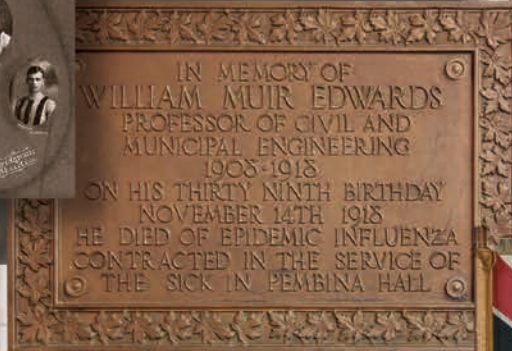


UofA • Engineer

Keeping in Touch with
Alumni



100 YEARS LATER

OUR FIRST FIVE ENGINEERS

Dr. Douglas Hamilton:
Rocket Surgeon

Rising
Stars

Remembering
Harry Hole

Counting the
costs of energy

Message from the Acting Assistant Dean External Relations

Helping others, as you would help yourself

What if you could go back in time and make your university education easier or more meaningful? Would you give the younger version of yourself a simple word of encouragement when you felt overwhelmed or homesick? Would you help yourself financially? Whatever deed you performed, how would your life have changed as a result of this kindness?



Clearly none of us can change the past, but you can have an impact on students who are going through the same demanding program you did—students who are just like you once were.

You can give students the experience you wish someone had given you, or perhaps someone did give you.

Established in memory of Michael Lazar (Computer '84) by the Computer Engineering Classes of '83 and '84, the Peer of Peers Award is interesting because students nominate one another for it—the award is presented to students on the recommendation of their classmates. Recipients are often described as “the type of person you’d want to work with.” They are team players who make university life better for those around them.

Recipients of this award are so proud of this recognition that they make a point of including the award on their resumes.

That’s only one type of award you, as alumni, have established to assist and encourage students. In a recent edition of *Legacy*, our planned giving publication, we told you about the situation that civil engineering student Dorcus Bakawa wound up in after a frightful car crash. A bursary established by the Civil Engineering Class of '49 allowed Dorcus to keep afloat financially and concentrate on her studies. An international student far from home, she feels blessed that engineers who graduated in 1949, who endured hardship themselves, had established a fund that will assist students, in perpetuity.

In the Department of Chemical and Materials Engineering, the T.W. Fraser and Shirley Russell Award has a profound impact on the development of a future professor by ensuring graduate students preparing for careers in academia have a dedicated teaching mentor guiding them.

The students of today are not that different from engineering students of the past. They want to learn and use their passion for designing, building, fixing and discovering to establish a career for themselves and to help our society. Along the way, they will struggle and fail, and they will overcome and succeed. A kind act of encouragement or support during a difficult patch can make all the difference, and may even be remembered and repeated for future generations.

How would YOU like to make a difference in the life of engineering students today? Let us know how we can help by emailing us at engineer.alum@ualberta.ca, or phoning (780) 492-4159.

Laurie Shinkaruk

Acting Assistant Dean, External relations

U of A
Engineer
Fall 2013 Issue 34

U of A Engineer is the Faculty of Engineering alumni magazine. It is published twice a year by the Dean's Office and is distributed to Faculty of Engineering alumni, friends, students and staff.

Dean of Engineering

David T. Lynch
(PhD Chemical '82), PEng

Acting Assistant Dean, External Relations

Laurie Shinkaruk

External Relations Team

Nena Jovic-Andrejevic, Linda Kelly, Corinne Longoz,
Leanne Nickel, Cindy Spears, Trevor Wiltzen

Publisher/Managing Editor

Richard Cairney

Copy Editing/Proof Reading

Richard Cairney, Leanne Nickel, Philip Mail

Art Direction

Halkier + Dutton Strategic Design

Contributing writers and photographers

Thomas Boyd, Dustin Delfs/
Laughing Dog Photography, Jason Franson,
Demetri Giannitosis
Tara Marchiori/Chasing Light Studio and Gallery,
Rick Pilger, Richard Siemens, Ellen Schoeck

Advertising

Richard Cairney

Tel: 780.492.4514 or 1.800.407.8345

Send Comments to:

Richard Cairney
Faculty of Engineering
E6-050 Engineering Teaching
and Learning Complex
University of Alberta
Edmonton, AB T6G 2V4

Tel: 780.492.4514 or 1.800.407.8354

Fax: 780.492.0500

email: richard.cairney@ualberta.ca

Website: <http://www.engineering.ualberta.ca>

Change of address:

cindy.spears@ualberta.ca

Publications Mail Agreement
No. 40051128

Return undeliverable Canadian addresses to:

Faculty of Engineering,
University of Alberta
E6-050 Engineering Teaching
and Learning Complex
Edmonton, AB T6G 2V4



FACULTY OF
ENGINEERING

FSC LOGO

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.

Table of Contents



11



16



26



6

6 Shhh!

If there's one thing we can tell you about Lucy Nolan's work at Intel, it's that we can't tell you anything about her work at Intel. But the path she followed to get there is an adventure worth reading.

8 Co-operative operative

Ken Porteous has grown the Engineering Co-op Program to one of the most successful programs of its kind on the continent. And the American Society for Engineering Education has recognized his work supporting co-operative education with a prestigious award.

11 Rocket surgeon

By following his passions and pursuing goals seemingly beyond reach, Douglas Hamilton has blended his interests as an engineer and an MD. The former NASA flight surgeon has been awarded the prestigious Distinguished Alumni Award for his achievements.

16 Rising stars

Do you remember the excitement of graduating? And can you recall the year of changes that followed? We visit four brand-new engineering graduates to find out what they have planned, and update you on four of last year's young alumni.

22 Counting the cost of energy

A new \$4.4-million industrial research chair is exploring the energy, economic and environmental costs of producing energy. This research will help government and industry understand which energy sources are most effective for different needs and will guide policy-makers to evidence-based decisions as they diversify energy use.

COVER STORY

26 100 years later

One hundred years ago the Faculty of Engineering graduated its first class of engineers. Like their teachers, these five original engineering alumni had a profound impact on our province and school, and their profession.

33 The founder of the faculty

William Muir Edwards was one of the four professors selected by founding president Henry Marshall Tory to open a new university in the West. This alone set him apart, but he went on to make an indelible mark, setting the tone for our traditions of teaching, research and service to others.

36 The Class of 2013

The Faculty of Engineering, with a little help from our friends, laid out a festive feast to wish our 101st graduating class well as they begin a new chapter in their lives.

38 Remembering Harry Hole

Engineer, entrepreneur, patriarch, philanthropist. Harry Hole (Civil '44), one of the most ardent supporters of the U of A and the Faculty of Engineering, passed away July 3 at the age of 91. A member of the U of A's "first family," Harry and his family have had a significant impact on the Faculty of Engineering.

On the Cover: Images from the earliest days of the University of Alberta and the Faculty of Engineering help breathe life into faded memories and archival documents. Extensive records held in storage at BARD, the U of A Book and Records Depository, tell the university's story. Outside Convocation Hall in the Arts Building, a plaque commemorating the life and achievements of William Muir Edwards, the flag of the U of A Troop from the First World War and the U of A's Active Duty Roll are all touchstones connecting us to our past.

DEPARTMENTS

25 In Memoriam

25 Kudos

Looking forward into our past

There's always a sense of newness and renewal here on campus. It always seems that anything is possible. Of course we have the rhythm of the school year to help us along in that mindset, with convocation ceremonies

in June and November, and fresh-faced students arriving each September. But the 'newness' comes almost daily.

Alumni Weekend, being held this year from Sept. 25 – 29, illustrates that cycle brilliantly as alumni and students mingle, bridging past, present and future.

Even in celebrating our faculty's history we can sense the excitement, frustrations and achievements of days gone by that make us what we are today. This edition of *U of A Engineer* is special in this regard.

The author of *I Was There: A Century of Alumni Stories about the University of Alberta, 1906 – 2006*, and *A Guide of Campus Maps*, Ellen Schoeck is one of the most knowledgeable people around when it comes to University of Alberta history. She has become great friends with many older Faculty of Engineering alumni,

notably Bill Kent (Civil '31) and the late Alvin Nelson (Electrical '39).

Ellen was the first person who came to mind when we decided to write about our first five engineering graduates. She knows where to look for information and has an uncanny ability to find tracks that have been covered by the passage of time. For Ellen, digging for these stories is a passion, a labour of love. She feels at peace flipping through pages of old alumni magazines or thumbing through newsletters; discovering original signed documents and photos breathes life into stories about our past.

This edition of *U of A Engineer* celebrates the history of our faculty, 100 years after our first engineers graduated. We also remember the remarkable William Muir Edwards, the university's first engineering professor, who set the standards in academics and community service that we uphold to this day. Ellen also spent time visiting with Muir's descendants, including his now 100-year-old daughter Joyce, in Ontario, while researching stories for this issue.

"This project felt personal," Ellen says. "Writing *I Was There* was different. Because there are only six people in these articles, I feel like I really got to know them."

You will too. The stories of our Faculty of Engineering's roots unfold, starting on page 26. The dedication of our founding professors and students to building this province set the standards in teaching, research and service that we still strive for today.

We also owe an enormous thanks to Jim Franks with the university's Books and Archival Records Depository (BARD) for his vital and enthusiastic assistance in helping us round up historic records, documents and photographs. BARD is a tremendous resource and its staff members are dedicated and talented individuals.

...

On another note relating to history, we made an error in our most recent edition. In an article entitled *The Gift* (*U of A Engineer*, Spring 2013) we failed to correctly identify the Class of 1983 as the first graduating class from the Computer Engineering program. This error has been corrected in online versions of the magazine.

Richard Cairney

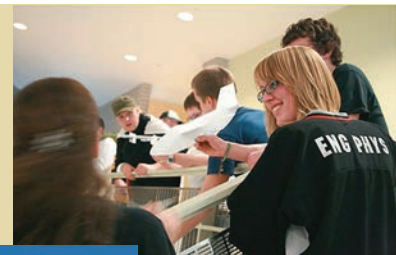
Richard Cairney
Editor

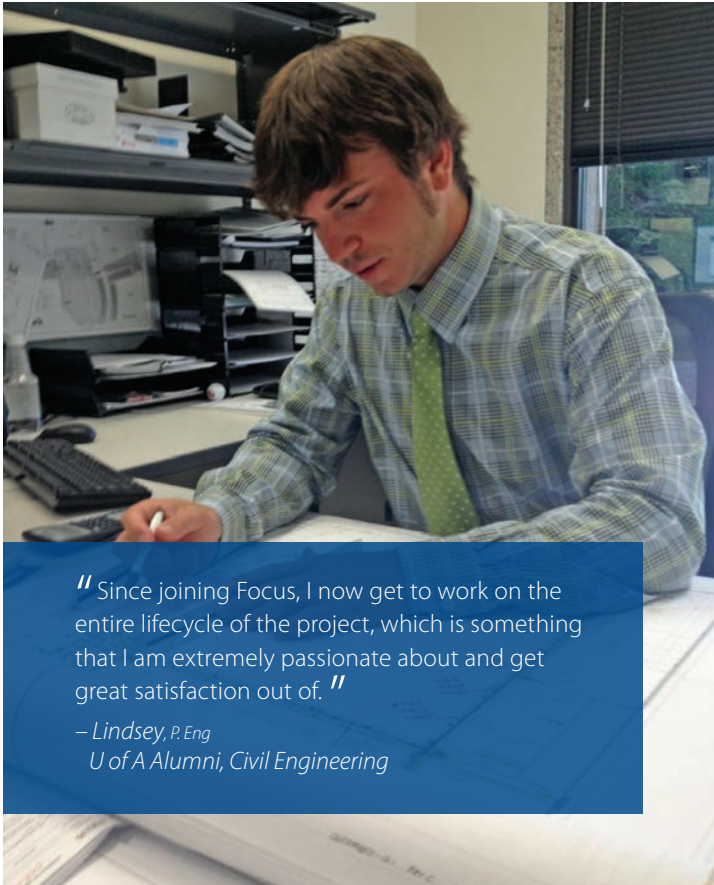
Staying in touch just got easier

Want to be informed about what's going on in the Faculty of Engineering?
Want to hear about other alumni, students and professors?

Become a fan of the U of A's Facebook page—you'll get news, photos and videos about the Faculty, students and alumni sent directly to your own Facebook account.

Join us online at:
www.facebook.com/UofAEngineering.





"Since joining Focus, I now get to work on the entire lifecycle of the project, which is something that I am extremely passionate about and get great satisfaction out of."

— Lindsey, P. Eng
U of A Alumni, Civil Engineering

Take your engineering career to the next level

Focus Corporation is a premier project delivery company, providing engineering and geomatics solutions to the energy, infrastructure, and land development sectors across Western Canada.

We are looking for experienced individuals that want the opportunity to become Branch Managers, Project Managers and more.

www.focus.ca > Join Our Team

FOCUS

Geomatics | Pipeline | Facilities Engineering | Civil Engineering

By sponsoring U of A Faculty of Engineering events, you are making connections with a vast network of more than 18,000 alumni.



making powerful connections



Hosted in Edmonton, Calgary, Fort McMurray, Vancouver, Victoria, Ottawa and Toronto, these special events draw talented engineering alumni, friends and guests. If you're looking for ways to reach highly educated engineering graduates, event sponsorship is a perfect introduction.

Find out how to team up with U of A Engineers today!

For information, contact
Laurie Shinkaruk, Acting Assistant Dean,
External Relations
403.718.6394 laurie.shinkaruk@ualberta.ca

Travel, sports and a thirst for knowledge have taken Lucy Nolan on an Lucy's Excellent Adventure

BY RICHARD CAIRNEY

A photograph of Lucy Nolan, a woman with short blonde hair, smiling and standing on a bridge at night. She is wearing a bright red long-sleeved blouse and blue jeans. Her hands are on her hips. In the background, a city skyline is visible with illuminated buildings and a body of water reflecting the lights.

Lucy Nolan's educational path took a sharp turn that changed her life after she spent a semester studying materials engineering at the University of Alberta in 2003, on exchange from the University of Wollongong in Australia. If she keeps a diary, it must read like an international adventure written by a woman who is part world-class athlete, part leading-edge researcher and part travel writer.

"I only spent one semester at the U of A, but I had a great time and met my future husband there as well," she says. "I grew up in the country [in Australia], but felt right at home in Edmonton." She and her husband were married and moved to Australia, but in 2008 returned to Canada.

Lucy decided to get her PhD. At about the same time, a new faculty member, Ken Cadien, had joined the Department of Chemical and Materials Engineering. Cadien left his position at Intel Corp. as a fellow—the most senior technical position at Intel—to work at the University of Alberta.

"I met with some other professors too, but Dr. Cadien and I clicked and I really was interested in his research area," Nolan recalls.

That research, into chemical-mechanical polishing in the production of semiconductors, is in itself somewhat

mysterious. In order to wire transistors together, small recessed channels are etched into silicon wafers. The wafers are later coated with copper to fill the channels. Excess copper is scrubbed away using nano-sized abrasives and chemicals.

"Industry has been doing this successfully for years, but no one is entirely sure how it works," Nolan explains. "That makes it difficult to adapt to changes the industry is facing, and we were coming up with new insights into how the process works."

There are thousands of variables that can be tested, with completely



an a long way nature

fashion, her way of blowing off steam was exceptional: she joined a women's Australian Rules football team and wound up playing for Canada in the International Cup.

It's a bit baffling even to Lucy, who literally stumbled into the local squad by accident. One day she and her husband were walking home from the Safeway store at Whyte Avenue and 109th Street and decided to take a shortcut home. They spied a group of people playing with what Lucy recognized as an Aussie Rules ball. After chatting with the coach, she went home, changed and returned for her first practice.

a whole cross-section of people, none of whom were grad students or involved in any way with what I was doing. Graduate research in particular is an individual pursuit and to be part of a team was great."

Just as Canada has in women's Aussie Rules football, the U of A is playing in the elite leagues of materials engineering research. With her PhD completed, Nolan has recently been hired as a yield engineer with Intel in Portland, Ore.—Cadien's old stomping ground. There, she's getting confirmation of what she'd already discovered on campus: that Cadien is a

"Everyone around here says, 'Oh you worked with Ken? Say hello for me!' And they all go on about Caltech and Berkeley and Stanford. And where did Dr. Cadien go? To the University of Alberta, in Edmonton."

— LUCY NOLAN

After playing locally for a couple of years, Nolan wound up as a member of the Canadian national Australian Rules football team, which travelled in 2011 to compete in the International Cup.

On its way to the final match, Nolan's Canadian side defeated the Australian side at McAllister Oval in Melbourne. "My family was in the stands and they were very conflicted," she says, laughing. In the end, the Canucks took silver after losing the final match to Ireland.

Aussie Rules football being Aussie Rules football and not hockey, the whole affair received minimal media coverage, but Nolan wouldn't trade the experience for anything. Just getting out onto the field was, for her, rejuvenating. For Nolan and fellow grad student and teammate Neda Dalili, who played on the Canuck squad against the U.S. in the annual 49th Parallel Cup, it was a refreshing escape from school.

"Getting out to practise or to play was a real release and a relief. When you move somewhere to go to school, it can be hard to meet people, so twice a week and every second weekend I got to hang out with

highly respected researcher and that the U of A is a leading research institution.

"Everyone around here says, 'Oh you worked with Ken? Say hello for me!' And they all go on about Caltech and Berkeley and Stanford. And where did Dr. Cadien go? To the University of Alberta, in Edmonton," Nolan says, with delight evident in her voice.

As for her new position, well, there isn't much that Nolan is permitted to talk about. In short, she sees new chip designs long before they come to market. "Other people design chips and they give them to us and we turn them into a manufacturable product," she says. "But I can't really say much more than that."

But she will say, unequivocally, that she loves it.

"I talked to Dr. Cadien about what I was going to do and I was very keen to work in the private sector. I had engineering jobs before and I like working in industry and physically making things, and he suggested Intel because he knew my research would fit in.

"Working here is fantastic—it is at the absolute cutting edge. It is amazing."

unpredictable results. "If you try something new, there is no way to know ahead of time what will happen. There isn't enough sureness about how the process works to even come up with computer modelling. There are models out there, but they are about as effective as just trying something and seeing what happens."

You can imagine how frustrating the challenge of improving the process must be. As anyone who works on complex problems knows, there are times when you just have to walk away from a task and not think about it. Lucy is no exception. But in typical

Thomas Boyd Photography

CO-OPERATIVE O



Ken Porteous has been presented with the ASEE Clement J. Freund Award in recognition of his impact on co-operative education.

Ken Porteous has been a guiding influence on the Engineering Co-op Program since 1985

By Richard Cairney

There really is no such thing as overnight success. It doesn't matter which field a person is in, success is built step by step, over years. Such is the case with the Faculty of Engineering's Engineering Co-op Program.

Started with 27 mechanical engineering students in 1981, it has become Canada's second-largest engineering co-operative education programs and one of the strongest in North America.

Giving recognition where it's due, the American Society for Engineering Education has presented one of its most prestigious awards to Ken Porteous. Porteous was awarded the Clement J. Freund Award in recognition of his impact on co-operative education.

"It came as a complete surprise," says Porteous, who left a position as director of corporate planning and information services with Syncrude Canada in 1985 to join the Faculty of Engineering. Porteous knew he had been nominated for the award by Ming Zuo and Larry Kostiuk of the Department of Mechanical Engineering in 2011, but wasn't selected that year. ASEE adjudicators kept his name in the running for a second round (the award is presented every two years) and by the time the 2013 winner was being selected, Porteous had forgotten all about it.

"It was nice to be nominated in 2011 because nothing ventured, nothing gained. I forgot about it until April, when ASEE notified me."

Porteous is a tremendous supporter of co-operative education. He says the co-op experience provides a better all-round experience than internship programs. In the Faculty of Engineering Co-op Engineering Program, students find five four-month paid engineering placements over four years that expose them to increasing responsibility and engineering complexity. By contrast, students in internship programs, which the U of A does not offer, typically get one placement only. These students spend 16 months with one employer.

"Our model is such that you start at a junior level position because you don't have a lot of academic background and in subsequent placements you assume jobs with greater responsibility and engineering content. In the oil and gas industry, for example, students often start out in the field, then move to a regional office and then do a final term at a head office.

"In our system, if you have a job that you don't like, it's only eight months at worst, and you're only 20 or 21 years old, so you learn what you can and get through it."

Porteous will only take credit for the co-op program's success as the orchestra

PERATIVE

leader. He says the day-to-day work done by those directly involved in the program is responsible for its success, citing assistant director Stephen Concini in particular, who basically manages the program from an operational perspective.

“There are four pillars to this successful program which are, in no particular order: 1) We have had very supportive deans in Fred Otto and Dave Lynch, who always promoted the co-op program whenever they would meet with industrial partners; 2) We have excellent, capable co-op students—these students are technically very good. Our engineering degree program is as good as any other in North America at the undergraduate level; 3) We have a very loyal and committed group of employers who have provided our students with great jobs and great experiences and in many cases they hire our graduates, and; 4) The people in the co-op engineering department, including those in the Engineering Employment Centre, are dedicated and service-oriented people who are completely focused on doing their jobs in assisting students in getting employment—co-op, summer and permanent.”

“This has been an extremely rewarding career—and working with students has always been a huge plus.”

—Ken Porteous

Be that as it may, there is no denying that Porteous’ achievements in academia are considerable. He taught engineering economics and co-authored a Canadian textbook on the subject, and collaborated with the School of Business to establish the combined MBA/MEng degree program.

With respect to developing co-operative education, a pattern of continuous growth and improvement is evident. Within two years of joining the faculty, Porteous was successful in obtaining accreditation for the co-op program from the Canadian Association for Co-operative Education. In 1985, the program had 150 students. That figure, in 2012, had reached 1,400. Employer participation has expanded from about 50 partners to more than 300. Overall, placement rates in the program consistently run between 90 and 95 per cent, even during economically challenging times. Porteous also oversaw development of the Engineering Employment Centre, which helps find summer and permanent jobs for students and alumni.

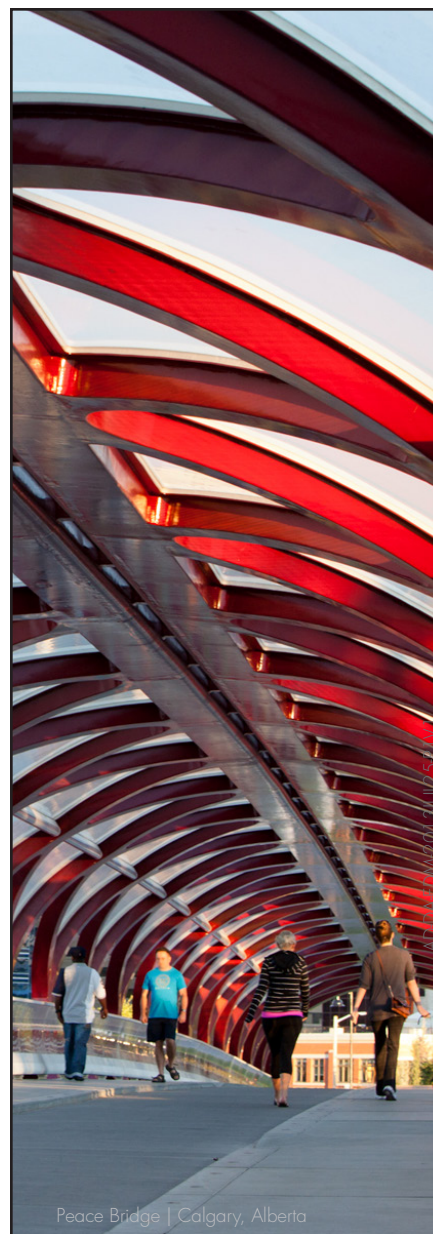
In the other half of his portfolio, he handles student awards and services, dealing with discipline matters as well as the gamut of issues undergraduate students seek assistance with.

This summer, Porteous stepped down from his position as associate dean. Tim Joseph, formerly a leader in the School of Mining Engineering in the Department of Civil Engineering, has been appointed Associate Dean (Student and Co-op Services).

Joseph will be responsible for the leadership of the undergraduate student services and co-operative education program. This encompasses activities spanning the full range from admission to graduation, and includes student advising, discipline, employment and awards.

But Porteous hasn’t quite retired—yet. He will serve the faculty in an advisory capacity for one more year.

“Joining the Faculty of Engineering is a decision I have never regretted,” he says. “This has been an extremely rewarding career—and working with students has always been a huge plus.”



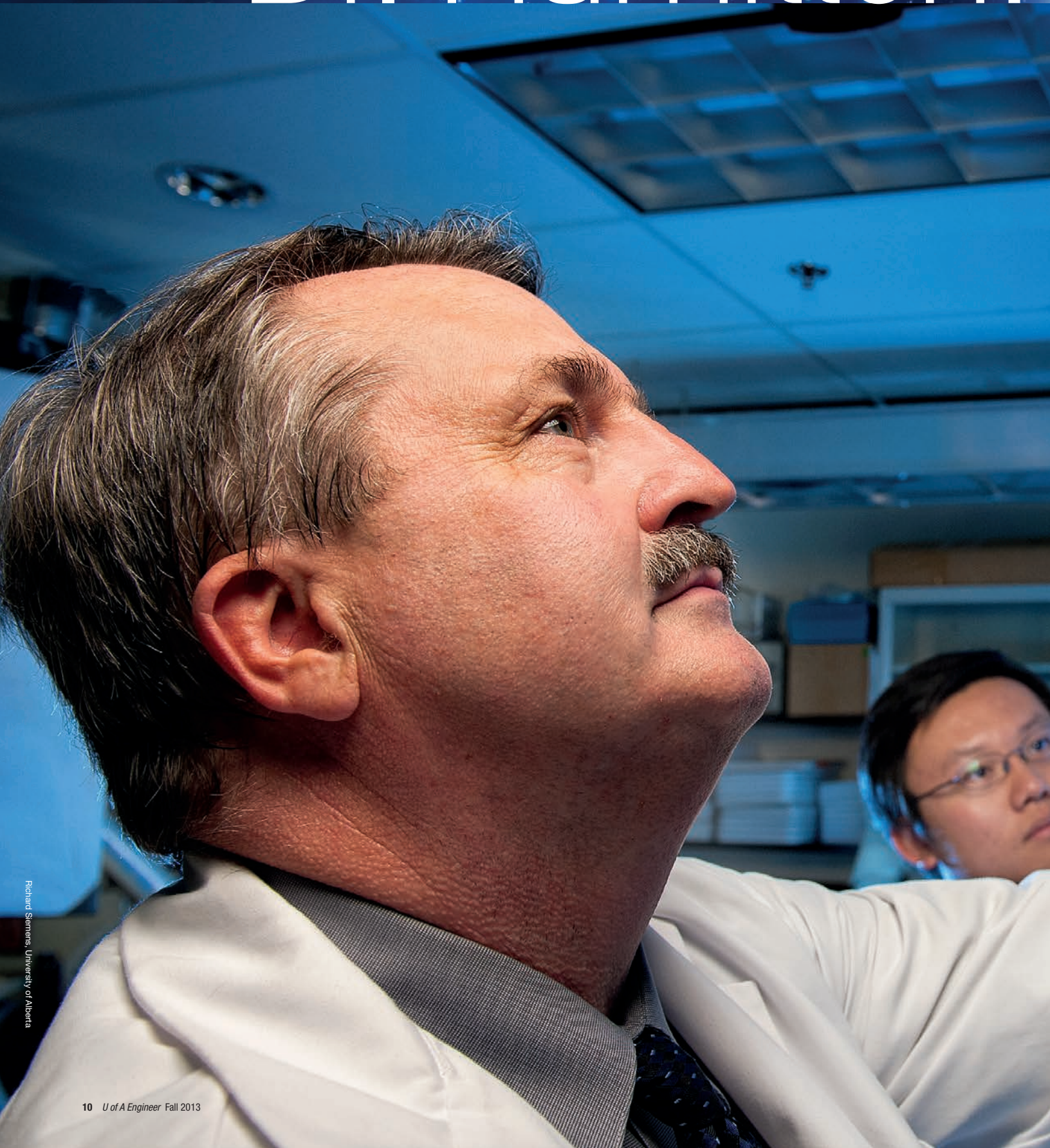
Peace Bridge | Calgary, Alberta

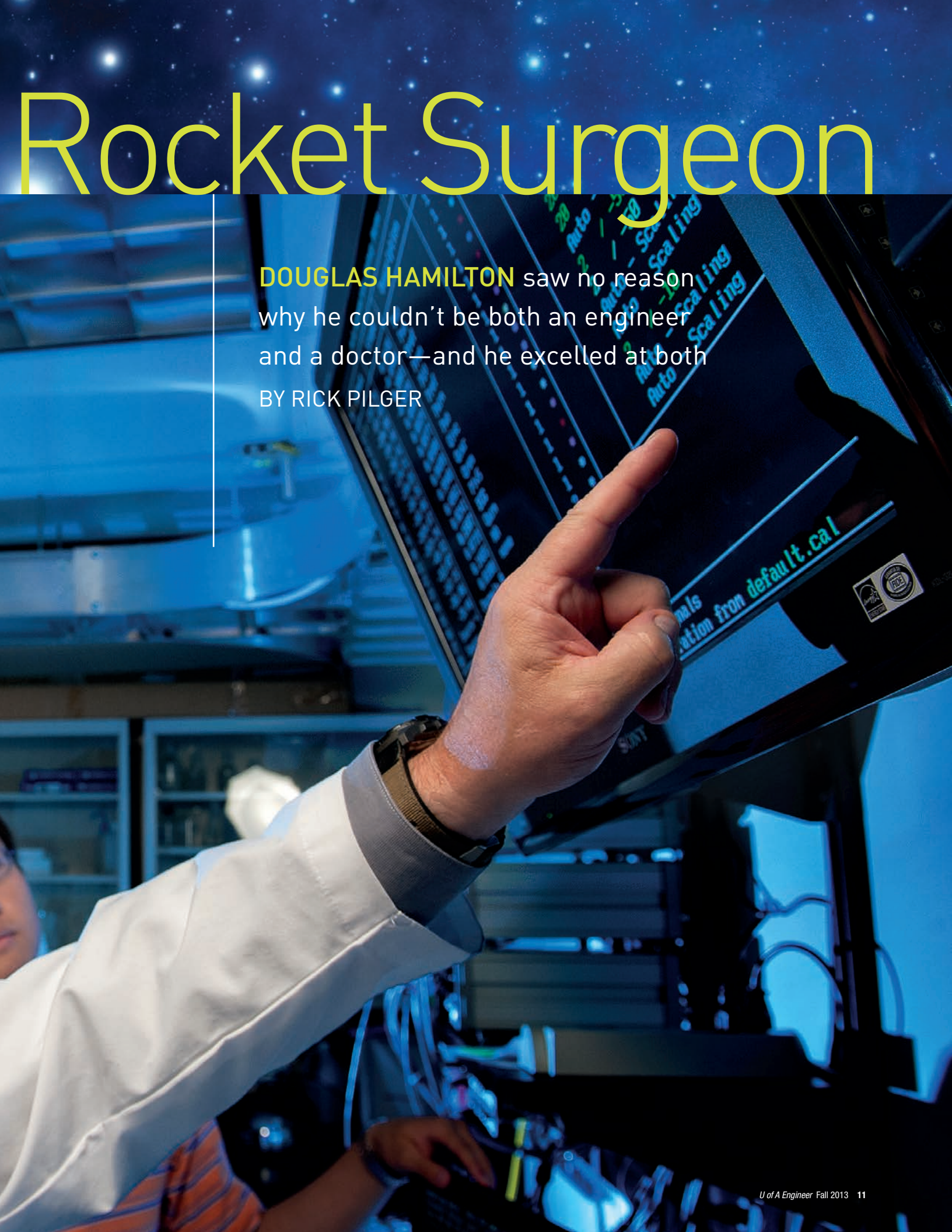
**PROUD TO
BE PART OF
THE GLOBAL
ENGINEERING
COMMUNITY.**



One Team. Infinite Solutions.

Dr. Hamilton:



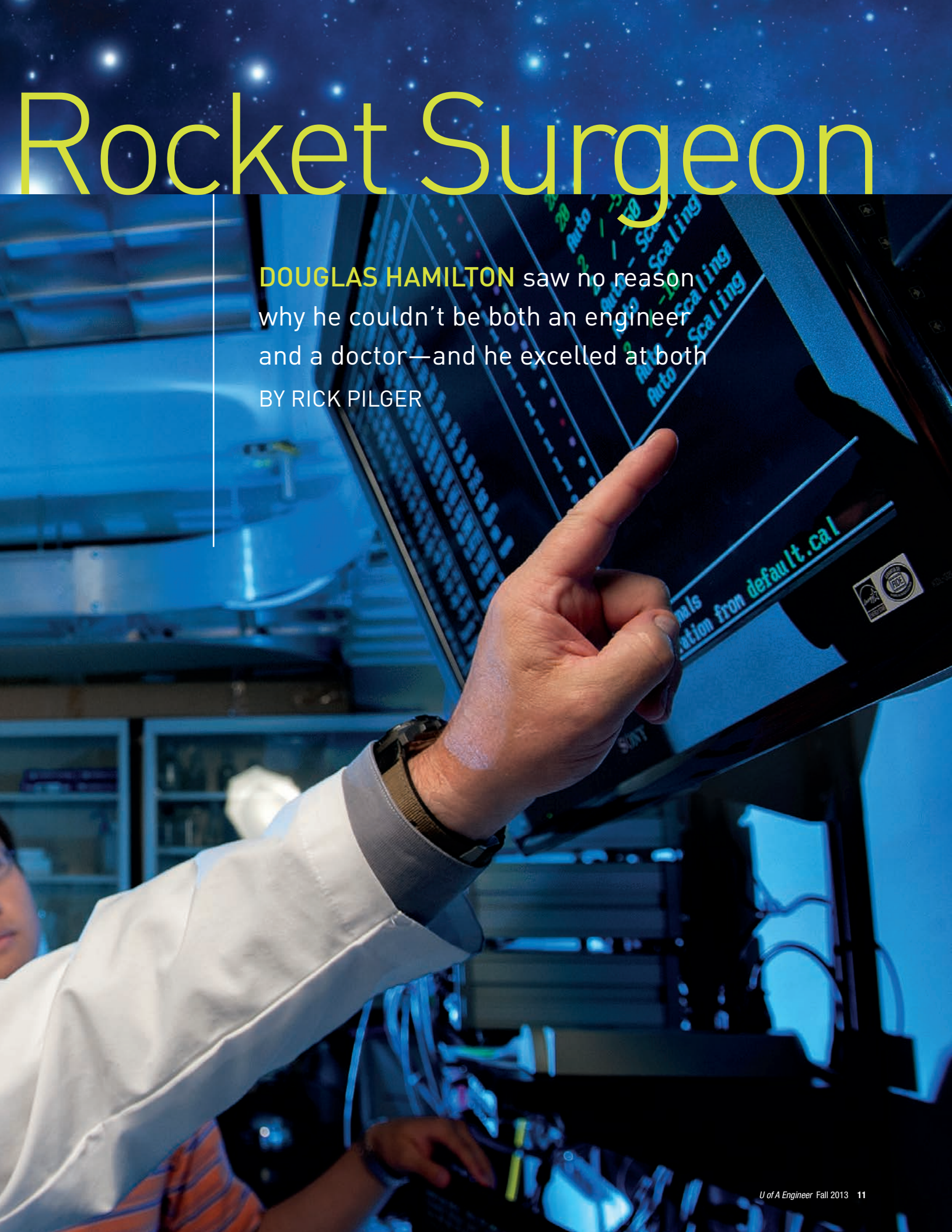


Rocket Surgeon

DOUGLAS HAMILTON saw no reason why he couldn't be both an engineer and a doctor—and he excelled at both

BY RICK PILGER

U of A Engineer Fall 2013 11



Rocket Surgeon

DOUGLAS HAMILTON saw no reason why he couldn't be both an engineer and a doctor—and he excelled at both

BY RICK PILGER

U of A Engineer Fall 2013 11

If not for a musical toilet seat, Douglas Hamilton (Electrical '80, MSc '84) may never have become a physician. Had he never become a physician, it's unlikely he would have won the prestigious NASA Exceptional Engineering Achievement Medal.

It might seem surprising that the space agency, which employs legions of brilliant engineers, would give its coveted medal recognizing engineering accomplishments "far above others in quality, scope and impact," to a flight surgeon. But it's not surprising at all to those who know Hamilton, who received the award in 2012 for work identifying and clarifying the risk of electric shock to astronauts performing spacewalks (commonly known as EVAs). This research, based on supercomputer models he was instrumental in developing, has not only informed the design of new EVA suits and resulted in revised space vehicle standards, it may well lead to improved design standards in the automotive and toy manufacturing industries.

Hamilton—known by his many friends as Dr. Hami—is a physician specializing in internal medicine. He graduated from the University of Calgary medical school in 1991, the class president and valedictorian. But he was first an engineer, having received bachelor's and master's degrees in

engineering from the University of Alberta. Even his friend Canadian astronaut Robert Thirsk, whom Hamilton supported as a flight surgeon, refers to him as "an engineer of astonishing ingenuity."

So who is he anyway? Scotty or Bones? Hamilton chuckles at the question, which he's obviously been asked before, and refuses to be pinned down as to which Star Trek character he identifies with. "It really depends upon the situation," he says. The edge, though, might have to go to Scotty, for Hamilton has a framed letter from James Doohan, the actor who played the ever-resourceful chief engineer of the USS Enterprise, on his wall. Prompted by a friend of Hamilton's, Doohan wrote the letter in the character of Scotty seeking to acquire one of Hamilton's inventions—a generator safe for use in explosive environments—for the USS Enterprise.

Hamilton recalls that when he began his medical career in Canada, his engineering background was regarded as a liability. "The thinking was you couldn't wear two hats at once," he says, "that if you were involved in engineering you wouldn't be giving medicine your full attention." When he left to pursue opportunities in the U.S., Hamilton argued that Canada would benefit from more physician-engineers "to prevent the art and science of medicine from being trampled by technology." Now

back in Canada, Hamilton is pleased to find a changed climate, one in which the added value that someone with a technical background can bring to medicine is respected.

At NASA—as at every place life has taken him—Hamilton enjoyed a reputation for extreme ingenuity and the ability to fix anything, capabilities that spring from a boundless natural curiosity. As a child, he was always taking things apart—including the colour television set his parents bought in preparation for the 1969 lunar landing. Fortunately, he had it back together and working when Neil Armstrong took his one small step.

His friend Canadian astronaut Robert Thirsk, whom Hamilton supported as a flight surgeon, refers to him as "an engineer of astonishing ingenuity."

While Hamilton routinely uses his technical ability to advantage in his role as a physician, he has also used it to improve a health outcome from the patient side of the relationship. That happened when he was set to undergo arthroscopic knee surgery and the surgical laser refused

exploring the final frontier

The Faculty of Engineering and its alumni have a long tradition of leadership and innovation in space exploration. A brief review of our collective achievements demonstrates a drive for excellence and the creativity and knowledge to reach the stars.

BRYAN ERB

(Civil '52, MSc '55, DSc [Hon] '90)

How do you protect astronauts from the intense heat that's generated when a spacecraft enters the Earth's atmosphere at speeds of more than 40,000 km/h? Bryan Erb played a key role in designing the heat shields that made human space exploration possible. In the fall of 1951, just before he graduated, Erb won a prestigious Athlone Fellowship to study aeronautics at the College of Aeronautics in Cranfield in the United Kingdom. After completing his thesis on heat transfer, he returned to Canada to work with A.V. Roe Canada Ltd. on its cutting-edge fighter jet, the AVRO Arrow. The

project was abruptly cancelled and Erb was one of a group of young, talented engineers recruited by NASA in 1959.

Erb was part of an eight-person team credited with performing the foundational work that allowed the Apollo space program—which developed the only manned spacecraft to reach the moon—to get off the ground. Erb conducted research into the heat shields that protected astronauts entering the Earth's atmosphere. He devised what he dubbed the "barbecue" method of thermal balance for the Apollo flights—rotating the spacecraft on its axis to keep it evenly heated on its journey to the moon and back. He also played a major role in activating the Lunar

Receiving Laboratory, where Apollo astronauts were quarantined and lunar material was examined. Later, he managed a project that used satellite data to conduct the first world-scale inventory of wheat. Following his retirement from NASA, he joined the Canadian Space Agency and represented Canada on the Space Station Program at the Johnson Space Center.

GARRY LINDBERG

(Engineering Physics '60, DSc [Hon] '12)

Garry Lindberg's career achievements include one of the most visible pieces of Canadian engineering ever produced—the Canadarm, a vital piece of equipment on more than 50 space shuttle missions.



Courtesy NASA

Courtesy NASA

to work. Hamilton, anesthetized from the waist down, directed the surgeon to take the back off the laser's control and was able to tell him how to get it working. When the surgeon expressed amazement that Hamilton could so readily remedy the problem, Hamilton told him it was easy—"I helped to design those controls."

In addition to surgical lasers, Hamilton has designed lasers for use in forensics and for the oil and gas industry. Among his other inventions—in addition to the generator that Scotty coveted—are a drill capable of taking tissue from a beating heart in one-tenth of a second and a special production tool used in building Boeing aircraft. And, of course, there's the musical toilet seat.

In the early 1980s, Hamilton was a master's student working in the U of A's Electrical Engineering laser laboratory under the supervision of John Tulip, who developed many medical lasers still in common use. Tulip recalls his former student as being "enormously fun to be around—enormously likable and creative." Tulip says Hamilton had "an enormous latent talent lurking—but at times it took a keen eye to spot it."

Tulip did spot it, however, and in his lab Hamilton did pioneering work designing lasers for photodynamic therapy, which uses photosensitizing agents along with light to



Richard Siemens, University of Alberta

Dr. Douglas Hamilton—Hami to those who know him—has returned to Canada after having a huge impact south of the border as a NASA flight surgeon, caring for indigent patients in Houston, and playing a key role in treating evacuees from New Orleans in the aftermath of hurricane Katrina. Now working at the University of Calgary, he hopes to build on the remote health-monitoring techniques he pioneered at NASA to improve care for Canadians living in remote communities.

kill cancer cells. Hamilton's main focus was on destroying brain tumours, but it proved impossible to photosensitize all the many tentacles of these fibrous masses. However, his work provided useful background knowledge and paved the way for later advances, including a new photodynamic therapy developed in Tulip's lab that may soon be used to treat prostate cancer.

During his time at the U of A, Hamilton found a variety of outlets for his ingenuity,

some less praiseworthy than others. Tulip recalls a pair of sunglasses Hamilton presented to him. Running around the lenses were flashing red lights. It was ingeniously done, and Tulip requested some extra pairs for gag gifts. While other stories of Hamilton's creativity abound, many are best not set down in print (including the one about the time the Aggies parked their wagon too close to the Engineering Building).



in 1974. Speaking to U of A students and professors in 2012, he joked that NASA wanted a space crane that was flexible but rigid, and strong but virtually weightless—essentially asking the impossible. A further complication was that it was impossible to conduct 3-D tests of the arm on Earth because the arm could not support itself. At its peak, 800 Canadian engineers, scientists and technologists worked on the project.

On Nov. 12, 1981, Canadarm made its space debut aboard the space

Working with the National Research Council of Canada, Lindberg became manager of the Canadarm project

shuttle Columbia and performed flawlessly.

In 1989, Lindberg joined the newly created Canadian Space Agency, where he rose to the position of vice-president of research and applications. There, he chaired an international committee that promoted and developed environmental and Earth-observing sensors and satellites.

H.F. LLOYD PINKNEY (Civil '59, MSc '63)

Internationally renowned in the field of engineering physics, H.F. Lloyd Pinkney was the principal investigator of the Space Vision System, the technology that serves as the eyes for the Canadarm.

The SVS was based on the Real-Time Photogrammetry System that he co-designed in the early 1970s. His work on the SVS, a vision system for robotic devices such as the Canadarm, was considered a major advancement in space technology. The SVS enables the Canadarm and the Canadarm 2 to handle payloads that are out of sight to astronauts operating these two giant robotic arms. It has also played an essential role in the construction of the International Space Station.

Pinkney was instrumental in advancing Canada as a leader in space technology. He began his 44-year career with the National Research Council of Canada in 1952. While working at the NRC, he completed his master's and

PhD in engineering mechanics at Stanford University. From 1996–2002, he worked as a scientific-engineering consultant with Neptec Design Group Ltd.

BEN SPARROW (Mechanical '99)

The founding CEO of Vancouver-based Saltworks Technologies, Ben Sparrow is playing a key role in solving the water problem that long space voyages present. Unpleasant as it may seem, urine is the only source of water in space once a supply of fresh water runs out. For decades, NASA has been experimenting with systems that run into the same problem over and over: they become fouled



Possibly to better channel their creativity, Tulip one day dispatched a trio of his students, Hamilton included, to meet a group of parents. The parents were having difficulty coping with the needs of their disabled children, and the hope was that emerging electronics technology could help. Hamilton discovered that one mother was having trouble keeping her son, who suffered from severe cerebral palsy, seated on the toilet. The only thing that helped was playing his favourite music. Back in the lab, Hamilton turned a toilet seat into a music controller—as long as there was weight on the seat, the music played. While there were some intricacies to the design, it was a rather simple invention. However, it made a huge difference to the child's family. And it gave Hamilton a taste of what it was like to improve the life of someone personally.

At about the same time, to better understand the properties of human tissue, Hamilton enrolled in a physiology class. And it was when he was thumbing through the course text that he was first struck with the life-changing realization that “the human body is just one huge collection of incredibly complex, non-linear negative feedback and control systems.” It was an insight that would bear fruit not too many years later.

After leaving the U of A, Hamilton established a family business manufacturing the spark-free generators and solar-



Hamilton and a colleague run through a CPR drill in a near zero-gravity training flight. Practicing medicine in low-gravity environments requires creativity to overcome unforeseen challenges.

powered pipeline valve actuators he had invented. Then an opportunity at the University of Calgary caught his eye: the medical school was looking for someone to install the computers for its new Health Research Centre and integrate them with the Foothills Health Region network. He happily took on the challenge, and his life might have been much different had it not been for one day when he was pulling cables in the ceiling above a research lab. Below him, he heard cardiovascular

physiologist Dr. John Tyberg and a student in discussion. “They needed some engineering input,” recalls Hamilton. He couldn’t keep quiet: “It’s the total integrated stress that’s important,” he called down. Startled, Tyberg and his student looked up, and soon after, Hamilton found himself enrolled in a joint MD-PhD program, working in Tyberg’s lab on issues related to the precise measurement of cardiovascular pericardial pressure.

To secure a spot in the medical school, Hamilton had to undergo an admission interview and, given his unusual background, acceptance was no foregone conclusion. What may well have tipped the balance was when one of the interviewers, in a decidedly skeptical tone of voice, asked what he had ever done to help anyone from a medical perspective. That’s when Hamilton told him about the toilet seat.

Following medical school, Hamilton began a residency in internal medicine, always downplaying his engineering involvements. Then, one day, he spotted an opportunity to bring his Scotty persona out of the closet. The Canadian Space Agency had announced a selection process to recruit four new astronauts, and Hamilton applied. He made cut after cut until he was in the final selection pool, but for him there was no cigar (as there was for Julie Payette, Dave Williams and Chris Hadfield).

It was a huge disappointment, sure,

with calcium sulphate. When NASA held a competition that invited the private sector to submit solutions, Saltworks’ desalination technology proved itself. The space agency has conducted ground testing using one of the Saltworks devices and has ordered three more for further investigation. “The system enables long space missions like trips to Mars,” says Sparrow. “The cool part is this is the exact same system that is helping companies such as oilsands clients in Alberta and Teck Resources, helping remediate mine water in B.C.”

CARLOS LANGE
Professor, Dept. of
Mechanical Engineering
In May 2008, when

Courtesy NASA



the Phoenix Lander touched down on Mars, it carried a bit of meteorological ingenuity designed by Carlos Lange, a U of A mechanical engineering professor.

Lange conceived the “Telltale,” a simple device used to measure wind speed and direction and was part of Phoenix’s weather station.

The Phoenix explorer and Lange’s device operated on the surface of Mars for five months—far longer than the anticipated 90 days. Lange’s students are still analyzing data the Phoenix collected, to find water in a liquid state on the planet’s surface.

Lange is one of the founders of the U of A Institute for Space Science, Exploration

and Technology, serving as a member of its executive committee. In this capacity, he helps students follow their curiosity about space exploration and aeronautics.

ROBERT FEDOSEJEVS
Professor, Dept. of Electrical &
Computer Engineering

Robert Fedosejevs has been involved in two important space-related research projects. One is the Sweeping Energetic Particle Telescope (SWEPT) concept study of a high-energy proton detector able to carry out a continuous sweep in angular space to map out the energetic protons hitting the International Space Station. This energy contributes a large fraction of the radiation dose

received by the astronauts and instruments. Fedosejevs also led a project to develop a High Energy Particle Telescope (HEPT), which could map out the angular distribution of high-energy particles for a proposed Canadian satellite mission (ORBITALS) to study the radiation belts during the current solar maximum cycle. The satellite proposal was led by Ian Mann in the Department of Physics. Unfortunately, the satellite proposal was not funded beyond the initial concept study phases.

JANET ELLIOTT
Professor, Dept. of Chemical &
Materials Engineering
An internationally respected
thermodynamicist in the

but Hamilton, always resilient, had caught sight of another opportunity. Encouraged to consider a career in space medicine, he attended International Space University (where he's since taught) and managed to obtain flight surgeon wings, training with the USAF as a foreign-national civilian. After beginning his space medicine practice at Star City, Russia, where he managed the health of astronauts training for International Space Station missions, he went to work for a NASA subcontractor at the Johnson Space Center in Houston in 1998. There he supported numerous space shuttle and International Space Station missions and also led the development of medical hardware and procedures to support short- and long-duration space missions. One of his many notable contributions was the redesign of the astronaut heart monitoring system at Mission Control.

In 2009, Hamilton was the lead flight surgeon for Canada's first long-duration mission, Thirsk's 188 days in space. The two have since become good friends, and Thirsk credits Hamilton's attention to details of his clinical care for enabling him to "maintain my productivity during this challenging six-month mission." According to Thirsk, "Doug's role on the medical support team resulted in many unique achievements and helped to secure Canada's reputation as a top-tier spacefaring nation."

During Thirsk's mission, he encountered vision problems seemingly caused by an enlarged optic nerve and swelling of the optic disc. It was something other astronauts had noted as well, and Hamilton did groundbreaking work to confirm that such changes in vision were the result of increased brain pressure. People who suffer from brain trauma—as a result of a car crash, for instance—can be similarly affected, says Hamilton, who is interested in studying the condition further and is devising non-invasive technologies for measuring brain pressure.

While Hamilton can take pride in many accomplishments during his time in Houston, his most profound memory from that time has nothing to do with space medicine. To maintain his clinical skills—"astronauts are pathologically healthy," he quips—Hamilton worked with Baylor Medical School providing care to Houston's huge indigent population. It was in this connection that in 2005 he became involved when word came that hurricane Katrina evacuees from New Orleans, many of them medically compromised, were on buses headed for Houston. They were to arrive in 12 hours and Hamilton rushed to the Astrodome to prepare for their arrival, which turned out to be much sooner than expected. For 2-1/2 days, he didn't sleep, and as the nighttime lead of a medical team of 3,000, he managed the triage and care of some 30,000

victims of the storm for two weeks.

Hamilton has helped after other high-profile disasters as well. In 2003, he was part of the investigative effort after space shuttle Columbia blew up while entering the Earth's atmosphere, and in 2010, he was part of the NASA team that helped design the rescue capsule that brought the trapped Chilean miners to the surface.

In 2012, Hamilton moved his family—his wife, two daughters and a son—back to Canada and accepted a faculty position at the University of Calgary, where he is a member of a project fostering multidisciplinary approaches to improving patient safety and quality of care. In addition to his work related to measuring brain pressure, Hamilton is interested in adapting the remote health-monitoring techniques he pioneered at NASA to improve the medical care of people living in remote regions of Canada. He's also a champion of electronic health records, having seen their value when he worked at Baylor's community health clinics.

This September, Hamilton will receive the Distinguished Alumni Award from the University of Alberta Alumni Association (he's already received a similar honour from the U of C). Such recognition can be seen as capping a career, but it's unlikely that Hamilton will soon give up his passion for boldly exploring new frontiers in engineering and medicine.

Department of Chemical and Materials Engineering, Janet Elliott has conducted research on the interaction of gravity with multi-phased fluid systems. She was one of the first 100 Canadians to fly on NASA's KC-135 reduced gravity (near-free-fall) aircraft. She participated in apparatus design, performed experiments in reduced gravity on two flights, trained her experiment's operators (including Canadian astronaut Marc Garneau) and provided safety and other documentation for NASA parabolic flight experiments for five campaigns.

Elliott and her graduate students have flown on four campaigns of Canada's Falcon 20 parabolic aircraft, provided by the National

Research Council through an agreement with the Canadian Space Agency. She has been invited to speak about her research at the Materials Research Society and the Japan-Canada Workshop in Space Technology.

ALBERTASAT

A student group from the University of Alberta Faculty of Engineering is on a winning trajectory, earning international accolades for designing a cube-satellite that would monitor greenhouse gas emissions.

The AlbertaSat-1 Project Team won the International Academy of Astronautics' environmental award for the best application of cube-satellite technology to

environmental issues, at the Mission Idea Contest in Nagoya, Japan, in late 2012.

The team is now entering a European Space Agency project to launch a network of 50 CubeSats into low Earth orbit to study Earth's lower thermosphere. The team will partially fund its satellite with a Kickstarter campaign. Follow the team on Twitter: @AlbertaSat or search AlbertaSat on Facebook.

CANOROCK

The Canada-Norway Student Sounding Rocket exchanges give undergraduate students a chance to launch a sounding rocket and analyze data collected in flight. Travelling to the Andoya Rocket Range in Norway, U of A students

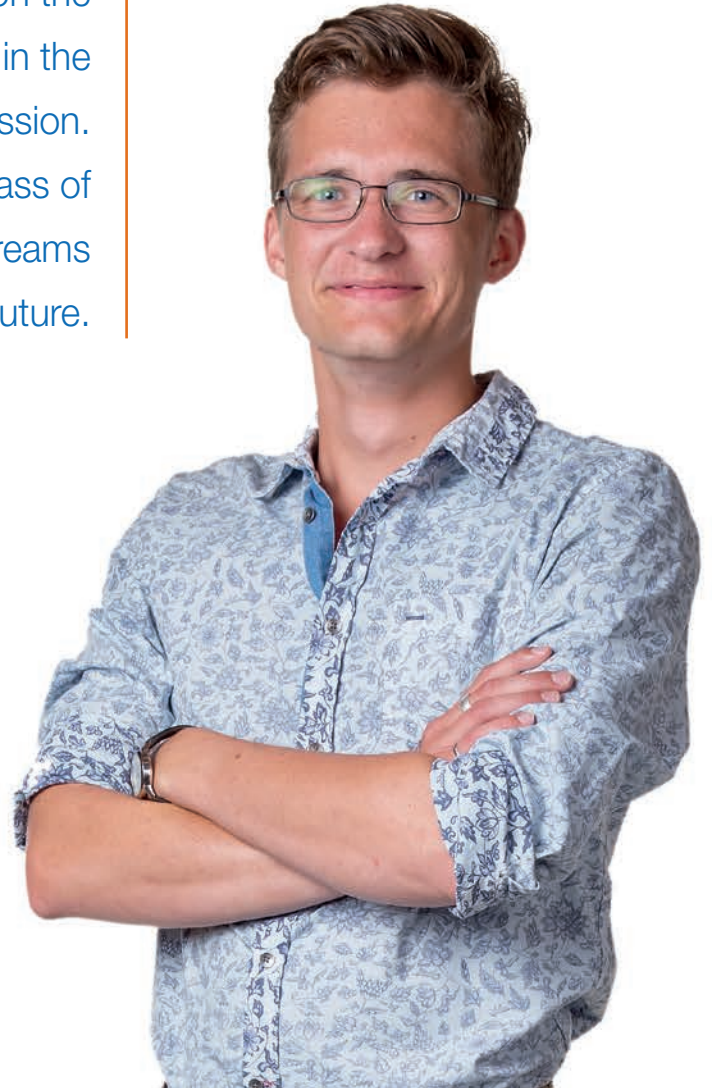
work with peers from around the world, connecting them with aeronautics experts and giving them hands-on experience that is often required to enter a graduate degree program. Marcy Frioult [Mechanical [Co-op] '13] says the experience confirmed she was on the right path. She is now planning to pursue a graduate degree in aeronautical engineering with a goal of a career related to space exploration. "Having that opportunity to participate in CaNoRock had a big influence," says Frioult, who is also a member of the AlbertaSat group. "This is the kind of work I've always wanted to be involved in."





RISING

One year after graduating,
four young alumni reflect on the
events of their first year in the
engineering profession.
And members of the Class of
2013 share their dreams
for the future.



STARS

CRYSTAL THEODORE

Making something of nothing with genetic machines

Crystal Theodore (Chemical [Co-op] '13) decided to make a change after studying biochemistry for two years at the University of Lethbridge, in her hometown. She preferred the pragmatic, big-picture thinking of engineering.

"Studying biochemistry for two years let me get to know who I was and what I wanted to do," she says. "I'm not in engineering for money—I'm in it because I find it interesting and applicable."

In her final year of engineering studies she played a key role on an interdisciplinary student team that won top honours for technology commercialization at the International Genetic Engineering Machine (iGEM) Competition at MIT. The team discovered a way to genetically modify a certain type of bacteria so it would turn waste paper into highly specialized chemicals, called aromatic compounds.

One of these products, shikimic acid, is the key ingredient in the flu-busting prescription drug Tamiflu. The team, called Upcycled Aromatics, projected it could earn \$4.5 million annually from shikimic acid production alone.

Theodore is now working towards her master's degree, hoping to develop a pilot plant for Upcycled Aromatics. The project gives her everything she likes about engineering: an interdisciplinary challenge with important applications.

"A lot of times in biology you have things developed at the lab scale but you don't look at how it will be implemented at the industrial scale," she says. "Engineers can look at a process and optimize it for certain conditions and in this team we had engineering students asking the biology students questions, then both aspects are developed together."



TYLER HEAL

Agent of change

For a guy who hoped to become an architect, Tyler Heal (Civil '13) is pretty happy about becoming an engineer. He embraces interdisciplinary work and applying engineering solutions to areas as diverse as structural engineering and public policy.

"There are so many broad things you can do and so many doors and opportunities that open up," he says of his engineering degree.

Heal has always had a big-picture view of engineering and student life. He volunteered as a photographer with *The Gateway* student newspaper and at the city's jazz music club The Yardbird Suite, played saxophone with the U of A Concert Band and volunteered to do website design with the university's chapter of Engineers Without Borders.

In his third year of studies, he came up with the idea of staging an annual exhibit

of artwork created by engineering students, faculty members and professionals. He also played a key role in establishing Engage North, a University of Alberta initiative launched this year to connect young people from Canadian universities to remote communities.

"The support you get from people here is great," he said, calling the faculty and its student groups "a great incubator" for new and innovative ideas.

It stands to reason then, that after graduating Heal has taken on employment in the Department of Civil and Environmental Engineering, working with structural engineering professor Robert Driver.

"I'll learn more about research and structural engineering. You get a taste of it as an undergraduate, and I'm interested in learning more."

ANDREW OVENS

The higher-ed payoff

Growing up on a farm near Cut Knife, Sask., Andrew Ovens (Computer [Co-op] '13) had the time and inclination to “mess with things until they broke and then try to fix them.”

His first stop after high school was NAIT's computer engineering technology program. He learned a lot but thirsted for more. “I told myself, ‘I’m not done.’” So he enrolled in the Faculty of Engineering's computer engineering program, in the co-op stream. Here, he found the challenge he was looking for.

“Coming to the U of A, I expected it to be different and more difficult, but it was on another level. Theory was the most difficult, and the interdisciplinary stuff.”

It paid off. This summer, Ovens started working at Microsoft's Redmond, Wash., campus. He was reunited with a team he

worked with during a co-op placement in 2012, working on the Active Directory service for Windows Server.

Active Directory allows a Windows network to authenticate and authorize users and devices. While it might not seem like the most glamorous computer engineering job, it's a perfect fit for Ovens.

“I enjoy the behind-the-scenes stuff,” he says. “Big database and back-end web stuff is where I'm interested.”

He has dabbled in startups, starting and ending two companies, but his new position with Microsoft offers a quality-of-life element he prefers.

“Microsoft really seems to care about employees. Everything they do is geared towards allowing employees to do awesome work. So I can see myself staying there for a while.”



MATT SPONIAR

Eco-car founder driven to succeed

Had he known what he was getting himself into, Matt Sponiar (Mechanical [Co-op] '13) might not have set out to build a new student club and a zero-emissions car while working on his engineering degree.

But he threw himself into the project and made the U of A Eco-Car Club a fixture on campus.

The work seemed never-ending. The group had to jump through bureaucratic hoops to establish itself on campus, attract sponsors and funding; there was also the matter of designing and building a hydrogen-cell powered car.

Overcoming one technical challenge after another, the team pulled off a second-place performance in its debut at the Shell Eco-Marathon in Houston, Texas in 2012.

This year, the broker hired to transport the car failed to fill out the proper paperwork and the vehicle was denied entry to the U.S. It was a devastating blow but younger members of the team learned a lot from other groups at the competition and are in good shape for 2014.

Sponiar is now beginning his career, working as an operations engineer for Shell Canada in Fort St. John, B.C.

The question begs to be asked: if he had the chance to do it all over again, would he?

“I honestly don't know,” he says. “But I found that by getting involved in student groups, you're exposed to problems you don't see in classes and to a whole group of different students and to industry. You start branching out and that helps you make decisions about your future.”

GINETTE DUBÉ

Steel resolve



If anyone had the idea that life gets easier after graduation, they might want to think again. “I’m in my shop working all day every day. And I’m up all night because that’s when my suppliers in China are up,” says Ginette Dubé (Materials ’12), the founding president and engineering director of Direct Alloys, a steel import company.

Dubé co-founded Direct Alloys during her third year of studies. In the year since she graduated, Dubé says, sales increased 54 per cent. In response to that growth and in anticipation of hiring its first employees, the company has just completed a 2,500-square-foot office and 7,500-square-foot shop in Nisku, just south of Edmonton.

Dubé half-jokingly admits to being nervous about expanding the two-person

operation: until now she and her business partner have handled everything from inspecting steel production facilities in China and developing their own material specifications, to shipping, sales and keeping track of the money.

While the company grows, she’s also addressing professional development. Working without a mentoring engineer presents interesting challenges in the P.Eng accreditation process, and while earning the designation may take longer than usual, she’s pleased that APEGA is helping her reach her goal. In the end, she says, standing as a P.Eng is more than a personal goal.

“It adds more respect knowing that you are a professional engineer,” she says. “It is a layer of credibility and respect—it’s respected everywhere.”

ANDREA BADGER

Embracing the unexpected

Andrea Badger has learned to expect the unexpected—in fact, it’s one of the things she loves most about her new career. As an environmental engineer working in the North, Badger has been involved in decommissioning old mines, which she says can be “nasty places” that provide fascinating engineering challenges.

This summer she was working on remediating a former lead-zinc mine in the Yukon.

When the prices for metals tanked in the 1980s, the mine’s owners mothballed the facility, which is now being closed altogether.

In this case, the owner is paying for remediation of the site and the mine has been maintained in a decent state. But the work is still complicated, says Badger, who is working with Golder Associates in Whitehorse, Yukon.

“What makes mines so interesting is

the complexity of the problems: you have everything from tailings ponds to waste rock to contaminated groundwater and hydrocarbon-contaminated soil, and then there are buildings that have to be demolished.

“It is definitely the kind of project that I find most intriguing and mentally challenging.”

Badger had previously studied and worked in the North, and her new home is proving to be everything she’d hoped for. The city has a vibrant arts community and great cultural facilities, and the landscape is perfect for outdoor enthusiasts.

“Up here, April is the best month for skiing. It sounds bad but it’s awesome: the days are long, the sun is warm and the snow is perfect.

“I’m spoiled,” she says. “I feel very good about where I am right now.”





DUSTIN STEWART

Taking the plunge

Dustin Stewart (Mechanical [Co-op] '12) relished student life and took on the mantle of leadership as president of the Engineering Students' Society. You might guess life as an EIT would be less exciting. Not so.

"My job here is very hands-on," says Stewart, who works at the Suncor refinery in Edmonton's east end. "It's fun. I had my final co-op term here and had a formal job offer handed to me in my last two weeks, which I was pretty happy about."

Stewart links maintenance crews and plant operators as a maintenance engineer, giving him a good overview of how the plant operates. "Every day you learn something new and I'm still learning a lot about my job and this facility."

At university, Stewart immersed himself in student governance and off-campus, he

volunteered as a youth group leader. His new volunteer duties are work-related. As a member of the refinery's technical rescue team, he trains for high-angle and confined-space rescues and first aid alongside his co-workers.

And he's discovering freedoms he missed out on as a student: an avid skier and mountain biker, he now has more time to pursue his recreational passions and actually gets vacation time—a luxury that is unavailable during student co-op placements.

In short, he's discovering the pleasures of life after graduation as he embarks on his professional career.

"All the elements I got out of everything I did in school, I have here. I have fun doing what I do."

CHRISTOPHER ROGERS

Getting settled at Stanford

When Christopher Rogers (Engineering Physics '12) graduated with a perfect 4.0 GPA (45 A+s and two As) he won more than accolades—he was also presented with the Governor General's Silver Medal and the C.D. Howe Memorial Fellowship award for academic excellence. The highest honour the U of A bestows upon an undergraduate student at convocation.

With the help of the \$11,000-award, Rogers was able to follow his dream to work towards a PhD at Stanford University. His plan was to explore the research options available to him at Palo Alto before committing to a single project or area.

"I'm still in the process of doing that now," he says. "I've tried out a couple of different labs and have taken some major courses and I'm trying out another lab this summer."

One electrical group lab Rogers worked in is involved in "emerging devices," which involves a lot of semiconductor physics work; the lab he is currently working in is more of what he calls an "applied physics" group. The research team is both experimental and theoretical, using optics and quantum mechanics for quantum computing and quantum information processing.

"Eventually I will have to make the hard call and choose one—I think it will definitely be one of these two," he says.

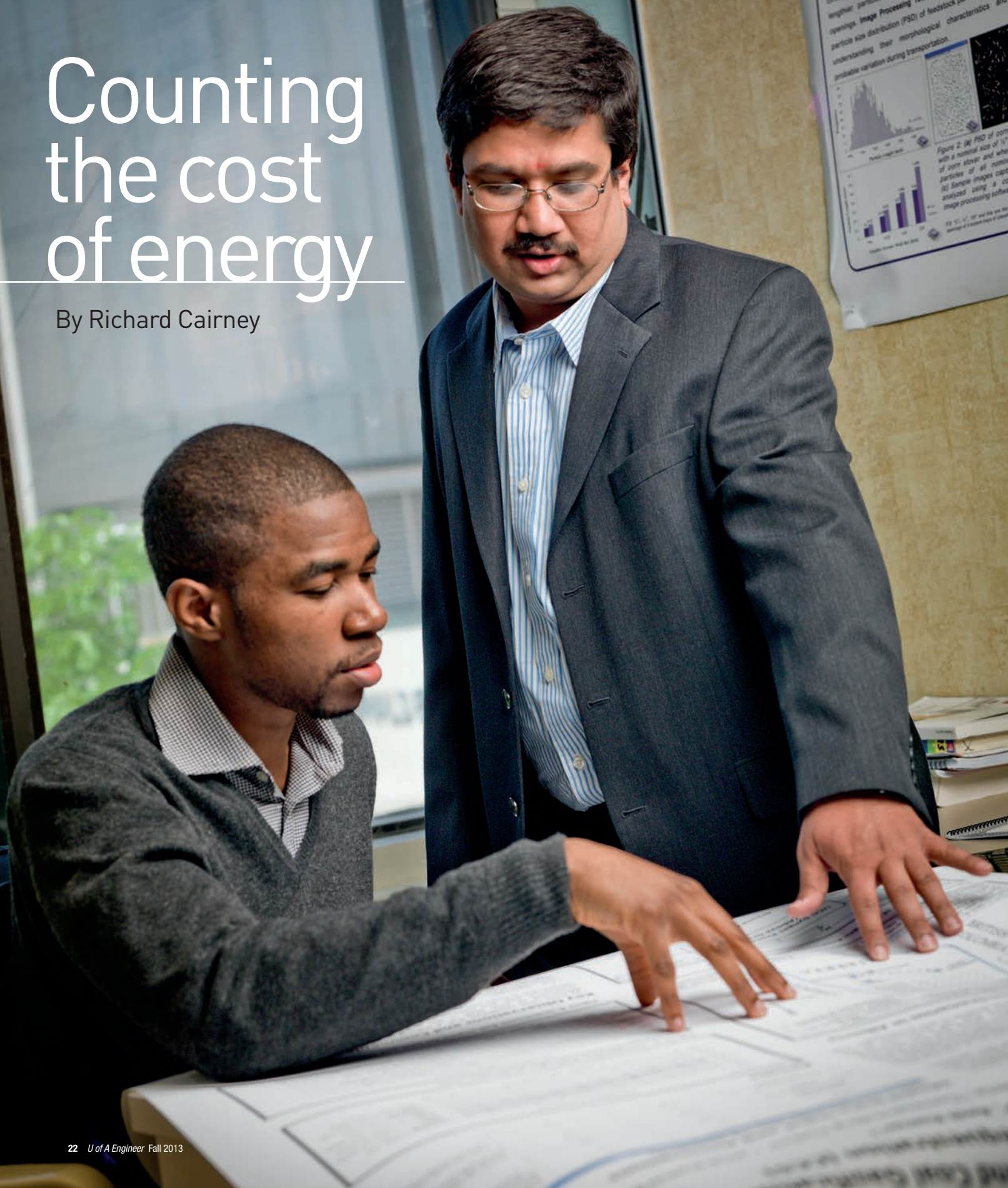
His goal with respect to grades is the same as it was while he was an undergraduate: do the best you can, and don't worry.

"It's different now. As a PhD student your main focus is your research. It's a lot different from undergraduate work."



Counting the cost of energy

By Richard Cairney



AMIT KUMAR and his research team are investigating the costs of energy production to help industry and government chart a path to energy diversification.

Do you use more energy, water and carbon producing a litre of gasoline or a kilowatt hour of electricity? Governments and industry are looking for ways to meet greenhouse gas emissions targets and to conserve water—but they need to know the most effective ways, and to understand the best technology available, to move to alternative energy sources.

Getting to the bottom of these questions is no small matter, and discovering the answers is the key to responsible energy use. A new national research program established at the Faculty of Engineering will strengthen the ability of industry and government to make evidence-based decisions about energy pathways and resources.

Amit Kumar, a professor in the Department of Mechanical Engineering, has been appointed as the Natural Sciences and Engineering Research Council of Canada/Cenovus/Alberta Innovates Associate Industrial Research Chair in Energy and Environmental Systems Engineering and holds the inaugural Cenovus Energy Endowed Chair in Environmental Engineering.

The \$4.4-million investment in these research programs is made possible through a \$3-million endowment created by Cenovus Energy, \$925,000 from NSERC, \$250,000 from Alberta Innovates - Bio Solutions and \$250,000 from Alberta Innovates - Energy and Environment Solutions. This research will play an important role in responsible energy development—Kumar has already made significant contributions to environmental and energy modelling.

The unique characteristic of Kumar's research program is that it integrates economic, environmental and technological assessments to help policy-makers in the public and private sectors find the best mix of energy sources to use, minimizing environmental impacts.

The research team looks at the historic use, costs and impacts of different energy

sources to predict the use of renewable and non-renewable energy sources and technologies. For example, one project isolates energy return on energy investment, calculating how many units of energy are required to produce another unit of energy.

"We want to examine the economics and environmental impacts of producing energy. How much water and land does it take to produce a kilowatt hour of electricity? How much CO₂ is emitted? And what happens when we produce that energy using coal or wind or hydro or biomass? We will look at wind, biomass, natural gas and oil and compare the costs and environmental impacts of producing them," says Kumar, whose research team will also investigate the best technologies to develop different energy sources.

Kumar was educated as an energy engineer at the Indian Institute of Technology. He came to the U of A in 2000 to earn his PhD and after completing post-doctoral work at UBC joined the faculty at the U of A.

"If you want to work in energy in a place where you can get support, this is the place," he says. "As a researcher, you want your research to be used. My goal is to give government and industry information that they can use."

His research began by doing modelling on energy pathways for Alberta Innovates - Bio Solutions and Alberta Innovates - Energy Solutions, and took off from there. Dean of Engineering David Lynch told a crowd gathered for the research chair announcement June 17 that the research program would not be possible without the collaborative partnership among

the university, federal and provincial governments and a strong industry partner—Cenovus Energy.

Cenovus, Lynch said, first established a \$3-million endowment to support the Cenovus Energy Endowed Chair in Environmental Engineering. The Faculty of Engineering and Cenovus then sought to expand the program, finding even more partners for whom Kumar's research has relevance.

"We've built a major collaborative partnership with Cenovus, NSERC, Alberta Innovates - Energy and Environment Solutions and Alberta Innovates - Bio Solutions," said Lynch. "We have a room half full of graduate students and industry partners. This is a best practice and a model of how to create a long-term sustainable partnership and obtain results."

How much water and land does it take to produce a kilowatt hour of electricity? How much CO₂ is emitted? And what happens when we produce that energy using coal or wind or hydro or biomass?

Kumar's NSERC Industrial Research Chair is the 22nd to be awarded to the University of Alberta and the 18th awarded to the Faculty of Engineering.

"The impact of energy resource systems on our environment is of vital importance to Canada," said Janet Walden, chief operating officer of NSERC. "An international leader in his field, Dr. Kumar's research program has been a huge success, largely in part due to his ability to establish and maintain successful collaborations. His research will help governments and businesses better assess the costs and

Amit Kumar and PhD student Babatunde Olateju pore over research notes. Kumar's research aims to uncover the economic, energy and environmental costs of producing units of energy from different sources. This information will help governments and industry determine the best way forward as they move toward different sources of energy.

environmental impacts of various energy technologies, and ultimately help shape the future of energy production in Canada.”

Industry partner Cenovus predicts Kumar’s research group will continue to have a positive impact.

“We expect the work this team is doing will lead to new tools that will help us do an even better job of unlocking the tremendous value of Alberta’s oilsands in a responsible and environmentally friendly way,” says Brian Ferguson, Cenovus president and chief executive officer.

Kumar has also been investigating the use of biomass as an energy source, and his team’s findings will have an impact on Alberta’s agriculture and forestry sectors and its bio-industries, says Stan Blade, chief executive officer of Alberta Innovates - Bio Solutions.

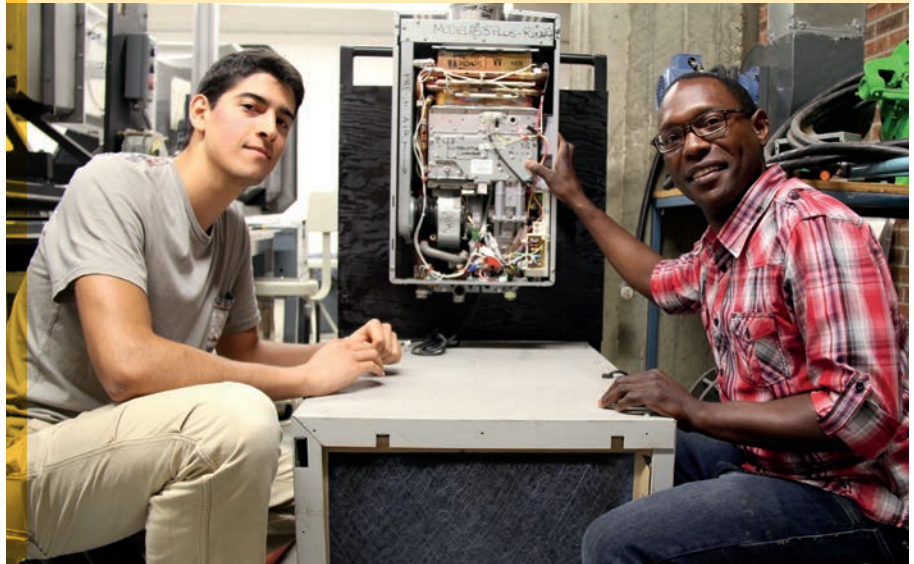
“We expect the work this team is doing will lead to new tools that will help us do an even better job of unlocking the tremendous value of Alberta’s oilsands in a responsible and environmentally friendly way.” —Brian Ferguson

Under this chair program, Kumar is also charged with educating highly qualified engineers who will be able to bring their energy modelling knowledge to industry and government. Kumar supervises 20 undergraduate, master’s and PhD students, research assistants and post-doctoral fellows.

Dean Lynch added that the announcement underscores the importance of collaborative partnerships among the university, industry and government, and demonstrates the ways that research benefits society.

“By providing the basic research foundation, we can promote the development and upgrading of Alberta’s natural resources in an environmentally responsible manner,” said Lynch. “At the same time, we are giving our students a truly world-class education and they in turn will bring their knowledge and expertise to industry and government as engineering professionals to solve future challenges.”

A big waste



Richard Cairney

Homes in Alberta waste about half the energy they take in. A new research project aims to address that.

Examining the economic and environmental costs of energy production in a holistic manner has important implications for resource development and environmental stewardship. Considering the amount of water and CO₂ produced when calculating the economic costs of producing a unit of energy will lead to better-informed policies and practices when it comes to selecting energy sources.

And looking at the impact that energy consumers have, can go a long way in supporting evidence-based decision-making.

As a side project to research being conducted by Amit Kumar, Department of Mechanical Engineering professor André McDonald is trying to determine the effectiveness of different technologies for heating homes and domestic water. Most Alberta households use a natural gas forced-air furnace and hot water tank. McDonald wants to determine whether natural gas-powered hydronic systems are more efficient. These systems eliminate hot water tanks, providing domestic hot water on demand and using hot water to provide heat in a forced-air space-heating system.

The research could address shocking inefficiencies.

“Residences waste about 50 per cent of the energy that comes into them in Alberta,” says McDonald. “Energy input for heating gets lost.”

Still in the earliest stages of the project, McDonald is giving an undergraduate student a chance to make foundational contributions to this area of research. Alberto Palomino, a third-year mechanical engineering (biomedical) student funded in part by an NSERC undergraduate research grant, is researching specifications of the hydronic systems and will create models used to determine energy input, efficiency, waste and levels of CO₂ mitigation. Palomino is also connecting with industry through collaboration with Rinnai U.S., a manufacturer of tankless water heater systems.

A master’s student will then refine the models and validate them through experiments. After that, Kumar’s team can estimate the energy and environmental impact of hydronic systems used in residential applications across the province and over decades.

Third-year mechanical engineering student Alberto Palomino, left, works with mechanical engineering professor André McDonald to evaluate the efficiency of a hydronic system to heat our homes and hot water.

—Richard Cairney

FLYNN, MORRIS PEng (Chemical '00)



Has been awarded the 2013 Confederation of Alberta Faculty Associations Distinguished Academic Early Career Award in recognition of his commitment to outstanding research. Flynn is an assistant professor in the Department of Mechanical Engineering.

FLYNN, PETER PEng (PhD Chemical '74)



Has been appointed to a three-year term with the Board of the Alberta Energy Regulator. The AER replaced the functions of the Energy Resources Conservation Board and will draw in the regulatory functions of Environment and Sustainable Resource Development over the next year, giving Alberta a single regulator for all upstream hydro-carbon activity, including oil sands. Flynn served as a professor in the Department of Mechanical Engineering from 1999 – 2011 and was the inaugural Ernest & Gertrude Poole Chair in Management for Engineers.

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

JOSEPH, TIM PEng



Has been appointed as Associate Dean (Student and Co-op Services) with the Faculty of Engineering. He will be responsible for the leadership of undergraduate student services and the co-operative education program. This encompasses activities spanning the full range from admission to graduation, and includes student advising, discipline, employment and awards. Since joining the faculty in 2002, Joseph has been a key faculty member in the area of mining engineering. He has taught 20 undergraduate and graduate courses across the mining engineering program, often teaching five to seven courses per year. He received the Faculty of Engineering Undergraduate Teaching Award in 2003 and he has led the development of innovative teaching approaches for the mining engineering program, including the establishment of the Alberta Chamber of Resources (ACR) Design Studio, to transform the Mine Design Project courses.

PORTEOUS, KEN PEng



Has been awarded the prestigious American Society for Engineering Education Clement J. Freund Award for outstanding contributions to the aims and ideals of co-op education. Porteous joined the Faculty of Engineering in 1985 to oversee the Engineering Co-op Program and stepped down from his position as associate dean, student and co-op services in August. In 1985 the co-op program had 150 students. That figure, in 2012, had reached 1,400 and employer participation has expanded from about 50 partners to more than 300.

SHULD, AL PEng (Electrical '66, MBA '85)



Has been awarded the Queen Elizabeth II Diamond Jubilee Medal in recognition of his outstanding contributions to the engineering profession and the province. He has been an APEGA staff member since 1982, serving for an extended period of time as director of registration, and is now serving as registrar. He has continued to work on improvements and updates to standards and approaches to licensing professional engineers and geoscientists in Canada.

In Memoriam

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

Robert Andres, Chemical '52, in in April 2013
Arthur Bergquist, Petroleum '51, in June 2013
Edwin Bradley, Petroleum '51, in June 2013
Thomas Peter Byrne, Engineering Physics '66, PhD (Mechanical) '71, in March 2013
Harry Duguid, Civil '50, in June 2010
Frederick Fenwick, Civil '51, in May 2013
Robert Foster, Civil '52, in June 2013
Michael Hallihan, Metallurgical '76, in May 2013
Harry Hewitt, Chemical '40, in March 2013
Harry Hole, Civil '44, in July 2013
T. Raymond Kirkham, Chemical '54, in September 2012
Earle Klohn, Civil '50, MSc (Civil) '52, in July 2013
Robert (Bob) Koles, Electrical '64, in April 2013
Peter Kozakewich, Electrical '51, in June 2013
Doug Love, Chemical '46, in May 2013
Michael MacGarva, Civil '81, MEng (Eng Mgmt) '98, in June 2013
Donald MacLeod, Metallurgical '58, in April 2013
Thomas McKibbin, Mechanical '05, in April 2013
Robert McQueen, Chemical '49, in February 2013
Keith Miller, Civil '63, in May 2013
Valdomir Miller, Electrical '49, in February 2013
Sylvester Petryk, Mechanical '65, in June 2013
H. Stanley Ragan, Civil '50, in March 2013
Donald Lee Redman, Mining '41, in April 2013
Victor Roberts, Chemical '66, in May 2013
Frank Ronaghan, Chemical '49, in May 2013
Donald Ross, Civil '40, in April 2013
Paul Sacuta, Chemical '83, in May 2013
Lloyd Snow, Electrical '50, in July 2013
Henry Terlecki, Petroleum '51, in June 2013
Frank Twidale, Civil '46, in May 2013
John Vandenborn, Electrical '60, in June 2013
Stanley H. Ward, Chemical '39, MSc (Chemical) '48, in November 2012
J. Arthur Webb, Civil '44, in March 2013

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

E. Max Adkins, Chemical '56, in May 2010
Donald Allan, Mining '38, in December 2010
Bryce Babcock, Electrical '51, in May 2006
Edward Caldwell, Mining '49, date unknown
Emil Drucker, Civil '59, in July 2007
John Parder, Chemical '49, in February 2012
Joseph Reichert, Civil '58, in March 2012
Vasile G. Roman, MSc '87, in April 2005
Daryle Scheelar, Electrical '72, in June 2010

Earle Jardine Klohn

AUGUST 14, 1927 - JULY 22, 2013

Earle died at Peace Arch Hospital, White Rock, B.C., of heart failure. He spent his last day alert and surrounded by his family. Born in Winnipeg, he grew up in Edmonton and graduated from the University of Alberta in 1950 with a BSc in Civil Engineering and two years later with an MSc specializing in soil mechanics and foundation engineering (geotechnical), which was then a new specialty.

He immediately joined Ripley and Associates and became co-founder of Ripley, Klohn and Leonoff. He retired in 1997 from Klohn Crippen.

His life was long and healthy, with two happy marriages and four children. He travelled widely for business and personal pleasure. Throughout his career he made significant contributions to his field in Canada and around the world. Among his many honours was the prestigious Legget

Award from the Canadian Geotechnical Society for outstanding contribution to geotechnical engineering. He was also particularly honoured that his Alma Mater named a science lab after him and his former firm set up a scholarship in his name.

He was pre-deceased by his first wife Beryl, sister Kay Ens, brother Alwin Klohn, and grandson Mark Mitchell. Earle is survived by his wife Lorna, sons Kim (Diane), Doug (Al), Michael and daughter, Jori Mitchell (Mike), four grandchildren, Megan Mitchell, Kevin Mitchell (Kristin), Valerie Klohn, and Andrew Klohn and his sister Marge Cunningham. He is remembered as a man of great integrity, both serious and fun loving, and was passionate about his career and family.

Donations in Earle's name may be made to the Heart and Stroke Foundation or a charity of your choice.

Dr. Fairley
a buff color being suggested. It was agreed
this to the ~~Board of Governors~~
The idea of separating the Faculties of Arts and
Applied Science was then brought up by the President for
discussion.

It was agreed to recommend to the Board of
Governors that the Department of Applied Science as it
now appears in our Calendar be organized as a Faculty.

Meeting then adjourned to meet on Saturday
at 1.30 p.m.

100 YEARS LATER

OUR FIRST FIVE ENGINEERS

By Ellen Schoeck



This is the story of the first five engineers to graduate from the University of Alberta in 1913: Milton “Bud” Brown (water power engineer), Joe Doze (farm boy turned land surveyor, with a beloved younger brother who dies in the First World War), Walter Draper (handsome soldier who steals away in the midst of the war to marry his Canadian sweetheart in Ireland); the brilliant Max Fife (athlete and star soldier, who goes on to MIT); and the dauntingly named Cyrus Percival Hotchkiss (whose friends just call him “Hotch”).

Their skin must have tingled with the anticipation of what they yearned for—something that was not available on their doorstep in Alberta at the time: higher education. Before the U of A was chartered in 1906, and before it opened its doors in 1908, would-be engineers had three choices: go east to study, head south, or cross the Atlantic. All were prohibitively expensive, and there were very few Albertans, indeed, who went on to higher degrees in any field of study.

There are families who moved to Edmonton to await the day when their children could enter the U of A. Engineering’s oldest graduate, Bill Kent (Civil 1931) recalls how his mother insisted on a move from rural Delburne, Alberta, to Edmonton so Bill could finish high school in the city and enter the U of A engineering program. Bill Kent, like so many young Albertans, had a natural bent

for engineering, and thanks to government foresight, there was a postsecondary engineering degree offered in Alberta to help him achieve his goal. Today, at 105 and still in his own home, Bill is the oldest engineer alive who worked on the Lion’s Gate Bridge.

The first five engineering graduates all enrolled on day one of registration at the brand-new University of Alberta on September 23, 1908. We know that the 1908 class president, F. Stacey McCall, camped out overnight to be the first to sign the 1908 register. No doubt the engineers were right beside McCall that night.

The university opened its doors in rented quarters in what is now Queen Alexandra School. Classes were delayed so rural students coming by horse and buggy could get through the melted muck of a chilly September. The university greeted 45 students, more than the first cohort at Harvard.

There were more than five would-be engineers who enrolled. A few other budding bridge and dam-builders signed the register in 1908 but they followed other paths before graduating, mostly to jobs in a province that was growing rapidly.

At the time the U of A opened, the discipline of engineering was rooting itself in the West, following the pathway blazed in Central Canada at McGill. The U of A was first off the mark in the West in offering engineering degrees, but it did not initially have the equipment or facilities to offer courses beyond the second year. The record

shows how founding President Henry Marshall Tory worked diligently at securing equipment for those two final years of engineering. It took time. He was a harridan in searching out the best, and his carefully crafted, hand-written letters to potential suppliers fill multiple boxes in the U of A Archives. If he located equipment the engineering program needed, he dispatched his first engineering professor, William Muir Edwards, to nail the purchase. Tory was focused on this effort. He did not want to educate engineers for a mere two years at the U of A and send them to McGill to complete their degrees. He knew they would likely never return. Tory wanted his engineering students to graduate in Edmonton, and make it their life’s work to build Alberta. Tory stretched resources to offer a second year of engineering, but there was simply not enough money to move beyond that. Tory manoeuvred to get the necessary funding while the first five engineering students took a voluntary year off school. Within a year, he secured the third and fourth years of the West’s first engineering degree program.

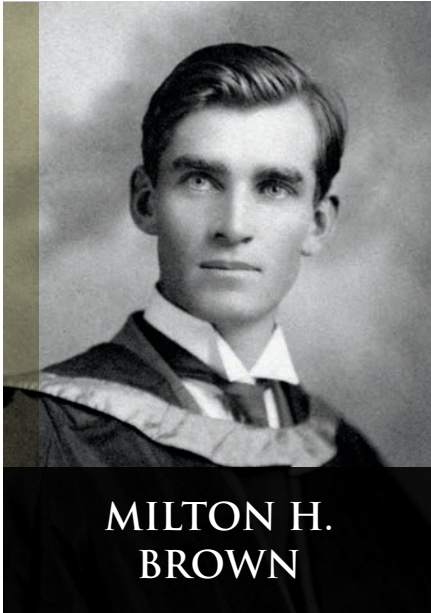
Our first five returned for their last two years of study. When they graduated from what was then Applied Science in May 1913, Tory spoke in his convocation address about this touching and remarkable fact:

“Three years ago, when we reached the third year of Applied Science, our equipment was not such that it would warrant us offering the course in third and fourth years. We suggested to these students that they take their third and fourth years at an eastern university. Instead of so doing they remained out of college one year, returning to us and completing their courses when the university was ready to give them the advanced work.”

This was an extraordinary vote of confidence from students in the future of the U of A and in the belief that the Faculty of Engineering could become the powerhouse it is today.

Taken in 1910, the main photo at left shows students in the 1913 and 1914 engineering classes. The university was then in temporary housing at Strathcona Collegiate Institute (now Old Scona Academic High School). U of A founding President H.M. Tory is at centre. The others are (front row) Milton Brown and Mr. Taylor; and (main row) Claude Ritson, Clem Nimmons, Joe Doze, Bill Hysop, Max Fife, Mr. Perron, Walter Draper, Jim McQueen, Herb Dickson, C.P. Hotchkiss, R. Martin, I. Grierson and Professor William Muir Edwards. Top left: Minutes from the meeting of the Faculty Council on Oct. 9, 1913 show the birth of the Faculty of Engineering. INSET: The flag of the University of Alberta troop from the First World War. The flag is on display in the Arts Building, just outside of Convocation Hall.

100 YEARS LATER



MILTON H. BROWN

U of A Archives UAA 82-122-3

Milton “Bud” Brown enrolled in 1908, graduated in 1913, and has been a mystery for decades.

Former Engineering Dean George Ford, in his history of the Faculty, *Sons of Martha*, says quite simply that there is no record of Milton except for his graduation date.

And yet, a few facts can be gleaned from early university calendars, *Gateways*, and

the alumni magazine *Trail*, predecessor to today’s *New Trail*.

Bud was born in North Dakota in 1887. How his parents came to Edmonton is a mystery.

Bud lived in Edmonton in 1908 at the time he enrolled at the U of A in engineering (then called Applied Sciences). He took the required geometry, dynamics, freehand drawing and mechanical drawing classes. He was first in his class in algebra, excelled in theory of structures and mechanics, and was awarded a scholarship. Unlike many of his classmates, Bud did not enlist in the First World War and thus cannot be traced through the rich online trove of First World War records in the University Archives.

Why didn’t he enlist? Perhaps it was because he was married during the war to Nina Hazelburst, five years his senior, and she was expecting. They had a son, Milton Junior, born in Edmonton in 1918.

For several years, Bud Brown disappears from any record.

But in the July 1920 edition of the *Trail*, a fellow alumnus refers to Bud Brown as one of several U of A grads who worked together for the Reclamation Service of

the Department of the Interior in Calgary. The specialty of the group was “water power investigation.” This small group of engineers was comprised entirely of U of A grads, from different graduating years.

Bud would have been smack in the midst of the early years of Calgary Power, formed in 1910 through a merger of syndicates. The stern and formidable R.B. Bennett, later prime minister, was one of the leaders of the young Calgary Power. At the time, the new province was at odds with the federal government over control of water rights. Surveys on First Nations traditional lands were controversial and there was a flurry of legislative changes driven by the Reclamation Act of 1919. The push was on to survey and control land and water. Some of Alberta’s first dams were built at the time Brown worked for the City of Calgary, with Ghost River and Horseshoe Falls at the top of the list.

After this one reference to Brown working in Calgary after graduation, he again drops out of sight.

Suddenly, his name appears in the 1924 *Trail* address directory of U of A graduates as living in El Monte, California—but all we have is an address. El Monte is located near Pasadena, where a large number of early U of A grads found jobs. A good guess is that he worked on flood control for El Monte, situated between the San Gabriel and El Hondo rivers. El Monte was a rich agricultural area, always at the mercy of the waters which bounded it.

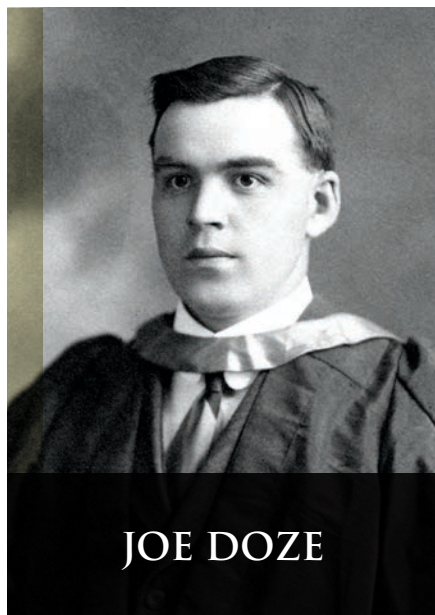
Then again, out of the blue, Brown appears in the 1931 *Trail* address directory as living in Helena, Montana. One can only guess the reason for the move, and the guess is that it had something to do with controlling the wild Missouri River that runs near Helena. His namesake son was schooled there, received a degree in microbiology, and lived in the same house with his parents, at 732-9 Avenue, Helena, Montana—for his entire life.

Milton “Bud” Brown died on July 20, 1946, at age 59. He is buried in the Forestvale Cemetery in Helena, Montana, where he no doubt helped tame the mighty Missouri.



U of A Archives 89-132-1

The first U of A Students’ Union executive. Seated centre are founding President H.M. Tory and Alberta Premier A.C. Rutherford. Seated middle row far left is engineering professor William Muir Edwards. A number of engineering students, including Joe Doze and Cyrus “Hotch” Hotchkiss, were on the larger Students’ Council.



U of A Archives UAA 82-122-4

Joe Doze was born in Nebraska in 1890 and raised on a farm in Beaver Hills, east of Edmonton, near what is now Elk Island National Park. He was the eldest of three children born to Gus Doze and Mary Frederick Doze.

Joe crackled with personality, drive and verve. One can imagine him on the farm, puzzling over how to fix machinery with no big-box hardware store close by, and struggling to solve the umpteen daily problems presented by farm life, with neighbours miles away by horse and buggy.

Joe enrolled in engineering in 1908 and his younger brother Jim followed him to the U of A a few years later. Joe had a talent for sports but seems to have concentrated on his studies before taking on sports full bore. By 1912, he was top of the heap in many non-academic ways: president of the Athletic Society (which put him on the Students' Council Executive), circulation manager of the *Gateway* and president of the rugby football team. Rugby football ruled the day, but Joe was also a star of the basketball team. Basketball was new to the U of A. People were swept up by it. The rivalry among local teams was intense, with games drawing sell-out crowds. In 1913 a basketball court was constructed as part of Athabasca Hall's dining room: dining room

at meal time, but otherwise a basketball court. Heartily welcomed by students, it was the university's first indoor sports facility.

Joe's younger brother Jim was his compatriot on the rugby field—two blue-eyed, brown-haired farm boys sharing the rough-and-tumble of a hard-hitting sport.

Joe graduated as an engineer in 1913 and on February 11, 1916, received his certificate as an Alberta Land Surveyor from the university's academic Senate, which granted degrees and certificates. He registered nine months later with the Alberta Land Surveyors' Association.

It was at this point when the paths of the two Doze brothers diverged. Only one went to war: young Jim.

What happened?

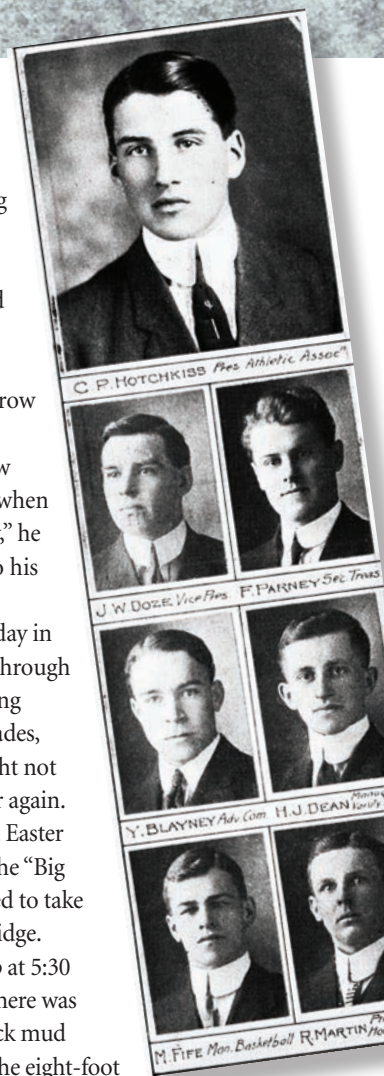
In 1916, the U of A's own troop, the 196th, was formed. President Tory persuaded Hector McLeod, a master's student in Engineering, to lead the 196th. Hector received his MSc in 1916, and later became Dean of Engineering at UBC, where a building is named after him. The university has kept the flag—it is the only troop flag not flying under the dome in the provincial legislature. Today, you can see the 196th troop flag, under glass, just outside Convocation Hall in the Arts Building.

Young Jim Doze joined the 196th immediately, and was soon battle-hardened. Jim joked to his older brother that rugby had prepared him well for trench warfare in France: "I have just come back after putting

in 10 days sleeping in the daytime and working at night close behind the lines, so have experienced the sensation of a narrow escape. I can 'get down' quicker now than I ever could when [we] played rugby," he wrote in a letter to his brother.

On Easter Sunday in 1917, Jim walked through the trenches, visiting with U of A comrades, knowing they might not ever see each other again. The following day, Easter Monday, April 9, the "Big Push" was launched to take control of Vimy Ridge.

Troops were up at 5:30 a.m. It was cold. There was sleet and rain. Thick mud would have filled the eight-foot deep trenches. The death toll was 3,598; 7,004 were wounded. Reports back to the U of A said that Jim Doze "came through without a scratch." But in June the U of A Comforts Club newsletter issued a correction: "Jim Doze reports that on June 9 he got a blighty in the arm and had been boarded [on a boat] and is to be returned



Chaldeans, Kurds, Nubians, Egyptians, Indians (of all castes) Chinese, a few Turks and of course all kinds of British troops. J. S. Doze who enlisted with the 196th, went to the 218th, thence to the 194th, is now officially with the 49th but had not as yet joined the unit (Feb. 22nd) and was working with an entrenching unit meanwhile. He makes a remark which all the rugby men will appreciate: "I have come back after putting in ten days sleeping in the day and working at night around close behind our lines, so experienced the sensation of a narrow escape. I can 'own' quicker now than I ever could when I played rugby." He states that whilst at Havre he had seen Lavallee on his way back to his unit so the news last week re

A report in the Comforts Club Newsletter sends news of engineering student Joe Doze's brother Jim, who recounts dangerous conditions from the trenches. Above, a clipping from the *Gateway* showing student representatives of different athletic teams. U of A Archives UAA *Gateway* Vol 2 Number 7 April 1912, p 58.

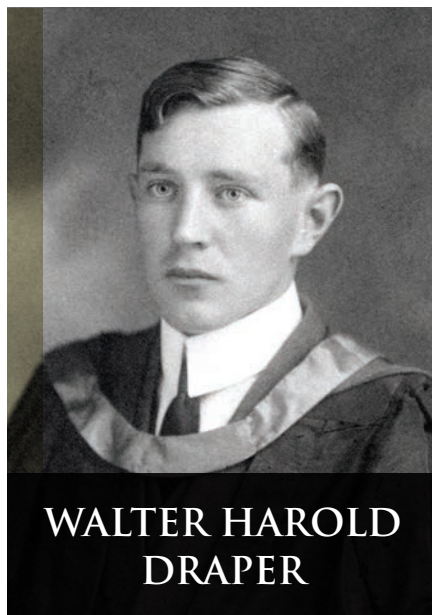
100 YEARS LATER

to Canada for treatment and expects to be back shortly." The "blighty" turned out to be gunshot wounds in the shoulder and wrist. While in hospital it was discovered that young Jim had TB. He was shipped back to Canada, treated in Alberta and the U.S. to no avail, and died in Fort Saskatchewan, Alberta, in 1919.

In the meantime, older brother Joe came in from the farm to spend a day in Edmonton, part of it on campus to talk with the young women who ran the Comforts Club. They wrote in the Newsletter: "Joe has been farming for some time but is not all that keen about it, speaking in a most disgruntled way about the scarcity of farm help which made it necessary for him to remain on the farm." And there was the reason Joe Doze did not go to war: he was the brother chosen to stay and keep the home fires burning. His parents had farmed in Ohio, Nebraska and Alberta for at least three generations. Even though Joe kept the farm going, it would have been a terrible blow to bury his younger brother Jim—his classmate, his rugby teammate.

In 1920, Joe was still living at the farm in Beaver Hills but by 1930, he had moved to Fort Saskatchewan, where he took up land surveying with a passion. Joe was an assistant on the Saskatchewan-Alberta Boundary Commission's party, which surveyed the boundary from Lake Athabasca to the 60th parallel. Doze Lake, situated 350 km north-northeast of Fort McMurray, was named after Joe in 1939. In 1945 Joe was elected president of the Alberta Land Surveyors' Association and was named an honorary member in 1963. Joe was regarded by ALSA as one of its founding members and was a role model for the new generation of surveyors, including Dave Usher (Civil 1949), head of W.D. Usher and Associates, whose memoir described the harsh, primitive conditions early land surveyors like Joe endured.

Joe died on September 11, 1972, having secured his reputation in Alberta's land surveying community as a pioneer of the first order.



**WALTER HAROLD
DRAPER**

U of A Archives UAA 82-1225

Walter Draper is another mystery.

Like Milton "Bud" Brown, according to former Engineering Dean George Ford in his history of the faculty, there are no records of Walter other than his graduation in May 1913.

Yet once more, the old calendars and alumni magazines, coupled with the Comforts Club's chatty letters during the First World War, unearth at least some pieces of Walter's life.

Walter was the only one the five original engineering grads to hail from Edmonton South, today's Old Strathcona. Back then, Edmonton and Strathcona were rival cities, and being identified as an Edmonton South student set you apart. In 1912, Edmonton and Strathcona amalgamated to form today's City of Edmonton, but at the time Walter enrolled in Engineering, the rivalry between

Edmonton North and Edmonton South was palpable, and each was a distinct group.

When it came to grades, Walter was the middle of the pack except for "materials of construction" and "graphical statics" where he excelled. Walter's class standings are recorded in early U of A calendars and leave this indelible footprint.

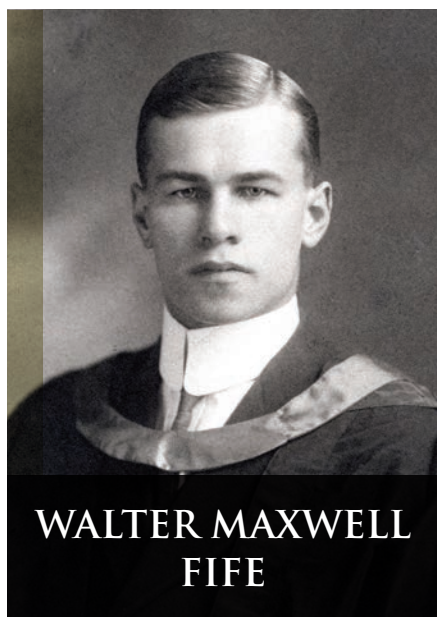
Walter graduated in May 1913, and received his certificate in land surveying right after his buddy Joe Doze. Shortly thereafter, Walter headed to the battlefields of Europe with D Company, Second Battalion Canadian Railway Troop, which was part of the British Expeditionary Force. He immediately went into training and wrote to the Comforts Club to say he had arrived safely in Europe. There is no further correspondence home from Walter except for a thank-you letter to the Comforts Club for a care package. In that letter, Walter tells of the shell shock experienced by a U of A engineering classmate C.W. Ritson (BSc 1914).

By 1917 Walter received his commission and attained the rank of lieutenant. He took a leave of absence in August and travelled to Ireland to marry his Canadian sweetheart, Lenore Patterson, daughter of Reverend William Patterson of Cook's Church, Toronto. The news was received with great joy back on campus—a tender relief from the endless news of death and dreadful wounds. The young women in charge of writing the Comforts Club newsletter, under the direction of engineering professor Muir Edwards, ran a front-page picture of the dashing Walter "just to show you what a fine looking chap that girl got!"

Army Agents, Bombay, India, whilst Lieut. Draper's address is c-o Can. Com. Depot, Army P.O., London, but he is likely in France now. Dexter reports "I am quite well" as does also R. E. Johnston. R. E. Westberg, No. 2327382, 8th Can. Siege Battery, France, reports himself on draft and expected to leave any day. As already noted, Lieut. Walter H. Draper (B.Sc. '13) was married on Aug. 14th to Lenore, third daughter of Rev. Wm. Patterson, D.D. of Cooke's Church, Toronto and as promised the photograph of the happy bridegroom is herewith presented. I had a letter this week from I. F. Morrison, who I stated, had a commission with the U. S. Engineers. It is, however, with the artillery

Finally, a breath of fresh air in the Comforts Club newsletter: word arrives that engineering alumnus Walter Draper has married.

Walter's commission meant he would be in the thick of war, but he survived. We know little about his life after that. He settled on Atlas Avenue in Toronto with Lenore, was employed by the province of Ontario, and survived a serious illness in the late 1920s. Walter and Lenore raised a son, John William Patterson Draper, who married in St. Thomas, Ontario, in 1945. Walter's trail then ends.



Walter was “Max” to his friends, and he was a star: extraordinary athlete, first in his class at both the U of A and later at MIT, engineering's first graduate to be on faculty as an instructor, lecturer and then assistant professor. And he was an engineer/soldier during the First World War.

Max was born in Peterborough, Ontario, in 1890, one of four sons and three daughters born to James Alexander Fife and Harriet Wright.

Young Max was born and bred to succeed. His father was in the extraordinary cohort of five students to receive their first graduate degrees from the U of A in 1911. Each of these five graduates went on to great success in their fields, from library science to education.

When the U of A's doors opened in 1908, Max's father entered the U of A with a BA in hand and sought a graduate degree. Young

Max entered the engineering program in the same year, as a freshman. At one point, there were five Fife family members at the U of A: a professor, a graduate student, and three undergraduates, including Max. The Active Service Roll in Convocation Hall records four Fife brothers as serving their country during the First World War: Max, Gordon, John and Harry.

Patriarch James Fife eventually became the Science Master of Edmonton High School and served as provincial school inspector for the Edmonton Public School District. He also taught summer school at the University of Alberta. Ecole J.A. Fife, in north Edmonton, is named after him.

And so Max Fife had a successful father to live up to. But it wasn't just his father whom Max had as a role model. There was also his older brother, Gordon.

Gordon Stanley Fife was a legend in the early days at the U of A. Gordon attended Peterborough Collegiate, where Frederick Haultain (first and only premier of the Northwest Territories) and former Prime Minister Lester B. Pearson attended. Gordon went on to Queens University and, after moving to Edmonton, was named as the inaugural (1908) Rhodes Scholar from the new provinces of Alberta and Saskatchewan. Upon graduation from Oxford, Gordon was hired as associate professor in history at the U of A and also lectured in the English department. His death in 1916 at the battle of Sanctuary Wood was a deep blow to the family and to the young U of A, whose students looked up to Gordon as an icon.

Let's follow young Max from the first day of class at the U of A.

Max was taking classes at the same time his father studied for a graduate degree, while his brother Gordon was a professor of history. His two younger siblings were in Arts, and that made for five Fife family members enrolled at the U of A between 1908-11.

Young Max went at it hard, full of purpose and intent. He was a natural as a budding engineer, and became an expert in indeterminate structures. His class standings are recorded in early calendars, and there are very few subjects where he was not at the top.



The Active Service Roll, painted on the walls outside of Convocation Hall in the Arts Building, records four of the five Fife family members as serving their country.

Max loved sports and was a triple threat: rugby, hockey and basketball. Max was a definite force to be dealt with in rugby football, along with his engineering buddy Percy Hotchkiss. Their fame is recorded in the wartime letters that went back and forth from the front to the U of A Comforts Club. Max's prowess in hockey is recorded in the first editions of the *Gateway*.

But it was basketball where Max mopped up the floor and made front page news. It was a brand-new sport, and he mastered it. Max was part of the 1911 team that won against the Edmonton “Doormats,” who had commandeered two Toronto basketball champions in an attempt to defeat the U of A team—to no avail. The U of A won 15-11, to a sell-out crowd.

There is a story about how President Tory came to the drafting room on a surprise visit and found students who were supposed to be intent on their assignments, but who instead were practicing their football passes. There was an awkward moment when the students waited to be scolded. But Tory, the stern Methodist minister, had a soft streak for sports and without a word, just left the students to their impromptu practice.

Max was president of both the Athletic and Literary Societies, and the only engineer to hold the exalted “Lit” position. And no one had ever held both positions. Each position placed Max on the executive of the Students' Union.

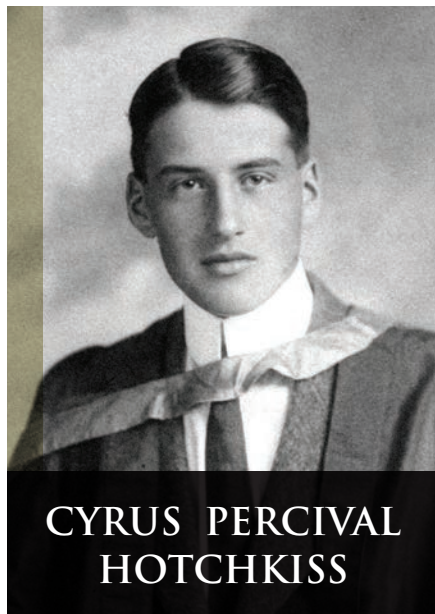
Max graduated in 1913 and won the prestigious John Alexander McDougall Gold Medal. He then worked as an assistant “instrument man” for the Dominion Land Survey and worked for the Dominion Bridge Company in Winnipeg before joining the U of A as an instructor later that year. In

100 YEARS LATER

1917, he enlisted for war service along with his younger brother Jack (BA 1920). This would have been a difficult family decision as the eldest son Gordon had just been killed in action.

Max taught marksmanship, became a Musketry Officer of the 19th reserve battalion, then joined the Maintenance Department of the Railway Troop in France, and ended his service as a lieutenant with the 4th Labour Battalion in France.

Max survived the war and married Vera May Bell in Edmonton in 1922. Max and Vera raised two sons, James Alexander and Walter Maxwell. Max received his MSc from MIT in 1924 and advanced there to assistant and then associate professor. He was a member of the Engineering Institute of Canada, the American Society of Civil Engineers, the Boston Society of Civil Engineers, and the American Concrete Institute.



U of A Archives UAA 82-122-7

The engineer with the lofty name was known to his friends simply as “Hotch”. Born in 1891 in Brantford, Ontario, his family moved to Detroit, Michigan, and then back to Canada, and then to southern Alberta. Why all the moves? Hotch’s father was a railroad man and travelled widely in Canada and the U.S., probably trolling for opportunities.

While in Detroit, Hotch’s father, Charles, was involved in the newspaper business.

Charles moved the family to Claresholm, Alberta, to start that town’s first newspaper, the *Claresholm Local Review Advertiser*.

Charles also had a ranch, and was a well-known Liberal. Charles’ work required him to spend time in Edmonton, and there he bought a house, right where the Legislature Building now stands. Charles’ son Hotch enrolled in applied science at the U of A on the first day of classes in September, 1908.

Hotch focused on civil engineering and surveying and his grades were solid. He excelled at sports and was a star in both rugby football and basketball, playing both sports alongside his classmate Max Fife. Hotch was president of the Athletic Society and a member of the executive of the Students’ Council, making three of the five first engineers members of the SC Executive.

War erupts. Hotch has graduated, and has been awarded his Land Surveyor’s Certificate by the University Senate in 1916. He has been admitted to the six-year-old Alberta Land Surveyors’ Association, and is now impatient to get to the front. He does not wait for a battalion to form. Instead, he enlists with the “engineers’ draft” as a sapper, headed to Europe with the 19th Alberta Dragoons, Canadian Overseas Expeditionary Force. “I got tired of waiting around for a post,” he said, “and so am enlisting and leaving Saturday for the headquarters of the unit at St. John’s, Quebec.” Hotch trained in England, and then headed to the front. He came out of the war without a scratch.

Back in Alberta after the war, Hotch married and took up land surveying. He was renowned for his work in surveying the Battle River area, under the legendary Irish surveyor J.T. Atkins. The tiny community of Hotchkiss and the Hotchkiss river stream, near the Town of Manning in northern Alberta, are named after Hotch. He suffered a debilitating injury building a bridge in Alberta, moved first to Ottawa, where he worked for the Dominion Fuel Board Mines Branch and then to Toronto, where he was western manager of the F.P. Weaver Coal Company.

Hotch always remembered the school that enriched his life and the lives of so many others. In 1968, four years before he died and 55 years after he graduated, Hotch

made a \$50 donation to the university. Why? Why, so many years later, did one of our first five send this gift?

Here is a guess: There is a story from the earliest days of our university about an unnamed student (now, quite conceivably Hotch), who broke a surveyor’s transit. Founding president Tory, remember, had struggled through his mission to raise enough money to buy the equipment required to provide students a full four-year engineering program. It is said that the student in question was either expected to or felt obliged to make good on the cost, which amounted to \$50. This was a lot of money—more than one student could come up with as an unplanned expense, so the entire group of students took the hit, each chipping in what they could to make up the cost.

Months turn into years and years pass into decades and Hotch, if it was he who broke the transom, wants to pay back his fellow students in the only way he can, by giving it to the university.

Of the first five, Hotch was the last man standing. He passed away in 1972 at the age of 82.

THE FIRST FIVE LEGACY

These first five engineers were pioneers in building Alberta’s infrastructure. They camped in rugged bush and had limited family life while they undertook the land surveying that demarked Alberta’s first boundaries. They designed and constructed bridges and they were the first to dam rivers. All this was done in the province’s earliest years, where comforts were mightily few in the lands where settlers first set foot.

Ellen Schoeck (BA Hons ’72, MA ’77) is author of *I Was There: A Century of Alumni Stories about the University of Alberta, 1906 – 2006* and *A Century of Campus Maps*. These books are available at the U of A Bookstore and won the City of Edmonton Historical Board Recognition Award in 2011, and *I Was There* won both Grand Gold and Grand Crystal from the Council for the Advancement of Secondary Education in 2007. Ellen has been on campus for 45 years as a student and administrator and is executive director of the Graduate Students’ Association.

U of A Archives UJA Gateway Vol 2
Number 7 April 1912 p 57



whilst the
ber list. As will be seen the
system.
Since the sterilizing plant has been in operation there
have been no new cases of typhoid except those coming from houses
in which typhoid cases were being nursed.
The plant was made by myself and assistants
th and 1st of the month. The results of
able as yet but will be reported on by me
respectfully suggest the advisability of a
the plant for some time to come.

STRATHCONA.
lose account for services and expenses in con-
installation of the permanent plant. This
include the test of the plant details of
available.
I am, Sir,
Yours sincerely,
W. Muir Edwards

FOUNDER OF THE FACULTY

Our first professor had a tremendous impact on his new community, dying in the service of others.

By Ellen Schoeck

Henry Marshall Tory was a man in a hurry. He wanted higher education brought to the West, and he joined Premier Alexander Rutherford, Alberta's first premier, in advocating for the new University of Alberta to be publicly funded, non-denominational and open equally to men and women—all revolutionary concepts in their day. Tory also argued that arts and science should be the foundation of the university and that the professions should be built on this base. The first profession he planned for was engineering. The U of A archives holds box upon box of Tory's handwritten letters sourcing the equipment for what was then called applied science, renamed engineering in 1948. Engineering was the first professional faculty in the sciences at the U of A, established in 1913. Among Tory's first four professors were a classicist, a modern-languages expert, an English professor and engineer-mathematician William Muir Edwards.



**WILLIAM MUIR
EDWARDS**

Top left: William Muir Edwards with the U of A team he coached to the 1911 provincial rugby football championship. At right, a letter from Muir to the Town of Strathcona in which he explains how he has solved a water treatment problem and ended a serious outbreak of typhoid.

Muir's mother was the iconic Henrietta Muir Edwards, one of the "Famous Five" who asked the Privy Council of England whether women were included in the definition of "persons" for the purpose of being elected to Canada's Senate. (The answer was yes.) Muir thus came from an ambitious family, and he graduated at the head of his class at McGill (BSc 1901). He immediately went on to his civil engineering degree at McGill (MSc 1902), winning the British Association Medal for Applied Science, and then served as an assistant professor at McGill until 1907. That's when Tory, also a McGill graduate, scooped Muir from McGill to the U of A. Muir and his wife Evelyn settled in one of the new Ring Houses. Located across from today's Faculty Club, these homes were specially built for the first senior faculty and deans to make up for the lack of housing in Edmonton at a time when many were living in tents.

How had Muir met his future wife, Evelyn? Their 100-year-old daughter, Joyce Edwards Scully, nails it with this short story: "Hen [Henrietta Muir Edwards] was teaching art, and my mother Evelyn was one of her students. My father happened by chance on

the art class, took one look at Evelyn and said, 'That is the woman I am going to marry.'" Muir then made a fiction of dating his friend, Evelyn's sister, who knew the game from the

beginning. She got Muir and Evelyn together in what was a great love match. Once Muir died, Evelyn raised their three children on her own. She never remarried.



U of A Archives UAA 69-12-76 (SCC2) Comforts Club 1918

William Muir Edwards poured his heart and soul into producing the Comforts Club Newsletter, which could be considered the Facebook of its time. The club pulled together news from letters written by students and faculty members serving in the First World War and forwarded the compilation, weekly, to subscribers and contributors. The packages often included local news, sweet treats and knitted socks and scarves.

A FAMILY AFFAIR

The Muir Edwards clan distinguishes itself through service

William Muir Edwards's mother, Henrietta, was a wonderfully dominant life force, and she loved the arts. Her family knew her as "Hettie" or "Hen," and here she will be called what her living 100-year-old granddaughter, Joyce Edwards Scully, calls her: "Hen." But her great-nephew James Edwards recalls her as "Hettie." By whatever name, she helped change history for women in Alberta.

Hen fought for women to have the vote, and her role as one of the Famous Five is celebrated in sculpture on Parliament Hill. A park in Edmonton is named after her, and murals in Edmonton and Calgary honour her. Two of her relatives love to tell stories about

her. One is her grandson Hugh Scully, surgeon extraordinaire and former president of the Canadian Medical Association, and the other is the Hon. James (Jim) Edwards, board chair emeritus of the U of A and a great-great-nephew of Oliver Cromwell.

Oliver Cromwell Edwards was Hen's father. He was a celebrated physician who provided care to the First Nations in southern Alberta and who was part of the first survey of what is now the Northwest Territories. Imagine living up to that.

Hen's great-nephew Jim Edwards says: "I recall Dad's stories about Cousin Hettie

arriving unannounced from Fort Macleod at our Edmonton home with her cardboard suitcase and red hair a-flying, on a suffragette mission to the legislature, and my grandmother never knowing whether she'd be there a day or a month. I also remember Dad's admiration of Muir, who was a 'man's man,' a leader in every sense, and who gave his life for his fellows, on his 39th birthday. He and Evelyn were frequent guests at our family home, of course long before I was born."

The Edwards-Scully clan today is replete with model citizens of Canada and the world, including judges, master landscapers, political analysts and doctors.

They know very little about their scion, Muir Edwards. No wonder. When he died, the world seemed to have ended for his family, right here on this campus: a young widow with three small children, and no pension. She immediately went back to her family in Ottawa, and the knowledge of her husband's contribution and relationship with the Faculty of Engineering faded over the years. Now, with this 100th anniversary of the first graduating class of engineers, the connection has been re-established between the U of A Faculty of Engineering and the remarkable Edwards-Scully clan. For us all, all Edmontonians and Albertans, we thank the extraordinary William Muir Edwards.

Back in 1908, Muir was more than just a bright young academic. He excelled at sports and by all accounts had a deadly drop-kick in rugby football. At McGill, he won the Athletic Association Silver Medal, breaking the record in the two-mile race. In 1908, he was not much older than his U of A students and, after class, Muir would take them to the open fields in Strathcona, near the old CPR station, to teach them to play rugby football. Muir later marked out the first football field on the new U of A campus. Students loved this man. He had heart and soul, was both friend and mentor, and students across campus named him as the first honorary president of the Athletic Club. And there is more to Muir's story about the beginning of student traditions at the U of A because, in 1908, Tory had Muir chair the first meeting of the Students' Union.

Two years later, in 1910, a typhoid epidemic hit the Town of Strathcona (which soon became part of Edmonton). The university closed, cancelling classes. Deaths in the city mounted, and several U of A students died. *The Gateway* ceased publication. Enter Muir, who found the source of the problem: an intake valve that was taking in raw sewage. Muir relocated the valve, with engineering trumping typhoid.

In 1913, Tory named Muir as the first head of the new Faculty of Applied Sciences. That same year, Muir and Evelyn welcomed their third child, Joyce and engineering's first cohort graduated.

Muir's care for students and community seemed to grow over time. During the First World War, when so many students were in the trenches and homesick for news from the U of A, Muir absolutely poured himself into a weekly publication, the Comforts Club Newsletter, that was sent overseas, along with hand-knitted socks, "tasty bits" like fruitcake and chocolate, and copies of the *Gateway* to students serving their country. Handwritten letters, now lost, flew back and forth between the university and students in the trenches of Belgium and France. Muir's Comforts Club Newsletter was like the Facebook of its time: he would aggregate news from student letters, along with stories from the university and the province, and send it out—every week—to its followers.

"He tenderly bore the sick in and reverently carried the dead out, and by ready acceptance of the meanest tasks inspired in others a true sense of service."

— WILLIAM HARDY ALEXANDER

In 1918, as Muir's beloved students returned to campus from the war, ready for celebration, the deadly Spanish flu epidemic hit, eventually claiming more lives than the First World War itself. Classes were cancelled. Pembina Hall was turned into an emergency hospital and morgue. Muir volunteered to nurse students through this deadly flu, and

HONOURING WILLIAM MUIR EDWARDS

A generous financial pledge has been made, anonymously, to honour the memory of William Muir Edwards. One of the university's first four professors and its first engineering professor, Muir was known for his selfless service to others. He died 95 years ago this November, on his 39th birthday, caring for victims of the Spanish Flu epidemic. If you have been inspired by his story, you can help support this initiative to preserve and promote his dedication to scholarship and service. Contact Leanne Nickel at 1-800-407-8345, 780-492-4159 or via email at leanne.nickel@ualberta.ca.

stayed away from his home, his wife Evelyn and his three young children, Douglas, Muriel and Joyce. Muir died from the flu on his 39th birthday. His close colleague, classics professor William Hardy Alexander, penned this upon Muir's death: "He tenderly bore the sick in and reverently carried the dead out, and by ready acceptance of the meanest tasks inspired in others a true sense of service." Muir Edwards loved U of A students, and they loved him back.

Today, you can visit the Arts Building, where you will find a plaque dedicated to Muir Edwards. It is the only plaque ever dedicated to a professor by the entire university. Muir is buried, with his parents, at Mount Pleasant Cemetery in Edmonton.

The family connection to the U of A remains strong. Muir's not-so distant relative, the Hon. James Edwards, is a former chair of the U of A Board of Governors and is one of the university's great supporters. He says Muir should be remembered for his contributions to the university and the community at large.

"Selfless service, athletics and civic contribution—those are the values he represents," says Edwards. "Tory gets most of the credit for establishing the university—and rightly so. But there were others involved and William Muir Edwards was one of them. He is a founder of this university. And I would say he founded well."



Ninety-five years ago this November, engineering professor William Muir Edwards died in the service of others. This plaque is on display outside of Convocation Hall in the Arts Building.

Celebrating with the

The 101st graduating class from the University of Alberta Faculty of Engineering celebrated with two convocation ceremonies in one day June 6, and gathered for a lunch with family, friends and classmates at the Engineering Teaching and Learning Complex.

Nearly 1,400 engineering graduates, friends and family were treated to a lunch sponsored by the Faculty of Engineering, Stantec, Shell and Canadian Natural Resources Limited.

It turns out that the graduates and their guests worked up quite an appetite: the lunch menu included more than 23 kilos each of beef and turkey for sandwiches, 20 dozen eggs, 474 buns, 376 croissants, 1,300 slices of cheese and 160 heads of romaine lettuce for Caesar salads—plus coffee, tea, juice and desserts.

The luncheon and convocation ceremonies represented both an end and a beginning for the 760 undergraduate and 191 Master's and PhD graduates. While they have completed one chapter of their lives, they now move on to another.



Class of 2013



Demetri Giannitsos (www.demetrijiann.com)



Our new graduates continue a long and proud tradition of engineering excellence at the U of A that began more than 100 years ago.

William Muir Edwards, a civil engineer who was one of the original U of A professors when the university opened its doors in 1908, began teaching engineering in 1909.

In 1913, the U of A's first degrees in applied science (later engineering) were bestowed upon five students: Milton H. Brown, Joseph W. Doze, Walter Harold Draper and Cyrus Percival Hotchkiss.



Remembering Harry Hole

alumnus, friend, philanthropist

Harry Hole (Civil '44), one of the most passionate supporters of the University of Alberta and the Faculty of Engineering, died July 3, 2013. He was 91.

Harry was born in Edmonton on Sept. 14, 1921. His parents, Annie and Harry Hole Sr., came to Canada from England and eventually sent all nine of their children to the U of A. Five of them—Bill (Civil '33), Jack (Electrical '37), Robert (Civil '44), Harry (Civil '44) and Jim (Civil '50)—earned engineering degrees.

The family's connection to the university and the Faculty of Engineering grew over the years. In 2002, four of the brothers—Harry, Robert, Jim and Ralph (BComm '42)—gave \$5 million to the Faculty of Engineering. That gift proved instrumental in leveraging further funding totalling \$65 million for the construction of the Natural Resources Engineering Facility, and established the Hole School of Construction Engineering. These developments have placed the U of A at the forefront of construction engineering teaching and research, globally.

Dean of Engineering David Lynch says the gift transformed the Faculty of Engineering, the construction industry and society.

"It is individuals like Harry Hole upon which strong communities are built," he said.

"Their support in establishing the Hole School of Construction Engineering enabled us to have and support the intellectual resources that have helped transform the construction industry," Lynch said, adding that the impact of the



Ada Hole, Muriel Hole (Nursing '48), Jim Hole (Civil '50), Harry Hole (Civil '44) and Dean of Engineering David Lynch (PhD Chemical '82) celebrate the 10th anniversary of the Hole School of Construction Engineering during an event hosted by the Faculty of Engineering in July 2012.

gift continues to grow as new knowledge is developed and new generations of engineers are educated.

"Harry's impact can now be seen in literally the entire construction sector of Alberta and beyond, and also in many educational institutions, in many locations, where graduates of the school have become key professors."

A former executive with the mechanical services firm Lockerbie and Hole, co-founded by his father Harry Sr., Hole was an ardent supporter of the U of A through generous philanthropy that will leave an enduring legacy for the entire institution, said President Indra Samarasekera.

"I am deeply saddened to hear of the passing of University of Alberta alumnus and friend Harry Hole," Samarasekera said, when word of Harry's passing reached campus. "I cherished the opportunity to

meet Harry and his wife Muriel. Their enthusiasm for the University of Alberta was boundless and I always appreciated their warmth and generosity."

U of A champion

Harry felt strongly about giving back to the community, including the U of A and other post-secondary schools in Edmonton.

In a 2006 interview upon his induction into the Alberta Order of Excellence, Harry said he was forever changed by the loss of friends during the Second World War.

"You were really looking through your career at some way of paying that back; it gave you a sense of responsibility," he said.

The motivation was there to "have a good life yourself and hopefully do something to improve the way for other people." In addition to supporting the construction engineering school, Hole

and his wife Muriel donated \$100,000 to create the Canadian Military and Veterans' Rehabilitation Chair. The family also provides support for the Muriel Hole Fund for Nursing Students, and the Hole Family Civil Engineering Endowment Fund.

The U of A recognized Hole's accomplishments in 2001 when he received an Alumni Honour Award, and in 2005 when he and brother Jim were awarded honorary doctor of laws degrees.

In July 2012, the Faculty of Engineering honoured the Hole family for its contributions to the faculty, the university and the province. At a special event celebrating the tenth anniversary of the Hole School of Construction Engineering, Harry expressed his pleasure with the school's progress and impact, and told younger members of the family he was "passing the torch" to their hands.

Community advocate

Hole's generosity extended well beyond the U of A; he was a strong community advocate and a member of numerous boards and organizations.

Hole was the founding chair of the Edmonton Police Foundation, which later created the Harry Hole Community Policing Award in his honour. He played a key role in the development of Edmonton Northlands, was a strong supporter of the Edmonton Community Foundation, and for 10 years was an honorary colonel of 15 (Edmonton) Service Battalion.

Hole's lifetime of accomplishments was honoured in 2006 when he was inducted into the Alberta Order of Excellence—the province's highest civilian honour—and again in 2012 when he received a Queen Elizabeth II Diamond Jubilee Medal.



The Legacy

How the Hole family's gift to Engineering is making a difference

Established through a gift from four of the Hole brothers, the Hole School of Construction Engineering is a world leader in construction engineering research and education. Some interesting statistics:

- The school employs 17 people: five faculty members, two post-doctorate fellows and 10 support staff.
- Twelve courses are available through the school—four for undergraduates and eight for graduate students.
- There are 78 graduate students enrolled in the Construction Engineering and Management program. Of those, 35 are working toward PhDs, 25 are in MSc programs and 18 are in MEng programs.
- In the 2012-13 academic year, 29 students graduated—eight with an MSc, 10 with an MEng and 11 with PhDs.
- Success loves company: the school has 35 industrial partner companies from different areas of the industry, including labour, municipalities, construction owners and contractors.
- In 2012, the Hole School of Construction Engineering had \$3.1 million in funding.
- Expertise: The school is home to the Canada Research Chair in Operation Simulation, the NSERC Senior Industrial Research Chair in Construction Engineering and Management, the NSERC Industrial Research Chair in the Industrialization of Building Construction, the NSERC Industrial Research Chair in Strategic Construction Modelling and Delivery, and the Ledcor Professorship in Construction Engineering.
- Sharing knowledge: graduates of the school have become leaders in industry and academia. Two of the school's professors, Ming Lu and Yasser Mohamed, are graduates of the program. Other notable alumni include Brenda McCabe, chair of civil engineering at the University of Toronto; Sam Salem, holder of the Yabroudi Chair of Sustainable Civil Infrastructures at Syracuse University; and Janaka Ruwanpura, who holds the Canada Research Chair in Project Management Systems at the University of Calgary.

By advertising in *U of A Engineer* magazine, you are connecting with more than 18,000 U of A Faculty of Engineering alumni.



making powerful connections



U of A Engineer gives you exclusive access to a dedicated readership of highly educated engineering graduates with a broad range of interests and expertise. You are also accessing a readership of young, ambitious engineering students: U of A Engineer is mailed directly to 18,000 engineering alumni and about 3,000 copies are circulated to students, professors and partners.

Whether you're looking for highly qualified personnel or providing service to professional engineers, advertising in U of A Engineer is right for you.

Find out more today!

Contact Richard Cairney
780.492.4514 / 1.800.407.8354
richard.cairney@ualberta.ca

Re:Engineering Leadership

Canada's top engineering schools open dialogue on critical skills shortage

This Fall, Canada's top engineering schools have joined together to lead a national dialogue on developing skilled postgraduate leaders. The national tour comes to **University of Alberta on Tuesday, October 8**

Come explore the possibilities of postgraduate engineering education
www.engineering.ualberta.ca/GraduateResearchExcellence

Canadian Graduate Engineering Consortium, a partnership of Canada's largest engineering schools

