Spring 2011

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U of A Engineer

Keeping in Touch with Alumni

Top 40 under 40

Intelligent prosthetics

Oilsands awareness

Life in the Legislature

St. Joe's living history

Message from the Acting Assistant Dean External Relations

It's hard to believe that spring is (finally!) upon us and that spring convocation is in full swing. The fall and winter semesters have been remarkably busy and the energy and creativity of our alumni, students and professors seem to never wane.

Our student teams hosted major national events this winter: the Mining Games took place during Reading Week, with the U of A team taking first place overall, and our Great Northern Concrete Toboggan Race team hosted more than 400 students from 21 schools across the country. Our GNCTR group was featured on CBC-TV by comedian and satirist Rick Mercer, who piloted the U of A toboggan and inadvertently caused some damage by steering into a windrow. But our students were prepared and replaced the broken steering skid before their next run. And Mercer more than made up for the crash with his wit!

Our student chapter of Engineers Without Borders made its presence known around the world with overseas fellowships and around the province through its excellent outreach programs. In fact, the U of A chapter won EWB Canada's award for Greatest Dedication for Learning. This encompasses having the most comprehensive member-learning strategy, an effective school outreach program and outstanding work on global engineering.

In the classroom and research labs, our professors continue to press for innovation, exploring more effective teaching methods and pushing the boundaries of knowledge. Last fall, movie mogul James Cameron met with a group of U of A professors—many of them from Engineering—to learn about leading-edge research we are conducting to develop new, clean oilsands technology.

And when the Canada Foundation for Innovation announced a new round of funding, it hosted news media in the lab of environmental and geoenvironmental engineering professor Ania Ulrich, whose research on decontaminating groundwater will play a key role in securing freshwater supplies around the world. Likewise, new research funding by the Natural Sciences and Engineering Research Council bolstered research projects in the Faculty.

There is professional recognition as well. Four of our professors were recently presented with APEGGA Summit Awards: Wilsun Xu (research excellence), Murray Gray (centennial leadership award), John Nychka (excellence in education) and Tian Tang (early accomplishment).

So as our future alumni prepare for spring convocation, the possibilities seem endless. We know they've learned from dedicated professors and that, under the guidance of our alumni in the engineering profession, they are well-prepared to meet whatever challenges they take on.

Laurie Shinkaruk
Acting Assistant Dean, External Relations

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UNIVERSITY OF ALBERTA

VISION To be one of the largest and most accomplished engineering teaching and research centres, a leader in North America.

MISSION To prepare top-quality engineering professionals, to conduct world-leading research, and to celebrate the first-class reputation and outstanding accomplishments of alumni.

VALUES Dedication, integrity, professionalism, and excellence in teaching, research, and service to the global economy and community.

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Message from the Editor

"You are astonished to see them come out of the ground."

Speaking with Kevin Neveu (Mechanical '82) last fall, after his company took part in the dramatic mine rescue in Chile, we joked that Neveu and his fellow students probably weren't taught how to drill a hole through a half-kilometre of rock to save the lives of trapped miners.

The CEO of Precision Drilling, Neveu chuckled, reflected on the thought and had this to say: he may not have been presented with this specific problem in class, but he was certainly taught how to tackle a challenge with so much at stake.

"That level of scrutiny and discipline I was trained on in the '80s is something we still apply today," said Neveu.

"Checking and rechecking work or having peer-group reviews of your work … these are important when you want to deliver a predictable outcome. And the outcome we wanted to deliver was predictable—we weren't rolling the dice."

The Calgary-based drilling company was contacted days after 33 miners were trapped underground at the Mina San Jose in Copiapó, Chile, on August 4, 2010. Precision had an oil and gas rig in the region and Chilean authorities wanted to know if the company could use the rig to help in the rescue efforts.

Three companies using different types of rigs were recruited to work on the rescue simultaneously—a drill owned by the Chilean mining company GeoTech reached the miners first, hauling the men out of the ground Oct. 13.

Neveu was more closely involved with this particular drilling operation than others, making sure that if the company were to aid in the rescue effort, it would have the necessary equipment and plans.

In the respect that work would be executed as planned, this challenge was no different from any other drilling job, Neveu says, adding that neither the company nor its drilling team allowed emotions to get the better of them because "urgency could have outweighed good decision-making."

But in reality, the task was extraordinary. Neveu stood just five feet from the rescue shaft as several of the miners were brought to the surface.

"Apollo 13 is probably the closest comparison I can make," he said.

"I didn't know the miners personally, but like everyone else watching this, you have a strong sense of relief—you have all those emotions—you are astonished to see them come out of the ground, and the men were just exuberant."

Amen to that.

Congratulations to you, Kevin, and to your team. You make us proud!

Richard Cairney
Editor

Masliyah earns international honour

Professor emeritus has moulded new engineers and elevated the science of the oilsands BY KATHLEEN CAMERON

Jacob Masliyah

Distinguished university professor emeritus Jacob Masliyah has been elected as a foreign associate to the U.S. National Academy of Engineering (NAE). Academy membership honours those who have made outstanding contributions to engineering research, practice or education, and is among the highest professional engineering distinctions accorded in the United States.

"It is a pleasure to receive this honour, especially coming from the U.S.," says Masliyah. "Most of my recognition has been within Canada, and now I'm getting international recognition. That is very hard to get while working in oilsands research."

Masliyah has been elected to the Earth Resources Engineering section of the academy, based on his contributions to science and technology in oilsands research. This section involves engineering applied to the discovery, development and environmentally responsible production of subsurface resources.

"My expertise in oilsands will be a good milieu to educate my U.S. colleagues about the status of oilsands and where we stand in terms of carbon dioxide emissions, water usage and tailings ponds," he explains.

Masliyah is one of only 13 Canadians accorded the honour since the NAE was founded in 1964. Two other U of A professors are included in this list: George Govier, who served as professor, chair of the department of chemical and petroleum engineering and as dean of engineering, inducted in 1979; and Norbert Morgenstern, distinguished university professor emeritus in civil and environmental engineering, inducted in 1992.

Masliyah has achieved great success during his 34 years at the U of A. His long list of honours includes the Order of Canada, the ASTech Award for Outstanding Leadership in Alberta Technology, the R.S. Jane Memorial Award and fellowships in the Canadian Academy of Engineers and the Royal Society of Canada. Masliyah also served as the NSERC Industrial Research Chair in Oil Sands Engineering and as a Canada Senior Research Chair.

Joy Romero, vice president of bitumen production, Horizon Oil Sands for Canadian Natural Resources Limited, has been an industry partner of Masliyah's and knows the impact of his work as a teacher and researcher. She says Masliyah has been instrumental in changing oilsands science and technology in three ways: he has taught students who have developed into talented and thorough industry engineers; he has made important discoveries about oilsands and refining oilsands; and he has been a major player in elevating the field of study.

"It's so wonderful to see Jacob personally recognized. No one could put more passion and effort and belief into what he does than Jacob. His secret is his passion for the students and their ability to learn. And for Jacob, a student is anybody who is willing to listen," says Romero.

"No one could put more passion and effort and belief into what he does than Jacob. His secret is his passion for the students and their ability to learn. And for Jacob, a student is anybody who is willing to listen."

— JOY ROMERO,
Canadian Natural Resources Limited

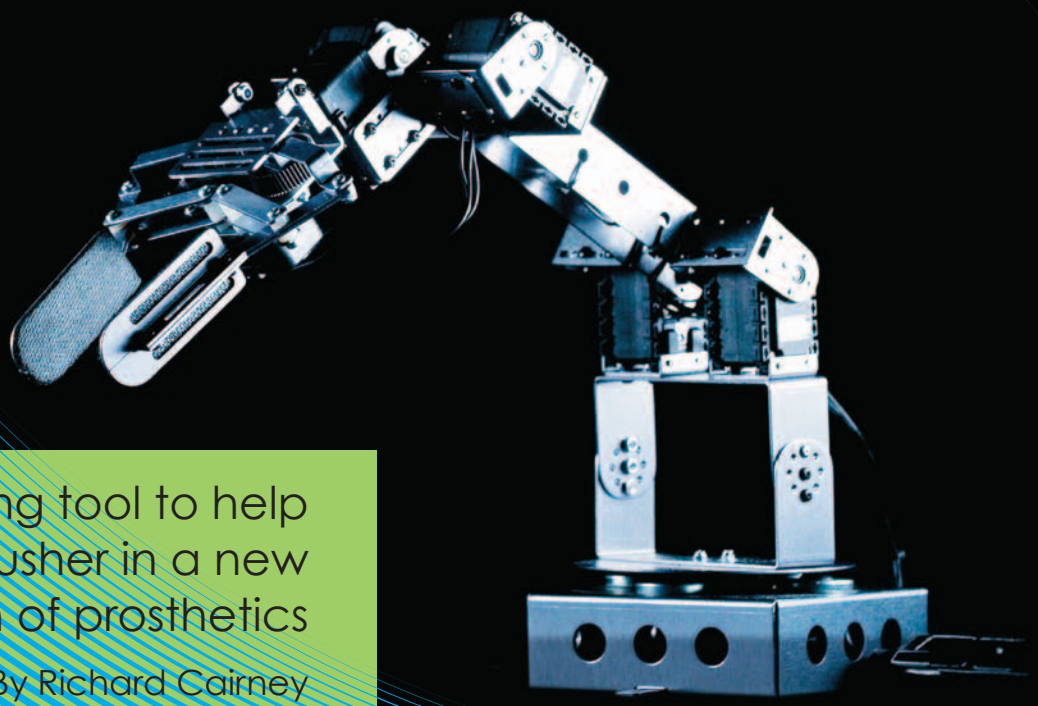
"His understanding of the issues associated with oilsands and his passion to do things better tomorrow than they are done today is really phenomenal. So much so that there are real, true gains in the industry because of the work Jacob has done with his students.

"To have that recognition shows the credibility—almost a coming of age—for our science: oil science. Because gold, silver and other sciences such as microbiology, all of these others have been around for such a long time, and now Jacob and the oilsands fall into that group. It's a tremendous recognition for Jacob, the University of Alberta and for oilsands as a whole as being a science and something to be recognized."

But Masliyah shares credit for any achievements: "We have a great department chair; we have a great dean. Everything is in place here for you to succeed. The sky is the limit as long as you can perform. Our leaders are always there to help, and we are very fortunate for that.

"Looking back on my career, if I look at the overall success that we have had, it was to have the industry recognize that only through the application of science can we resolve the challenges that we have," he says. "That idea has permeated the industry, and I think our work at the U of A has helped a lot with that."

Paving the way for intelligent prosthetics



A new training tool to help amputees could usher in a new generation of prosthetics

By Richard Cairney

Necessity may be the mother of invention, but innovation is pure creativity. Given the opportunity to pursue his passions, Rory Dawson (Mechanical '08) has developed a tool with a robotic arm to help train amputees to use high-tech prosthetics that respond to muscle signals. Working in consultation with the Glenrose Rehabilitation Hospital, Dawson designed, built and tested the training tool as part of his master's degree. At the same time, he is assisting amputees who are in line to receive high-tech prosthetic arms.

"The work that Rory is doing is meeting a specific need," says Gary Faulkner (Mechanical '63, MSc '66), a former chair of the department of mechanical engineering who now serves as director of research and technology development at the Glenrose. "We don't have the capacity or ability to do these kinds of projects, especially when there is potential that you may not be successful, so we look for partnerships with groups in the university as one way to increase our capacity to design these kinds of things."

Dawson's robotic arm will benefit amputees who are waiting for advanced prosthetic arms that have a more 'intuitive' feel. When the user tightens a tricep or bicep muscle, the prosthetic arm flexes up or down just as an arm would ordinarily. Amputees are able to control multiple movements on their prosthetic arms through a surgical procedure in which doctors essentially re-wire severed nerve endings that control the wrist to a point on an amputee's chest, where sensors on the prosthetic arm can detect signals and carry them to the hand and wrist. Picture a series of extension cords and you've got the basic idea.

With his master's degree now completed, Dawson is working as a research associate with one of his supervisors, mechanical engineering professor Jason Carey, to put the final touches on the project and bring the research to amputees.

The project could expand in scope. Dawson and Carey are working with Patrick Pilarski, who earned his PhD in electrical and computer engineering in the Faculty of Engineering, to develop an advanced prosthetic arm that incorporates artificial intelligence. Pilarski, now doing post-doctoral research with the Alberta Ingenuity Centre for Machine Learning and the U of A Department of Computing Science, envisions a day when prosthetic limbs gather information about their environment and make predictions about what motions or functions they'll be required to perform next (see story, page 10).

Pilarski says it's possible to enhance a prosthetic with environmental sensors and computing power, giving it the ability to pool and make sense of data. Dawson's training tool is a great starting point, but that project is a long way off. At present, Dawson's project is nearly ready for patients to use.

The Glenrose project proved a perfect match for Dawson's interests in both robotics and mechanical engineering. Dawson credits extra-curricular projects for preparing him for his master's degree. Time spent working as a member of the Autonomous Robotic Vehicle Project helped him feed his fascination with robotics. "I was always interested in robotics, and being a part of the ARVP allowed me to supplement my mechanical engineering education with hands-on robotics work. I was able to take mechanical engineering and apply it to robotics.

"I never thought, starting in mechanical engineering, that I would be able to move into areas I was interested in, like biomedical engineering and robotics. Through summer research programs and student vehicle projects at the university, I was able to create my own educational program."

There was a time when Dawson felt less confident about his ability to take on a challenge like this. He says he often felt he was just keeping his head above water during his undergraduate years, until everything seemed to come together in his final year.

"During my fourth year, things started to click. I started getting more confident. My MecE 460 capstone design team went to the nationals," he says. "I went into my master's with this attitude that I could do anything. If you grind away at something long enough, you can make it work. And that's what I did."

Dawson built the arm and learned to write the computer software that it runs on.

Jason Franson

Patrick Pilarski, Jason Carey and Rory Dawson with Dawson's robotic arm. The device can be used to train amputees in the use of complex new prosthetics.

Jason Franson

"I went into my master's with this attitude that I could do anything. If you grind away at something long enough, you can make it work. And that's what I did."

— RORY DAWSON

He even changed his proposed project at the outset of his master's, from a prosthetic leg to an arm. Dawson approached Carey, a mechanical engineering professor with a special interest in biomedical engineering, about his interest in robotics and biomedicine. Carey, whose own master's and PhD research covered tissue mechanics of the shoulder and composite materials for catheters, knew how to combine the two.

"I literally grabbed Rory by the shoulder and we walked over to Fahimi's office [mechanical engineering professor Farbod Fahimi, who specializes in robotics and co-supervised Dawson's project] and we came up with a project," says Carey. "When we initially met with the Glenrose, it was to discuss a robotic leg—but that wasn't what they needed. Their priority was training amputees to use these arms; within a couple of weeks we had another proposal for them."

But it has always been clear that the project could also become a platform for new and improved control technologies for prosthetics. Enter Pilarski—a creative thinker with an imagination that runs amok and pushes boundaries. At the encouragement of his supervisor, reinforcement learning guru Rich Sutton, Pilarski attended the Glenrose's Spotlight on Research breakfast in 2009, where Dawson was presenting a poster about the training arm. The two hit it off.

It turns out that Pilarski's background isn't dissimilar to Carey's and Dawson's. He'd always been interested in robotics and, during high school, studied sports medicine. Pilarski's father is a metallurgical engineer and his mother is a renowned cancer researcher. For his PhD, Pilarski worked with electrical engineering professor Chris Backhouse, whose collaborations with Pilarski's mother led to the development

of the so-called 'lab on a chip' technology that puts the diagnostic power of a clinical lab into the hands of front-line health care workers.

"I liked applying computational techniques to medical problems in novel ways, but what I really enjoyed about my PhD research was its artificial intelligence component—the aspect that brings a physical system to life," says Pilarski. "Now, pursuing AI with Rich Sutton brought me to a place where I realized, 'Wow—I can apply this work to my passion for prosthetics and robotics!' "

Specifically, Pilarski and Dawson hope their collaborative research will lead to the development of a prosthesis that can 'learn' through a form of artificial intelligence known as reinforcement learning. In its simplest sense, Pilarski compares reinforcement learning to training a dog: when the dog follows a command, it gets a treat; when it fails to follow a command, it doesn't. Pilarski and his colleagues in Sutton's lab have trained small robots to perform specific functions by simply pressing the plus or minus keys on a video game control pad. The same rules could apply to a 'smart' prosthetic. In fact, Pilarski and Dawson have evidence of this, based on work they have done using a computer simulation of the training device.

"I liked applying computational techniques to medical problems in novel ways, but what I really enjoyed about my PhD research was its artificial intelligence component—the aspect that brings a physical system to life."

— PATRICK PILARSKI

"Rory and I started working on applied reinforcement learning, and within three or four months we had enough data for a first demonstration of principles; within a year we had a research paper accepted to an international conference on rehabilitation robotics," says Pilarski. "Right now, Rory and I are reconstructing the proof of concept on the physical system so we can replicate what we did on the simulator, using the real robotic arm."

"It has always been at the back of our minds in this project that this could become a platform for a new and improved control technique," says Dawson. That project may well go ahead but, for the time being, his work will focus on helping patients in the immediate term.

"We want to interface this with a patient," says Carey. "The idea is that you are given this tool that you can use to train yourself for your special arm so that once you get that arm, you at least have an idea of how to use it."

A LEG UP

How creative thinking and persistence changed the lives of amputees around the world

By Isabelle Gallant

Kelly James, inventor of the C-Leg, in his workshop.

Jason Franson

Inspiration can come from the most unlikely sources. It was a humble farm tractor that helped Kelly James (Mechanical '81) design the world's most sought-after prosthetic leg. James is the inventor of the C-Leg, a microprocessor-controlled knee joint that adapts to a person's walk in real time.

In the early '90s, however, when James was working on the leg, the hydraulics were giving him trouble. He realized that when an amputee was about to take a step, there was so much pressure on a valve inside the

leg that it wouldn't open, causing mobility problems. The challenge was vexing.

One day, James was watching tractors in a farmer's field. He realized that the hydraulics used in the tractors did remarkably heavy lifting under intense pressure. James studied the hydraulics in the machines and applied them to the prosthetic leg.

"That was really the moment where I said, 'OK. I can now, with a very small motor and a very small battery, control this guy, his whole body weight, on the edge of a stair and control his descent.' "

James first started working with prosthetics while earning his degree in mechanical engineering. He was interested in biomedicine and, in essence, created his own course option, doing research on electric hands in the Department of Physiology. After graduating in 1981, he was hired by the department to conduct research into prosthetic legs.

James studied animals to see how they moved, then hooked up prosthetics to instruments that recorded the knee angles and forces for amputees walking.

"I slowly honed in on the fact that with a computer program, I could follow the changes in the signals," says James. The computer in the C-Leg cycles once per step, tracking the person's movements and moving from one phase to the next in the gait cycle.

The C-Leg is battery-operated, with a small motor, the same kind used in remote-control airplanes. James started off by building four test units.

"All sorts of trouble occurred. The Edmonton winters, the signals would drift … I had to improve the electronic end of it. The air would get into the hydraulics. I wasn't really a manufacturer and a producer, I was an inventor. I didn't really want to get into building these things."

James eventually formed his own spinoff company, Biomech Engineering, bought the leg from the university and struck out on his own. He travelled around the world to conferences trying to sell his leg to a manufacturer. At trade shows, he walked from booth to booth with his prototype slung over his shoulder. But most manufacturers were reluctant. What James was selling was,

Jason Franson

James fine-tunes the workings on the C-Leg.

in retrospect, ahead of its time.

"They all said, 'I don't know, it's pretty complicated.' Remember, in 1992 people didn't know anything about computers."

James persevered, even when people in the prosthetics field told him the idea was crazy. But in 1992, German prosthetics manufacturer Otto Bock approached James at a trade show. In a closed-room meeting with the company's owner and top engineers, they made James a deal for the leg, on the spot.

"What really surprised me about the meeting was that they were so respectful of the leg. After I had talked to all the American companies and they had just slammed the door in my face, I spoke to the German company and they were so, 'Wow, this is really amazing, and how did you do it?'"

James sold the patent rights for the leg to Otto Bock, in return for a flat fee and a royalty agreement. He started flying to Germany three to five times a year to help the company perfect the leg. They produced the first C-Leg in 1995, a streamlined, silver-and-blue leg with reworked electronics that function in the cold and the heat. Today, about 2,000 C-Legs are sold every year.

But there were obstacles to overcome along the way. Otto Bock nearly decided not to manufacture and sell the leg after one doctor's experience. The doctor, an amputee, was impressed with the leg after wearing it around for a couple of hours. But when he took it off to put his old prosthesis back on, he fell down the stairs. The C-Leg was too good in the sense that it was dangerous for someone to readjust to a less-sophisticated prosthesis.

Otto Bock executives were upset, says James. "They were saying, 'This is a no-brainer, we're not going to build this knee … we can't put amputees at risk.'"

James managed to convince them otherwise. "Let's just change the number of phases the knee goes through during a step," he said. The idea of easily tweaking a few lines of code for the knee's microchip was an eye-opener for Otto Bock. Over time, the phases of the knee evolved, eventually eliminating any phase where the knee is locked and anything that made the knee too complicated for users to figure out.

The knee's simplicity is one of its main selling points. "You don't read a manual, you don't understand it, you don't think about it—you just walk," says James.

That's one reason Ben Proulx loves his C-Leg. The 20-year-old lives in Sherwood Park, Alberta. He lost his leg to cancer at age three and was first fitted with the C-Leg when he was 13.

Proulx played sports as a child and, until he got the C-Leg, his hydraulic knees broke every few months. Getting the new leg "was a big change for me," says Proulx.

He has back problems from walking with a limp for most of his childhood. "Right away the leg started diminishing that. It made running easier because of the resistance changes. It just made everything easier."

"They all said, 'I don't know, it's pretty complicated.' Remember, in 1992 people didn't know anything about computers."

— KELLY JAMES

Thousands of C-Leg users around the world are grateful to James for changing their lives. At trade shows, "people would come up and cry: 'Thank you for building this! It's saved my life.'"

James is now working on leg braces for people with spinal injuries and diseases, using the same microchip and valve combination as the C-Leg for easier movement. Despite having fallen into the field of prosthetics by accident, he has no plans to change his career path.

"I'm happy that so many amputees are walking properly now."

Isabelle Gallant is an Edmonton-based writer and broadcaster.

THE ARM THAT WILL BLOW YOUR MIND

Patrick Pilarski has deep reserves of enthusiasm—and it's contagious. Speaking to a group of high school students in a Faculty of Engineering DiscoverE outreach camp last summer, he explains how reinforcement learning can make machines 'intelligent.'

Using a small robot called the CritterBot and a simple Wii video game control pad, Pilarski demonstrates that by using positive or negative feedback—pressing the plus or minus symbols on the pad—the students can 'train' the robot to do their bidding. One student teaches the robot to spin in a counter-clockwise direction. Another teaches it to use its motion detectors and follow a soccer ball.

All the while, Pilarski explains reinforcement learning and artificial intelligence by comparing it to the human experience. He reminds students what it was like the first time they dribbled a basketball—how awkward and clumsy they were. But the more they practised, the easier the action became. One student compares that type of muscle-memory to learning to play the clarinet.

With the parallels he draws between computers and humans, it's no surprise that Pilarski sees prosthetic limbs of the future acting co-operatively with people.

"If you're a carpenter and you lose your arm in an accident, why not have a hammer for a hand?" he asks. "Or if you're doing drywalling, why not have a drill?"

But Pilarski envisions a future in which it isn't just form and function that make prosthetics special—but the 'intelligence' they have and the 'decisions' they make. It's a brave new world with no limits. Imagine, for example, an arm that telescopes out, extending your reach to the top shelf in your kitchen because it 'knows' you're cooking.

Pilarski explains it this way: we've got the computing horsepower to put all kinds of sensors into a prosthetic arm—a computer that knows what time it is and what the date is, a device that measures air temperature, accelerometers and force sensors so an arm knows something about its own motion. And importantly, it has memories it can draw upon. Using all the data its sensors provide, a prosthesis could arrive at the conclusion that on Wednesday night at 8 p.m. it is at the bowling alley. Having determined its whereabouts, it prepares to move its wrist and elbow accordingly. Or, it could realize that every weekday at 6 p.m. it is in the kitchen preparing dinner and that a shrug of the shoulder from its owner, in this setting, means the arm should telescope out to reach that bag of rice on the top shelf of the pantry.

The arm would act in the context of its environment. Pilarski wants to see limbs that adapt to their owners' lifestyles, constantly comparing their current state to previous performances and standard-setting calibration tests. "When I'm in the car, it would know if I am reaching for the stereo or the rear-view mirror, because it knows where the stereo is. So my hand would open to just the right size when I reach for the rear-view mirror, because it figures out that I am going to adjust the rear-view mirror. And when I bring my hand to my face, it figures out that I want to adjust my glasses.

"Our computational power is going through the roof, and the amount of data we have coming in is getting bigger and bigger—it's like a fire hose. It is on our shoulders to develop methods to capture this data and do something with it," he says.

"I'm in the business of applied science; at heart, I am an engineer. I like applying theory to real-world domains."

— PATRICK PILARSKI

Now doing post-doctoral research with the university's Reinforcement Learning Artificial Intelligence Laboratory and the Alberta Ingenuity Centre for Machine Learning, Pilarski says his head spins when he considers the phenomenal advances that have been made there. "These labs are developing cutting-edge artificial intelligence and machine-learning methods.

"I want to figure out how these techniques can be applied to real-world problems. I'm in the business of applied science; at heart, I am an engineer. I like applying theory to real-world domains. Through my work, I want to pursue discipline-crossing research and do some good with it."

— **Richard Cairney**

Patrick Pilarski explains how artificial intelligence and machine learning parallel human intelligence and learning.

Jimmy Jeong

Fraser Institute honours Markin

Award recognizes promotion of free market ideas

Allan Markin, chairman of the board of Canadian Natural Resources Limited, was presented with the Fraser Institute's T. Patrick Boyle Founder's Award, which recognizes excellence and achievements in the promotion of economic freedom and free-market ideas.

In accepting the award last November, Markin spoke of synergy and personal responsibility.

"We are all entrepreneurs at Canadian Natural. The soul of an organization is created by the combined voices of its employees and leaders," he told the crowd of more than 500 who joined in the celebration.

Markin went on to say that ego often gets in the way of achievement, and that successful entrepreneurs are those who listen to others before acting. Listening to and valuing the opinions of others generates more than just good ideas—it creates a sense of teamwork and goodwill and improves productivity.

"People can be more productive when they are heard and valued," he said. "Their opinions matter, and we do everything we can to develop their expertise so that they want to continue to share their expertise with us."

Canadian Natural is a world leader in the exploration and development of crude oil and natural gas. Under Markin's direction, the company has cemented itself as Canada's largest heavy oil producer and second-largest natural gas producer.

Markin himself is a major philanthropist, having donated generously to numerous causes across the province, notably the University of Alberta Faculty of Engineering, as well as various other academic institutions and health care facilities.

Allan Markin

"Allan Markin is an icon among Canadian entrepreneurs, and his generosity of spirit is unsurpassed," said Brett Skinner, Fraser Institute president.

"Allan's leadership and vision have made Canadian Natural an indispensable player in the economic success of both the province and the country, and his philanthropic legacy will forever enrich Canadians."

Alumni Events

Faculty of Engineering events keep you connected to what's happening in your faculty. We invite you to attend the following events taking place this spring in Edmonton and Calgary. (Plans for events in Vancouver, Victoria, Toronto and Ottawa this fall are being considered.)

Admission and refreshments served at the events are complimentary—but to ensure we plan for the correct number of guests, we ask that you confirm your attendance no later than one week prior to the event using one of the following methods:

- Online at www.engineering.ualberta.ca/events
- By e-mail to rsvp@engineering.ualberta.ca
- By phone on the Engineering RSVP line at: 780.492.7167

Thursday, May 5 - Edmonton
Edmonton regional alumni and friends reception for graduates from 1985 and earlier

4:30 to 7 p.m.
Solarium (2nd Floor), Maier Learning Centre, Engineering Teaching and Learning Complex (ETLC), University of Alberta (approx. 116 St. and 92 Ave.)

Alumni host: Tom Gooding (Mechanical '78)

Who's invited: All Engineering alumni who graduated in 1985 or earlier, and their guests

Reception includes a presentation at 5:45 by Dr. David Lynch, Dean of Engineering, on the myths and realities of Alberta's oilsands development.

Thursday, May 12 - Calgary
Calgary regional alumni and friends reception

5 to 7:30 p.m.
The Westin Calgary
Britannia Room
320 4th Ave. SW, Calgary

Alumni host: Michael Sikorsky (Computer '96)

Who's invited: All Engineering alumni who are living in, working in or visiting the Calgary area, and their guests

Reception includes a presentation at 5:45 by Dr. David Lynch, Dean of Engineering, on the myths and realities of Alberta's oilsands development.

Thursday, May 19 - Calgary
Lecture: "The birth of a clean energy superpower: advancing canada's vision"

Presentation by Dr. Qingxia (Chad) Liu and Dr. Rick Chalaturnyk of the U of A's Canadian Centre for Clean Coal/Carbon and Mineral Processing Technologies (C5MPT)

4:30 to 5:15 p.m. Opening reception
5:15 to 6:45 p.m. Lecture and Q&A
U of A Calgary Centre
120, 333 5th Ave. SW

Wednesday, May 25 - Edmonton
Seminar: "You're never too young to have a will—the making of an un-will"

Presented by Remi St. Pierre on behalf of the Faculty of Engineering's External Relations Office

11:30 a.m. to 1:30 p.m.
E6-060, ETLC (Engineering Teaching & Learning Complex), University of Alberta (approx. 116 St. and 92 Ave.)

Who's invited: All alumni, students, faculty and staff

Lunch will be provided.

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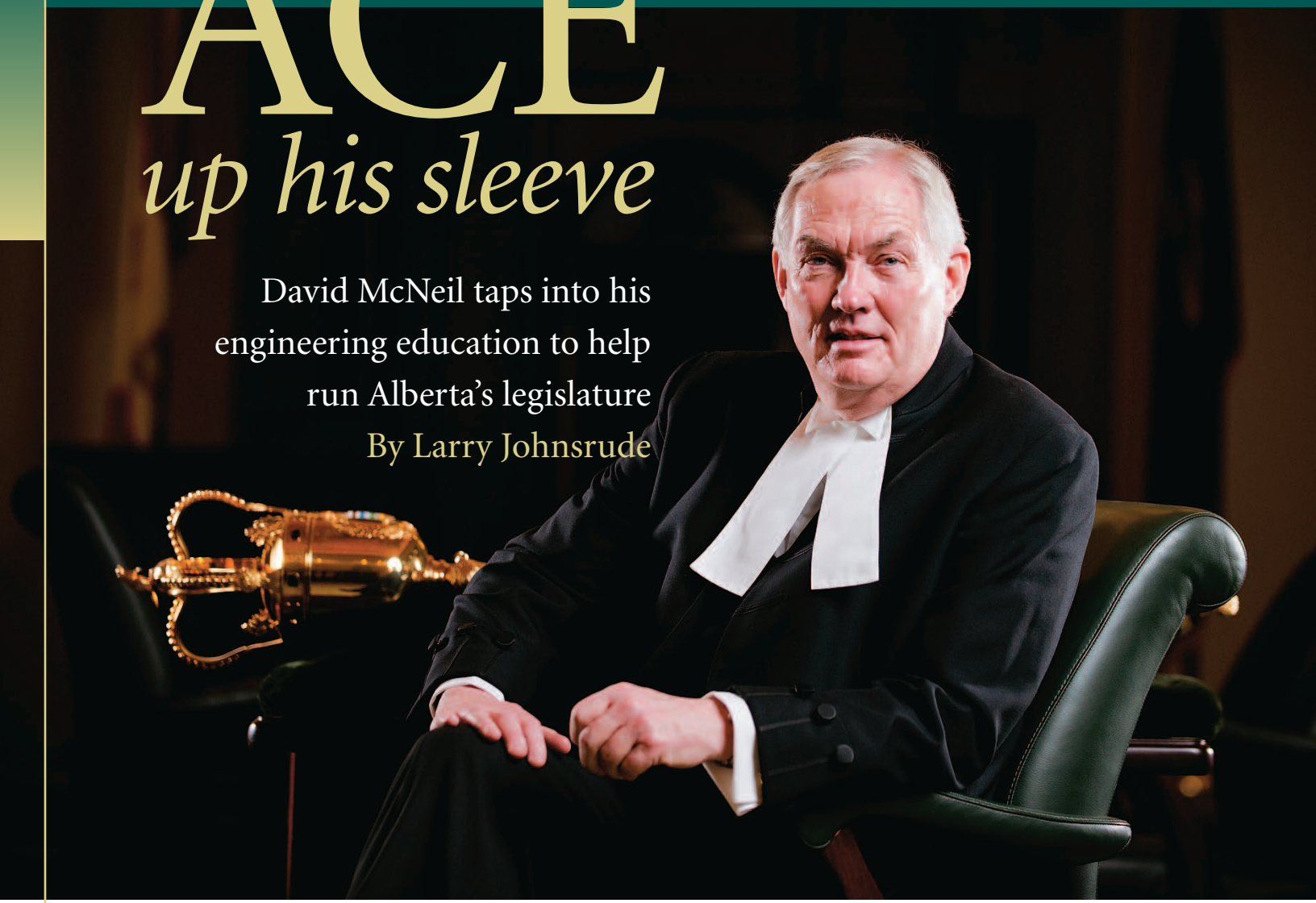
the ACE up his sleeve

David McNeil taps into his engineering education to help run Alberta's legislature

By Larry Johnsrude



Amid the hurly-burly of political theatre, David McNeil (Chemical '67) appears as an island of serenity.

Wrapped in a black legal robe, he sits stone-faced in the eye of the daily storm of bickering, shouting and name-calling. As clerk of the Alberta legislature, McNeil relies on his inner calm and engineer's mind to bring a semblance of order to the chaos. "Part of being an engineer is being a problem solver," he says. "There's always a problem here to be solved."

While people occupying positions like his generally have backgrounds in law or political science, McNeil started his career as a chemical engineer. The journey that took him to a job managing a roomful of politicians had a few twists and turns. But the way he explains it, it makes perfect sense.

Growing up in Calgary, McNeil's formative years were during the early 1960s, when the expanding world of science and the space race caught his imagination. With his interest in math and sciences and his origins in oil-rich Alberta, a career in chemical engineering seemed a natural choice. While studying at the University of Alberta's Calgary campus, he spent his summers working for Imperial Oil, where his father also worked as an accountant. Upon graduating with his bachelor's degree in 1967, McNeil moved to Toronto to work as a quality control engineer in the Kodak plant, the largest in the country, specializing in processing Kodachrome photographic slides. It was there that a string of events would change his career path.

While at Kodak, an industrial psychologist came to the plant to do profiles on the employees, identifying those with leadership skills. It was an experience that piqued McNeil's interest

in what he calls the "softer human side" of engineering. It prompted him to pursue a master's degree in management sciences at the University of Waterloo, which had just introduced industrial psychology to its engineering faculty. He was one of the first students to graduate from the program, and went on to earn his PhD in 1975.

Returning to industry, he accepted a job with engineering giant Bechtel, which was designing the Syncrude oilsands mine and plant near Fort McMurray—one of the province's first megaprojects. McNeil applied his expertise in organizational behaviour to setting up a workforce for the massive project. But as that job wound down, and facing the likelihood of a transfer to Saudi Arabia, he looked for work closer to home. He took a position as human resources planning officer in the Alberta government's Personnel Administration Office, which is in charge of all government employees. He served in various capacities in the PAO before going to work in a similar field for the Saskatchewan government in 1984.

Opportunity brought McNeil back to Alberta in 1987, when the position of Clerk of the Legislative assembly opened up. With his background in government personnel and human resources, McNeil was intrigued by the prospect of adding the political element to the mix. Despite his lack of experience in parliamentary procedure, he felt his expertise in management systems would make it a good fit.

"Parliamentary procedure was something I could learn," he says. "I had an experienced staff that could help me there. It gave me the opportunity to take what I knew from management systems in government and the private sector, and apply it to a whole new level."

As clerk of the legislature, McNeil's most visible responsibility is keeping the legislative assembly operating smoothly—a challenge in itself, considering there are now five parties with representatives in the house, compared with only three after the 2008 provincial election. "My job is to look after 83 politicians and make sure they have the office space, the staff and all the other resources they need to do an effective job representing their constituents," he says.

In the house, McNeil joins the daily Speaker's Parade opening the daily session and then sits quietly at the table in the centre, whispering advice to the Speaker and the house leaders on parliamentary procedure. "When there is a problem, I can offer a solution," he says. "But it is only advice. Often, the problem is of a political nature rather than a procedural one, and that's up to the politicians to deal with."

His duties extend beyond the chamber—as far as the province's boundaries, in fact. All government and opposition caucus offices fall under his area of responsibility, as do the MLAs' constituency offices, their staff, research and communications allowances, the legislature library and Hansard, the official verbatim transcript of legislature and committee proceedings. McNeil is also ultimately responsible for the smooth operations of the offices of the assembly, including the privacy and information commissioner, the auditor general and the ethics commissioner.

It's an area growing by geometric proportions. "When I came here in 1987, we had a budget of $12-to-$13 million a year," he says. "Now it's $58 million a year."

Perhaps the greatest advancement is the expansion of the legislature's digital world. When McNeil took over, there was only one computer for the entire legislative assembly office, used for accounting and payroll. Now, there are literally hundreds, offering web pages for the MLAs, instant access to the legislature library, Hansard online, live streaming video of the chamber, and digital access to all 83 constituency offices, regardless how remote. "I look for a scientific solution," he says. "As life becomes more complex, there is much more information out there on every topic, and there is increasing public demand for it. A lot of this can be dealt with by technology."

McNeil's aptitude for math has come in handy on a number of occasions. A recent example was when the Wildrose Alliance gained a fourth member, earning it official party status in the legislature. The problem was in figuring out its budget based on its number of members, complicated by the fact that its leader doesn't have a seat in the house. "I just thought up an algebraic equation, introduced a variable and had an answer," he says.

One project occupying much of McNeil's time is the multimillion dollar renovation of the Federal Building, a 1950s-era building to be used as legislative offices. "Having an engineering background gives me a fair bit of credibility with the builders," he says.

Speaker Ken Kowalski, the third Speaker under whom McNeil has served, says he offers a valuable perspective.

> "They all bring different perspectives and skills to the job. But I don't know if there are many others who would use an algebraic equation to settle a dispute over caucus allowances."
> — David McNeil

"Dr. McNeil's background in engineering has certainly influenced the analytical and integrated approach of his leadership style," Kowalski says. "Needless to say, it [the legislative assembly] may not be an environment that attracts engineers. However, Dr. McNeil has played a vital role in the evolution of the organization. I have seen him tackle complex issues by gathering all of the relevant information, dissecting the issue to its very root and then presenting a common-sense solution."

McNeil acknowledges that when he meets with other legislative and parliamentary clerks, he's probably the only engineer in the bunch. That's not to say they don't do a good job. "They all bring different perspectives and skills to the job," he says. "But I don't know if there are many others who would use an algebraic equation to settle a dispute over caucus allowances."

Larry Johnsrude is a veteran political affairs journalist and news broadcaster in Edmonton.

Jimmy Jeong

TOP 40 UNDER 40

Tegan Martin-Drysdale

Jason Franson

Michael Sikorsky

Roth & Ramberg Photography

Jocelyn Grozic

Trudie Lee

Three U of A Engineering alumni were named Top 40 Under 40 in the Calgary and Edmonton editions of *Avenue* magazine. While they've all chosen different paths, they share common characteristics: they challenge conventional wisdom and end up on top.

Jocelyn Grozic

Civil '94, PhD Geotechnical '99

Passionate pioneer

Dedication to dirt is unlocking the fuel of the future

By Judy Monchuk

Jocelyn Grozic knows her dirt. In fact, students say she loves her dirt. And she wouldn't disagree.

"It's hard to be passionate about something you don't like," says Grozic, (Civil '94, PhD Geotechnical '99) a rising star in the emerging field of gas hydrates, crystallized substances trapped in soil below the northern permafrost and under the ocean floor. Hydrates are gaining international attention as a potential alternative fuel source.

"I love working on stuff that hasn't been done before," she says, adding that her passion for discovery and teaching can be traced back to her engineering education. A brief consulting stint in Vancouver after earning her engineering degree convinced Grozic of the need for graduate work. She returned to the U of A because of its strong reputation and credits professors Peter Robertson and Norbert Morgenstern with changing her career path. Both men are forward thinking and can look at the big picture—helpful traits when trying to convince young academics to look beyond a narrow niche.

"They fuelled my passion for research," she says. "They taught me to ask questions. They were instrumental in creating an environment where I could get into the frame of mind to go on and do research. Dr. Morgenstern always asks 'What's the missing piece of physics?' To think like that is really what's required to do research."

Now an associate professor in the University of Calgary's civil engineering department, Grozic introduces her passion for soil to hundreds of first-year engineering students. She also hopes to open their eyes to the joy of research: a tall order in a province where engineers have a lucrative future in private industry.

"You get these light-bulb moments," says Grozic. "I like to inspire young people if I can. Sometimes, they just need to know that if they work hard enough, this can be for them, too."

Grozic's enthusiasm is infectious. Her teaching, for undergraduate and graduate students, has been honoured with excellence awards.

She is as passionate about her research as she is about teaching. And she's exploring an important research area. Gas hydrates are solid, ice-like substances of highly concentrated natural gas, with a breakdown of one part water to 165 parts methane gas. It's estimated that gas hydrate reservoirs contain more than double the organic carbon in conventional energy sources, offering tantalizing possibility to a world searching for transitional energy options.

For more than a decade, Grozic has studied underwater hydrates, determining what happens when rising temperatures cause the hydrates to decompose. She has raised more than $1.5 million to create a laboratory at the U of C, where she models the impact of global warming and offshore energy production to see how changes in heat and pressure contribute to hydrate breakdown and whether this causes large submarine landslides on the ocean floor.

With a growing number of offshore developments in place for conventional oil and gas operations, there is a huge interest in determining if the hydrate hazard can be managed to increase worker safety.

Increased demand for alternative fuel sources has also heightened international attention, in particular from Japan and Korea. The United States established a dedicated program to determine if gas hydrate reserves offshore are recoverable, both from economic and technological perspectives. Interest ramped up after production of natural gas from a hydrate reservoir in the Mackenzie Delta in 2009 proved hydrates were more than just a theoretical energy source.

"The idea that we can use hydrates as a vast source of natural gas is very appealing," says Grozic. She is in almost daily contact with her U.S. counterparts, trying to establish a project to compare and co-ordinate the results of gas hydrate research being done around the world.

"We realize that we have the technology to produce from a hydrate well," she says. "More research worldwide has led to better understanding. These models are saying this can be economically viable."

Grozic is also involved with a three-year study funded by the Natural Sciences and Engineering Research Council that looks to understand permeability, or the ability of fluids to flow through CO_2-hydrate reservoirs.

Grozic also likes to apply her passion for science and society at a far more personal level. She has visited classrooms to talk about career options through the outreach program of APEGGA, and was disappointed and surprised to find young girls who didn't feel those jobs were applicable to them. The daughter of an engineer father and a biologist mother, Grozic never thought she had any career limitations. As the mother of two young daughters, aged four and six, she knows the importance of keeping all options open and being a positive role model.

"I don't believe we need to drag women into engineering, but they shouldn't be limited by the fact that they're girls."

Judy Monchuk is a Calgary-based author, journalist and student.

Tegan Martin-Drysdale

Civil '02

Building success

Tegan Martin-Drysdale follows her instincts and finds rewards

By Fish Griwkowski

The key moments in Tegan Martin-Drysdale's career come down to two gut reactions. For the first, she was visiting Vancouver, laying eyes on that Escher-like community spiral, the Library Square complex. "I said to the guy I was with, 'I am going to work for the company that built this someday. I know I will.' And then I forgot about it." She explains this a decade later, at a coffee bar in downtown Edmonton.

Fast-forward from her Vancouver prediction to Martin-Drysdale's final university term in 2002, her civil engineering degree near its culmination. She was on a junior structural design co-op placement with CoSyn Technology. One task that came her way was a mid day industry conference including such topics as the use of pre-cast panels up in Fort McMurray. But, as she puts it, "Great—free lunch!"

There was more to it than that. "I sat down and chatted with the guy beside me. We talked about my experiences, about life in general, and at the end, he said, 'If you're ever looking for a job, or need any guidance, contact me.'"

The card she was handed read Norman Webster, who was then president of Read Jones Christoffersen, engineering consultants. After a Google search of RJC, "the first picture that comes up is Library Square. I was so excited! I couldn't believe it." The man who had just offered career tips was linked to a founding inspiration.

Martin-Drysdale may not believe in fate, exactly, but her gut was certainly telling her to take advantage of the coincidence. Webster, now a managing principal with RJC, recounts their meeting: "Sometimes when you meet young engineers you can tell they have a feel for how structures behave; she certainly seemed to have that. She was bright and focused and had a sense of drive about her.

"She has very high standards. I understand she persisted over a considerable period of time," he says, recalling the interview process.

Martin-Drysdale's version: "I literally just sent my resumé to one company, and that was them. I wouldn't accept that there was a second option," she smiles.

> **"When I said I wanted to build things, that's what I meant."**
>
> **— Tegan Martin-Drysdale**

This single-mindedness traces a path throughout Martin-Drysdale's life, through her first 18 years on a Peace Country farm. She got to be "second mom," and gobbled up fiction during three hours of school bus travel a day. "Looking back, it was a fantastic way to grow up. You learn a lot about work ethic, about helping the greater good and the family. I knew I wanted to build something. I was an artist, but I really loved math—the black and white of it."

Here began her cocktail dream of architecture: art plus math. Her stepfather was a welder and taught her the basics, young. "We'd buy a new grain bin and no concrete truck showed, so you learned a lot about rebar. I was shovelling concrete at 15, 16. I built my own three-storey tree house. We had a rope swing like Tarzan." In Grade 9, one teacher told Tegan she was an overachiever. "Growing up where I grew up, you didn't do things half-assed."

Despite how adventurous this all sounds, the engineer admits taking a careful path after her home-schooled high school, going to Grande Prairie Regional College then transferring to the U of A, where she would ultimately graduate with distinction. She took the toughest co-op program postings intentionally. One still fills her with a wistful look, a placement with the Northwest Territories Power Corporation. "Some friends of mine were saying, 'Oh, I sat in a truck all summer.' But I was travelling all over the NWT and Nunavut, going to remote communities."

Up north she built and maintained powerhouses for generators where only charter flights reached, including near Tuktoyaktuk. "I saw parts of Canada I will probably never again see," she says, adding that her employer empowered her through trust. "It was always, 'Here, you're on your own. Good luck!'"

Now—what about that second gut reaction? It came after graduating and after more than six years at RJC, where she evolved from engineer-in-training, designing columns, to being a lead structural engineer with a 42-storey tower to her credit. Now she had a team of junior engineers working under her, doing her old jobs.

"That transition as an engineer you never get taught, how to transition from a design engineer to a manager. It just happens over a period of time. Suddenly you end up spending more time managing people or attending meetings, working in the project group, than you end up designing.

"You look at how much construction was done in the Calgary downtown core since 2001; it was overwhelming. My mentor John Charrett said to me at the time, 'You will look back on this. Ten years from now you may not have built another tower since.' Some people only hit a boom cycle once in their career. But when you're in it, you just feel buried and behind."

Martin-Drysdale realized she had to follow her instincts again; even though the economy was slowing down, she was thinking about architecture. "I still love buildings, but I wasn't on the right side of the table. I wanted to be where the major decisions are being made, to express my creativity. The ultimate decision sits with the developer, where the money is. I wanted to be part of the decision-making process of building. What it looks like, what the use is, the location, how it interacts with the community, who lives there.

"When I said I wanted to build things, that's what I meant."

Two years ago she took a job as project manager with ProCura real estate services in Edmonton. With her engineering education, "when you sit at the table with the consultant and architect, the nice thing is you understand how the building comes together."

Since moving back to Edmonton, she has also become sustainability director of the Riverdale community league, talking about products, upgrades to homes, solar panels, energy audits, rain barrels, composting, community gardening and so on. Speakers are brought in. She also covets her role with NextGen, the city's under-40 think-tank, "to try and be that missing link between city council and the 'next gen' community. It's a group of diverse, passionate people that really want to make the city a better place."

They, and she, are excited about the development potential of The Quarters Downtown, Rossdale and especially the City Centre Airport lands. "The city owns the land. They have 100 per cent control of what happens there. They could do something unique for Edmonton, for North America. I have high expectations of them. They better get it right," she laughs. It's her passion for sustainable development and community building that earned Martin-Drysdale an *Avenue* magazine Top 40 Under 40 award.

"I strongly believe in mixed-use social household income and backgrounds. When you put rich, poor, you mix them all together, people accept each other. You're not removed from a situation. If you can drive away from it then you're going to ignore it. You need people in the street. To me, building a complex that's all seniors is just as wrong as building one that's all high-end, or all social housing. We're one of the few societies in this world that says 'Now that you're done contributing you can now go to your corner.' The elderly have so much knowledge, so much to contribute.

"That's the real sustainability."

Fish Griwkowski is an Edmonton journalist, photographer and artist, and an Avenue magazine *Top 40 Under 40 award recipient.*

Michael Sikorsky

Computer '96

Man on a mission

Michael Sikorsky guides students along the path of the entrepreneur

By Richard Cairney

Michael Sikorsky (Computer '96), CEO of Calgary-based Robots and Pencils Inc., was selected by *Avenue* magazine (Calgary) as a Top 40 Under 40 because "he's a wildly successful tech entrepreneur who has started six businesses—two of which he sold for a sweet payday. He has also played a part in the success of countless other companies," according to the magazine.

It is a fair accounting but not complete. At the U of A Faculty of Engineering, Sikorsky has also initiated the Entrepreneur-in-Residence project. He shares his entrepreneurial and technical expertise with engineering students who are interested in starting their own businesses. In his intensive two-day Startup School, he reviews the different routes students can follow to establish their own businesses, illustrated by his own documents, successes and failures.

Sikorsky works with the students, travelling from Calgary to host office hours on campus to follow their progress and advise them on product development, market research or securing investments.

The inaugural project wrapped up when Sikorsky invited a group of investors to listen to pitches from the students in "Beaver's Den," a home-grown version of the TV series *Dragons' Den*.

The outcome was spectacular. Panelists included Brian Prokop, an investor in dozens of companies from traditional oil and gas to IT to food and drink; Dave Howard, an angel investor who is also heavily involved in the Canadian Legacy Project that aims to improve the lives of disadvantaged youth, seniors and veterans; Dr. Leslie Roberts, an entrepreneur and president and founder of the GoForth Institute; and David Richard, a 32-year veteran of the oil and gas industry. Together, they offered more than $100,000 in investments, along with promises of mentorship to the students.

Together, they offered more than $100,000 in investments, along with promises of mentorship to the students.

For Sikorsky, Beaver's Den was all about the students.

"It's super hard getting up there and talking to these guys, asking them for money. They should all be proud for getting through this first one," he says. "I did very little coaching with the students this year—and look at this, we got some real deals done. I was worried that maybe no one would want to invest, but the students gave them reason to. It was great."

Father Glenn McDonald, left, with engineering students Kristen Antonio and Adam Pittman.

ST. JOE'S LIVING HISTORY

Engineering students are somehow drawn to the campus residence

By Scott Rollans

Every day, thousands of U of A students pass the noble brick facade of St. Joseph's College without a glance. But for nearly 600 engineers, "St. Joe's" represents an indelible part of their university experience. Through most of its long history, St. Joe's has attracted an inordinate number of engineering students. Even the current director of residence at St. Joe's is an engineering alumnus.

"In any given year, a third of the male residents are engineers," observes Father Glenn McDonald (Mechanical '01), St. Joe's director of residents. "It's never been an intentional thing. We don't actively recruit first-year engineers. But, for some unknown reason, St. Joe's tends to be a great incubator for first-year engineers."

Glenn, himself a former St. Joe's resident, has his own theories about the phenomenon. "It could be that the community life of St. Joe's naturally helps them do well," he says. "It teaches you to attack problems in a group, instead of trying to trying to do them on your own, which is the kiss of death in engineering."

Glenn also credits the college's emphasis on intramural sports. "Engineering is very demanding, and the guys and girls deal with a lot of stress. Campus Rec gives a healthy outlet for that."

As a matter of fact, each resident is expected to participate on 10 intramural teams—a tradition that has paid off. For 24 consecutive years, St. Joe's has won the Campus Rec Intramurals Cup for men. "It's a tradition we hold very near and dear to our hearts," says Glenn. "We go up against Engineering, Nursing—all the large faculties. We're only 63 guys, and yet we win the cup every year."

For fourth-year mechanical engineering student Adam Pittman, the residence's camaraderie was a strong draw. "We had a dozen first-year engineers in my first year here," he says. "I was attracted to the idea that there'd be a lot of other guys with similar interests, in similar programs. The sense of community is really, really strong. I have made lifelong friends here."

The same holds true for women at St. Joe's, even though their residence—Kateri House—is down the street at HUB Mall. Kristen Antonio, a first-year engineering student from Edson, Alberta, credits St. Joe's for helping her adjust to life away from home. "Knowing a bunch of other students going through the same things—like other first-year engineers—has helped a lot. It made the transition from high school to university a lot easier."

That special St. Joe's bond stretches far back through the decades, says Glenn. "Even in my time, in the late 1990s and early 2000s, we had engineers who had been here in the 1950s, and they would come back and want to see their old rooms. The rooms are very small—but there was still that sense of community, even back then."

John Basaraba (Chemical '51) is living proof. Basaraba first came to St. Joe's in 1949, after enduring a winter's worth of 90-minute commutes by streetcar from Calder, where he had been staying with relatives. "That streetcar was terrible—honest, it was," he grimly recalls. "It was always frozen; it was even too cold to open a book. The conductor had a little stove to keep the front warm, so he wouldn't freeze and fall off his chair, but the rest of us were pretty cold."

A minor surgical procedure proved a blessing in disguise, says Basaraba, when it forced him to seek lodgings closer to campus. The St. Joe's rector offered him a bed in the attic, in a space shared by two other students and the college janitors. "It was the only vacant square foot in the building. But, my standards weren't the Hotel Macdonald—my standards were a farm at Smoky Lake."

Best of all, the bed came with St. Joe's meal privileges. "We got the same grub as everyone else," says Basaraba, "and the food was the best on campus.

"We had a brunch on Sunday mornings, for all the guys who went out on Saturday night. Visitors were welcome—50 cents got them a wonderful meal. So the Athabasca and Assiniboia boys would come over."

Back then, St. Joe's was also the scene of some youthful hijinks, according to another former resident, Gerry Maier (Petroleum '51). "I remember one guy who was a bit aloof and didn't participate in a lot of things. He was always studying." Maier and his pals sneaked repeatedly into the student's room, shortening the legs of his chair and study table a half-inch at a time. "After about three weeks, he finally realized something funny was going on," laughs Maier.

These days, Glenn does his best to manage similar impulses—a tricky job for someone not much older than his charges. "The one thing I really had to work on was being a disciplinarian," he admits. "I'm a priest, but I'm like a parent to all these young people." Living alongside the guys helps him build a connection, he says. "There's a whole gamut of difficulties and issues that you don't see in the classroom but that come out as part of living with them. And you're trying to help them to grow as human beings. Whether they be Catholic or non-Catholic—if they're my resident, we're trying to keep them on the straight and narrow."

Glenn clearly relishes St. Joe's role in shaping young lives. But, back when he was a third-year engineering student, he had no idea how profoundly the college would shape his own life. He had decided to move into St. Joe's after experiencing the first unexpected inklings of a spiritual calling. After a lifetime of self-identification as a math and science geek, the concept of an abrupt shift to a right-brain career in the priesthood seemed almost absurd. "I was, like, 'That's crazy!' " he now chuckles. "Theology is about old languages, big ideas, concepts about God—which are much more difficult to nail down than Pythagoras's theorem, or the heat equation, or something like that."

As this strange new idea gradually took root, he decided to complete his engineering degree—a move he has never regretted. "Engineering forever changes the way you think," he says. "It gives you those logical, problem-solving skills: this is the problem; how do you break it down? I took those skills that engineering taught me and transferred them to theology. Engineering was a passion for me. It was hard—it was really hard—but, as they told you in first year, it builds character. It pushed me from being a boy to a man."

"I was attracted to the idea that there'd be a lot of other guys with similar interests, in similar programs. The sense of community is really, really strong. I have made lifelong friends here."
— Adam Pittman

Now, as residents director, Glenn hopes St. Joe's can continue to provide students with the same thing it provided him: a great experience that leads to something even greater.

"We will have failed them if their years at St. Joe's are the best years of their life. St. Joe's should be a stepping stone—just like their time at the university should be a wonderful time, but not the best. It should give them the tools and abilities they need to go on to do amazing things."

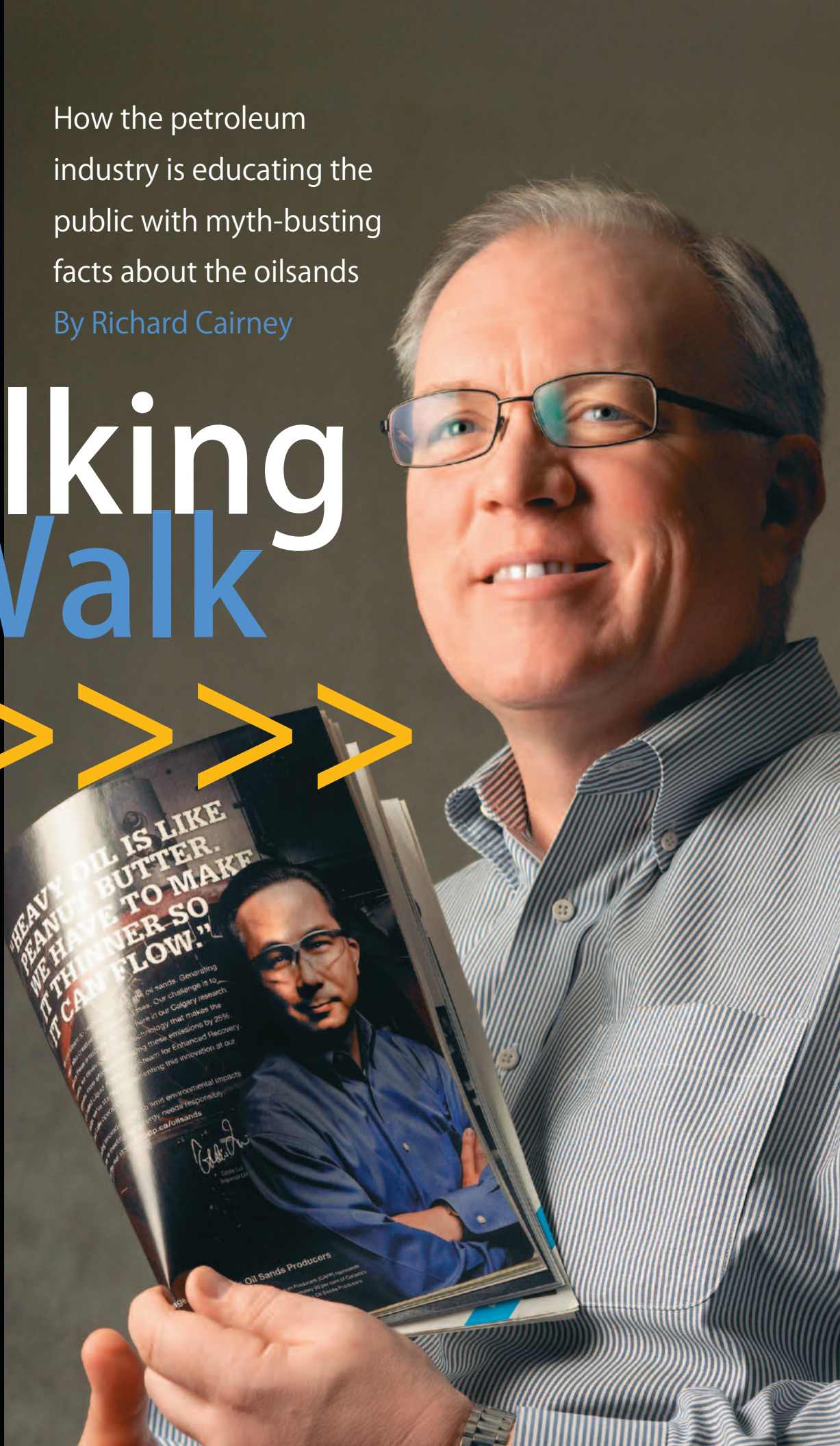
Scott Rollans is an Edmonton-based writer, editor and musician.

Jason Franson

How the petroleum industry is educating the public with myth-busting facts about the oilsands

By Richard Cairney

Walking the Walk



CAPP president Dave Collyer (Mineral Process '77) led Canada's petroleum producers to the forefront of a public awareness campaign that depends on facts, not hyperbole.

Trudie Lee

Environmental groups had been complaining about the impact of oilsands development in northern Alberta for some time when, in April of 2008, more than 1,500 ducks landed in a tailings pond at Syncrude's Fort McMurray plant. The event was no doubt an environmental tragedy, but it has also become an important tool used by groups opposed to continued development of Alberta's oilsands. They demand a moratorium on oilsands development and stronger environmental regulation of the industry. With media relations savvy, established networks of like-minded individuals and—yes—legitimate concerns, environmental groups spread awareness worldwide of the oilsands and their impact.

The issue has become something of a *cause célèbre*. Last fall, movie mogul James Cameron toured the oilsands and then met with University of Alberta researchers at the Faculty of Engineering to learn about what's being done to reclaim land affected by the oilsands industry and to reduce the industry's impact. Internationally, environmental groups were calling for a boycott of tourist travel to Alberta. The province sent special envoys abroad to counter the 'dirty oil' campaign. Negative images gained traction in the media: oil-covered ducks, tailings ponds and land strip-mined for bitumen. In the court of public opinion, the oilsands industry was taking a beating.

While this was frustrating to watch, industry officials like Eddie Lui (Mechanical '81) also saw an opportunity to bring research and advances in oilsands technology front and centre in the debate.

"As a company, we talk about the 'social licence' to operate, to develop the oilsands responsibly," says Lui, Imperial Oil's vice president of oilsands development and research. "I feel strongly about the oilsands and their importance to Alberta, Canada and the global energy supply—and I'm responsible for developing new technologies to make them work better. We have to be responsible and make sure our operations are safe and environmentally acceptable."

Lui is one of a handful of industry workers, from the boardroom to the oilfield, featured in a public awareness campaign launched last fall by the Canadian Association of Petroleum Producers (CAPP). It's part of an effort to defend the industry from misinformation, bring objective facts to the public and shift public opinion about the oilsands. At the same time, the campaign aims to demonstrate leadership and give facts to individuals and groups who support the industry, enabling them to talk about improvements that have been made over the course of decades to reduce the environmental impact of the oilsands.

According to Dave Collyer (Mineral Process '77), president of CAPP, Canadians have a balanced and realistic understanding of the oilsands. Polling done by CAPP shows that, in broad terms, Canadians understand the economic importance of the oilsands, appreciate the value of having a reliable supply of energy and expect

Imperial Oil vice-president Eddie Lui is featured in one of several CAPP commercials. Lui says environmental stewardship is part of the industry's "social licence" to develop the oilsands.

industry and governments to demonstrate ongoing improvement in environmental performance.

The commercial Lui appears in features new technology, developed by Imperial, that injects solvent with steam to boost recovery from oilsands deposits. The method reduces greenhouse gas intensity by 25 per cent. Another commercial features Devon Energy power engineer Gordon Lynch talking about using brackish water instead of fresh water to produce oil. In a third, Shelley Powell, an engineer with Suncor, talks about a new method being used to dry tailings.

Last year, the major oilsands players took a major step forward on tailings ponds, the lakes of toxic sludge that are a byproduct of bitumen extraction. In December, senior executives from Canadian Natural Resources Limited, Imperial Oil, Shell Canada, Suncor Energy, Syncrude, Teck Resources and Total E&P Canada announced they were sharing all of their research on tailings and would work together to help solve the problem. Lui, who was on hand for the announcement, says it was an unprecedented development.

"It was historic—you had seven companies removing monetary and intellectual property barriers to collaborate. There are different technologies being developed, but by agreeing to open all the books, to share all we've learned and all of our operating experiences just means we will develop better solutions faster and cheaper."

The CAPP awareness campaign, Collyer says, "is very much about having people who are working on these projects, like Eddie and many others who are strongly committed and passionate, talking about the results they are delivering and very tangibly demonstrating the improvements that have been made—and there are many."

That might come as a surprise to some people. Opponents of oilsands development approach the public relations battle with not only media savvy, but also a flair for hyperbole. It's easy to evoke an emotional response to pictures of strip-mined land, tailings ponds and ducks covered in oil. But Collyer says the oilsands are a more complicated story and he admits communication has not been the industry's strength.

"We need to realize that the campaigns by many organizations do stretch the truth, if not factually misrepresent the performance of our industry," says Collyer. "And [the oilsands industry] has not been actively engaged, historically, in telling our story beyond talking to our local and regional stakeholders who are directly affected by development. In today's world, it is important that we communicate more broadly, and our communications must go hand-in-hand with continuous performance improvement."

The CAPP awareness campaign and commercials produced by Cenovus were part of the discussion during a public forum on corporate social responsibility held to observe National Engineering and Geosciences Month at the U of A with panelists agreeing the oilsands industry has become a target for environmentalists.

The speakers, who all agreed that the oilsands industry is emblematic of carbon use, included Gord Winkel, a former vice president of Syncrude Canada who is now the Industrial Professor of Engineering Safety and Risk Management in the Department of Chemical and Materials Engineering, Lianne Lefsrud (Civil '94, MSc '96), a doctoral student in organizational analysis at the who has worked in regulatory affairs with APEGGA; and Tyler Wry, a professor at the Wharton School of Business at the University of Pennsylvania who specializes in social entrepreneurship.

Lefsrud told the audience that the commercials give the industry some power in the debate because it is "defining what improvement looks like."

Winkel, who rattled off a litany of statistics describing environmental improvements the industry has made over 40 years, said that in emotional debates "numbers aren't always welcome" but the commercials and print ads at least get a conversation started. He cited a Cenovus commercial that begins with a close-up shot of an industrial plant then pans out to show that it is surrounded by vast tracts of boreal forest. Winkel said, "If I walked up to you and told you that after 40 years the oilsands industry has disturbed less than two one-hundredths of one per cent of the boreal forest, that might not mean much to you. The picture is more effective than anything I have just told you."

Liz Hannah, vice-president of communications with Cenovus, says the company's 'A different oilsands' and 'More than fuel' advertising campaigns remind people about the uses for oil and natural gas in our daily lives, and educate them about in-situ bitumen extraction, which doesn't involve strip mining or tailings.

"For us, it was a business decision to ensure that people understood the value of the oil and gas they use every day, and to understand where their oil is coming from—specifically what our operations

look like in the oilsands," Hannah says.

"We want to make sure people understand that companies are doing the best they can to get the oil out, and they are really committed to improving how they are getting the oil out of the ground."

While Wry cautioned that BP had branded itself as a 'green' company long before the Gulf of Mexico disaster, he added that he is "amazed" at the shared values on either side of the oilsands debate. "If you're in Greenpeace it's not OK to question whether climate change is real or not," he says. "I think there is a reasoned position to be taken on either side."

But if environmental groups cite one fact and industry cites an opposing fact, where can average people go for objective, big-picture facts? Collyer and Lui both agree that academics have an important role to play in getting information out. Collyer cites a report, written by the Royal Society of Canada in December 2010, that provided an objective scientific perspective on the oilsands. The report concluded that the oilsands do not affect the environment to the extent claimed by its critics, but that more work is required by governments to improve monitoring and by industry to further mitigate and reduce its environmental impact.

Lui admits public pressure is driving changes in the industry and the regulations under which it operates. But he adds that another factor behind changes—for example, collaborating on tailings research—is just knowing that it is the right thing to do. He talks passionately about the company's approach to doing business, which takes into account what he refers to as the three Es: energy, the economy and the environment.All three need to be considered in company decisions, he insists.

"Let's be clear. We as a company are here to make money, not lose it. But there are decisions we make that are going to cost us a little more to implement, but in your gut you know it is the right thing to do, so we go ahead and do it," he says. "If it were only about making money, it would be too easy. It is not all about making money."

Cenovus has launched its own public awareness campaign, educating people about the many uses for petroleum products and about in-situ oilsands operations.

An attraction to REACTIO

Nexen professorship takes aim at taming catalytic reactions and educating engineers of tomorrow

BY RICHARD CAIRNEY

Jason Franson

You get a strong feeling that Arno de Klerk is a good teacher when you ask him to explain catalytic reaction engineering to a non-engineer. Most everyone knows that a catalyst prompts or speeds some process or another and that heating chemicals can speed up reactions. De Klerk has a way of expressing it that colourfully illustrates the subject he teaches and researches.

"We can look at conversion in two ways. Years ago all we did was use temperature, and even today we do a lot of thermal conversion to make molecules just fall apart. It's a free-for-all. It's like a bar fight, with all the molecules doing whatever pleases them, and they just fight it out."

Under the newly established Nexen Professorship in Catalytic Reaction Engineering, de Klerk is focusing on taming those kinds of scenarios, with an eye to reducing waste and pollution.

"Using catalysis, we put something in place that makes it easier for the molecule to do its thing, in less severe conditions—it's more like a debate club. It's civil."

The technique can also provide pathways for selectivity to avoid waste, he explains.

"Society is increasingly aware that it isn't right to be wasteful with resources or to pollute. And we can put in a lot of preventive measures, as engineers, and a lot of engineering is about mitigating the impact on the environment.

"But what we are talking about here is not making a byproduct that's harmful in the first place, so we don't have a new problem to deal with."

The establishment of the professorship by Nexen, a Calgary-based global energy company, "creates a wonderful opportunity," says de Klerk, adding that catalytic reaction engineering encompasses a breadth of products too long to list.

"Really, it's everything," he says. "It's the conversion of bitumen to transportation fuels, or how do you take a lump of coal or a handful of bitumen and turn it into gasoline or jet fuel, or shampoo or laundry detergent or Aspirin?"

Andrea Bosnjak, who oversees Nexen's community investment initiatives, says establishing the professorship is an important part of the company's desire to give back to the community through education while enabling the advancement of a Faculty that supports the responsible growth of Alberta's energy industry. She says it's important to Nexen that such investments endure—supporting educational initiatives creates a positive impact that is far-reaching and long-lasting.

"The idea is to help the universities fund programs that enable them to strengthen

Arno de Klerk, Nexen Professor in Catalytic Reaction Engineering, says partnerships between industry and academia are catalysts for great things.

their educational offerings while also providing Nexen and our industry peers with well-qualified employees. Our partnership not only helps with the education of students and gives them real-life, relevant experience but also helps further the dialogue when it comes to technological innovation in our industry, and we want to be part of that progression," she says.

"You have these university students who are being introduced to this area, who are going to be taking this further as they move in their careers, and this knowledge will be passed to generations to come."

It's just another example of the role Nexen plays in public service. For the last decade, the company has provided scholarships that allow students from Yemen, where the company has significant assets, to study in Canada.

De Klerk says partnerships like this benefit society overall. Undergraduate and graduate students benefit by learning about existing, relevant challenges in catalytic reaction engineering, helping to develop new solutions and, ultimately, applying their education in industry.

"Years ago, all we did was use temperature, and even today we do a lot of thermal conversion to make molecules just fall apart. It's a free-for-all. It's like a bar fight, with all the molecules doing whatever pleases them, and they just fight it out."

— Arno de Klerk

"Industrial visits" with Nexen will help de Klerk identify challenges faced by industry.

"There is a natural marriage between industry and academia. The university is very well set up to ponder the fundamental issues, and if we can identify opportunities, we can come up with something that is beneficial to society."

After all, he says, that's only fair. A new Canadian, de Klerk is tremendously impressed by the fact that companies such as Nexen work in partnership with higher education and that they are genuinely interested in sustainable products and the betterment of society.

"For me, this is wonderful. I am not a born Canadian, and the sense of social responsibility in Canada is so refreshing—the fact that a company looks out beyond its next balance sheet is wonderful. There seems to me to be a real sense of social responsibility here that you don't often see."

Alumni Weekend 2011

Thursday, September 22, through Sunday, September 25

We're revving up for a fantastic fall weekend full of familiar faces!

Each year, the Faculty of Engineering's External Relations team works with the U of A's Alumni Affairs office to put on a great weekend of activities for Engineering alumni to enjoy during Alumni Weekend. This year is no different as we prepare to celebrate special anniversaries for anyone who graduated in years ending in "1" or "6," as well as welcome all of our alumni back to our beautiful green-and-gold campus.

A major change this year is that the U of A's Alumni Affairs office will not be mailing out a full brochure with event information—all information will be posted on its website. But to ensure you have all the information you need for events hosted by the Faculty of Engineering, in June we will be mailing out an Alumni Weekend 2011 brochure to all alumni celebrating special anniversaries, as well as to all local alumni, regardless of their graduation year. Put this in a safe place over the summer, as it will come in handy when you attend Alumni Weekend.

Some alumni are hesitant to return to campus during Alumni Weekend and attend an Engineering event because they think they won't know anyone. Past experience suggests this is rarely the case!

Friday, September 23

Class of 1951 Luncheon
11 a.m. to 2 p.m.

Royal Glenora Club (11160 River Valley Road)

All alumni celebrating an amazing 60 years—or more—since graduation are invited to a special luncheon in honour of this year's "inductees," the Class of 1951. The beautiful river valley setting for this get-together is the Royal Glenora Club, which celebrates its 50th anniversary this year.

Dean's Reception
4:30 to 7 p.m.

Solarium, 2nd Floor
Maier Learning Centre, ETLC (Engineering Teaching & Learning Complex)

In the evening we gather all Engineering alumni—regardless of graduation year or discipline—and their guests together at the Dean's Reception. Dr. David Lynch, dean of engineering, will provide a brief "state of the faculty"address, with the majority of the event devoted to mingling and reminiscing with friends, former classmates, and even a few professors.

Saturday, September 24

Dean's Breakfast
9 to 11 a.m.

Solarium, 2nd Floor
Maier Learning Centre, ETLC (Engineering Teaching & Learning Complex)

If you're a graduate from 1966 or earlier, don't stay out too late Friday night because you'll want to get up in time to attend the Dean's Breakfast. In addition to a great meal, you'll hear a fascinating presentation on a timely engineering topic by a current Faculty of Engineering professor. (There are so many to choose from, we haven't decided on the topic yet!)

Engineering Expo
10 a.m. to 3 p.m.

Maier Learning Centre, ETLC (Engineering Teaching & Learning Complex)

Come out to the Engineering Expo to see informative displays, watch fascinating demos and talk to today's engineering students, professors and researchers. If you have children, grandchildren, or anyone else in your life who is considering taking engineering at the U of A, this is a great opportunity to learn about the world-class education we offer and the leading-edge research being conducted on our campus. Watch our website (www.engineering.ualberta.ca) for updates on possible mini-lectures, recruitment presentations, building tours, and other activities.

Engineering Cocktail Reception
5:30 to 6:45 p.m.

Edmonton Expo Centre, Rooms 107/107A

If you're attending the Alumni Gala Dinner on Saturday evening, plan to come a little earlier for the Engineering Cocktail Reception. It's a great place to socialize with all engineering alumni—and stave off the late-afternoon hunger pains—before joining your tablemates for dinner.

Class Reunion Organizers

The Engineering alumni below have enthusiastically volunteered to be class reunion organizers for Alumni Weekend 2011. If you are a member of one of the classes listed below, you may have already received a call or e-mail regarding plans for the reunion of your class. If not, please contact Leanne Nickel at 780.492.4159 or **leanne.nickel@ualberta.ca** to find out how to get in contact with your class organizer. If your class is not listed, you may want to consider volunteering to help ensure you don't miss this great opportunity to get together!

1951	Chemical Engineering	Art Davison
1956	Electrical Engineering	Matt Romanow
1956	Petroleum Engineering	Len Maier
1961	Civil Engineering	Leon Root, John Krebes, Ernest Portfors
1961	Mechanical Engineering	Doug Dale
1971	Mechanical Engineering	Glen Hammerlindl
1976	Electrical Engineering	Glenn Stowkowy
1981	Civil Engineering	Eric Jensen
1981	Mechanical Engineering	Barry Wasyliw
1991	Mechanical Engineering	John Barnes
1996	Mining Engineering	Fenna Poelzer
2001	Mechanical Engineering	Eric Matheson-Jones

Kudos Taking pride in achievement

BAYLE, CHRISTIAN PEng
Mechanical '92, MEng '93

Has been appointed Chief Operating Officer of Inter Pipeline Fund. During his 13 years at Inter Pipeline, Bayle has held several senior positions in the areas of pipeline operations, corporate planning and commercial development. Inter Pipeline is a major petroleum transportation, bulk liquid storage and natural gas liquids extraction business based in Calgary, Alberta. Structured as a publicly traded limited partnership, Inter Pipeline owns and operates energy infrastructure assets in Western Canada, the United Kingdom, Germany and Ireland.

BENKE, LARRY PEng
Electrical '73

Has been elected a member of the board of WorleyParsons at its recent AGM in Sydney, Australia. As the former CEO of the Colt Companies, Benke led their 2007 merger with WorleyParsons. Benke retired from his operations role as managing director, Canada in June 2010.

CAMPBELL, GLEN PEng
Civil '06

Has been awarded the Consulting Engineers of Alberta's 2011 Harold L. Morrison Rising Young Professional Award. With AECOM, Campbell created an in-house field design manual of the process to be used as a standard for all City of Edmonton neighbourhood renewal projects. He is an active volunteer within the profession, with the Association of Consulting Engineering Companies and the community, offering instruction in squash and supporting the Suzuki Society for Talent Education.

DiBATTISTA, JEFF PEng
MSc Structural '95, PhD '00

Has been elected president of the Consulting Engineers of Alberta Board of Directors. DiBattista is a principal with DIALOG, in Edmonton.

KING, FRANK PEng
Chemical '58

Has been awarded the Canadian Engineer Leader Award from the University of Calgary Schulich School of Engineering. The award recognizes an engineer who has achieved professional excellence and acts as a role model for future engineers through his or her practice and community service.

KIPNES, IRV PEng
Chemical '59, LLD (Hon) '09

Has been appointed as the 25th Dr. Allard Chair in Business at Grant MacEwan University. Kipnes, who is the executive chair and director of Liquor Stores, North American Limited, started his career as a chemical engineer for Imperial Oil, then as president and CEO of North West Trust. With his wife, Dianne, he has contributed to numerous community initiatives through the Dianne and Irving Kipnes Foundation.

KVISLE, HAL PEng
Civil '75

Has been appointed to co-lead the Alberta government's new oilsands environmental monitoring panel. Kvisle retired last year as CEO of TransCanada Corp. He will co-chair the 12-member panel, charged with developing a system for gauging the impact of oilsands development.

MASLIYAH, JACOB PEng

Has been elected as a foreign associate of the National Academy of Engineering, one of the highest professional distinctions awarded to an engineer, for advancing science and technology for the recovery of bitumen from oilsands. Masliyah is a University Professor Emeritus, in the Department of Chemical and Materials Engineering.

McNAMARA, GLENN PEng
Mining '78

Has been appointed as CEO of Petromanas Energy and appointed to the company's board of directors. He is a past governor of the Canadian Association of Petroleum Producers and a former president of BG Canada. He has held several senior executive positions with Exxon Mobil/Imperial Oil Resources, Exxon Mobil Canada Energy Ltd. and Mobil Oil Canada. Petromanas is focused on the exploration and development of oil and gas in Albania.

MICHALCHUK, GARY PEng
Civil '84

Has been awarded an Ernst & Young Entrepreneur of the Year 2010 Award. Founder and president of EIL Environmental Services, Michalchuk recognized the need for viable and affordable waste management and disposal-recycling options to help minimize environmental impact. The company has been providing hazardous waste management services, including used-oil recovery and recycling services, to companies across Western Canada since 1991.

MONTPELLIER, ALLAN PEng
Mechanical '94

Has been appointed managing director of the Boston office of WSP Flack + Kurtz. A senior vice-president and project executive, Montpellier has managed projects in a wide range of sectors, including principal in charge for the LEED Platinum Tacoma Center for Urban Waters project, project manager and lead engineer for the LEED Gold Woodland Park Zoo's interactive multimedia Zoomazium in Seattle, Washington, project manager and lead engineer for the Pier 1 Embarcadero adaptive reuse project (San Francisco, CA) (which received the AIA COTE Top Ten Green Projects award for 2002), and project manager and lead mechanical designer for the 300,000-square-foot Lion Plaza retail and office redevelopment in London's financial district.

DR. MURRAY R. GRAY, PEng
Has won the APEGGA Centennial Leadership Award. Gray is a world-renowned expert in petroleum processing, especially heavy oils and bitumen. Over the past 33 years, he has built an outstanding research record in the area of upgrading heavy oil and bitumen. He has produced 195 papers, reviews, book chapters and patents. He wrote and published the key book in his discipline, *Upgrading Petroleum Residues and Heavy Oils.* Gray is the scientific director for the Centre for Oil Sands Innovation and holds the NSERC-Imperial Oil industrial research chair in oilsands upgrading and the Canada Research Chair in oilsands upgrading.

DR. JOHN A. NYCHKA, PEng
Metallurgical (Co-op) '97

Has won the APEGGA Summit Award for Excellence in Education. Nychka exudes a passion for teaching that is evident in his approach to teaching a full range of class sizes, from large core undergraduate courses to small electives. A materials engineering professor, Nychka has become a leader in initiatives to improve the quality of undergraduate teaching. He developed and organized the U of A's first engineering workshop on teaching assessment and serves as a teaching mentor, recently taking on this role university-wide. He serves as co-chair of the departmental teaching enhancement committee, whose broad mandate is to evolve the curriculum and teaching practices to build better engineers and professors.

Do you have news to share? Send your news of awards, appointments and other successes to engineer.alum@ualberta.ca.

TELLAMBURA, CHINTHA PEng
Has been elevated to an IEEE Fellow in recognition of his contributions to physical layer wireless communication theory. Tellambura is an associate professor in the Department of Electrical and Computer Engineering at the University of Alberta. The status of Fellow is one of the Institute of Electrical and Electronics Engineers' most prestigious honours.

DR. TIAN TANG, PEng

Has won the APEGGA Summit Award for Early Accomplishment. She joined the Department of Mechanical Engineering in 2007. Tang is leading a team of graduate students studying mechanical and interfacial behaviours at nanoscale level and in biological systems. Her findings are used in many engineering applications, such as the development of new methods to process carbon nanotubes, and the design of synthetic polymers as gene delivery carriers to treat cancer. She has published 26 papers in international journals and is a reviewer for the NSERC Discovery Grant, and for prestigious journals such as *Science*, *Journal of Royal Society Interface*, *Langmuir*, *IEEE/ ASME Transactions on Mechatronics* and *IEEE Transactions on Nanotechnology*.

DR. WILSUN XU, PEng

Has won the APEGGA Research Excellence Award. Xu is a professor in the Department of Electrical and Computer Engineering and is the NSERC / iCORE industrial research chair in power quality. He started researching distributed generation (DG) anti-islanding protection in 2003 and is recognized as a leader in the field. He secured the support of ATCO Electric and Manitoba Hydro and conducted field demonstrations of the technology. His work has led to the publication of three papers in international power engineering journals and has resulted in a patent in the U.S.

David W. Murray

Known for being humble and generous, Dr. David W. Murray, a civil engineering professor with the department for almost 50 years, lost his battle to Lewy body disease and passed away last summer just days before his 80th birthday.

A native of Calgary, David completed his bachelor's in civil engineering at the University of Alberta in 1952 and, thanks to receiving the Athlone Scholarship, earned his MSc at the Imperial College in London, England, in 1954. He married Pearl in 1956, who was his life companion for the next 54 years. His journey as a professor at the University of Alberta began in 1960. A few years after joining the department, and with four young children in tow, David went on to complete his PhD at the University of California in Berkeley.

Studying abroad instilled in David a love of travel. Throughout his career, he invariably spent his sabbaticals abroad. "Our family saw a lot of the world because of him and his work," says Pearl. "We lived in Wales, Brazil and Germany—we travelled Europe from London to Istanbul and visited places like Machu Picchu in Peru. When we first were married, I was a farm girl who had never been beyond Alberta's borders! I can't believe how fortunate I have been to see the world as our family did."

David's early academic career focused on finite element analysis. After serving as chair of the department from 1982 to 1987, David returned to research and took up pipeline structural analysis.

"After his term as chair, David experienced a renaissance in his research," says Roger Cheng, current chair of the department. "He really created a whole new area of research for our department—and he made most of his contribution in this area after he had technically retired, as a professor emeritus."

David taught graduate students from all over the world, including India, Egypt, Iran and China. His long international collaboration was with the civil engineering department at Pontificia Universidade Catolica (PUC) in Rio de Janiero. He co-operated with researchers in Brazil for over 15 years, supervised several Brazilian graduate students and had several extended visits to Rio de Janiero. PUC recognized his contribution to their PhD program by awarding David an honorary professorship in 1991.

David's last graduate student defended his thesis in 2008, marking David's 48th year with the U of A civil engineering department.

"His life-long commitment to research and teaching, his world experiences that he shared with his family—I think it's a powerful example of a life well-lived," says Pearl. She is currently writing a book about his legacy, to celebrate David's life.

A scholarship has been established in David's memory. For more information, contact the Department of Civil and Environmental Engineering at 780-492-4004.

In Memoriam

The Faculty of Engineering sincerely regrets the passing of the following alumni and friends.

Lloyd Atkin, Civil '76, in September 2010
Mark Baron, Civil '54, in February 2011
Marvin Bayer, Electrical '59, in December 2010
Kristy L. Beinert, Electrical '06, in December 2010
C.R.T. Bingley, Electrical '49, in August 2010
James Buchkowsky, Mechanical '73, in October 2010
Robert Cook, Chemical '49, in October 2010
Charles Cotton, Civil '74, in November 2010
William Dexter, Chemical '50, in September 2010
Robert Dilke, Civil '47, in August 2010
James Ferguson, Civil '59, in December 2010
Royden Fisher, Petroleum '53, in August 2010
Dr. Donald Flock, Professor Emeritus, Mining Engineering, in February 2011
Mark Glaser, Petroleum '92, in January 2011
Ted Godard, Mining '39, in June 2010
Jack Harper, Chemical '50, in January 2011
Tom Hatch, Civil '60, in December 2010
Philip Heaton, Mechanical '93, in October 2010
A James Hoshizaki, Mechanical '93, in August 2010
Dmetro Hunchak, Electrical '62, in February 2011
John Jameson, Civil '63, in August 2010
Dennis Jensen, Mechanical '61, in September 2010
Thomas Kostiuk, Civil '51, in April 2010
Dr. Don Koval, Professor, Electrical Engineering, in January 2011
Jack Lawrence, Chemical '50, in June 2010
Edward Linney, Electrical '51, in September 2010
Gordon McCormack, Chemical '49, in October 2010
Donald McDougall, Chemical '65, in January 2011
James McKendry, Civil '60, in October 2010
John Mekechuk, Civil '54, MEng (Civil) '81, in January 2011
William Moore, Chemical '50, in February 2011
Harold Morrison, Civil '50, in August 2010
Richard Moyse, Civil '49, in August 2010
Wayne Paltzat, Civil '91, MEng (Civil) '93, in October 2010
Manfred Rockel, Petroleum '88, in January 2011
Dr. C.M. Rodkiewicz, Professor Emeritus, Mechanical Engineering, in September 2010
Barry Sanderson, Chemical '59, date unknown
Robert Shortreed, Electrical '47, in August 2010
Brian Spilak, Mechanical '95, in February 2011
John Swift, Chemical '41, date unknown
Peter Symborski, Civil '59, in October 2010
Robert Taylor, Electrical '48, in October 2010
Russel Terlesky, Chemical '62, in December 2010
Victor Thomas, Chemical '36, in November 2010
Robert Walker, Chemical '48, in December 2010
Bill Weir, Professor Emeritus, Civil '55, in October 2010
Bruce West, Chemical '52, date unknown
Del Wright, Chemical '59, in September 2010

The Faculty of Engineering was recently made aware of the passing of the following alumni more than a year ago.

Renard Campmans, Mechanical '97, in November 2009
Alfred Drew, Civil '27, in 2006
Ronald Millican, Chemical '66, in July 2009

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University of Alberta ENGINEERING

Where do ENGINEERS come from?

Established by U of A engineering students, the DiscoverE outreach program encourages youth to discover the wonder of engineering, science and technology through fun hands-on activities, school workshops and summer camps. Whether they're building popsicle-stick structures, peering into the Milky Way, or learning about artificial intelligence and machine learning, DiscoverE participants enjoy experiences that inspire curiosity and build the confidence to explore and create.

DiscoverE reached almost 20,000 youth in 2010. U of A students delivered camps and workshops in 49 communities outside of Greater Edmonton, reaching 12,636 youths in remote communities. What's more, 39 per cent of DiscoverE camp participants are female and the Girls, Engineering & Mentorship (GEM) Club hosted more than 100 girls between Grades 3 and 9.

The Faculty of Engineering is grateful to our DiscoverE partners for their generous support:

CATERPILLAR® · Esso Imperial Oil Foundation · Suncor Energy Foundation · Syncrude · Shell

I wish to make a gift of:

☐ $100 ☐ $500 ☐ $1,000 ☐ $2,500 ☐ Other $_____

☐ Cheque (made payable to the University of Alberta) ☐ VISA ☐ MasterCard

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☐ a corporate matching gift form from my (or my spouse's) employer

If you were an Alberta resident on December 31, 2010 and have already given $200 elsewhere, your combined income tax savings will be:

Your donation to the U of A	$100	$500	$1,000	$2,500
Your tax credit for your gift:	$50.00	$250.00	$500.00	$1,250.00

To best meet Faculty of Engineering's needs, donations may be directed to endowed funds. Donations made to endowment funds are invested in perpetuity and the investment earnings are used to advance the specified purposes of the fund within the University.

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$ _____ Other _____

☐ I would like information on how to make a gift of publicly traded securities to support the Faculty of Engineering at the U of A.

☐ I would like information on how to include the Faculty of Engineering at the U of A as part of a will, life insurance, or other planned gift instrument.

☐ I have provided for the Faculty of Engineering at the U of A in a will or trust agreement.

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