Alumni Insider*. Watch for it in your inbox every month.

people of the generosity of the emperors and politicians who paid for their entertainment. At the same time, it cultivated loyalty to the regime, he says.

DON'T BLUSH: Though scholars disagree about the intention of the erotica (images of fertility or meant to enhance intimacy?), these scenes were featured in everything from murals in private homes to decoration on functional items like lamps.

PLAINWARE IS ANYTHING BUT: The Roman equivalent of Corelle dishes or Tupperware, these were the most frequently used objects in daily life. Archeologists like Rossiter study how everyday objects change over time—in form,

material or construction—in order to understand the technological advancements of the ancient world.

SLOW DOWN: Don't skip over the signs, says Rossiter, which explain how (for example) a rhinoceros ended up on a coin. (After ordering the transport of exotic animals from Africa for the Colosseum's opening celebration, the Roman emperor stamped the animals on commemorative coins to remind people of his generosity.)

Rossiter is one of many speakers to share expertise at alumni events. Visit ualberta.ca/alumni/events.

DON'T MISS OUT ON...

FAMILY EVENTS

Reconnect with your alma mater and give the kids a fun day out! Designed with little ones in mind, family events create a fun and educational experience for children. Your kids can be creative with fine arts students or get out and get dirty at the U of A Botanic Gardens. Check out activities like this plus more at ualberta.ca/alumni/events



@aswalli: Enjoying watching @BearsandPandas vs. Dinos V-Ball today with my fellow @UAlbertaAlumni - Pandas take first set 25-21!

AL-KARIM WALLI, '96 BSC (COMPENG)



EVENT WISDOM

“What do you do for work? Where did you go to school? Have you ever used the First-Time Home Buyers' plan?”

Really good first-date questions, according to **Bridget Casey**, '10 BSc, founder and CEO of Money After Graduation, a financial literacy website that empowers 20- and 30-somethings to better manage their finances. The millennial finance expert spoke at a workshop for recent grads in Edmonton.

98

Volunteer mentors helping to empower U of A entrepreneurs through the Venture Mentoring Service. ualberta.ca/alumni/career-support/venture-mentoring-service

150

Block A sweaters given out to recognize the contribution of female athletes who played in U of A varsity sports prior to 1980 but were not awarded sweaters. (The men were.) ualberta.ca/athletics/alumni/



Be Social

@UAlbertaAlumni

@UAlbertaAlumni

@UAlbertaAlumni



Paying it forward with a gift of life insurance

Former international student **Dilip Kembhavi and his wife Alaka** wanted to give back to the community that gave them so much.

By arranging a gift of life insurance to the university, the Kembhavis will help more students than they ever imagined possible.

To learn how you can make a difference by giving a gift of life insurance, please contact us:

780-492-2616 | giving@ualberta.ca | uab.ca/LifeIns



"Donating life insurance was appealing — providing good tax benefits while allowing us to create a substantial impact in the future."

Donors Dilip Kembhavi, '74 MEng, '78 MBA, and his wife, Alaka.

smalltalk



The One That Got Away

➔ As students, we had endless topics at our fingertips and yet sometimes graduated without taking That One Class. But take heart; as **Meg Dea Vail**, '81 BA, says, "It's never too late!" Find more or share your thoughts at facebook.com/UAlbertaAlumni.

I wanted to take the Anatomy 403 lecture SO bad, but I knew that it was a really difficult course and didn't want to have my GPA suffer when I was applying to a professional program.

—*Jamie Hudson*, '16 BSc(SpecCert), on Facebook

I wish I had taken more French classes. Years later, my daughter attended a French school in Montreal. At a parent-teacher interview, we were told to speak more French at home. (We were totally English-speaking.) I tried to follow that advice but my daughter said, "Mom, your accent is so terrible." So I stopped trying. My daughter, however, spoke French so well she got a job with the federal government in Edmonton.

—*Joyce Mattson Cutts*, '53 Dip(Ed), '54 BPE

A symbolic logic class in the philosophy department. I'm a math and science teacher and there are lots of times I think it would be good to use with students. It was always on my "if I have room next semester" list.

—*Jeff Suess*, '94 BEd, '05 MEd, on Facebook



There was an Irish literature course I thought would have been very interesting, but it was offered at 8 a.m. At the time, sleeping in seemed better than waking up for an 8 a.m. class, but I wish I hadn't been so lazy!

—*Adam Snider*, '05 BA, on Facebook



I was really grumpy at being forced to take an art history class during my after-degree. I already had a whole degree I wasn't "using," so I resented having to take another class I perceived as irrelevant. Of course, now I realize that all education is worthwhile and all my university experiences contribute to my career. Today I would absolutely love to learn from an expert about all the beautiful art in the world! I really regret not having a better attitude toward that class.

—*Leanne Garon Thompson*, '01 BSc, '03 BEd, on Facebook

I wish I had taken more criminology courses. I took one and loved it. As a high school principal, it might have come in handy.

—*Lisa Hilsenteger*, '88 BEd, on Facebook

Music appreciation. I can recognize Mozart and Bach sometimes, but I wish I knew more!

—*Meg Dea Vail*, '81 BA, on Facebook

More history! Aboriginal history.

—*Carol Watson*, 'BA(RecAdmin), '00 MA

I wish I had taken something other than Fortran as a computer class. Pretty much anything else would be more useful today.

—*Deanne Whitten Hislop*, '82 BA, via Facebook

I'm into genealogy now, so I wish I'd had the time to take a history class. —*Jill Hankewich*, '89 BSc(Pharm), on Facebook



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