Celebrating Queen’s Engineering!

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Giving people the tools to succeed
A TIME TO CELEBRATE

Welcome to the Winter 2011 issue of The Complete Engineer. This issue is a celebration.

We are celebrating our past. You will find a special four-page pullout that illustrates our Faculty’s history and features a handy timeline detailing our evolution. Also in this issue, a Q and A with Principal Woolf describes the role our Faculty has played at Queen’s University and the future he sees for us.

We are celebrating our present. We profile ten of our alumni. These are men and women who have been shaped by their experience at Queen’s and in turn are shaping the world around them. We also profile the research of Dr. Tim Bryant, a professor in our Department of Mechanical and Materials Engineering, whose work on an improved, affordable prosthetic foot is helping people in the developing world who have lost lower limbs due to landmines and natural disasters.

We are celebrating our future. Read about our students, their activities, their initiatives and their accomplishments.

We are celebrating Queen’s Engineering and Queen’s Engineers, and there is much to celebrate.

I would like to take this opportunity to thank the faculty members, department heads, staff and students of the Faculty of Engineering and Applied Science. It has been a challenging and exciting three years and, with the support of this great group of people, we have accomplished much. I would like to highlight a few of the key developments.

We have:
- Completed our strategic and academic plans
- Welcomed ten new faculty members
- Started two new degrees at the graduate level
- Received one of the largest single donations to Queen’s University
- Produced new recruitment materials, new websites, and videos
- Welcomed 150 more undergraduates students a year
- Increased our international undergraduate enrollment by 8.6%
- Been awarded over $60 million in research funding including a $17 million Canada Foundation for Innovation grant and $5.8 million in Ontario Research Funding
- Established three new research chairs

Further:
- Our professors have won three Premier’s Excellence awards
- Our incoming average has increased by 2%
- Our 2010 incoming class was 28% women, the highest percentage of any Faculty that offers programs from across all disciplines
- Our professors have won over 30 teaching awards
- Our design teams have done extraordinarily well! In 2010:
  - Queen’s Space Engineering Team placed sixth at the annual CanSat challenge in Amarillo Texas
  - Queen’s Formula SAE Team was the top Canadian team, finishing 16th out of 120 teams, at the Michigan International Speedway. This represents the team’s best result in its 17-year history
  - Queen’s Baja SAE Team placed seventh overall in Design Judging at Baja SAE Carolina, and received second place for their Design Report
  - Queen’s Mostly Autonomous Sailboat Team placed third in the Sailbot class at the World Robotic Sailing Championship
  - Queen’s Aero Design Team placed 18th out of 29 teams in the SAE 2010 Aero Design West competition in Los Angeles, California
- We have a new Aboriginal Access program to support enrollment of Aboriginal students in engineering
- AND we have a new name, The Faculty of Engineering and Applied Science

As you can see, we are in the midst of much change. Change can be challenging, but it also brings new and exciting opportunities. We’ve been pleased to welcome back many visiting alumni recently, and I encourage you to come visit as well – come and share in our excitement.

I wish you all a safe and prosperous 2011.

Kimberly A. Woodhouse
PhD, PEng, FCAE, FBSE
Dean, Faculty of Engineering and Applied Science
Q You received your Bachelor of Arts from Queen’s in 1980. Do you recall your initial impressions of the Engineering Faculty and its students? How were they unique?

I had pretty early contact with engineering students. Quite literally the first two people I met at Queen’s when I arrived at Brockington House to check in were two Science ’79 engineers, Charlie Lund and Michael Campbell. I’m still in touch with both and the latter was a housemate on Alfred and then Frontenac Street. I was struck by the enormous camaraderie and spirit among engineers, even by normally high Queen’s standards, and also by the exceptional rigour of their courses. The workload was legendary (though I suppose mine in Arts was just as heavy, just differently distributed).

Q The Faculty of Engineering and Applied Science has played an important, often pivotal, role in Queen’s history with its faculty and alumni making invaluable contributions – men like George Grant, James Douglas, Douglas Ellis, and Hugh Conn, to name but a few. Do any of their stories particularly resonate with you?

I’ve spent some time poring over the two volumes of Queen’s history published so far and also read up on the Faculty’s more recent history. What’s clear is that while engineering has been a relatively late addition to some other universities, it has been a core part of Queen’s from nearly the beginning. I think the early founders and teachers, people like Nathan Dupuis, had a vision of a program which, while “applied,” also offered a very broad-based curriculum. It’s not surprising that many of our engineering grads have acquired transferrable skills that have seen them succeed in other spheres, for instance in the financial services sector. We should note some recent successes – notably Julie Lassonde, who addressed spring Convocation. Faculty graduates are creating a distinguished record for the future.

Q These are challenging times for the University, but we have seen challenging times before. What lessons can we take from the past to help us now?

As a historian, I would note that the past does offer us some lessons, including the fact that we’ve been in difficulties before – in the 1860s and again in the 1920s and 30s. The Queen’s name and reputation has emerged stronger, if different, every time. Personally, I’m extremely bullish about Queen’s. All universities are facing stress; there is no question these are challenging times, particularly with government deficits, significant restraints on our revenue sources, and other public policy areas, notably health, crowding out higher education. The appointment of one of my fellow university leaders, Queen’s grad David Johnston, as our next governor-general, is a very positive step in terms of the profile of postsecondary education. With regard to the particular challenges facing Queen’s, we have huge human capital upon which we can draw among our students, faculty, staff and alumni.

Q Traditions are very dear to the hearts of Queen’s engineers, as they are to all Queen’s alumni. This is a source of great strength and pride. How do you balance a respect for the University’s past and its traditions with the need to move forward and evolve?

Again, one of the lessons we should take from the past is that we shouldn’t be imprisoned within it. We are justifiably proud of our traditions. The legacy of Queen’s engineers and their “Renowned Spirit and Unrivaled Excellence” is a core part of the Queen’s experience, and that will never change. But as I noted nearly a year ago in my installation address, tradition is all about cumulative change; it’s not about preserving everything that we have indefinitely. George Grant would not recognize the university of today, just as our first Principal, Thomas Liddell, wouldn’t have recognized the university of Principal Grant’s time. We should preserve those things that are
absolutely core to our identity and mission as a national trust for teaching and research, and we should be carefully selective about new ventures, rather than galloping off in every direction. Some things probably do need to be set aside because, though we are comfortable doing them, they may not meet the needs of 21st-century students. The ongoing academic planning process will help us determine our future path.

**Q What role do you see the Faculty of Engineering and Applied Science playing in the University’s future?**

Engineers have a "let’s solve it" approach to problems and this is needed right now at Queen’s and in the world. Engineering grads have also been among our most generous donors, people like Alfred Bader and Robert Buchan. All levels of government have talked about the need for more ‘highly qualified persons’ in Canada, and Queen’s Engineering and Applied Science alumni (from both our undergrad and postgraduate programs) perfectly fit this need. The broadly interdisciplinary approach the Faculty has taken over the years, including the common first year, provide examples of innovation that other Faculties may borrow from, as appropriate. I’m looking forward to working with Dean Woodhouse and her team on continuing to promote the Faculty and its interests.

**WELCOME: 2 new faculty**

Joshua Marshall, The Robert M. Buchan Department of Mining

Dominik Barz, Chemical Engineering
Since 1998, the team has been developing and refining a prosthesis originally designed for use in flat areas in rural Thailand; the device is now successfully used in many areas worldwide. Today, in collaboration with the Universidad Don Bosco in El Salvador, the design team – a partnership that includes Rob Gabourie, a professional prosthetist from Niagara Prosthetics International; DuPont Canada; Centennial Plastic Mfg. Inc. and Queen's Chemical Engineering student Laura Towsley – is field-testing a new version of the mechanical foot that is size-adjustable, more comfortable and suitable for use in hilly terrain.

"The wearer needs enough of a bounce to help them climb hills, but not so much of a bounce that it makes it hard for them to come down hills," says Bryant. "Finding that balance is the big design challenge. You have to be responsive to the needs set of the users."

The prosthetic itself is not meant to make direct contact with the ground, but to fit inside a shoe. To do that, users slip a "cosmesis" – a urethane foam cover that is custom-shaped to a fit user's shoe size – over the prosthesis. Together, the two items enable an amputee to become mobile and, to a casual observer, look the same as anyone else.

Best of all for potential users in developing countries, the new foot costs a fraction of its conventional counterpart, which is good news for hundreds of thousands of people in countries like Haiti and El Salvador who have lost lower limbs to natural disasters and land mines.

"It's great to see how eager people have been to support the project," says Dr. Bryant, a Parry Sound, Ontario native whose entire academic career, from undergraduate student to faculty member – has been spent at Queen's.

“Everyone seems to be willing to contribute financially or in-kind because of our target population.”
Queen’s Formula SAE team delivers best season ever

The Queen’s Formula SAE Design and Race team is on a roll.

The team, comprised of engineering students who each year design and build a one-person race car from scratch, is celebrating its most successful season in international competition since the team’s inception 17 years ago.

In a competition in Michigan this past spring, the Queen’s squad placed 16th overall out of a 120-team field, making it the top Canadian school. Thanks to a huge sponsorship push, the team participated in a second competition for the first time in its history. The members travelled to England’s legendary Silverstone Circuit, where they placed 26th overall out of 100 teams, making them the top-ranked North American entrant.

“At Silverstone we were on pace for a top-ten finish, but a tiny engine issue caused the car to retire just two laps from the finish,” says the 2011 team’s project manager, Curtis Hogan. “We know we deserved to finish, and we’re extremely proud of our team.”

Hogan, a third-year mechanical engineering student, credits this year’s unprecedented success to the efforts of a close-knit team that pulled consecutive 80-hour work weeks – this, on top of academic work – to create a car that was lighter, more responsive and easier to drive than previous models.

The building of the Formula SAE car – SAE stands for the Society of Automotive Engineers, the organization that sponsors the competitions – is one of the most remarkable student projects at Queen’s. Students computer-design many of the car’s components, fabricate the parts using equipment in McLaughlin Hall’s machine shop and painstakingly weld, screw and bolt everything together into a sophisticated high-performance vehicle that, from a standstill, can reach a hundred kilometers an hour in three seconds flat.

The goal is to engineer a car that, in the annual Formula SAE student competitions, will be judged by auto-industry experts on criteria including design, cost, manufacturability, on-track cornering speed, acceleration and fuel economy. The students must be able to present a business case for a large production run of their vehicle, which means they must apply marketing and business skills to sell mock investors on their “company.” A 25-kilometre endurance race is the ultimate test of the car’s performance and reliability, and success in this event clinched the top finish for the Queen’s squad in Michigan.

The team members are also responsible for raising sponsorship money through marketing and promotional activities, creating and managing a budget, communicating with sponsors and faculty, and mentoring lower-year students on the team in order to perpetuate its existence after the experienced senior members graduate and leave Queen’s.

The 2010 team was made possible by support from 34 sponsors, corporate and otherwise, including the Faculty of Engineering and Applied Science, the Department of Mechanical and Materials Engineering, Honda, Vale, Shell, Bombardier, Iscar and the Queen’s Science Class of ’62.

“Team members are exposed to advanced skills that most students don’t have the opportunity to learn. Second-year students are doing everything from FEA and CFD simulation, to operating an engine dynamometer and running the CNC mills and lathes in the machine shop,” says Hogan. “The team really opens your eyes to what’s out there… the learning we experience is incredible.”

With no fourth-year members on the team this year, the team will face many challenges, but its members are hopeful for a successful season. Says Hogan: “We’re a young team, but we’re extremely dedicated and our future looks bright.”
CELEBRATING OUR ENGINEERING ALUMNI

Our alumni are leaders, entrepreneurs, trailblazers and pioneers: men and women who are shaping the world around them.

In whatever they do, our Engineering alumni take with them the common experience that they shared at Queen’s – an experience that many credit with laying the foundations for their future success.

Here are just a few of their stories.

LEADING the way

As an engineer, Merv Dewasha always ensures that the structures he designs are well-built and long-lasting. As an Aboriginal person, he works equally hard to give young First Nations men and women from across Canada an opportunity to forge a life in science and engineering as rewarding as his own.

Dewasha grew up in the 1950s on the tiny Wahta Mohawk Territory near Orillia, Ontario, but unlike many of his peers, didn’t attend school there. His father worked on the railroad and needed quicker access to the train lines than the reserve could provide, so from November to April his family moved to nearby Bala, where Merv attended a two-room village school. He excelled in science and math and was always at the head of his class.

After high school Dewasha enrolled in the engineering program at Queen’s and became one of the few Aboriginal students on campus. His mere presence made him a pioneer. It was only in 1960 that the Canadian government had altered longstanding legislation to allow “Indians” to attend university to pursue careers as doctors, lawyers or engineers.

“If I had been born ten years earlier, it would have been illegal for me to go to Queen’s University,” he says. “It’s unfortunate, but that’s the history of Aboriginal people in Canada. Those are some of the impediments that our society has had to deal with.”

At Queen’s Dewasha received a firm grounding in civil engineering and picked up “soft” interpersonal skills whose value he would only fully understand many years later.

After his graduation in 1971, Dewasha worked for Parks Canada as an engineer on the Rideau Canal, then moved west to Saskatchewan to begin what became a 30-year career with the Department of Indian Affairs. His experiences there would shape his life’s work.

As Dewasha travelled around the province on behalf of his employer, he was shocked by the Third-World quality of much native housing and infrastructure. He realized the shoddy construction was a consequence of the fact that reserves were a federal responsibility to which provincial housing, health and safety standards did not apply. As he worked his way up through the department to become a director of engineering – first in Saskatchewan in the mid-1970s, and later in Ontario – Dewasha became instrumental in developing the first building code for on-reserve housing and a training program for native housing inspectors.

Merv had other concerns. Most infrastructure work on reserves was carried out by non-native contractors, meaning that millions of dollars in wages were not benefitting the community. To rectify this, over the years, Dewasha worked to help First Nations communities assume responsibility for roads, schools, bridges, and water treatment plants – capital projects that had previously been controlled and managed by far-off Indian Affairs bureaucrats. He also helped to implement training and employment programs that ensured that Aboriginal people were part of work and maintenance crews.

Another Dewasha concern involved the funding of capital projects on reserves. Until 1994, the Indian Act prevented First Nations band councils from borrowing money, so a band that wanted to build, for example, a school, was required to apply to Indian Affairs for funding that might take years to arrive. Dewasha helped to orchestrate an arrangement whereby bands could take out bank loans that allowed them to build the school (or whatever it was they wished to build) long before the standard Indian Affairs funding would have arrived.

Dewasha has also undertaken numerous initiatives with banks, universities and colleges, professional associations, the Canadian Armed Forces and the National Research Council that underline his commitment to improving educational and employment opportunities in science and math for Aboriginal people. These include the creation of the non-profit Canadian Aboriginal Science and Engineering Association; a career symposium that showcases science- and math-related education, employment and trades opportunities open to Aboriginal youth; and, with the Canadian Construction Association, a program to certify trades and project managers among Aboriginal youth.

Although he is no longer directly involved with many of these ventures – his philosophy is to start something, then train others so that they can sustain the organization themselves – Dewasha is not resting on his laurels. These days the 64-year-old routinely works 60-to 80-hour weeks as the majority owner of Neegan Burnside Ltd. and Nuna Burnside Engineering and Environmental Ltd., companies that provide career development to Aboriginals and Inuit youth.

One of the firm’s most recent successes was the engineering work on the Meno Ya Win Health Centre in Sioux Lookout, Ontario, a 140,000 square-foot facility that Dewasha says is a rarity among North American hospitals in that it treats patients using both Western medicine and traditional native healing practices.

The harmonious cultural co-existence that takes place at the new hospital reflects an approach that Dewasha has favored for decades.

“I tried to retire once, but the elders said that I was too young and had important knowledge that had to be passed on to the next generation,” says Dewasha, who speaks with pride about the talented staff he has trained over the years to be fully competent engineers capable of working in different cultural settings all over the world. “I think that’s sort of the last leg of my career, to provide leadership to Aboriginals in science and engineering through my companies so that they can work anywhere, with anyone.”
At the time the roadway was being evaluated in the early 1960s, he says, the mining companies were developing rapidly in the northern Ontario. While working in the mining industry, he formed a professional relationship with federal and provincial officials. He was also involved in seminars and continuous interaction with customers in the construction and pre-cast concrete industries, which were developing rapidly in the area. After completing his contract, he worked with Strabag, an engineering firm that designs everything from bridges to tunnels and highways. He worked on projects in Calgary, Toronto, and Montreal. He moved to Montreal in 1975 to join the engineering department at his father’s firm, Surveyer, Nenniger & Co., which is being co-developed with Lafarge Canada to form Canada Engineering Associates. In 2002, he was promoted as president of the firm’s engineering department.

When Marston graduated from McGill University with a Master’s degree in civil engineering, he started working for Strabag, a construction company in Canada. He worked on projects in Calgary, Toronto, and Montreal. After completing his contract, he worked with Strabag, an engineering firm that designs everything from bridges to tunnels and highways. He worked on projects in Calgary, Toronto, and Montreal. He moved to Montreal in 1975 to join the engineering department at his father’s firm, Surveyer, Nenniger & Co., which is being co-developed with Lafarge Canada to form Canada Engineering Associates. In 2002, he was promoted as president of the firm’s engineering department.

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The journey from MINING AND AGRICULTURE to ENGINEERING AND APPLIED SCIENCE has been long, with more than a few twists and turns along the way.

FOUNDE

The names behind the buildings…

A SHORT HISTORY OF THE FACULTY OF ENGINEERING AND APPLIED SCIENCE

The first version of the Honours Engineering program was launched in 1941, with the Department of Electrical Engineering adding undergraduates in 1946.

- 1966: The Engineering Library (now the Engineering Commons) opens.
- 1967: The Canadian Engineering Association (CEA) selects Queen's as the site of its annual conference.
- 1968: The Engineering Pub (later known as “Ritual”) is opened.
- 1969: The first engineering graduates are painted purple in honour of the engineers who served in WWII.
- 1970: The Engineering Association of Ontario (EAO) is established.
- 1971: The first women to graduate from the Faculty of Engineering are among those who receive degrees.
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Queen’s engineer seeks to conquer the highest peaks on 7 continents

In May 2003, when Adam Janikowski received his Classics degree from Queen’s – his second, having earned a Chemical Engineering degree a year earlier – he felt on top of the world. Six years later, he’d actually be there.

The Picton, Ontario native and son of Queen’s alum Andrew Janikowski (Meds’75), Adam has always loved outdoor adventure. Through his teens he worked as a councilor at summer camps. Later he became a scuba diver, a life-guard and a ski patroller. Now, with Mount Everest behind him, he’s climbed the highest summits on five of the seven continents – and he’d like to knock off the rest.

Janikowski took up mountaineering in 2001 during a family trip to Africa in which he, his father and sister Tine Schaffer (BSc Mining Eng. ’99, MSc Chem Eng) summited the 5,893-metre Mount Kilimanjaro, the continent’s highest mountain. Adam enjoyed the experience so much that, after earning his Classics degree, he rewarded himself with a trip to Argentina, where he scaled the 6,962-metre Cerro Aconcagua, South America’s highest peak.

During the summer of his final year at Queen’s, Janikowski worked at an oil and gas company in Calgary. Following graduation he returned to the city, uncertain whether to capitalize on his engineering education by pursuing a career in the technical side of the business or in finance. The latter subject had piqued his interest when he chaired the board of directors of Queen’s Campus Bookstore, which is owned and operated by engineers and which generates more than $10 million in annual revenue.

The finance option ultimately won the day. But while Calgary was tantalizingly close to the ski slopes of the Rockies, Janikowski had always yearned to live in London, England, so he engineered a role for himself at a Canadian investment bank that had an office in the city and made the move. He ensured that he’d be entitled to five weeks holiday per year – enough to cram in a few adventures.

“Investment banking isn’t the driving force in my life,” admits the 31-year-old, who is now a vice-president who deals with oil and gas companies outside North America. “I’ve had some success, but work is really just a way to fund my extracurricular activities.”

One of those activities consisted of climbing Denali – also known as Mount McKinley – in Alaska. He spent three grueling weeks on the 6,194-metre peak in 2006 – including four days cooped up in a tent during a four-day blizzard – and reached the top. That was rewarding, but so was the time he spent with his tentmate, an American medical doctor and astronaut named Scott Parazynski. The two hit it off.

It wouldn’t be the last time they’d be together. In December 2007 Parazynski phoned Janikowski with a tempting offer: would he be interested in climbing Mount Everest?

“It wasn’t like opportunity was knocking, it was trying to force the door open,” recalls Janikowski.

It was an expensive commitment that would mean two-and-a-half months away from family and friends. Nevertheless, after getting leave from work and clearance from his wife, Maribeth Williams (ArtsSci ’02), five months later he found himself acclimatizing himself to the thin air on the world’s loftiest mountain.

It was a strange time to be there. It was just before the Beijing Olympics, and the Chinese government had purchased all the Everest climbing permits from the Nepalese government in an attempt to clear climbers from the mountain’s south side so that a Chinese team could carry the Olympic torch to the summit from the north. But since emptying the Nepalese side would have devastated the local villages that rely heavily on expeditions for income, the Chinese agreed to allow a few teams onto the mountain on the condition that they’d be able to keep tabs on them.

To that end, a Chinese representative was posted to Janikowski’s team. Satellite calls were monitored, and videocameras confiscated. Undeterred, Janikowski, Parazynski and their Sherpa guides slogged to the highest camp, and on May 22, 2008, Adam finally stood on the roof of the world. Sadly, Parazynski had injured his back that day and was unable to complete the climb. He was airlifted off the mountain for surgery, but returned the next year to finish the job.

Janikowski says climbing has brought him in contact with some very interesting people. There was Parazynski the astronaut, and an oil-patch CEO with whom he climbed Russia’s Mount Elbrus, Europe’s highest peak. On one climb he met Prince Charles’ surgeon, on another, a fellow who held a PhD in chemistry and who had literally run around the world for charity.

Queen’s, too, also helped Janikowski forge some strong relationships. He met his wife there, and five of the six groomsmen at their wedding were fellow Queen’s engineers. As a student he participated in varsity rugby, wrestling and downhill skiing, and still counts many of his teammates as friends. Today he’s a member of the University Council and regularly contributes to fundraising campaigns.

“Queen’s and my engineering education are so vitally important to who I am, it’s almost part of my DNA,” says Janikowski. “Even today, if I walk into a room anywhere in the world and meet someone wearing an iron ring, there’s an instant connection.”

Adam Janikowski, Sc’02 Chemical Engineering, Artssci’03 Classical Studies, on top of Mount Everest

5 down, 2 to go

THE COMPLETE ENGINEER 15
As a thinker, entrepreneur, author, activist and chair of a Danish foundation that supports renewable energy and sustainable living, Ross Jackson is trying to steer humanity on a different, more nature-oriented way of life.

As a young man growing up in Ottawa, Jackson followed global issues such as overpopulation, which already in the 1950s was touted as a critical threat to human existence. Today the threats are different: global warming, overconsumption, overpopulation and species extinction. Some would also add the looming specter of declining oil availability, and Jackson agrees.

“The greatest short-term threat to our way of life is peak oil, the point coming very soon when demand for oil and gas will permanently outstrip supply,” he says. “We are on the threshold of a major discontinuity in human history.”

It has been a unique and circuitous path to his current situation. Jackson trained as an engineer for two years at Carleton University, and transferred in third year to Queen’s to finish his degree. It didn’t take him long to plunge into campus life: in February of his first year at Queen’s he was elected president of the Engineering Society, a hectic job that filled his non-academic hours with administrative and committee duties.

On his graduation in 1960 he relocated to Indiana to pursue a Masters degree in Industrial Management at Purdue University, and followed that up with a doctorate in Operations Research from Case (now Case Western Reserve) University in Cleveland, Ohio. Operations research is a specialized branch of economics that uses mathematics and statistical analysis to solve complex problems. Jackson moved to Denmark in 1964, having found a job at the fast-rising computer giant, IBM, where his skill set was in demand. He intended to stay for a couple of years to get a foothold in the information-technology industry, which he did. But he also met his future wife, Hildur, an activist who looked at things in a very different way that appealed to him, and has lived in Denmark since.

“I was a very top-down, corporate executive type,” says Jackson. “She was a grassroots activist, and she made me more aware of that side of things. Today I have one foot in each camp.”

In 1966 Jackson and a colleague from Case Western formed a management consultancy that advised on problem-solving strategies for industries including shipping, banking, transportation, publishing, manufacturing, insurance, tobacco, pension funds, slaughterhouses and dairies. In 1970 the pair founded SimCorp, a software firm that made financial software and is now one of the largest of its kind in Europe. Later Jackson began focusing more on international finance, consulting around the world on investment strategies for banks, insurance companies and mutual fund providers. This led Jackson into research in currency trading methods and the creation of various investment strategies that capitalized on his operations research approach.

But Jackson’s involvement in the foreign exchange markets had persuaded him that while aspects of international trade and finance were enriching corporations and their shareholders (and himself) – as they were supposed to – they were also perpetuating generations-old cycles of poverty and environmental destruction, particularly in developing countries.
His view on these matters took a more philosophical turn in the early 1980s when he travelled to India and met Muktananda, a Hindu swami whose teaching led Jackson to an epiphany.

“I felt a divine connection,” he says. “Material things meant less after that.”


His newfound consciousness reinforced his growing sense that humanity needed to move in a different direction that was more respectful of nature and the environment. In 1987, this notion prompted him to establish Gaia Trust (www.gaia.org), a foundation that supports a more holistic way of life and sustainable projects such as self-sufficient ‘eco-villages’ where people grow their own food, know each other personally and collectively live in harmony with the earth. Describing his conversion from businessman to environmental activist, Jackson penned a second autobiographical book, *And We ARE Doing it: Building an Ecovillage*.

*Future*, in 2000. Since its inception, Gaia Trust has funded more than 300 projects in over 40 countries, primarily supporting the Global Ecovillage Network and Gaia Education, an educational program in sustainability design, while investing in several Danish ‘green’ startups – including small windmills, solar panels, and organic food producers.

Ironically, he now feels that many of the economic ideas and institutions he once favoured are counterproductive, and even dangerous. He is now writing a book entitled *Breakaway* – in which he says, for instance, that complex financial instruments such as naked derivatives should be banned. Moreover, he recommends that the World Trade Organization should be replaced by a new trade organization that permits restrictions on global capital flows and allows protective tariffs so that all countries, but particularly small or developing nations, can have more fiscal and cultural independence and better protect the environment.

It is critical, says Jackson, that all countries should be able to put tariffs on imports from polluting corporations and industries. “As it is now, the WTO allows the most polluting companies to be rewarded with the largest market share,” says Jackson. “That has to change. We need to harness the private sector’s creativity in a legal framework that is protective of the environment.”

Ross Jackson’s interests are very broad. He recently wrote a two-volume work (novel plus documentation) called *Shaker of the Speare*, on the life of philosopher Francis Bacon, who, according to Jackson and many others who have studied the matter, wrote Shakespeare’s works under a pseudonym. (See www.ross-jackson.com).

When he’s not writing Jackson serves as a director and principal shareholder of Urtekram, Scandinavia’s largest organic-foods wholesaler, and oversees a handful of family-owned companies. He recently purchased a 20-hectare farm, which, although it’s too small to build an eco-village on, is large enough to accommodate occasional workshops on the subject.
Breaking down a problem and rebuilding something out of the pieces

Steven Woods has always liked breaking things down and analyzing their constituent parts. Perhaps this isn’t surprising, given that his father was a plant geneticist whose job was to reconfigure the DNA of canola and other oil-producing crops to make them faster growing or more drought resistant.

Steven’s predilection for things scientific led him to Queen’s in 1992 and the Engineering Physics program. It was the perfect environment: the class was small, consisting of about 40 extremely bright students who, like Woods, welcomed the challenge of solving difficult problems and had a desire to solve bigger ones.

“As undergraduates, we knew we weren’t at the forefront of physics, but we saw where that forefront was and really got an understanding that if we wanted to tackle something that hadn’t been done before, there was a path to get there,” says Woods. “It was no longer something that seemed so out of reach.”

After graduating in 1996, Woods became a process engineer at Celestica, a multinational firm that helps companies develop, launch and market new products, and immersed himself in the world of software systems. From there he moved to Ehvert Engineering, a software consulting firm where he further refined his skills. At Ehvert he met Abe Wagner, another Queen’s engineering grad two years his junior who shared the same work-hard, play-hard ethic that was the norm at Queen’s.

It was an exciting time to be in the computer industry. The dot-com and e-commerce world was growing at a furious pace, and eager software designers were tripping over themselves trying to develop the next great product that would take the Internet by storm. Woods and Wagner were in the thick of it.

“We had all this energy, we saw that the Internet was growing at a tremendous speed, and we wanted to do something with it,” recalls Wagner. “Fortunately we knew the right people to help make that happen.”

Around 1999, along with a group of eight Queen’s alumni they had connected with via the faculty grapevine, Woods, Wagner and Mark Organ (Life Sciences, ’96) began zeroing in on an idea. Most successful e-commerce sites, such as the online retailer Amazon.com, were based on completing secure transactions for purchases of CDs, books and other consumer items. In that now-common model, the buyer chooses what she wants by clicking on it, which puts the product into an online “shopping cart.” The contents of the cart are paid for via credit card and shipped to a location specified by the buyer.

Buying a CD online – an example of a consumer “commodity purchase” – is relatively straightforward. But Woods and his colleagues began wondering how the Web could assist in business-to-business purchases of complex, high-expense items such as computer network systems, financial services or hospital laboratory equipment. In such “considered purchases”, typically worth over $100,000, several people may have a stake, and a say, in the buying decision. And it was this realization that transformed Woods from being an engineer only, to an engineer-entrepreneur.

“We were interested in things that didn’t fit the shopping-cart metaphor,” explains Woods. “So, given that observation and the ability to break down a problem into its parts and rebuild something out of it that had come from the engineering and engineering physics world, we could see a way to do it.”

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discipline, we brainstormed what was possible and thought, ‘There’s a business here.’"

The result of this brainstorming was a company called Eloqua, which Woods co-founded in 1999 with Wagner and Organ. Eloqua helps corporate marketers identify potential customers through their online behavior. For example, imagine you head a company that sells computer-networking equipment, and you have a website that customers use to learn about your product line. Eloqua allows your marketing department to analyze the online behavior of your website visitors – the pages they visit, the files they download, the videos they watch – to get a sense of what they’re interested in buying. That information can be passed to the sales department, which can then direct its sales team to contact the various people from a given company who have demonstrated an interest in your product.

“If you suddenly see five people from a certain organization and they’re all over your white papers and case studies and their Google searches are for the right set of terms, well, that is probably an indication that something is happening at that organization,” explains Woods, who is Eloqua’s Chief Technology Officer. “You need to get your sales people talking to them and helping them figure out the right answer.”

One advantage Eloqua has over its handful of competitors is that it was one of the first companies to adopt what’s known as a “cloud computing” platform. This means that, instead of manufacturing and selling boxed software meant to be installed on individual computers, Eloqua maintains a set of massive servers that provide the firm’s services to subscribers via the web.

“Right now, cloud computing has almost unlimited potential for growth,” says Wagner, who is Eloqua’s VP of Engineering. “Eloqua’s platform and our direct connections to other technologies in the cloud have us well positioned for the future.”

Today, Eloqua is an industry leader and is growing fast, with some 250 employees in Toronto, Boston, San Francisco, Austin and Washington, D.C., London, England and Singapore. Employees are chosen according to how well they mesh with the culture that the founders feel most comfortable with.

“You need to find staff who can manage that balance between learning from past experiences and challenging convention in order to move toward the future. It’s a balance that is often surprisingly difficult to find,” says Woods. “That’s why we’ve always been very happy with Queen’s grads – you get a sort of energy there in terms of the attitude of working hard, of balancing the technology and business aspects of what we do.”
Peter Kenny grew up on a farm near Stratford, Ontario, and learned about the value of hard work and self-sufficiency at an early age. Today, after a successful 53-year career as an engineer and entrepreneur, he’s come full circle as a philanthropist who helps other people around the world, including farmers, become more independent so they, too, can succeed.

Kenny’s family stressed the value of education, so after high school Peter applied to the Queen’s Department of Mechanical Engineering, one of Canada’s top schools. He graduated in 1955, and the next year supplemented his technical training with business acumen by taking an MBA program at the University of Western Ontario.

After graduating in 1957 he returned to Stratford for a job at an engineering firm headed by Oliver Gaffney (Sc’44), a family friend. In 1960 he went to work for another Queen’s alumnus, Roy Hurd (Sc’48½) who managed London Concrete Machinery. It would prove to be fruitful partnership.

In 1965 Kenny became a co-founder and shareholder with Hurd and Norm Hartviksen (Sc’57), another Queen’s engineer, in Kanmet Casting Ltd., a Cambridge, Ontario foundry that cast parts for the agricultural industry. The company was acquired in 1974 by its biggest customer, Massey Ferguson, the legendary Canadian tractor manufacturer.

Kenny’s next venture, in 1975, was with Roy Hurd in Neelon Casting Ltd., a Sudbury foundry that primarily cast disc brake rotors and was sold to Dana Corp. in 1994. In the meantime, Kenny became a founding investor with Roy’s son, Gordon, of a firm that has evolved into North American Stamping Group, which turns out various components for the auto industry and which has six plants in Canada, the U.S. and Mexico.

Another opportunity came along via Dennis Hurd (Sc’65), another son of Roy Hurd. In 1983, Dennis approached his father and Kenny with an idea.

“He wanted to build an underwater bus that would take people about 150 feet down to observe the wonders of the ocean,” recalls Kenny. “It sounded good to me, so his father and I backed him.”

Today, Atlantis Submarines operates eleven submarines now operating in Hawaii, Guam, Barbados, Cozumel, Aruba and Grand Cayman. Over the past 25 years the fleet of $6-million vessels has carried some 13 million passengers on underwater sightseeing trips. As well, Dennis Hurd and his collaborators have worked with the U.S. Coast Guard and the U.S. Bureau of Shipping to set the standards for passenger submersibles the world over. Kenny is chairman of Atlantis Submersibles.

“We created the industry,” says Kenny, who credits Dennis Hurd with being the driving force behind Atlantis’s remarkable evolution. “It just goes to show that a big part of success involves partnering with the right people.”

Kenny is a longtime supporter of Queen’s who has established a pair of engineering scholarships, and he is a faithful attendee of his graduating class’s five-year reunions. Much of his time is taken up by his role as head of the Kenny Family Foundation, which funds projects that help people overcome challenges – particularly lack of education – that hinder them from achieving their full potential. Kenny is hands-on about the work: he and other family members personally visit every project site to audit its progress.

“We don’t just throw money at things,” he says. “Businesses only become successful through the efforts of people, and sometimes all they need are the tools to succeed. Our goal is to provide those tools so that people can become more self-sufficient and remove the barriers to success themselves.”

To that end, the Kenny Foundation has backed a diverse number of projects – including the Queen’s Project on International Development (QPID), which sends students on summer
projects that help expand the potential for development in marginalized communities. The Kenny Foundation has backed a QPID project in Nunavut, but the program has also completed more than 200 other projects in Bolivia, Peru, India, Nicaragua, Peru, Bolivia and Burkina Faso.

One Kenny Foundation project took place in Thunder Bay, where the Kennys funded the establishment of a one-week summer orientation program for 30 Aboriginal high-school students at the Confederation College Aviation Centre to encourage their interest in becoming pilots and mechanics. “The need is there,” says Kenny. “There’s a northern Ontario airline [Wasaya Airways LP] owned by Aboriginal people that employs 85 pilots, but only one is Aboriginal. That just doesn’t seem right.”

Though its focus is Canadian Aboriginal communities, the Kenny Foundation also operates in East Africa, where it provides a number of schools in Uganda with a pair of cows – an endeavor that combines agriculture and education and which, not surprisingly, is close to Kenny’s heart. Like all other foundation initiatives, it has been developed in close partnership with people in the host community, who are best able to judge local needs. “This helps to educate the kids and gives them milk for their daily nourishment,” says Kenny. “It also encourages the parents to send the girls to school, because otherwise they’d keep them at home working. But if they think they can learn something at school that would help them on the farm, they’ll send them. It’s been a fairly encouraging program … because education is the key to prosperity.”

One of the projects that the Kenny Foundation sponsors is the annual “Books, Fun and Sun!” literacy camp for children in Baker Lake Nunavut. Pictured here are Queen’s student’s Patrick Sawtell and Lauren Long.

WHAT’S YOUR STORY?

Help us continue to celebrate the interesting stories of our Engineering and Applied Science alumni! We want to hear about, and share, more of your experiences since you graduated from Queen’s. If you would like to suggest a story about any of our alumni, or share your own, please contact Joanne Grills in the Faculty of Engineering and Applied Science Advancement office. Then watch for these stories on our website and in future editions of The Complete Engineer.

Contact: Joanne Grills, 613.533.6000 or 1.800.267.7837, Extension 75248, grillsj@queensu.ca
Renowned spirit, Unrivaled excellence

Without Queen’s, where would you be …?

where would Queen’s Engineering be without you?

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Faculty of Engineering
and Applied Science

Something to CELEBRATE!

The Queen’s Engineering tradition of spirit and loyalty continues to thrive on campus and around the world.

Over 17,000 graduates now proudly call themselves engineering alumni of Queen’s University. They include industry leaders, outstanding entrepreneurs and award-winning contributors to society, both at home and around the globe. Many of these alumni have chosen to invest in future generations of Queen’s Engineers through their generous support to the Faculty of Engineering and Applied Science.

Join others in providing a distinctive learning experience to our future leaders of the 21st century. There are many ways our alumni and friends can contribute to the present and future excellence of a Queen’s Engineering education.

Are you involved in an innovative or unique initiative? Do you have corporate insights that could benefit our students … the leaders of tomorrow? Are you interested in providing support for our innovative programming, the student experience, excellence in teaching and research and/or revitalizing our infrastructure?

The Development Team in the Faculty of Engineering and Applied Science are a dedicated and experienced team eager to help our alumni remain connected and involved.

We encourage you to ask us how you can make a difference for our engineering leaders of tomorrow.

Without Queen’s, where would you be …?

where would Queen’s Engineering be without you?