

U of A • Engineer

Keeping in Touch with
Alumni

The Optics of Photolithography

Dave Markle
Engineering Physics '58

Greetings from the Assistant Dean



The arrival of the New Year prompts reflection on achievements past and anticipation of future triumphs for the Faculty of Engineering. Last year marked some significant milestones: the launch of Campaign 2008 and the grand opening of the Allan P. Markin/Canadian Natural Resources Engineering Research Facility (NREF) being two that come to mind.

In the upcoming year we can anticipate the completion of construction of the Natural Resources Canada National Institute for Nanotechnology (NINT). There will be a subsequent relocation of nano-related researchers from the Chemical and Materials Engineering and Mechanical Engineering Departments of the Faculty of Engineering to the fifth and sixth floors of NINT. Moving seems to be a theme here at the Faculty, having just witnessed the consolidation of Civil, Environmental, Mining, and Petroleum Engineering staff and researchers in NREF.

Meanwhile, Campaign 2008 keeps moving with over \$200 million of the total campaign goal of \$310 million achieved to date. Engineering alumni have contributed handsomely to the campaign with high profile donations from Allan P. Markin (Chemical '68, LLD [Hon] '02), Harry Hole (Civil '44), James F. Hole (Civil '50), Ralph K. Hole (Commerce '42), Robert Hole (Civil '44), Dr. John Poole (Civil '37, LLD [Hon] '87) and Barbara Poole, and others. While these are some of the more substantial contributions to Campaign 2008, every donation gets us further to our goal. So, to those of you who have contributed to the success of the campaign, my sincere thanks. I look forward to your generous and enthusiastic participation in the future.

Best wishes for a happy and prosperous new year and enjoy the winter 2005 issue of *U of A Engineer* alumni magazine.

David M. Petis
Assistant Dean, External Relations

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

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Faculty of
ENGINEERING
University of Alberta

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

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

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



Faculty of
ENGINEERING
University of Alberta

Message from the Editor

The awards keep arriving. *U of A Engineer* alumni magazine won a national award from the International Association of Business Communicators (IABC). The Silver Leaf Awards recognize and reward excellence in the Canadian communications profession. The judging panel awarded the magazine a 5.12 out of 7, citing its success in understanding the target audience's needs and characteristics. This recognition, while noteworthy, must be taken in context. The Canadian publishing industry is becoming increasingly fragmented, resulting in narrow niches for publications. *U of A Engineer* is a prime example of a niche publication that reflects the interests and tastes of a carefully targeted audience. Or does it? How would you evaluate this publication? I'd love to have your feedback. Please reply by e-mail to sherrell.steele@ualberta.ca or phone me at (780) 492-4514. I look forward to your opinions.

Sherrell Steele

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Publications Mail Agreement No. 40051128

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When Philip Shum applied to be an engineering undergraduate in the early 1980s,

Alberta Petroleum Expertise

Travels the

WORLD

by Bruce White

one of the reasons he chose petroleum engineering was that he wanted to travel.

Good thing, because Shum (Petroleum '87, MEng Petroleum '91) has earned his fair share of frequent flyer points. He began his career in Hong Kong with a Chinese trading company, then returned to Edmonton to help Alberta share its know-how with developing oil-producing nations around the world.

As the president of the Canadian Petroleum Institute (CPI) for Asia, Shum has helped Alberta pioneer business with a host of nations, including China, Vietnam, Thailand, Bangladesh, India, and Pakistan.

One of his most interesting challenges, however, is the CPI's ongoing work in Afghanistan, a daunting place even for a nor-

mally adventurous oil worker. In the past three decades, Afghanistan has been occupied by the Soviet Union, ruled by tribal warlords and the Taliban. It became the training ground for al-Qaeda and, since Sept. 11, 2001, it has been bombed and then occupied by a U.S.-led multinational force. Canadian soldiers continue to risk their lives in an effort to bring peace to this troubled land.

D



Philip Shum
(Petroleum '87,
MEng Petroleum '91)

222	Kabul, Afghanistan	11:30	Depart/Part 11:30
017	Dar es Salaam, Tanzania	11:45	Early/Tôt 11:00
056	Lima, Peru	12:05	Early/Tôt 11:45
703	Hanoi, Vietnam	14:30	Depart/Part 12:05
654	Bangkok, Thailand	15:55	Delay/Tard 16:45
227	New Delhi, India	16:15	Depart/Part 15:55
035	Manila, Philippines	17:30	Depart/Part 16:15
924	Kuwait, Kuwait	18:00	Depart/Part 17:30
116	Islamabad, Pakistan	19:05	Depart/Part 18:00
314	Maputo, Mozambique	19:30	Depart/Part 19:05
254	Dhaka, Bangladesh	20:45	Delay/Tard 21:30
711	N'Djamena, Chad	21:05	Depart/Part 21:05
	Kabul, Afghanistan	22:15	Depart/Part 22:15
		23:30	Depart/Part 23:30

Meanwhile, Afghanistan faces an urgent environmental problem: its forests are being ravaged for fuel. The World Bank and the Asian Development Bank want the country to develop its gas reserves as a more desirable domestic fuel source. But before that can happen, the government of Afghanistan needs help in preparing for oil and gas development. Because of similar work the CPI had done in Peru, the Asian Development Bank awarded it a contract to strengthen Afghanistan's Ministry of Mines and Industries.

Afghanistan's known potential gas reserves total 120 billion cubic metres, or about what Canada produces in one year. ("Not huge but still substantial," says Shum.) Much greater reserves may also lie waiting to be discovered, given the country's proximity to both Iran and Kazakhstan.

Afghanistan currently produces 600,000 cubic metres of gas a day. It actually exported gas during the Soviet occupation of the 1980s, but that infrastructure is gone now. The World Bank and the Asian Development Bank are eager to see increased production, but in a way that will benefit the war-torn country.

In 2004, experts from the CPI trekked to Afghanistan from Edmonton and Calgary for what's known as a regulatory-technical assistance project.

"We try to help the government reorganize the ministry looking after the hydrocarbon industry. That is our main goal," says Shum.

First, the ministry needs help to establish policy and regulatory structures, and to set up educational and human resource development programs. Afghanistan also needs to convince potential investors that their billions of dollars will be safe.

That is no small challenge in a country still largely ruled by warlords with little conception of western-style property rights. Still, Afghanistan's diverse factions might be convinced that development is in everybody's best interests, and that they should work with the government.

"You have to show the people that the national government is working,

that it's listening to local people," says Shum. That's why the 2004 election was so important, he adds.

"President Karzai can turn to the world and say, 'Here, I have the support of the people.'"

Stable government and regulatory structures greatly reduce the political risk for international oil companies. In return, royalty revenues may one day help Afghanistan pull itself out of its vicious cycle of poverty and violence.

Skeptics, of course, will seriously doubt energy development will do much good in Afghanistan. After all, in countries all over the world energy development has enriched a few local tribal chiefs while doing little for ordi-

nary people. Organizations like the World Bank have grappled for years with the problem of corruption in oil-producing countries.

"They have a new catch-phrase called 'revenue management,'" Shum explains. "What that means is that you have all this revenue coming from oil and gas royalties, and you have to provide a system to capture and manage this revenue to be sure it goes where it's supposed to."

A current example in West Africa is being watched closely. A \$4-billion (US) oilfield development in Chad and an export pipeline through Cameroon have been structured to combat potential corruption.

The countries have passed laws to ensure oil revenues are handled in a transparent manner and are reinvested in their economic development. An international commission has both the power and the political will to ensure this gets done. Its success or failure might lead the way for emerging oil producers such as Afghanistan.

This kind of work may seem a long way from building pipelines, pumping stations, processing plants, and storage facilities. However, before you can do the petroleum engineering, you have to do some cultural, political and economic engineering.

You have to ensure that the new plant and equipment will be able to function once the

China and Alberta

China, the world's fifth-largest oil producer, has been a net importer of crude since modernization began to take off in the early 1990s. China is Alberta's third-largest trading partner, buying not only raw materials such as polyethylene, canola oil, and wood pulp, but also oilfield technology.

With most of its oil and gas deposits in remote north-western regions, China has a keen interest in Alberta's cold-weather expertise as well as its heavy oil and oil sands technologies. Calgary's Husky Oil, owned by Hong Kong interests, is an active player in China's offshore production.

The China National Petroleum Corp. (CNPC), with a workforce of more than a million people, has ties with Alberta that go back two decades. CNPC has an office in Calgary. And since 1990, the CNPC-Alberta Petroleum Centre in Beijing has helped coordinate the transfer of petroleum and environmental technology from Canada to China.

The Centre in Calgary trains people from China for work not only in China, but also in other oil-producing countries. Through a home-stay program, the students also learn English and are exposed to North American culture.

For years the CPI has trained executives from the CNPC, helping it to evolve from a communist state-owned business to a publicly traded corporation.

Alberta expertise travels the world

steel pipes are all finally in place, and that they will continue to work after the local people take delivery.

Fortunately, Shum has a lot of experience with the cultural side of petroleum engineering.

When he graduated with his bachelor's degree in 1987, Alberta's oil industry was in a deep recession. Shum found a job in his native Hong Kong working for a company representing an Alberta oilfield service company, Nowsco (since taken over by Texas-based BJ Services).

The oil industry has always been something of a cultural melting pot. Shum found himself working with Chinese, Japanese, Italians, French, and Americans. He learned to work not only with different human cultures, but with different business and political cultures as well.

Shum's work included looking after offshore well testing in the South China Sea and Bohai Sea for the China National Offshore Petroleum Corporation. Nowsco and other oilfield service companies such as Halliburton helped China bring in up-to-date fracturing and acidizing technologies. Shum also helped commission a couple of testing laboratories for the China National Petroleum Corporation. He was involved with several acidizing/fracturing demonstration projects that showed the Chinese how to apply the Canadian technologies.

The Canadians also brought in vehicles built by Foremost Industries of Calgary, a company that remains a major supplier of drilling equipment and large all-terrain vehicles (similar to those ridden by visitors to the Columbia Icefields). It marked the beginning of a business relationship between the Alberta and Chinese oil industries that continues two decades later.

"Today, you go to a Chinese oilfield and you won't be surprised to find Canadian-made equipment and computer software," Shum says.

While Nowsco and Shum were sharing Canadian expertise in China, the U of A Engineering school was also becoming involved with Asian petroleum industries.

In 1982, the United Nations Development Program asked the U of A Faculty of Engineering to train petroleum technical instructors from Indonesia. The Faculty began

hosting the "Summer Institute" while full-time students were away on summer break. Students from around the world came to learn not only about the technical nuts and bolts, but also about the culture of the global petroleum industry. They toured drilling rigs, oil sands plants, and other facilities. When they returned home they often adopted Alberta methods for their own organizations. That led to orders from Alberta suppliers of oilfield services, equipment, and environmental services.

Alberta became a preferred place to send students from developing countries because of its long-established industry and its good regulatory systems, and because of Canada's stature in the world.

"Canada started its oil and gas industry back in 1947, while a lot of emerging countries are just starting their industries now. We made our mistakes, and now a lot of countries can learn from our mistakes," Shum says.

At the end of the 1980s, Shum returned to Edmonton, completing the U of A's joint Masters of Engineering and MBA program in 1992.

"I used to be a professional student," he laughs.

With academic credentials and real-world engineering experience, plus a background of working with people of diverse cultural origins and with corporate and government-run organizations, in 1993, Shum joined the Canadian Petroleum Institute (which had evolved from the Summer Institute).

At first, he was on the road for about 30 percent of the time to everywhere you can imagine an oil executive going and many other places as well. While the places change, the work doesn't.

"The things we have been doing in Afghanistan are not that different," says Shum. "It's just the location that's different."

Shum is not the only U of A engineer to play a leading role on the staff of the CPI (now headquartered in an industrial park in southeast Edmonton). Its past president, Peter Adams, is a former dean of the U of A Engineering Faculty. Why so many engineers? Despite their stereotype as nerds, engineering students learn how to work co-operatively on all kinds of projects. Shum says this is especially true for engineering students in the smaller specialties like petroleum engineering,

In addition to China, the Canadian Petroleum Institute works with other emerging energy producers, including: **India, Pakistan, Bangladesh, Thailand, Kuwait,** and **Chad**. Previous clients include the **Philippines, Vietnam, Peru,** and numerous **African** countries.

In **Africa**, CPI has helped to train geophysicists, geologists and drilling engineers from **Sudan**. They've also helped a state-owned **Tanzanian** company develop the Songo Songo gas fields. A special course brought the deputy directors of national oil companies from all over Africa to study in Alberta.

Alberta and Canada are also involved with the oil and gas industries in **Bangladesh**, a small producer with substantial reserves and the potential to export to India. In one program, Canadian universities enrol Bangladeshi engineers in masters and doctoral programs, training them to become engineering professors at the Bangladesh University of Engineering and Technology (BUET). (A former U of A student is the president of BUET.) As well, CPI has worked with CIDA (Canadian International Development Agency) and international agencies to train personnel, with the goal of setting up a Bangladeshi gas regulatory system.

with only about 30 or 40 students per class.

"You think about it; you're taking about six courses and you just can't do it all yourself. You're forced to work together with other people. We didn't just talk about teamwork; we had to work together to get the assignment done," says Shum.

Perhaps it also instils a can-do attitude. "In engineering, the quest for knowledge is always there," Shum explains. "You're always trying to solve problems."

Whatever and wherever they may be.



*Bruce White
(bruce@bizedmonton.ca) is
a business writer and editor
based in Edmonton.*

He built his career on structure and solid foundations, but it was blind faith that brought **Gary Bardell** (MSc Civil '78) to Edmonton and the University of Alberta. He and his wife, Susan, had never been west of Sudbury when they packed up their car and headed across the country in August 1976 solely on the advice of some of his former professors.



the CONST

From the very beginning, Bardell's path in engineering had been influenced by the advice of others. His older sister knew he enjoyed math and sciences in school and told him he should think about engineering.

"I didn't know much about engineering at the time," says Bardell. "I thought that it sounded interesting and it was something that used math and science and that's how I ended up getting into it."

Bardell, former president and CEO of The Churchill Corporation, was born in Halifax and grew up in Ottawa. Although having been accepted at a number of engineering schools, he chose Carleton University as it was closer to home.

There were no obvious signs in his youth that he was destined to become an engineer, but as it came time to go to school he managed to narrow his scope a little.

"I think it was more of the practical, hands-on type of things I was interested in. I guess that's why I went into civil engineering as opposed to electrical or some other discipline.

A black and white portrait of Gary Bardell, a man with white hair and a mustache, wearing a dark suit, white shirt, and patterned tie. The portrait is centered and occupies most of the page. A horizontal gold bar is overlaid across the middle of the image, containing the title and author information.

RUCTOR

by Murray Donaldson

Gary Bardell
(MSc Civil '78)

The building part of it struck me as something interesting. Designing and building—I liked that idea once I started to find out a little bit more about engineering,” he says.

After graduating from Carleton with a civil engineering degree in 1974, Bardell and his wife, a high school sweetheart, moved to Toronto.

“I didn’t really want to work for the federal government at the time so I chose to leave Ottawa. When I was attending Carleton I had two professors that had gone to the U of A and they both were talking about how good a university it is and that the engineering school is one of the best. I had pretty good marks in my undergraduate program, so they were encouraging me to go on to post-graduate work and they encouraged think about the U of A.”

At the time, Bardell put that advice aside in order to get into the workplace. He ended up working for the Ontario provincial government. He took a job designing bridges in the Ontario Department of Highways.

“I think it’s the right thing to do for people to give back to the industry that has given them a career.”

Because of his experience in bridge design, Bardell applied to study structural engineering at the U of A. Soon, the couple found themselves setting up house in the married student residence at Michener Park.

“We didn’t really come out to look at the campus at all. We just applied and got into these things, loaded up our car in August and drove

way discovered that his professors had been right about the U of A.

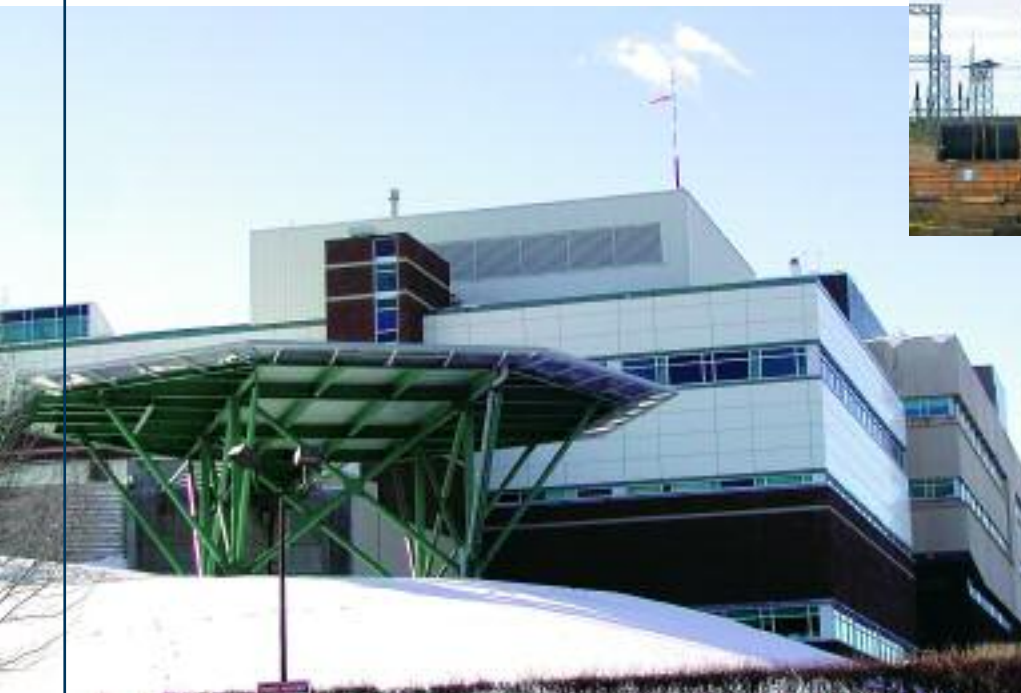
“At the time when I was there, the U of A structural engineering program was one of the best in North America. It had an incredible faculty and they were doing great research programs together with private consulting.”

Bardell often wonders at the little chances in life, where something or someone in your life can reappear later and make things fit into place. At the U of A, his Master’s thesis defense committee included the Dean of Engineering, Peter Adams. Adams is now chair of the board at the Churchill Corporation, where Bardell currently works.

“People like Peter, I really admire. They



A powerline project by a Churchill company.



A Stuart Olson construction project — the Red Deer Hospital redevelopment in Red Deer, Alberta.

After a couple of years, though, the Bardells decided Toronto was a little big for them.

“In the 70s, we thought it was a nice place but we didn’t really want to raise a family there.”

across Canada with all our belongings and ended up in Edmonton. We never went back. Our plan was to come out for one year and that was in 1976.”

Bardell earned his Master of Structural Engineering degree in 1978 and along the

are leaders in their industry in both the research part of the profession as well as the consulting part. They combine it together. There were a number of professors like that.”

The Bardells decided to stay in Alberta, mainly due to the opportunities in engineering.

“In the late ’70s there were lots of things happening in Alberta, and Ontario was pretty slow. I had decided at that time that government work wasn’t that exciting for me.”

Instead, he went to work for Dominion Construction.

In 1979, Bardell joined Stuart Olson Construction as project manager. He worked his way up through positions in operations, development and general management to become president in 1997.

“It’s a combination of technical work, managerial work, and an opportunity to see things being built. You can see your accom-

plishments; that's one thing that's very interesting about the construction industry. You can look around the city and the province and see buildings and projects you've been involved with over the years."

Bardell rarely has to look far. During his time with Stuart Olson and Churchill, he has been involved in such standout projects as the Edmonton City Hall, Grant MacEwan College, and the Hotel Macdonald restoration project. He's presently involved in an expansion to the Red Deer Hospital and a recreation facility in Fort Saskatchewan.

In 2002 Bardell was approached to succeed Hank Reid as president and CEO of The Churchill Corporation, Stuart Olson's parent company. The new job required him to come at engineering from a new angle.

"Running Stuart Olson, you are a little more hands-on, more aware of the details of the projects, the details of running the business on a day-to-day basis. The getting of the work, the estimating, the marketing, the business development, the execution of the work and the operations and monitoring projects. At the Churchill level, it's more of the financial end of it, more strategic end of it, a broader perspective."

In late 2004, Bardell stepped down as President and CEO to spend more time with his family in Calgary. He remains with Churchill as an advisor to their board of directors while working on specific projects.

Throughout his professional career, Bardell has invested much of his time volunteering for industry associations

"I think it's the right thing to do for people to give back to the industry that has provided them a career. I'm very much a believer in that. We have encouraged our people at Stuart Olson and our other companies to get involved with industry associations."

One of the volunteer activities Bardell is most proud of is helping to set up a construction engineering program at the U of A. Along with a group of industry professionals in the early '80s, he started lobbying and working with the Alberta Construction Association to convince them of the need for such a program. When the program launched in 1986, it was the only one in Canada. Bardell is pleased to see Churchill now hiring people who went through a course he helped build.



A Churchill company refinery project in Regina, Saskatchewan.

In 2003, the Calgary Construction Association presented Bardell with the Ted Walden Award, the most prestigious award they bestow. Bardell was both honoured and astounded by the depth of research that went into the award ceremony.

"They did the research themselves, it was not something I provided. That probably impressed me more than anything, hearing your accomplishments in front of a room with 300 people."

It was an emotional night for Bardell, who was happy his family was there to share it with him. Bardell says he had people, including some senior employees in Churchill, coming up to him after and saying; "Wow, I knew you were involved in the associations and the industry but I didn't realize you had accomplished those things."

"That was important to me," he says. "Because then they realized how important it is to give back to the industry and the community. If they can see that I've done it, then they can realize the importance of that kind of involvement as well."

As part of the award, a four-foot bronze statue called "The Constructor" stood in the lobby of Stuart Olson offices.

Bardell has built more than a career out of engineering. He has helped set standards in the industry and encouraged others to do the same. His continued input both professionally and voluntarily is a welcome presence, as "The Constructor" attests.



Murray Donaldson is an Edmonton-based editor and freelance journalist.

Calgary CONSTRUCTION Association

Among his many other volunteer endeavours, Gary Bardell (Civil, '77) spent 14 years on the Board of Directors of the Calgary Construction Association.

The roots of the CCA date back to 1944, when a number of construction pioneers united the industry into one association called the Calgary Builders' Exchange. The first president was Ted Walden.

The CCA is a non-profit, voluntary membership association that promotes honourable business practices and excellence in construction. The association provides many services to around 500 member companies in the Calgary area.

Like the Alberta Construction Association and the Canadian Construction Association, the CCA is a voice of the construction industry.

Go to www.cca.cc to visit the CCA website.

Above his computer,
alongside timetables
and lists of contractors,

Bill Van der Meer
(Civil '74) has tacked
up a Golden Bears
hockey schedule.
It's no coincidence.

BY SUSAN BEACH

Ring Around Edmo

A TEAM EFFORT



Edmonton

Van Der Meer's love of teamwork has come in handy while constructing the South West Ring Road, Edmonton's most high profile recent transportation-engineering project.

Since the 1970s, the province has been buying up quarter sections of land circling Edmonton, creating a right-of-way for a planned 80-kilometre ring road. This Transportation-Utilities Corridor (TUC) will also provide a more efficient route for transmission lines, power lines, and pipelines for the city in the future.

Work on the SW Ring Road Project began about five years ago. Several engineering firms are helping plan, design, and construct 18 bridges, five interchanges and the road itself. With the help of a consulting team, Van der Meer is overseeing the SW section of the road from inception to completion.

The project has posed many challenges. At Calgary Trail, where the SW and SE Ring Roads meet, engineers will construct 12 bridges, six on each side, to create the first three-level interchange built in Alberta. At another crossing, at the North Saskatchewan River, geotechnical engineers went through comprehensive testing and planning before construction could begin on the twin bridges.

"The existing slopes on the river are very unstable, so we had to put in about 137 piles in a row, each one 1.5 metres in diameter, to prevent the fill we put in from failing," Van der Meer explains. "If the existing ground had

Bill Van der Meer
(Civil '74)

been stronger, no piles would have been required.”

At one point the media publicized a girder that slipped off its temporary mooring during construction. But the contractor involved replaced it immediately, at no cost to the project, and bridge construction has proceeded to standards and ahead of schedule.

Coming up with a reliable crossing over Whitemud Creek Ravine gave their toughest design challenge. Ground conditions there are extremely unstable, says Van der Meer.

“There was a real risk of putting in slopes and a conventional bridge and having them fail, having the ends of the bridge settle or collapse.”

The solution, developed by teams of engineers, is more an arch than a bridge. It provides a stable road above while allowing the creek, hikers, and wild animals to pass underneath.

Van der Meer’s responsibilities now include managing construction of the next phase of the perimeter freeway as a P3 (Public Private Partnership) project.

“The SE Ring Road will be Alberta Transportation’s first P3 project and so I’m looking forward to something different again.”

Bids for this P3 will involve much more than construction of the road and its 22 interchanges. A selection team, including

Van der Meer, will choose one contractor to design, construct, and then maintain the road for the next 30 years, with the province paying the contractor back over three decades.

Bill Van der Meer’s steady career has prepared him to oversee the Ring Road Project. After graduating, he worked for the City of Edmonton for 25 years, managing the design and planning of three major freeways: Whitemud Drive, Yellowhead Trail, and Capilano Freeway (now Wayne Gretzky Drive).

“I’ve been involved in roadway design and construction for 30 years and I’ve never tired of it, because each new project has had new challenges...but I must admit that the SW Ring Road project is the biggest and most interesting yet.”

When the province began to move ahead on plans to build the SW section, Van der Meer volunteered. He was seconded to the Government of Alberta, where he oversees the roles of both the province and the city.

“The City is a major stakeholder, so we looked at where access and interchange locations would be. Once the basic plan was agreed to, we have had meetings with the City on an ongoing basis, to coordinate some of the major tie-ins, places where the City has projects that complement ours.”

It also helps that Van der Meer knows whom to call at the City to sort out drainage tie-ins, lighting, and other issues as they arise.

Van der Meer’s role in the SW project includes watching the budget and ensuring that work proceeds on time, according to plan, and to government standards.

“We write the terms of reference for what we want, administer the contracts for design and construction, and supervise construction work on a daily basis.”

Two other government staff, Kip Hritzuk and Nathan Stelmach (Civil ’03), both construction engineers, work with Van der Meer and a consultant team drawn from participating firms. The team supervises the seven engineering consulting companies on a daily basis.



South West Ring Road — *The Facts*

Seven consulting companies work on the South West Ring Road Project., UMA Engineering Ltd., Associated Engineering Ltd., AMEC Infrastructure Ltd., AMEC Earth and Environmental Ltd., Stantec Consulting Ltd., Earth Tech Ltd., and EBA Engineering Consultants Ltd.

The 18 bridges require approximately 20,000 metric tonnes of steel and 60,000 cubic metres of concrete.

As transportation needs increase, five more interchanges will be built to freeway standards, for a total of 18 bridges and 10 interchanges.

The SW section comprises approximately 15 km of four-lane divided

road, with a concrete road surface. This is the first concrete road built by Alberta Transportation. Road construction includes grading over 10 million cubic metres of dirt, 230 metric tonnes of granular, and over 100,000 cubic metres of concrete.

In preparation for the bridge construction over the North Saskatchewan River, crews installed tangent piles in a line (spaced 3.5 metres apart) along the front of each of the approach fills, with 88 piles on the north side and 49 piles on the south side. Installing the piles below the existing ground will intercept potential slope failures from the weight of the earth fills (up to 20

metres in height). A total of 137 piles were installed, at a cost of \$3 million.

Costs of the Whitemud Creek Ravine Project include over \$1 million for the geotechnical work, including installation of drains to dry the land; another \$10 million for the arch; and \$5 million for the fill and road construction.

Final landscaping and reclamation for the SW Ring Road will cost close to \$4 million.

While Van der Meer is excited to be managing such a large project, he quickly acknowledges that many engineers have taken part. He can name over two dozen U of A Engineering alumni involved.

“Wayne Tomlinson (Civil ’74) was in my class,” he said. Tomlinson works as construction administrator for Earth Tec Ltd., one of the main contractors. Carl Clayton, with Stantec, has been a lead person on the consulting teams.

Van der Meer’s experience as a student prepared him well for the role he now plays in Edmonton’s Ring Road Project:

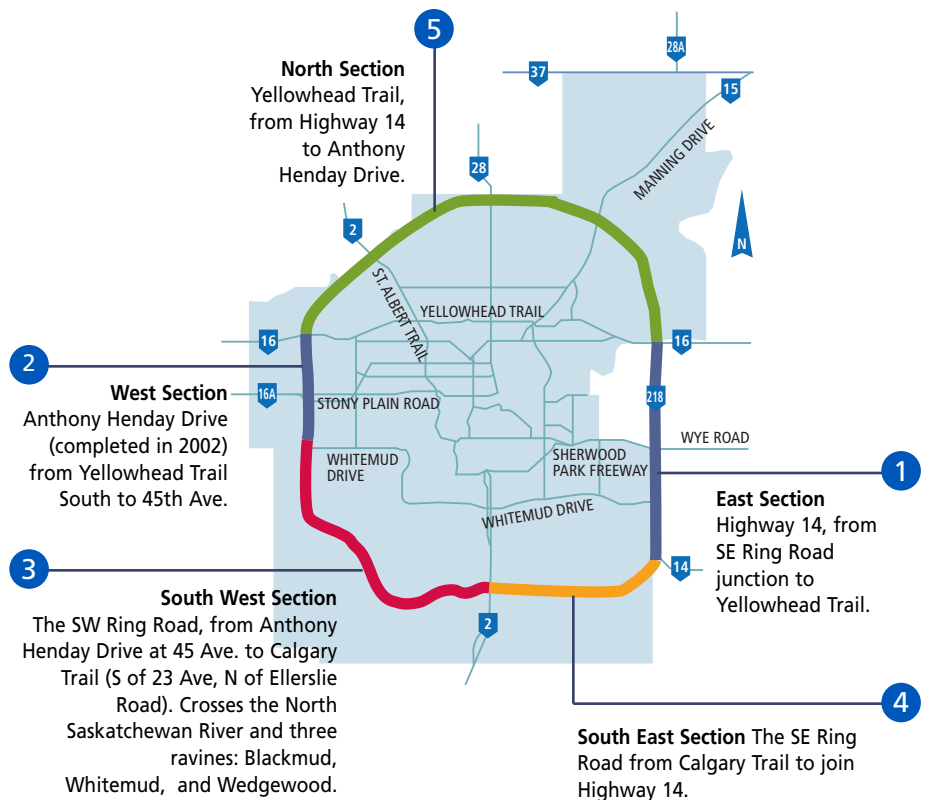
“The U of A Civil Engineering program gave me a great education in the sciences, but more importantly I met many new friends, was involved in many of the class activities, learned how to work with other people and to work on a team.”

It’s a long-standing, time-honoured, and much-needed tradition among engineers to work together well. This team shows that amazing results can be achieved by continuing that tradition.



Susan Beach is an Edmonton-based writer and editor.

Construction — *The Sequence*



★ Completing the SW and SE sections of the Ring Road will put about 50 of the planned 80 km in operation. Eventually, the remaining 30 km will extend the North section of the Ring Road to 186 Ave. and St. Albert.

Floor and Arch — *The Reclamation*



At the proposed crossing site at Whitemud Creek, historical land use has made the ground particularly unstable. A pit mine operated in the ravine from the early

1900s until 1951. When it closed, the tailings and other debris were dumped into the pit and covered. Van der Meer likens building a bridge on a former pit mine to “putting it on a big wet sponge.”

Consulting engineers came up with a concrete structure 18 metres high, 20 metres wide, and 60 metres long, providing both floor and arch. When combined with the fill around it, it will fully support the new road. Construction crews built the arch to one side of the creek, then shifted the creek’s path to flow underneath. Concrete beams inside the archway provide key structural support; they also support a pedestrian walkway underneath the arch, about halfway between the road and the ground below.

Wild animals may pass undisturbed under the arch on their own trail alongside

the creek. Van der Meer says they looked at existing animal crossings along the Banff Highway, but he has not found a similar structure in North America designed to accommodate both unstable ground conditions and the needs of highway traffic, recreation, and wildlife.

When mine operators left tailings to leach into the soil they created a virtual moonscape, covering about 300 square metres and supporting no vegetation. Van der Meer hopes to leave the land in better shape than it was before the crossing was built. As part of the cleanup and reclamation after construction, crews will cover the barren landscape with loads of topsoil. They will then plant new trees and shrubbery, both to screen and to mark out a new wildlife trail.



a toast
Ver

Lorenzo Donadeo (Mechanical '81)



to
million

by Tom Keyser

The year was 1997.

The international business negotiations had just taken a sudden and unexpected turn.

The vendor's negotiators were fully prepared to bid farewell to a portion of their client's French oil holdings, which had been on the table from the start.

But they were caught off guard when the buyers—an upstart Calgary company known as Vermilion Resources Limited—asked them to toss in some other liquid assets.

“When we asked them to throw in the wine cellar, all you could hear was dead air on the other side of the phone,” grins Lorenzo Donadeo (Mechanical '81), savouring the taste of that memory.

The global energy giant reluctantly gave in, accepting \$42 million in exchange for 150 oil wells in the French countryside—plus an on-site bonus of well-aged bottles from some of the world's finest wine-producing regions. Donadeo (pronounced Donna-DAY-o) and associates Jeff Boyce and Claudio Ghersinich had good reason to hoist their glasses in a celebratory toast. In sealing the deal, they had tripled the size of their modest energy company and landed a palate-pleasing bonus in the bargain.

As enjoyable as the (now somewhat depleted) wine cache has been through the years, it was the acquisition of those French wells that elevated Vermilion Resources to “player” status within the Canadian energy industry.

Five years later, Vermilion Resources followed a prevailing oil patch trend. It transformed itself from a mid-sized oil and gas company into an energy trust, a move that achieved the desired result. Investors responded positively and the company's valuation soared.

Today, with Donadeo doing triple duty as CEO, president, and director, Vermilion Energy Trust owns estimated reserves of 90.9 million barrels of oil (or equivalent). It also owns the respect of industry analysts. Many rank Vermilion among Canada's most astutely managed energy trusts.

And it all came about because three shrewd entrepreneurs went in search of new opportunities in the land of Balzac, Voltaire, joie de vivre and savoir-faire.

When thoughts turn to global oil production, places such as Texas, the North Sea, Nigeria, and the sparsely populated Russian steppes generally spring to mind. But oil in France? Sure, Provence's Baux River valley enjoys a reputation among wine connoisseurs. But few non-specialists realize that French well sites generate more than 34,000 barrels of black gold each day.

Seven years ago, even Donadeo's team was only dimly aware of the fact. So when a vendor announced its intention to sell French properties, which were producing 3,500 barrels a day, the Vermilion partners collectively raised their eyebrows. The more research they did, the more interested they became.

“It was a big jump for us,” Donadeo reflects. “At the time, our company was only producing about 800 barrels of oil a day in Western Canada. But we wanted to grow and it was getting hard to find value in assets to acquire in this country. When we saw the opportunity in France, we realized we'd be able to buy foreign assets at about one-third the cost of a comparable property at home.”

The twin oil fields—one situated about 80 kilometres southwest of the city of Bordeaux and another east of Paris—looked like a low-risk bargain for a variety of reasons. French authorities had established a royalty-payment scheme that the company found easy to live with. Meanwhile, preliminary research indicated that the company should be able to keep a lid on operating costs (not that unforeseen glitches didn't arise). And France had a stable and compatible business climate, in contrast to such politically unpredictable oil-producing hotbeds as Sudan and Kazakhstan.

“At the time we moved in, the vendor had been projecting to shut in these fields within

four years,” Donadeo continues. “But we were able to give the new assets our full care and attention and have actually been able to increase production to 6,000 barrels a day. We're still going strong after seven years and our engineering reports suggest these wells will produce for another 20 years.”

Vermilion unit-holders have no reason to gripe. The company has fully recovered its initial investment of \$292 million, including \$250 million in developmental costs, and its French assets “are now worth about \$350 million, free and clear,” according to the chief executive.

Donadeo's European adventures—Vermilion Energy Trust has since acquired additional producing properties in the Netherlands—reflect his internationalist roots. The son of immigrant parents, Donadeo grew up speaking Italian. His father, an asphalt foreman in Red Deer, had spent his first two years in Alberta toiling in a grimy central-Alberta coal mine.

“My dad told me those were the worst two years of his whole life,” Donadeo recalls today.

The father's hard-won lessons took permanent root in his offspring.

“Through him, I learned the value of hard work and determination. His experiences taught me the value of a good education,” says the CEO.

Donadeo excelled in math and science throughout grade school, but he didn't set his sights on the University of Alberta right away. After graduating from high school, he spent two years studying welding engineering technology at Calgary's Southern Institute of Technology (SAIT).

His success at SAIT gave him the confidence to take a shot at U of A's mechanical engineering program.

“I'm not that smart but I worked hard,” he recalls. “Some of the calculus courses were so tough. I thought, ‘My gosh, what does this have to do with anything in the world?’ It's only after graduation, when you get out in the workplace, that you start to understand that they're teaching you a thought process, a methodology for problem-solving.”

In his U of A aerodynamics class, Donadeo and three classmates drafted a new design for a gliding airplane, earning second place in a national competition at

A producing well at Parentis Lake, France.





Drilling at
La Torche field,
France.

“You get together as a team, learn how to interact effectively, how to divide the workload, and to work collaboratively to reach the objective.”

Hamilton. The experience reinforced the future CEO’s faith in creative teamwork.

“You get together as a team, learn how to interact effectively, how to divide the workload, and to work collaboratively to reach the objective. These are invaluable skills, though I may not have fully realized it at the time.”

After graduating with honours from the U of A, Donadeo accepted a job offer (one of nine offers that came his way) with Hudson Bay Oil & Gas, a company acquired by Dome Petroleum a few months later. As a young engineer at Dome, Donadeo worked for a time under the supervision of Hal Kvisle (Civil ’75), now chief executive officer of TransCanada Corporation.

“Dome was a unique company, very entrepreneurial,” says Donadeo. “They encouraged people to come up with their own ideas.”

Donadeo had plenty of those, including his one overriding ambition—to someday make the big decisions for his own oil and gas enterprise.

“With an eye to my future as an entrepreneur, my initial goal was to gain exposure to a number of different aspects of the business,” he recalls.

With Dome and, later, with Amoco Petroleum Ltd., Donadeo built compressor stations and gas plants, served as a produc-

tion engineer in the Athabasca shallow gas fields, became a field engineer on the oil side, and eventually rounded out his resume with a stint in gas marketing.

“Field experience is a key to your development. It gives you the hands-on experience that’s so important when you start making decisions from head office,” he says.

Ultimately, Donadeo reunited with Ghersinich, who’d been a trusted colleague at Dome. Together, they ventured into uncharted territory, as partners in a successful private company called Vista Nuova Energy. In 1995, Vista Nuova was rolled into a new public company—the original Vermilion Resources. By this time, the pair had recruited Jeff Boyce to the executive team. And within two years, the trio found themselves negotiating the French oil deal.

To this day, Donadeo regards the French transaction as the turning point in his career. Learning the finer points of operating in a foreign land proved an education in itself.

“We learned a couple of things the hard way,” Donadeo admits. “In France, it takes longer to get regulatory approvals (to drill new wells), so you have to do a better job of planning. We went in thinking we would show the French the Canadian way of operating,” he laughs. “We do things the international way now.”

Drilling costs also turned out to be significantly higher on French soil than back home. Early on, Vermilion temporarily ceased operations to extensively re-evaluate cost structures before taking measures to streamline the process. Eventually, they sheared costs in half.

Then there was the work force, understandably wary of the new bosses.

“We were dealing with essentially a union mentality,” says Donadeo. “Our guys had a challenge getting workers to buy into the concept that if they worked harder, adding value (to the company), that they’d earn more.”

In contrast, it didn’t take long for the Vermilion executive team to wholeheartedly embrace a new and creative incentive program. It involved that wonderful wine cellar, stockpiled with sublime vintages from the 1960s and 1970s.

“Today it’s not as well stocked as it once was,” Donadeo concedes with a smile and a shrug. “We made it part of the bonus pool. Those first few years, we had more wine than money to give them.”



Tom Keyser is a Calgary-based freelance journalist.



Dave Markle
(Engineering Physics '58)

Ask Dave Markle (Engineering Physics '58) about the value of a university education, and he gives you a straightforward answer: "My engineering degree changed my life completely."

The Optics of Photolithography

Dave Markle by Connie Bryson

The Edmonton-born engineer hated high school.

"There was no intellectual stimulation. It was as boring and as monotonous as it could possibly be. Engineering at the University of Alberta opened my eyes to what learning could be and what being an engineer could be. Many of our professors were not only great teachers of their particular discipline but they had also worked in industry. They provided much-needed motivation for the hard work we were doing. I came away from our University with a love of learning, confidence in my ability to learn, and a huge respect for the value of knowledge."

His undergraduate degree also set Markle on a career that has seen him make major contributions to engineering theory and practice. He is a renowned optical scientist who has played an instrumental role in the development of advanced photolithography systems used in the manufacture of semiconductor devices. He holds more than 43 patents. In 2004, Markle was elected to the U.S. National Academy of Engineering, one of the highest professional distinctions accorded an engineer.

But back in 1954, when Markle started university, photolithography was in its infancy. In those days, he was interested in learning

all he could about engineering physics. This was a problem because, at the time, the course was not taught at the U of A. However, his classmates managed to convince the Physics Department to re-institute the course.

Engineering physics was a demanding program, and Markle thrived on the challenge.

"If you blinked, you could be at the bottom of the class," he says. "But we worked together and with small classes we really got to know each other. If one of us was going to miss a lecture, someone would always take an extra set of notes."

Markle recalls one particular lecture when his five classmates were out with the flu. He assumed that the professor would cancel the class since he was the only student in attendance. But he didn't. So Markle got out five pieces of carbon paper, put them in place, and began taking notes.

"Every time I got to the end of a page, I had to shuffle quite a bit of paper. The professor stopped lecturing, waited for me to get the papers organized, then continued speaking. Although this story always makes me smile, it demonstrates the commitment of the faculty to learning."

After graduating from the U of A, Markle won an Athlone Fellowship to study in

Engineers, in their quiet way, make the world a better place.

England. He earned a Master's degree in reactor physics at the University of Birmingham and went on to a diploma in business administration from the London School of Economics.

"The business course was a wonderful experience. Learning about business was a good complement to my technical education. I think this is something more engineers should do, and it is perhaps an area where Canada should focus in order to encourage entrepreneurship. It's vital that technical entrepreneurs also understand business."

The exposure to business issues made Markle eager to work in private industry. But as a Canadian nuclear engineer, his most likely employer would have been Atomic Energy of Canada, with whom Markle had already worked for two summers. A government job simply did not interest him, so he explored

(ICBMs) made the Bomarc missile obsolete. Markle was seconded to the U.S. Defense Advanced Research Projects Agency (DARPA) and began work at Cape Canaveral. His project involved making measurements to be used to design satellites to detect the launch-boost phase of enemy ICBMs.

His involvement in the project ended at the height of the Cuban missile crisis, a time Markle remembers vividly.

"I was working at Patrick Air Force Base, which was continuously patrolled by circling aircraft. They took off every half hour, so the "kaboom" from the afterburners was a constant reminder of the turmoil in the world. When I drove back to Toronto, we passed innumerable military convoys going south down the highway."

The missile projects had sparked Markle's taste for designing instrumentation. After a couple more years at De Havilland, he went to work for Perkin Elmer in Norwalk, Connecticut. He worked in the electro-optical division, making one-of-a-kind optical systems for highly specialized applications such as space-borne telescopes.

Markle's boss was Harold Hemstreet, who "very much wanted to make more than one of something" according to Markle. He assigned Markle's team to build a photolithography machine. Photolithography is one of the key steps in making integrated circuits. The process transfers the image of a circuit from a glass mask onto a silicon wafer coated with photosensitive material. After development, the pattern on the resist layer is transferred to an underlying layer to define one of the circuit layers. A completed circuit might contain two dozen layers.

Although the first tool the Perkin Elmer team came up with was, in Markle's words, "unbelievably awkward and user hostile in every respect," the team members felt there was great market potential for the right tool. Hemstreet went to the Perkin Elmer board to request money to develop a commercial system. When asked how many he thought could be sold, he estimated about 50.

"Apparently the board nearly laughed him out of the room. They thought that was the funniest thing they'd ever heard," notes Markle. "No one believed the market was that

large. But Harold had a good track record, so we got the money."

The team started developing the machine in 1972, and the first one sold a year later. In total, Perkin Elmer sold about 3,000 photolithography systems, making it the company's best-selling product ever. The electro-optical group became Perkin Elmer's microlithography division, which was eventually sold to another company.

Disillusioned by decisions made by the Perkin Elmer management, Markle went to work for California-based Ultratech Inc. (Nasdaq: UTEK) in 1984. He is now Ultratech's senior vice president and chief technology officer. The company designs, manufactures, and markets photolithography equipment used worldwide in the fabrication of semiconductor and nanotechnology devices. Ultratech has also developed a new technology called "laser thermal processing" for integrated circuit manufacturing.

"There's never a dull day at Ultratech, because I get to work with so many different technologies," he says. "That's what I like most about my job. And the fact that I work with many, very bright people—as I have throughout my career.

"Fact is, engineering is not a solitary pursuit. It is a collaborative effort. People from all around the world have supplemented and updated my technical education, and broadened my perspective in directions I scarcely even imagined upon graduation. I didn't realize it at the time, but my professors at the University of Alberta exemplified this collaborative ideal. They laid a firm foundation for the sharing of knowledge and lending a helpful hand to anyone who could use it.

"Engineers, in their quiet way, make the world a better place, and we need more of them. I'm concerned that enrolment in engineering is in a 10-year decline in North America. Those of us who have benefited from a good education need to do a much better job in convincing young people that a career in engineering is well worth the effort. It certainly has been for me."



Markle proudly demonstrates Ultratech's technology.

other opportunities—sending out what he figures were at least 100 resumes from England.

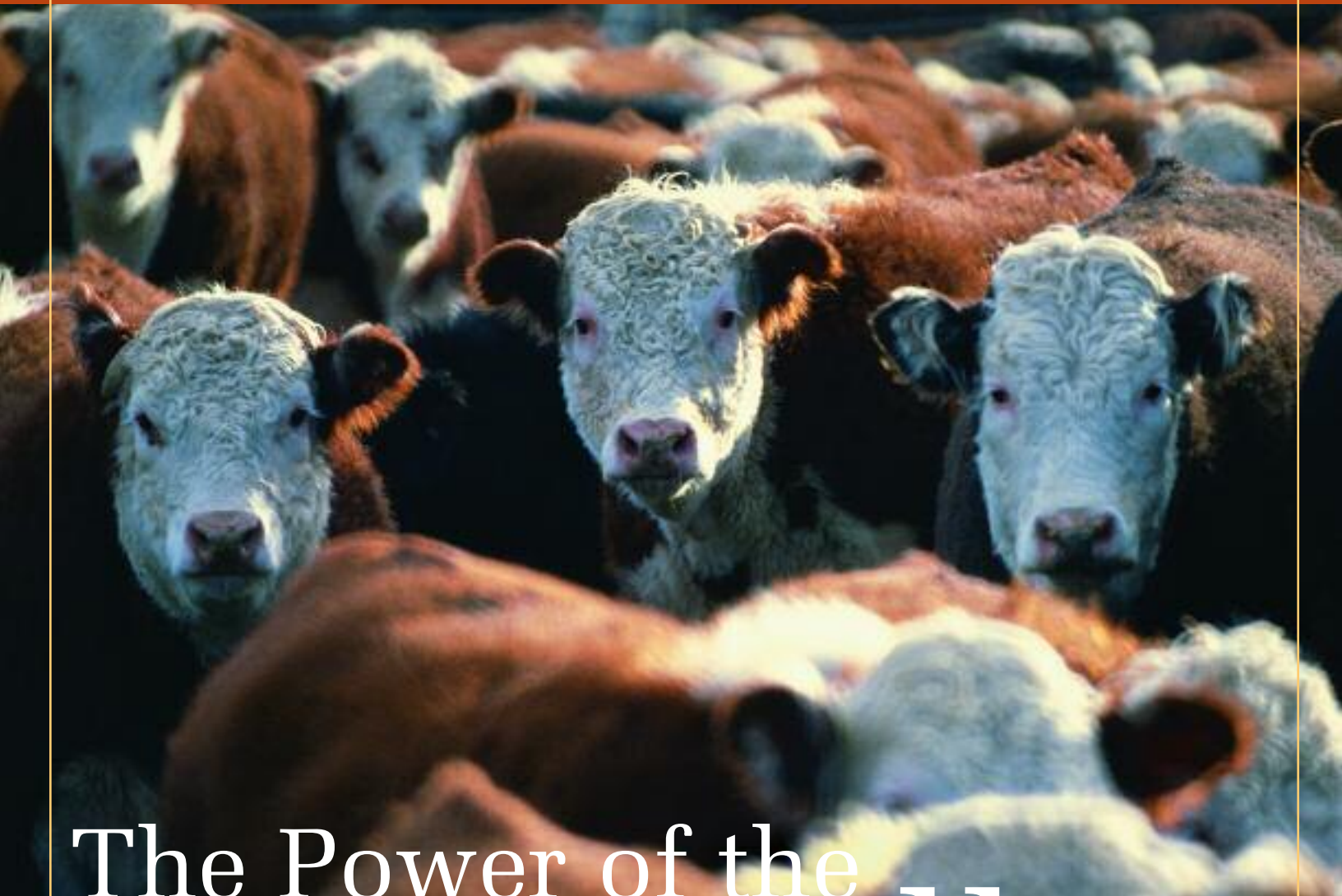
None of those letters got him an interview, so he responded to an ad from De Havilland Aircraft SPAR Division in Toronto. De Havilland needed an engineer to work on the design of an infrared fuse for the Bomarc missile. (In the early 1960s, the plan was to use a network of these guided missiles to shoot down Soviet bombers.)

"I told them in the interview that I was a nuclear engineer and didn't know that much about infrared. To my total surprise, they said it was okay. They didn't know that much either, and they had books on the subject that I could read!"

The project, which was on track for success, ended abruptly when the new threat from intercontinental ballistic missiles



Connie Bryson is an Edmonton-based freelance journalist.



The Power of the Feedlot

Stan Gordeyko (Electrical '71) and Jim Kulchisky (Electrical '68) spend a lot of their time connecting alternative electricity sources into the provincial power grid—a job that takes them to some, well, surprising places.

BY TONY KRYZANOWSKI

“This job definitely isn’t boring,” observes Kulchisky.

Most recently, they were contracted to handle the interconnection of power generated by the unique Integrated Manure Utilization System (IMUS) project in Vegreville, Alberta.

IMUS uses the process of anaerobic digestion to produce biogas from manure, which in turn is used to generate electricity and heat. The IMUS process also produces bio-based fertilizer, pathogen-free and biodegradable consumer products, and water to irrigate crops.

The company behind IMUS, Highmark Renewables, is working with the Alberta Research Council (ARC), Alberta government, and Canadian government to commercialize the IMUS process.

Gordeyko and Kulchisky became involved in the project through their employer, High Time Industries Ltd. They worked with ARC at the conceptual stage of the project, conducted preliminary technical studies on interconnecting the \$6.5 million IMUS pilot plant, and built the infrastructure to take the generated power from the plant to the provincial power grid.

The biogas collected from the top of the pilot plant's digesters consists of between 57 and 59 percent methane gas. The remainder, carbon dioxide and trace gases, are consumed later in the closed loop manufacturing process to balance pH in the liquid stream. The methane is burned in combination with natural gas to power a GE Jenbacher, 999 kW generator, which can operate at between 50 and 100 percent load. It can accept a variable gas blend, so Highmark Renewables has the flexibility to adjust its ratio of biogas to natural gas depending on power prices.

looking for new sources of revenue. Converting manure to electricity represents a way to literally generate new income.

Biogas plants can also act as an energy hub for other agriculture-related industries that use a lot of energy. Examples include ethanol plants and greenhouses.

"We think there is a huge opportunity to add further value to manure and at the same time, provide an opportunity to move into other industries that are users of heat and power," says Mike Kotelko, Highmark Renewables co-owner.

feedlots in Alberta alone that have the size to support a project like this," says Gordeyko. "I also believe that there is a really big need for it, maybe not so much on the power generation side, as from the causal effect of removing manure and all the consequences of manure from the environment. Plus, you do get a good by-product from it."

Highmark is using the pilot plant to optimize lab scale IMUS processes and to integrate the IMUS process into the logistics of an actual, operating feedlot. This conversion plant is unique in North America in that it uses exclusively high-solid content manure. Anaerobic digestion technology has only recently made this possible.

Although future commercial IMUS plants will operate on a continual basis, the pilot plant works on three, eight-hour cycles: feeding the digesters, separating the solids from the liquids, and nutrient recovery. The plant will consume about 100 tonnes of wet manure daily, or about 20 percent of the total output from the nearby feedlot.

Highmark Renewables plans to market the technology to large feedlots with existing integrated operations like processing plants and packing plants. It will likely also appeal to areas where several neighbouring feedlots could share a centrally located IMUS plant. The technology could also be sold to areas where large numbers of livestock are concentrated on a comparably small land base.

Power deregulation has made it possible to sell alternative streams of power generation to the provincial grid.

The project had its electrical engineering challenges. Hooking IMUS into the power grid meant connecting a power source of only 600 volts to an interconnection of 25 kilovolts. Gordeyko and Kulchisky managed this voltage differential using special cables and equipment. At the same time, part of the power generated by the IMUS pilot plant is used by the adjacent feedlot. So the project required two streams of power flow.

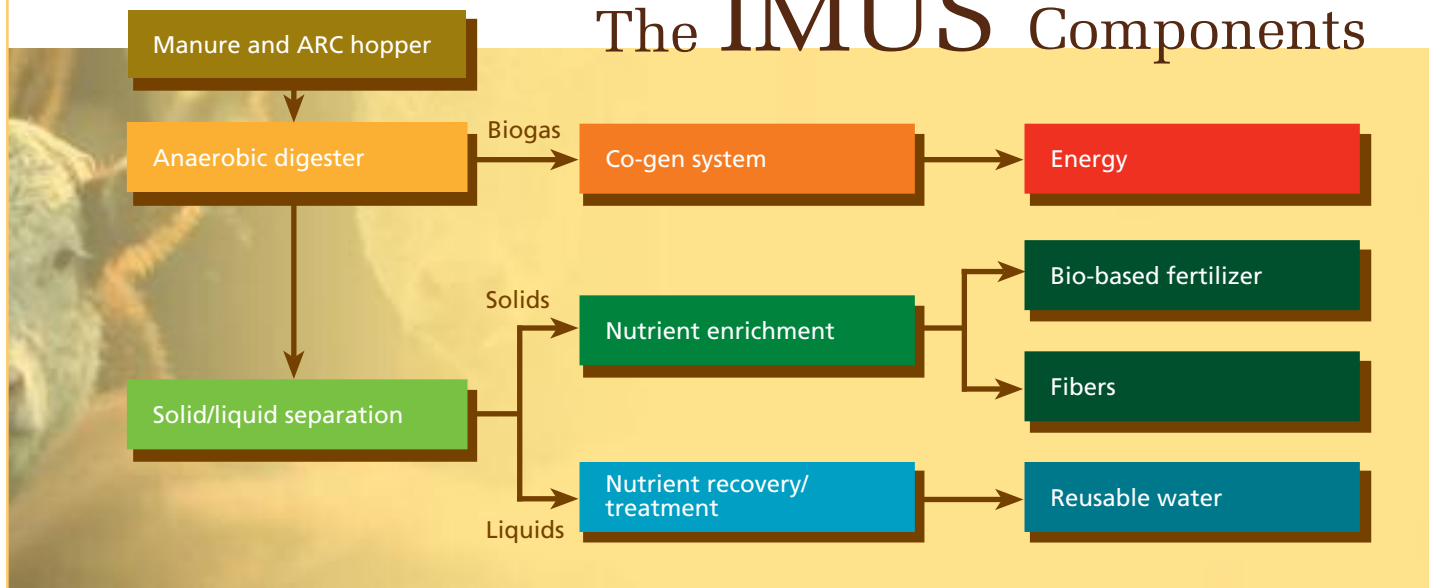
Highmark Renewables hopes to begin marketing IMUS technology to other feedlots within two years. Because the feedlot industry has reached maturity, owners are eagerly

World demand for renewable energy will likely increase. Right now, only three to four percent of Canada's energy supply comes from alternative sources, and two to three percent in the United States. As energy costs increase, many experts believe the figures will grow to 10 or even 20 percent over the next 20 years.

At the same time, the huge quantity of manure generated by Canadian feedlots poses a significant environmental threat. Anaerobic digestion has already been successfully used to treat manure in Europe, and the same could be done here.

"I believe that there are probably 80 other

The IMUS Components



A commercial IMUS plant operating a three megawatt power generator will cost between \$8 and \$9 million, Kotelko estimates. Assuming the owners market both electricity and bio-fertilizer, a plant would likely pay for itself in seven or eight years. Owners could collapse that timeframe further by finding ways to use the excess heat generated by the plant, or by charging tipping fees for processing organic waste generated by outside sources.

“The economic model is tight right now, there’s no doubt,” says Kotelko. “However, we’re confident that we can optimize the cost of construction as well as optimize the process over time.”

Gordeyko says the pilot plant began generating power in November, 2004 and is operating successfully.

“We helped to take the electrical interconnection portion of the project from concept right into where we actually built it, tested it, and commissioned it,” says Gordeyko.

“Probably the most interesting aspect to these smaller interconnections is dealing with the regulators and the political side of it all. The deregulation rules are still evolving.”

Major discussions typically occur between the new power producer, regulators, and the existing power companies servicing the area. Regulators must ensure that the new power producer does not negatively impact on power service being provided to customers of the existing utilities.

Power deregulation has made it possible to sell alternative streams of power generation to the provincial grid. Gordeyko and Kulchisky find themselves in demand, thanks to their knowledge of high-voltage power generation.

Both men were recruited straight out of university by well-known high-voltage power generators who were looking for people with a demonstrated ability to learn. And both say their U of A degrees left no doubt in the minds of recruiters.

Kulchisky spent more than three decades at TransAlta Utilities before joining High Time Industries three years ago. Gordeyko has had a much more varied career path. It includes stints with Ontario Hydro, 18 years with TransAlta Utilities, and three years working for the Nigerian Power Authority, training its engineers to operate the country’s high voltage power system.

“Our challenge is to try to come up with terms and conditions that a lot of people who aren’t involved in the high voltage industry can relate to,” Gordeyko says. “How do they assess the risks and make decisions when they don’t understand the business? The key challenge we have is to educate—to put the technical aspects in terms they can understand.”

“It’s something that people aren’t used to, yet they have a strong desire to interconnect power they are generating into the utility,” adds Kulchisky. “It can be challenging to them as well as for us.”



The IMUS project in Vegreville, Alberta.

Because of all the innovative ways people are finding to generate power, Gordeyko and Kulchisky have found themselves working with a much larger client base. They enjoy the challenge—even if they have to hold their noses on some projects.



Tony Kryzanowski is a St. Albert-based freelance journalist and ASTech Award winner.

2005 Engineering Perspectives Calendar


Thanks for your contributions to the 2005 Engineering Perspectives Calendar. Feedback has been very positive and donations raised to date exceed last year’s total. This will greatly assist the Engineering Students’ Society.

Interested in participating in the 2006 calendar?
Contact Sherrell.Steele@ualberta.ca for further information.





(left to right) Steve (Civil '79),
Al (Civil '77), Glenn (Electrical '76) Stowkowy.



They were born in the same hospital, raised in the same house, attended the same schools, and played on the same teams. In the late '70s, the Stowkowy brothers from the Dovercourt area of Edmonton all graduated in engineering from the University of Alberta. Born within two and a half years of each other, these competitive siblings were referred to by their father as the GAS (Glenn, Allen, Steve) house gang. They were born with a competitive edge, which still lingers now; just ask each one who is the better golfer.

ENGINEER X3

Some might assume that they all went into the profession because their father was an engineer. However, although Steve insists, “Dad would have been the best engineer,” the three brothers embarked on their journeys individually. Here, in no particular order of age, success or superiority on the golf course, are their stories.

BY MURRAY DONALDSON

GLENN STOWKOWY Electrical '76



Principal with the firm and buildings practice leader for Alberta North, Stantec Consulting Ltd.

As the oldest brother, Glenn was the first to make his way through the U of A. He says that all three brothers had always intended to go to university in their home town, but the faculty of choice was by no means predetermined. Glenn chose to go into engineering because of his interest and ability in math and sciences, particularly physics. He found the U of A to be a great fit.

"I really enjoyed it. From an educational point of view it was the most exciting period of my life. It was more diverse academically and socially than anything else I had known."

The summer after his first year, Glenn worked as a draftsperson for Allsopp Morgan Engineering—at the time, the largest electrical

tions (no computers back then!). That, says Glenn, was a very exciting time. During what was a mini Alberta boom, he assisted on dozens of downtown office buildings and such prominent projects as Edmonton City Centre and Commonwealth Stadium.

Currently, Glenn oversees the electrical, mechanical, structural, and performance engineering groups in northern Alberta for Stantec. Essentially, he has been with the same company since he graduated from U of A in 1976. Allsopp Morgan Engineering became Morgan Dowhan Engineering, and Morgan Dowhan was acquired by Stantec Consulting in April 1996.

And he has never really left the city that gave him so much early on in life. Despite a very short stint in Calgary in the late 70s when the company opened an office there, Glenn has stayed in Edmonton. Over the 30 years he has been working, he was the electrical consultant for the Royal Alexandra Hospital Redevelopment, Red Deer Regional Hospital Redevelopment, and the recent Edmonton International Airport Redevelopment.

As well, he has been able to continue his association with the U of A and the Faculty of Engineering. Glenn was the principal electrical engineer on the Electrical & Computer Engineering Research Facility and the Engineering Teaching & Learning Complex.

"It is a proud association to be giving back to the Engineering department and helping to develop it further."

He was also involved in a new trend in engineering design, as a member of the consulting team for the National Research Council's new National Institute for Nanotechnology on the U of A campus. The facility had to fit within peculiar electrical design constraints and stringent structural and mechanical specifications.

"There's still lots of opportunity in this field, maybe even more than when I graduated. And it's more exciting and much more diverse now, not just in the construction industry but in all facets of the electrical engineering discipline."

Like quite a few of his classmates, Glenn married a nurse, Donna. Their son, Kyle is in his fourth year at the U of A, aspiring to get into Law.

"Being an Arts student in a family full of engineers has subjected Kyle to some family

get-together humour that only engineers would find funny," noted Glenn.

When Glenn relayed these humorous situations to the Dean, Dr. Lynch suggested that engineers should be subjected to more sensitivity trainings in their classroom years.

AL STOWKOWY Civil '77



President and chief operating officer, Stuart Olson Construction.

Al, the middle child, went with his feelings on engineering.

"It was where my heart felt right, and I was inclined to choose construction. As a kid I always found myself building or fixing things" he says.

His older brother was already in electrical and enjoying the challenge, but Al decided not to follow him. He chose Civil, and never looked back.

"It was superb. The best time of my life, absolutely."

Al met his wife at the U of A. She was performing on the engineering kick line at the end of her fourth year, despite being a commerce student.

"She chased me shamelessly," is his memory of events.

After enjoying the university life, Al worked as a project manager for eight years with Alta West Construction. His first

"From an educational point of view it was the most exciting period of my life."

consulting firm in Western Canada. He enjoyed the electrical aspects of the work and decided to pursue electrical engineering through university. After working three more summers as a draftsperson, the same company hired Glenn as an engineer-in-training. Under the supervision of John Morgan, he performed hundreds of manual lighting calculations and panelboard feeder sizing calcula-

STEVE STOWKOWY

Civil '79

assignment out of university was on a construction site in Fort McMurray, an addition to the hospital.

“Here I am an engineering graduate, relegated to a construction site,” he thought at the time.

In retrospect, it turned out to be the best learning experience he ever had. It allowed him to take the technical things he learned at school and apply them to the practical side of the industry. Soon, though, he felt his career opportunities at Alta West had been capped.

So in 1985, Al joined Stuart Olson Construction as a project manager. With Stuart Olson, Al has managed to do the most cross-country transfers of the brothers. In 1988 he helped set up the company’s new Vancouver office, and he became VP operations of the West Coast branch the following year. He transferred back to Calgary in 1991 for family reasons: his own family and his wife’s family were all close by

Al progressed through Stuart Olson, and in 2002 was appointed president and COO. Now that he oversees the entire company, a lot of people look to him for guidance and leadership. The only downside is that he doesn’t get as much contact with the actual construction as he used to.

He also has to do a lot of travelling among the three offices in Edmonton, Calgary, and Vancouver. Going to Edmonton is made easier by the fact that his two children, Brett and Ashley, are there. They both attend U of A and are both in engineering. Ashley is a third-year mechanical engineering student and Brett is also in mechanical, one year behind his sister.

Al has managed to maintain a connection to his alma mater through work. He has been involved with projects on campus, in particular the Centennial Centre for Interdisciplinary Science (a two-storey sub-surface facility nestled in the courtyard of the Biological Science building and extending towards the Physics building) and the Agrifood project (a south campus building for food processing sciences).

His strong bond with his brothers perhaps influences his attitude towards the family/work relationship. He always tells employees that family is more important than the job, and should always come first.



Regional vice president, UMA Engineering Ltd.

Although the youngest and third brother to venture into engineering, Steve insists it was very much his own decision to go down a similar road as his brothers.

A “much younger” two-and-a-half years behind Glenn, Steve was eager to get a job and get on with life. As far as he saw it, his choices along with engineering were law, medicine, and accounting. Like his brothers, he was already interested in math and sciences and had seen his brothers enjoy what they were doing.

“It made a lot of sense,” he says. “The books were cheaper.”

Steve describes himself as the kind of guy who, once he gets involved, stays focused and gets the results he needs. But despite a successful career in engineering, and with an MBA under his belt as well, he says by the time he is 60 he hopes to know what he wants to be when he grows up.

After his first year at the U of A, Steve made the decision to go into Civil based on a little feedback from his brothers.

“They were certainly there if I needed them.” During summers he worked for a consulting engineering firm as a field inspector. That was back when a summer job could pay for tuition and books for the upcoming year.

Then, as now, the U of A had some world-class Engineering professors.

“That’s the kind of thing you probably don’t appreciate as much then as you do now.”

Since graduating in ’79, Steve has worked with UMA. When he came out of school he had four job offers waiting. He chose UMA because it was the largest and most stable of

the companies. It would also allow him to work on projects in Edmonton, the home town of his wife Bonnie, also a U of A engineering grad (Civil ’80).

“She asked to borrow my notes, but she didn’t really need them. I should have figured something was up,” Steve says.

Initially Steve worked in land development as a resident engineer in the Lessard area of Edmonton. He found, though, that in the winter there was not much to do. He was given the opportunity to work in transportation at UMA and became proficient as a transportation designer. Although his team leader wanted to keep him around, he had it in mind that he didn’t want to be a roadway engineer.

Steve began to pursue an MBA part-time in 1985. He eventually took a leave of absence for a few months to finish it, graduating in ’88. When he returned to work he found himself involved in more multi-discipline work. He was involved in facility projects in the Arctic and also worked on the Oldman River dam.

In 1994, Steve’s wife was transferred to Calgary with Enbridge. When he asked UMA for a transfer, the VP of UMA’s Calgary office was pleasantly surprised that he would go to Calgary, no strings attached.

“In terms of moving away from home, that’s about the easiest move to make,” says Steve, who still works out of the Calgary office and became regional vice president in 2000.

Steve has been proud to be a part of environmental projects, especially the DEW Line clean up in the Arctic. He manages that project, which UMA expects to work on until at least 2015.

The three brothers still spend as much time together as they can. The sports and games they played as kids have become golf games and family get-togethers.

Although work doesn’t come up much as a point of conversation (“We don’t get into it,” says Glenn) the brothers appreciate and recognize each other’s efforts and successes.

“There’s a sense of accomplishment and we are very proud of each other,” says Glenn. “They’re my best friends, too.”



Murray Donaldson is an Edmonton-based editor and freelance journalist.

FEEDBACK X3

What is the most challenging project you have worked on and why?

GLENN: The Royal Alexandra Hospital Redevelopment Project back in the late 1980s. We provided for a new high-voltage power distribution ring and an emergency generator power distribution ring for all the buildings on the entire hospital campus (the project also included a new \$100-Million Diagnostic Treatment Centre/Material Management Centre/Emergency Centre), all the while maintaining power services to one of Canada's busiest hospitals.

AL: \$67 million Red Deer Regional Hospital Expansion. This project had an extremely tight budget with an aggressive timeline. Compounding this was the fact that construction occurred within and adjacent to a fully operating hospital.

STEVE: The DEW Line clean up project for the Department of National Defence. I've been working on this project since it started in 1992—it's scheduled to be completed around 2015. It involves the environmental cleanup of 21 Distant Early Warning Sites along Canada's arctic coastline. In addition to the basic challenges imposed by any multi-million dollar project involving multiple stakeholders, some of the other significant challenges are the remote site locations, site access, transport costs, climate, short construction season, sensitive arctic ecosystem, permafrost conditions, labour supply, and wildlife, including polar bears.

What is the most rewarding project you have worked on and why?

GLENN: The University of Alberta—Electrical & Computer Engineering

Research Facility (ECERF) and the adjacent Engineering Teaching Learning Complex (ETLC). Partaking in group discussions with the Engineering Faculty (Dr. David Lynch and Phil Haswell) and with staff that was still there from 25 years ago (Dr. Capjack), and being part of the design team for such a prominent project was a personal satisfaction. The construction completion also coincided with our 25-year engineering class reunion, which made for a most gratifying and special weekend in 2001.

AL: Lamb Weston Potato Plant in Taber, Alberta. This \$60 million design build construction project was completed in a meagre nine months spanning the winter. The project commenced in early August 1998 on a remote green field site and was producing french fries in mid-April 1999. This hugely successful hyper-track project resulted in life-long friendships with many of the project stakeholders.

STEVE: Any of the projects that have a positive affect on people's lives are the most rewarding. As engineers, it's often easy to simply focus only on the technical aspects of a project. The most rewarding project for me is the DEW Line clean up project. The project team has made a sincere effort to involve aboriginals and northerners in all elements of the work, and they are very appreciative of this. Another rewarding aspect is the relationships I have been able to develop with project team members. It has been very satisfying to see the professional development of our team members as we grow up together on this project.

Who was your favourite engineering professor?

GLENN: Dr. Vermuelen, Dr. Capjack, and Dr. Tulip. At the time, they were all from a younger generation of professors that related very well to the class.

AL: Pat Boutillier. "Boots" was a fun-loving guy who had the great ability to mix good sound teaching while making it fun.

STEVE: There were many. As today, the Civil Engineering department at the U of A was well known for the reputation of its professors. We had the privilege of being instructed by many world-class professionals: Morgenstern, Kulak, MacGregor, Longworth, Murray, Wawaruk, Verschern, Eisenstein, Teply, Thompson, and the Hrudeys are a few that always come to mind. My favourite was probably the late Larry Gerard—he specialized in hydraulics and ice flows. He had a lot of energy and time for his students, and his exams and assignments were very challenging.

What is your favourite golf accessory?

GLENN: My son Kyle—not really a golf accessory, but some days he must feel like one when playing with me. We probably play 30-40 games a year together, and have for the last 12 years. We have a chance to share some quality time together, with one of the pastimes I really enjoy. I have most enjoyed watching his game improve from giving him four-shots for 18 holes, to taking four-shots—and seldom now do I win.

AL: My nine iron—it is the club that I use most frequently on approach shots to the green and has been one of few consistent performers in my bag.

STEVE: My putter. I've had it since I was about 15 years of age. It's the simplest of blade putters, and it has sunk a lot of putts over the years.



the Engineering solarium



Dr. Lynch delivers welcoming remarks on the official opening of the solarium.

Margo Miller

It's a sunroom, meeting place, and traffic hub. The Engineering Solarium is now officially opened in the Faculty of Engineering. Located south and east on the second floor of the Engineering Teaching and Learning Complex, this exciting new space for students, staff, and alumni accommodates 350 casual seating and study places and plenty of room for special events.

Connected to all other Engineering buildings (and the soon-to-be completed National Institute for Nanotechnology) by pedway link, the space is already beginning to attract considerable traffic and student interest. The design has high windows facing south, which will provide natural light year-round. A sound system, projection screens, removable seating,

and removable partition wall also make the patio flexible enough for student functions such as the graduate pancake breakfast. The space is evenly divided into casual seating and quiet study space.

With a two-metre diameter Engineering gear as the focal point and gears on all the round tables, this has already proven to be a valuable spot for media conferences, donor announcements, and alumni receptions.

Future plans include the redevelopment of the food service area for a commercial tenant.

The main engineering challenge was scheduling construction around class and exam schedules. Congratulations to the construction teams for completing this important addition to the Engineering family of buildings.

Solarium Construction Facts:

- Tables and chairs to accommodate 350
- Sliding glass partition allows approximately 200 seats to be in a separate quiet area
- Area 632 square metres (6,800 square feet)
- Glass curtain wall on east and south sides
- Accessible to shipping and receiving for delivery of food and beverage services

Solarium Technical Facts:

- Wireless Internet and power receptacles for laptops
- Pan-tilt-zoom video camera with remote operating capability
- Wireless microphone and omnidirectional sound reinforcement
- Two projection screens providing good sight lines from all areas of the room
- Conduit and cable trays accommodate high/speed/real time connection, able to download complex imagery such as CAD
- Portable podium contains all multimedia feeds and external links including local and national digital network feeds and wired and wireless network connections
- Broadcast feed for local and national news media



The first official event held in the Solarium, the announcement of \$10 million donation from Imperial Oil Limited.



Content provided by Phil Haswell, Director of Facilities for the Faculty of Engineering.

Manfred Fehr

Citizen of the W

*Here we meet Manfred Fehr
(MSc Chemical '69),
a professor in Brazil.
www.manfred.triang.net*



U of A Engineering alumni are making an impact across Canada and around the world. "Virtual Engineer" features on-line interviews with alumni working outside of Edmonton.



What has been your career path from graduation to now?

Maybe I should go just a little further back. I went to Edmonton in 1967 to study for a Master's degree. This implies some previous history. At the time, I had worked my way through high school in good old Germany, and through the Chemical Engineering undergraduate course at Laval University in Quebec City. Thus I had arrived at my third language of instruction.

Following the stay at the U of A, I joined the Canadian University Service Overseas (CUSO) to work as a teacher in South America. So away I went to Mexico for a crash course in Spanish. Those were good times. In early 1970 I found myself in Columbia teaching Chemical Engineering subjects at the Industrial University of Santander. I stayed there for three fabulous years and among other things met my wife. From then on, there were two of us against the world. My next assignment was to visit various universities in Peru on behalf of CUSO and place Canadian teachers there. We ended up in Venezuela in 1973 where I worked as visiting professor at the Central University in Caracas. Times continued to be good. It was about then that I had decided to stay on in the academe for good.

Consequently, I needed the PhD. So our next stop was back home in Quebec City in the graduate school at Laval. By the time we got there in early 1974, there were three of us. Our son was born on the move.

Right after defending my thesis in late 1977, we left for Algeria where I had found a job as teacher at the Engineering School of the Algerian Petroleum Institute. I might add that at that time there were four of us. Our daughter was born just before leaving Quebec City. So you can imagine cruising around in strange fields with two infants, but we were young and did not mind much. For various reasons we decided not to stay in Algeria longer than a year, and thus I started scouting for the next job. I found it in Brazil, of all places, and did not hesitate one minute. Suitcases were packed, some freight was shipped, and back on the plane we were. I studied Portuguese on the way over and was ready to teach shortly after arrival.

To make it short, Brazil turned out to be our home. I had never imagined. We liked it and are still here 25 years later. Times continue to be good. Of course all of us have been Brazilian citizens for a long time now. I am full professor at the Federal University in Uberlandia, and our children have both graduated and are independent. In fact, my pre-

ferred hobby nowadays is to play with my granddaughter. Over the years, my job has taken me to many more places on short-term assignments. Among others, I was in Sweden for a semester as post-doctoral fellow, in India for a month as consultant, back in Canada for a year on sabbatical leave, in Spain and in Britain for a month each on co-operative projects, and last but not least, attended conferences in China, Turkey, Chile, South Africa and Australia on various occasions.

What has been the most memorable/exciting/disappointing/challenging/rewarding aspect of your career thus far?

Let's start with memorable. I do not know whether you can appreciate the effort behind changing nationality twice and building up a new identity, both private and professional, each time. This experience I will always remember. First from Germany to Canada and later from Canada to Brazil, my life has been divided almost equally between the three.

Let's go on to exciting. The academic career is intrinsically exciting, as you have to be alert all the time to face young students. There is no time to relax. In my case, the additional factors of different languages and idio-



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syncrasies raise the level of excitement some more.

Disappointing? Yes, there is some disappointment. It has to do with outworn thinking models that are still present in the academic context and that apparently do not go away.

Challenging is the correct word to define the necessity to compete not only with younger colleagues, but also with international peers in terms of scientific output.

So we end up with the rewarding aspect. Upon looking back, I can say that my multinational career has been extremely rewarding in terms of personal satisfaction and as a modest contribution to a tolerant one-world community. I have called at 34 countries so far, on all continents, and never had the feeling of being abroad. I cherish the following idea from the teachings of the Dalai Lama: Live a good and honourable life so that when you get old and look back, you can enjoy it all over again. This is what I am doing now.

What are some of the unique engineering challenges in Brazil?

The engineering challenges are not really unique. They are the same as in all developing countries: transform raw material commodities into manufactured products before

exporting in order to improve the trade balance and the employment situation. With the advent of industrial globalization, this is perfectly feasible. Our industrial park is mature enough to do it. It is simply a matter of creating the right incentives—an administrative problem. Now I am dedicating my time to improvement of environmental management practices. Solid waste management, for example, ceased to be an engineering challenge a long time ago, and is now an educational challenge of major proportions.

What has been your proudest achievement, personally, professionally or socially?

There are a few items I am proud of professionally. I developed universal fuel equivalence tables, an environmental management matrix for a town, the divided waste processing model, and new academic thinking models. I also founded and presided over two local chapters of the Brazilian Chemical Engineers Association. Personally, I have been able to cope with the need to raise children practically on the run, and with the demands of constantly changing geographical work environments. I suppose that socially, all this experience may be encapsulated in the more than 50 citations in International Biographical Encyclopedias and in the

American Medal of Honour for a world citizenship adventure awarded to only 100 persons worldwide.

How did your education or experience at the Faculty of Engineering/University of Alberta equip you for your career path?

It equipped me well. In the early years of my teaching assignments, I drew heavily on the experience with pilot plant scale digital process control I acquired at the U of A. At the time this was original pioneering work.

What are your remaining connections/associations with the Faculty of Engineering/ University of Alberta?

None really, apart from the alumni magazine, which I read with joyful reminiscence.

What emotional/sentimental/intellectual/professional connections/associations still remain with the Faculty of Engineering/University of Alberta?

Today, after so many years, the connections are mainly sentimental. I feel proud of having studied at the U of A, and I also remember the marvellous times I spent in the Rockies, hiking in the summer and skiing in the winter. Those remembrances are eternal.

What fosters pride for you as an alumnus?

To see that the U of A has lived up to the challenges of modern times and ranks among the top institutions in North America.

What messages do you have for potential students, undergraduates, and young professionals just entering their fields?

I once coined the following statement for my students: As engineers, always remember that there are as many challenges outside as there are inside the battery limits of industrial facilities. Engineering expertise is taken for granted on the present job market. You need other credentials to make a difference. Carefully select and acquire those credentials. The World has become a village. Explore it. Inhale it. Enjoy it. Live it. Do not keep sitting around in your backyard.

Chemical Engineering

Lieberman, Ray (Chemical '57)

If you are a typical engineer, most of the courses you've taken at university or in subsequent continuing education, have been technical and job related. Now, if as a result of retirement or just good planning, you can spare three weeks, you can submerge yourself in the pursuit of liberal arts and humanities studies.

The Edmonton Lifelong Learners Association (ELLA), in association with the University of Alberta, is presenting their annual three-week Spring Program of 32 courses beginning on Monday, May 2nd, 2005 at the U of A.

Courses are offered in anthropology, art, art history, classics, drama, fitness, history, literature, music history, philosophy, political science, poetry, sociology, and writing. Lunch times offer a selection of guest speakers from our community. The only limit on the courses one may take is your own timetable. Classes are all presented in the daytime. There are no academic prerequisites, no exams, no pressure—just the sheer enjoyment of learning with new and old friends.

ELLA is a volunteer association of lovers of learning who plan, develop, and deliver the Spring Program. An annual membership fee allows a person to enrol in the courses offered. Currently the membership fee is \$20.00 and the tuition fee for the whole program is \$185.00. If you are interested, please call (780) 492-5055 for more information.

Civil Engineering

Adam, George (Civil '49)

A strong contingent of civil engineers from the graduating class of '49 was present at Reunion 2004 in Edmonton on September 30 to October 2, 2004. While 40 of our classmates, former professors, and spouses enjoyed a special class luncheon on October 1, many of this group participated in other activities organized by the Alumni Association during Reunion Weekend. The civil engineers who graduated 55 years

ago were mostly returning service veterans who registered in the fall of 1945 and the special additional class in January 1946. The graduating class of 1949 included 54 veterans and six students direct from high school.

With a strong contingent of '49 Civils employed in Alberta, this group organized a 15-year reunion in 1964 at the original 400 Club in Calgary. We were successful at the time in tracking down addresses for all 60 classmates and have kept information up to date for the past 40 years. A total of 12 additional reunions have been held across Western Canada as follows: 20 years, Banff; 25 years, Edmonton; 30 years, Calgary; 34 years, Saanichon; 37 years, Sidney; 40 years, Edmonton; 42 years, Sidney; 45 years, Kananaskis; 47 years, Sidney; 48.5 years, Kelowna; 50 years, Edmonton; and 52 years, Sidney.



This group has joined with homecoming weekend activities in Edmonton at the 25, 50, and 55 years and also enjoyed the Sidney area and coastal cruises on the "SS Breeze" on four different occasions.

Attendance at our reunion has always been great; however, with the passage of time, we have lost 27 of our classmates and a number of others find that failing health makes it difficult to travel to these gatherings. With this in mind, an attendance of 20 classmates at Reunion 2004 was indicative of a continued interest in getting together.

While our class bursary fund is growing slowly, we look forward to continued support from the Civil '49 class in the year ahead. We extend a big thank-you to the alumni affairs officers and our class representative Dave Usher (Civil '49), as well as his support team for organizing the great events, which we enjoyed in Edmonton in '04.

Kinch, Jason (Civil '98)

Just a quick note to update you on what has been going on in my life. I got married on April 30, 2004 and went on a cruise in the Mediterranean for my honeymoon. Upon our return to Canada, my wife Kimberly and I both started new jobs in Squamish, B.C. Kim is working as a dental assistant and I am employed with the District of Squamish, busy preparing for the 2010 Olympics. And to top it all off, I received my P.Eng. designation at the beginning of the summer!

Engineering Physics

Syed, Wasif (Engineering Physics '03)

I am now studying in a PhD program in applied physics at Cornell University, New York, in the United States.

Mechanical Engineering

Fakinlede, Omotayo A. Dr. (PhD Mechanical '85)

I have been receiving the Engineering Alumni magazine for several years now. I am now director, energy information systems at the Energy Commission of Nigeria. I want to thank you for the quality of the magazine and the way it connects me to the great time of opportunity to learn that U of A represents. Please continue the good work.

Metallurgical Engineering

Morrison, Darel (Metallurgical '68)

I recall fondly my days at U of A, but doubt I would recognize much, if anything, of the campus from the maps in the last alumni publication. Although it's been 36 years since graduation, it does not feel that long and it's nice to jog one's memory to old school times and friends. Still am not sure how I was coerced into accept the engineering president's job of 1967/68 but in the end it was fun. Since 1973, have worked totally overseas in the oil and gas industry in such out-of-the-way places as Libya (Sahara desert), Indonesia (Irian Jaya jungle), Egypt (Red Sea), Peru (costal

desert), Abu Dhabi (sand, sea, desert), Ecuador (rain forest), Russia (frozen Western Siberia), Oman (desert), and presently Egypt (coastal desert). I live in Cairo with my Egyptian wife and two daughters, ages 12 and seven. I don't recommend a vagabond career to all but am still working at it, at least for a bit longer.

Santarossa, Robert (Bob) (Metallurgical '76)

Add another linkage name to the Dr. Ford people on the Canadarm and International Space Station. I obtained the contract, as the project manager, for the International Space Station Arm for FRE Composites Inc., a General Electric spin-off company (then located in St. André, Quebec). I wrote the bid proposal along with another engineer, Walter Feassler, who was educated at a Quebec University. We won handily against U.S. competitive bidders (including the then manufacturers of the Canadarm, handed off to them by General Dynamics, the initial builder of the Canadarm) and Canadian competition. By the way, the only thing Canadian on the Canadarm was Spar's electronics and the Canadian flag on the arm blanket; the physical arm itself was built in Pomona, California by General Dynamics.

I must admit, when they first installed it on the Space Station and it had problems, there

were a few tense moments on my side even though my part in the project was long over by then. Fortunately, it was a software problem (SPAR) not a hardware problem on the physical boom itself. Apparently they call it CANADARM2 nowadays (better than SSRMS, i.e., space station remote manipulator system, as it was originally called).

We kicked-off the project with Spar Aerospace and handed off the project to the then aerospace/defense FRE Composites engineering team.

A few years after graduating in 1976, I took a fracture mechanics course from Dr. Ford. It came in handy, especially when we had to specify the fracture mechanics testing for the Space Station arm. You don't want to know how they tested the Canadarm for this—it was very primitive.

I am a big fan of Dr. Ford's—he was an inspiration to me. Years ago, in the early 90s, I had to step in and teach the role of engineering in business and the economy for a mining engineering professor on sabbatical to fourth-year engineers and BCom students (perhaps for Dr. Patching?) and Dr. Ford, over two or three lectures, gave the history of engineering from his book. It was absolutely spellbinding. He was awesome.

Mining Engineering

Toutant, Anne Marie (Mining '87)

I moved to Fort McMurray, Alberta this past spring with my husband Chris (BA '88, BEd '90 and Golden Bear basketball '84-'88) and our two daughters. I am now vice president, mining with Suncor Energy Incorporated.

Petroleum Engineering

McKale, Rene (Petroleum '99)

My wife Lacy and I (married December 2003) have moved from Houston, Texas to Dubai in the United Arab Emirates as of August 1, 2004. I have taken a position with the national oil company here (Dubai Petroleum Co.), and we are settling in nicely. Although it's been a little warm, it's starting to cool down . . . getting into the high 20s at night. I am also playing hockey here for the Dubai Mighty Camels ...it's true! Would be nice to hear from fellow U of A grads I know. E-mail me at rsmckale@hotmail.com.

Keep in Touch

engineer.alum@ualberta.ca



Graduate's Name _____

Year of Graduation and Degree _____

Do you have a new address?

Home Address _____

Business Address _____

Organization _____

Title _____

Street _____

City _____ Province _____

Postal Code _____ Telephone _____

Fax _____

Preferred E-mail _____

What's New with You?

(Comments for possible publication in a future magazine.)

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Extraord INV



When Harry Stevinson (Electrical '44) took a scenic flight as a teenager with pioneering bush pilot and barnstormer Sheldon Luck, little did he know that the seeds for a life-saving invention had been sown.

BY WANDA VIVEQUIN

Circling the prairies near Bashaw, Alberta that day, young Harry wondered what would happen if the plane went down in a remote area. How would people know where to look? He mused that a bird sitting on the plane would fly away at the earliest indications of trouble, and would survive the crash.

Years later, Stevinson put that flash of insight to work in a National Research Council (NRC) project spanning the 1950s

inary ENTOR



(left to right)
Art Stevinson (Harry's brother),
Warren Dahl, and Hubert
Cartwright with Harry Stevinson's
custom car in 1934.

and 1960s. The result, called the Crash Position Indicator (CPI), helped to save lives not just in remote parts of Canada but all over the world. Even the U.S.A.'s Air Force One came equipped with one during the 1960s.

Stevinson, who has lived in Ottawa since 1953, is among the "who's who" of Canadian inventors. His brilliant inventions, many of them tested at the home laboratory in his basement, sometimes left his colleagues at the NRC scratching their heads.



The crash position indicator being inserted into the holder on the tail of an airplane (circa 1960).

The CPI, however, made his name as an inventor. This specially shaped airfoil, containing a radio that generates a distress signal, automatically jettisons from a crashing plane and flutters gently to the ground.

Because the CPI was developed in the days before transistors, its design had to protect the fragile vacuum tube circuitry from the shock and fire of a plane crash. It also had to be able to float on water, and to protect the radio from cold temperatures. When jettisoned, it had to miss the tail of the airplane and fly far enough to avoid being destroyed in the crash, yet it also had to land near the crash site in order to aid search and rescue crews. Each airfoil had to be specially shaped and balanced to match the speed and design of the aircraft.

Stevinson was born 1915, in the now-abandoned town of Passberg, near the Frank Slide, on the British Columbia-Alberta border. His father was a church minister and his mother was a journalist. His father's postings took the family over vast parts of B.C. and the prairies. The family moved 17 times before Harry left home at the age of 19. His parents settled in Bashaw, Alberta for several years, and when they decided to move yet again the teenaged Harry decided to stay on his own.

Stevinson's inventing career got off to an early start. Right after completing high school, he built a custom car out of pieces of old Model Ts that he found behind the barns and in the fields. By putting a Chevrolet transmission backwards, behind the original

Model T transmission, he was able to get seven speeds forward and five reverse. Harry made an aerodynamic wooden frame over the old Model T's running gear and fitted a steel skin over that. The resulting overdrive gear ratio and aerodynamic shape resulted in a 23-horsepower car that could travel up to 70 miles per hour with the engine revving at not much more than idle speed. The whole car cost only \$23 to build, and attracted swarms of curious onlookers whenever he parked it in a new town.

With only 23 horsepower, the car took a while to get up to speed. At the time, there were only 10 miles of paved road in Alberta, and Stevinson got tired of losing speed every time he came up behind slower traffic. His solution was to install a large truck horn to clear the way. Because the rear seat faced backwards, Harry's passengers could easily enjoy the startled looks on the faces of the drivers as they were passed by this speedy, strange-looking contraption.

After high school, Stevinson earned 15 cents an hour working as a mechanic at the local garage. Three years later he opened a general repair business with his friend, Al Hurt. During the depression, the business grew to include radio, lock, gun, and bicycle repair, and eventually took over the building next door to allow tractor sales and repair. Later in life, Harry would often laugh as he recalled taking a particular old horse as a trade-in for a tractor. Try as they might, Harry and Al never managed to unload the



Harry Stevinson and his dad with the completed custom car.

horse, since any farmer could tell at a glance that the poor creature had no work left in it.

In 1939, Stevinson enrolled in Electrical Engineering at the U of A. Between classes, he taught basic electrical circuit theory to Navy cadets. He was drafted to fight in World War Two, but a professor wrote explaining that Stevinson would better serve the war effort by completing his schooling as an engineer.

On campus, Stevinson was prone to episodes of exceptional tomfoolery. A 1940 yearbook picture shows him spewing gasoline from his mouth, over a lit match, producing a flame over five feet long. Other tales have him parading around the snow-free university campus on skis, and clacking down lecture theatre stairs during classes.

He joined the navy upon graduation, in 1944, and was posted to National Headquarters in Ottawa. There, he helped solve electrical and mechanical problems with the Navy's shipborne radios and other equipment.

In 1945 he joined the NRC in what later became the aeronautical division, and quickly put his remarkable imagination and problem-solving skills to good use. His colleague and friend Jack Templin says the NRC was perfect for someone like Stevinson.

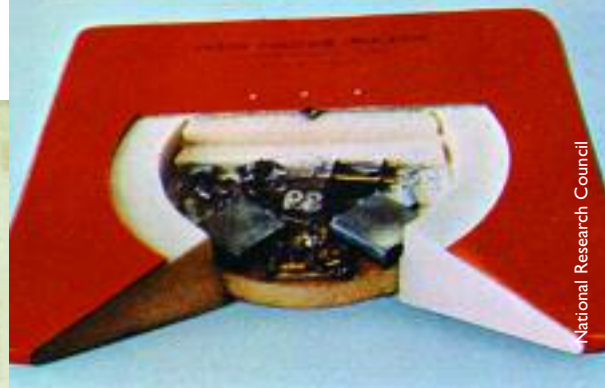
"The place was pretty free and easy, and Harry was just like a big kid."

Finally, in the late 1950s and through the 1960s, Stevinson was able to put his teen flash of inspiration to the test. The NRC invited him to develop the CPI and pledged to support his work on every aspect of its development.

Despite the considerable resources at Stevinson's disposal at the NRC, Templin says, he always tried to make his experiments "easy on the taxpayer." To test the parachute and airfoil dynamics, Stevinson dropped his prototypes from balconies, rooftops, out of

airplanes, and even launched them from giant catapults. Templin also recalls one time when Stevinson fired a rocket from the cliff of an unused gravel pit, to test the CPI's design under more lifelike conditions.

After many years of fine-tuning, the CPI was ready for use on subsonic aircraft. Early crashes of bush planes proved that the CPI could preserve the radio on land or water



The crash position indicator, an early design.



Stevinson at work at NRC on one of his many inventions.

and transmit a strong distress signal for several days.

The CPI was first commercially produced in Carleton Place (near Ottawa) by Leigh Instruments. At the NRC, Stevinson eventually designed successful supersonic CPIs that Leigh Instruments then produced. Over the years the CPI generated over \$100 million in sales for the company. The U.S. Air Force credited the device for saving many lives in the Vietnam War and elsewhere. Stevinson was always humble about his achievements, and pleased to receive letters of thanks after a rescue.

HARRY STEVINSON,

WHO HAS LIVED IN OTTAWA SINCE 1953, IS AMONG
THE "WHO'S WHO" OF CANADIAN INVENTORS.

Templin marvels over Stevinson's ability to visualize creative solutions where others have given up. In one top-secret assignment, the NRC team was trying to come up with a way to drop an object from a low, fast-flying aircraft onto a small target zone. Stevinson stunned a boardroom full of colleagues saying he could design a parachute that could open, close, and reopen again. When some of them

Update on



told him it was impossible, Harry made a small working model using a handkerchief, string, and staples.

The result was the repeating parachute. As soon as the payload is released from the plane, the chute opens to stop the forward momentum. Stevinson designed the canopy to spin when open, thereby twisting the shroud lines and forcing the chute to collapse. This allowed the payload to freefall for a designed length of time, thereby keeping it from drifting with the wind. Meanwhile, the shroud lines transferred the twisting momentum to the payload. Once the chute had collapsed, the payload continued to spin, eventually untwisting the lines and allowing the canopy to open a second time—just soon enough to slow the payload's descent before landing. Templin accompanied Stevinson for the initial drop test, and everyone was amazed when the payload hit the target on the first attempt (it took a while to achieve consistent results). Templin believes the military eventually used the design, though the exact details of the project were classified.

After leaving the NRC, in 1979, Stevinson spent a decade working as a consultant for Leigh Industries. The last five of those years were voluntary, because he could not be bothered to file timesheets.

Sadly, Stevinson now suffers from Alzheimer's disease—a cruel blow for a sharp and active mind like his—and has recently been admitted into special care. The family takes comfort in the lasting and beneficial effect of his many achievements.



Wanda Vivequin is an Edmonton-based freelance journalist and frequent traveler to Nepal.

The Faculty of Engineering is proud to be part of the University of Alberta's fundraising campaign. "Campaign 2008—Celebrate One Century—Build the Next" is the official theme. Engineering alumni play a leadership role in this important campus initiative. In addition to campaign co-chairs **Tim Hearn**, chair, president and CEO, Imperial Oil Limited, **Nizar Somji** (MEng Chemical '85), president and CEO, Matrikon, and **Jim Stanford** (Petroleum '60, LLD [Hon] '00), president, Stanford Resource Management, a number of honorary patrons have been recruited to help the campaign. These patrons act as informed advocates for the campaign and role models of philanthropy.

"It's no surprise that Engineering graduates number 11 of the 19 on the University's patrons list," says Dr. David Lynch, Dean of Engineering. "Our alumni are leaders in the profession and the community. They get things done. Who better to assume this important role?"

To date, more than 65 percent of the campaign goal has been achieved. Check the Faculty of Engineering web site for further information and updates on Campaign 2008.

The international team includes:

John Poole (Civil '37, LLD [Hon] '87) and **Barbara Poole**, Edmonton

James F. Hole (Civil '50), Edmonton

Harry Hole (Civil '44) and **Muriel Hole**, Edmonton

Allan Markin (Chemical '68, LLD [Hon] '02), Calgary

John Hokanson (Civil '72) and Susan Hokanson, Edmonton

Gerry Maier (Petroleum '51, LLD [Hon] '99), Calgary

Chuck Hantho (Chemical '53) and **Phyllis Hantho**, Toronto

Charles Chan (Civil '79, LLD [Hon] '97) and **Macy Chan**, Hong Kong

Craighton Twa (Electrical '59) and **Irene Twa**, Calgary

Rohit Sharma (MSc Electrical '91, PhD Electrical '96), California

Stewart Davis (Chemistry '40), Edmonton

Errors and omissions

There was an error on page 28 of the fall 2004 issue. It was incorrectly stated that Virginia Webb was the first female graduate of the Faculty. E. Virginia Webb (Civil '48) wrote to let us know that she was the first female graduate of Civil. The earliest female graduate was Esther Rabkin (Electrical '35).

Fred Parkinson (Civil '56) noted an error of date on page 31 in the fall 2004 magazine.

Parkinson says, "Where Ms. Collins claims that Pearl Harbor was bombed on December 8, 1941, any history books that I have seen put the ignominious day on December 7, and I have just checked on the modern oracle of exactitude, Google, and they too place that event on December 7."

On page 33 of the fall 2004 issue, the map incorrectly indicates Nunavut instead of the Northwest Territories. Thanks to John H. Parker, O.C., (Chemical '51) and Dr. Garry

Hollingshead (Civil '60, MEng Civil '65) for lessons in geography.

There were errors in the kudos on page 42 of the fall magazine. Steve Stowkowy (Civil '79) is in the UMA Calgary office (not Edmonton) and is regional vice president, Calgary, and Brian Ross (Civil '78) is with AMEC Earth and Environmental (not AMEC Infrastructure). Thanks to Sharon Moroskat, Executive Assistant, Consulting Engineers of Alberta for these corrections.

Reunion WEE



by Katherine Irwin
and Leanne Nickel

Reunion Weekend 2004 was a whirl of tours and openings, meetings, receptions, dinners and lunches, brunches too, and our annual open house. Alumni, students and their parents, friends of the Faculty, government representatives, and staff came together for a very busy weekend to celebrate, reconnect, and discover the changing face of Engineering at the U of A.

On Friday, October 1, alumni and their guests gathered to kick off Reunion Weekend with the annual Dean's Reception. Guests enjoyed the opportunity to reconnect with classmates, to meet professors and colleagues, and to remember their days on campus. More than 300 reception guests shared laughs and memories.

Immediately following the Dean's Reception were the grand opening ceremonies for the Allan P. Markin/Canadian Natural Resources Limited Natural Resources Engineering Facility (NREF), the new home of the Department of Civil and Environmental Engineering. Dr David Lynch, Dean of Engineering, Dr. Rod Fraser, U of A President, Maria David-Evans, Deputy Minister, Alberta

Learning, and alumni Dr. Allan Markin, Harry Hole and Jim Hole welcomed more than 1,150 alumni and guests to the celebrations. Following the speaking program and ribbon cutting, tours of the new facility were available to alumni. Comments such as "marvelous space," "wow," and "how things have changed since I studied here!" were heard throughout the building.

On Saturday, October 2, Dr. Lynch welcomed alumni who finished their studies in 1954 or earlier to a special brunch. More than 120 alumni and their guests enjoyed a hot brunch, and listened to Dr. Lynch talk about the future of engineering at the U of A and the key role our alumni have played in shaping what is now one of North America's most respected engineering faculties.

Following the brunch, alumni enjoyed Engineering Open House, which included tours of all Engineering buildings, displays from many student groups, and opportunities to learn more about the facilities and research being undertaken. A series of lectures provided information on topics ranging from thermodynamic calculations to self-cleaning



Peter Nettleton (Civil '53)

"Reunion 2004 was, as expected, a masterpiece of organization, generous donors, excellent talks by the Dean and others, and spectacular new buildings. Your hospitality made sure there was good conversation between professors and graduates of various years."

windows, from NREF design features to building better fishways. Adults and children alike enjoyed the hands-on demonstrations.

Reunion 2004 was an unqualified success and we are looking forward to Reunion 2005.



Alvin Nelson (Electrical '39) (Back row, far right.)

"From all reports our small group of 1939 graduates enjoyed the event very much. One of my classmates I had not seen for over 50 years. The other four were present at our 60th reunion. On Saturday afternoon I walked around the campus to see if I could find some old landmarks. I also enjoyed meeting with students and staff during this walk and learning a bit about what has taken place over the past 65 years."

KEND 2004

REUNION 2005

September 29
to October 2

If you graduated in a year that ends in a “5” or a “0”, then 2005 is a special reunion year for you. Plan to attend Reunion 2005 on the University of Alberta campus during one of the most colourful times of the year. It’s also a special year for the province as we mark Alberta’s 100th birthday in 2005. A cause for celebration all around!

Reunion 2005 brochures will be mailed out in early June to alumni celebrating special reunions this year. While these invitations will go out to alumni who graduated in years ending in a “5” or “0,” all U of A alumni are welcome to attend Reunion 2005 activities.

Watch for more information on Reunion 2005 at www.engineering.ualberta.ca/alumni or in the Summer 2005 issue of *U of A Engineer*.

Were you a year late and a course short?

Were you supposed to graduate in a year ending in a “5” or a “0”, but ended up graduating a year later because you were a course or two short? Make sure you receive information about Reunion 2005 so you don’t miss out on celebrating your reunion with the classmates you knew best during your university days. Contact the Faculty of Engineering’s External Relations Office at engineer.alum@ualberta.ca or (780) 492-7050. We’ll help you connect with your “real” graduating class.

Class organizers needed!

Volunteers are needed to help connect with old classmates and organize activities for Reunion 2005. If you’re celebrating a special reunion year in 2005 and would like to make sure your class gets together to celebrate, we could use your help!

Class organizers play a vital role in tracking down long-lost classmates and in arrang-

ing special class activities. The External Relations Office of the Faculty of Engineering can assist you by providing last-known contact information for your classmates and drafting and mailing out letters to them. The Faculty also hosts several events during Reunion Weekend that provide great opportunities for everyone to get together. Let us help you ensure your reunion is a memorable one.

Interested? Contact Leanne Nickel in Edmonton at (780) 492-4159 or Laurie Shinkaruk in Calgary at (403) 531-5873 and we can get you started.

Upcoming Alumni Events

The Faculty of Engineering is pleased to host the following events for Engineering alumni:

Thursday, March 17

Edmonton Regional Alumni & Friends Reception for Mechanical Engineers

Tuesday, April 26

Fort McMurray Regional Alumni & Friends Reception

Tuesday, May 17

Calgary Regional Alumni & Friends Reception

Thursday, May 26

Edmonton Regional Alumni & Friends Reception for Civil, Environmental, Mining, and Petroleum Engineers

Friday, June 10

Convocation Pancake Breakfast for New Engineering Alumni

For more information on any of these events, visit www.engineering.ualberta.ca/alumni or contact the Faculty of Engineering’s External Relations Office at (780) 492-7050.

in memoriam

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

Bailey, Robert L. (Petroleum '53)
Becker, Donald F. (Chemical '33)
Brown, Gordon E. (Civil '48)
Browning, Charles E. (Electrical '50)
Chernuka, Dr. Michael W. (Mechanical '69)
Cowling, Norman (Civil '63)
Davis, Arthur P. (Engineering Physics '41)
De Vos, Bernhard J. (MEng Civil '68)
Donald, G. Rae (Civil '60)
Henry, Keith (Civil '48)
Johnstone, Kenneth C. (Mining '50)
Kinna, Ronald (Electrical '70)
Lesk, I. Arnold (Engineering Physics '48)
Madill, Joseph T. (Electrical '39)
Manyluk, Alexander F. (Mining '45)
Martin, William D. (Civil '44)
McNeill Donald L. (Mining '49)
Nicoll, Duncan J. (Petroleum '76)
Nyberg, Carl B. (Civil '47)
Peters, Wayne J. (Chemical '01)
Santiago, Jaime (PhD Electrical '78)
Schulte, Ted M. (Civil '40)
Shannon, Harold C. (Civil '47)
Skoworodko, Kenneth A. (Mechanical '73)
Thompson, Harland A. (Electrical '36)
Trotter, Fred J. (Mechanical '64, MEng Mechanical '67)
Wilson, Thomas E. (Mining '49)

for the record (missed memoriams)

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

Danchuk, Earl M. (Civil '45)
Guild, Donald E. (Mining '57)
Hagen, Arno W. (Civil '56)
Neeland, Donald W. (Mining '51)
Parham, Kenneth R. (Civil '59)
Thompson, Lorne R. (Civil '58)

BANNER, ROSS

(Metallurgy '68, Mining '71) PEng has been appointed chief engineer to head up the project team for Farallon Resources Limited. Mr. Banner has rejoined Farallon after a distinguished career in project management and development. Banner worked in engineering and senior supervisory positions at several Canadian mines such as Tundra Gold, Bull River Mine, Granisle Copper, and Premier Gold. His experience also encompasses engineering and management for several large-scale British Columbia mine development projects including Bullmoose Coal, Quintette Coal, Crows Nest Resources, Premier Gold, and Mt. Milligan.

BRAWN, ROBERT **(Chemical '58) PEng**



has been appointed chair of the Van Horne Institute for International Transportation and Regulatory Affairs board of directors.

Mr. Brawn has held numerous senior positions during his career in the oil and gas industry. He is currently chair emeritus and director for Acclaim Energy Trust, a director of Alberta Treasury Branches, Parkland Industries Ltd., Forzani Group Ltd., the Calgary Airport Authority, Zapata Energy Corp., and chair and director of Grande Cache Coal Corporation. Brawn's many community service contributions include president of the Young Presidents' Organization (Alberta); president of the Independent Petroleum Association of Canada; president of the Calgary Chamber of Commerce; director of the Canadian Chamber of Commerce; director of the OCO '88; chair for the Calgary Winter Festival Foundation; and co-chair of the Calgary Economic Development Authority. Brawn serves as an honorary lieutenant colonel in the Canadian Army. He has also received several awards including the

Community Service Award from APEGGA and, from the Government of Canada, the Canadian Commemorative Award.

BROUWER, RICHARD **(Mechanical '82)**



has been appointed president of ATCO Pipelines. Mr. Brouwer joined ATCO as engineer, gas operations in 1982. Prior to his

involvement with ATCO Midstream, Brouwer worked at a number of progressively responsible technical, marketing, and operating positions with ATCO including senior engineer operations, supervising engineer marketing, manager storage, and general manager, integrated gas system. Prior to his appointment to president of ATCO Pipelines, Brouwer was president of ATCO Midstream for four years. Brouwer has been an integral part of the development of the "midstream" sector in Canada. He is a former board member and executive director and treasurer of the Canadian Gas Processors Association and is also a former director of the Small Explorers and Producers Association of Canada. Currently, Brouwer is a director of the Canadian Energy Pipeline Association.

CUMMING, KEVIN J. **(Civil '86) PEng**



has been appointed president, ATCO Midstream. Mr. Cummins joined ATCO in 1986 as facilities planning engineer with

Northwestern Utilities, now ATCO Gas. He was appointed vice president, gas gathering and processing, ATCO Midstream in 2001 and was named to his prior position as vice president, business development, ATCO Midstream in 2002.

EHRMAN, BRADLEY J. **(Petroleum '99) EIT**

has been appointed engineering manager for Dorchester Minerals, L.P. (Nasdaq: DMLP - News) in Dallas, Texas. Mr. Ehrman was previously employed by PanCanadian Energy and Schlumberger Limited at various locations in Texas and Canada.

GIRCZYC, DR. EMIL **(Electrical '79)**



has been appointed president and chief executive officer for Summit Design Inc., a world leader in electronic system-level (ESL) design

solutions and methodologies in Burlington, Massachusetts. Dr. Girczyc has over 20 years experience in EDA management. Most recently he served as the president and CEO of 0-In Design Automation, and led the company through the market adoption of assertion-based verification. Before joining 0-In, he was vice president of marketing at Cadabra Design Technology, now part of Synopsys. From 1989 to 1997, he held several management positions at Synopsys, where he led the research and development efforts for HDL Compiler and for several new products, including DesignWare, Behavioral Compiler, Cyclone, and most recently served as the vice president and general manager of simulation. Prior to Synopsys, Girczyc held positions as Audesyn, Inc., BNR (now Nortel), and taught computer and electrical engineering at the University of Alberta and Carleton University.

HOWARD, JOHN A. **(Chemical '68) PEng**

has been appointed to the board of directors of the trust's operating subsidiary of APF Energy Incorporated in Calgary. Mr. Howard has had a distinguished 35-year career in the oil and gas industry, and held senior leadership roles with Aberford

Resources (president and CEO, 1981-87), Novalta Resources and its successor, Seagull Energy Canada (president and CEO, 1987-97) and Sunoma Energy (president and CEO, 1999-2000) and Barrington Petroleum (president and CEO, 1999-2001). In addition, Howard served as a governor of the Canadian Association of Petroleum Producers (1995-97) and its predecessor, the Independent Petroleum Producers Association of Canada (1982-87) including as its chair (1986-87). He also served the Government of Canada as a member of the Energy Options Advisory Committee (1987-88). Howard has sat on the board of many corporations and is currently a member of the following boards of directors: Bear Creek Energy Ltd., Chariot Energy Inc., Eastshore Energy Ltd., Trifecta Resources Inc., and Westrock Energy Ltd.

KING, FRANK **(Chemical '58) PEng**



was appointed to the board of directors for CanWest Global Communications.

LUTLEY, HOWARD **(MSc Civil '81) PEng**



has been appointed vice president, mining and extraction with UTS Energy Corporation in Calgary.

PLECASH, ROSS **(Mechanical '88) PEng**



has been appointed chair of the Alberta Computers for Schools project. Mr. Plecash is director, corporate and member

affairs, for the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

POLICICCHIO, SETTIMIO
(Electrical '79) PEng



has been appointed vice president, engineering and construction, with ATCO Electric in Edmonton. Mr. Policicchio's group will provide support to both transmission and distribution in several key areas including engineering, project management, materials management, and metering. He will also take on responsibility for aboriginal strategy and regulatory support—essential functions that serve ATCO's wires business. His additional projects include mapping and isolated generation remediation. Policicchio joined ATCO Electric (formerly Alberta Power) in 1979 and has held a variety of positions in the company, including manager of system operations, manager of energy risk, and senior manager of transmission. He was appointed vice president, operations in January, 2000. In July 2001, Policicchio was appointed project manager, special projects, for ATCO Utility Services. In November, 2002, he returned to ATCO Electric to take on the role of vice president responsible for planning, engineering, and construction.

PURCELL, JAMES D.
(Civil '77) PEng



has been named president and general manager of Lehigh Cement's White Cement Division for North America. Mr. Purcell has also been named to Lehigh's North American executive committee. Purcell has held several key positions with Lehigh and predecessor companies Genstar and CBR since 1977, in operations and general management, as well as business development and total quality in western North America and Europe. In 2001, Purcell relocated from Vancouver to Lehigh's headquarters in Pennsylvania to take on the position of director

of business development, coordinating business strategies for North America. Lehigh Cement is the largest business unit of the HeidelbergCement Group, based in Heidelberg, Germany and operating in 50 countries. HeidelbergCement Group is the third largest cement group in the world.

RIVA, WALTER
(Mining '49)



was appointed to the Canadian Mining Hall of Fame in recognition of his tireless leadership of Canada's coal mining industry. Mr. Riva started his career as an underground labourer at Canmore coal operations. In 1949 he joined Canmore Mines Ltd. as a mining engineer, eventually becoming executive vice president and CEO. Riva moved to Denison Mines and then to Kaiser Resources in 1973, first as vice president, coal mining operations at Sparwood, B.C., then as president of its coal division in Vancouver—the first Canadian to hold this position. When Kaiser was acquired by British Columbia Resources Investment Corporation in 1980, Riva became president and CEO, and then chair and CEO. He retired from management to serve as vice chair and later chair of B.C. Resources until he fully retired in 1986. A pioneer, Riva developed new markets and introduced new technologies and procedures. He introduced mechanized mining at Canmore, using continuous miners and shuttle cars to improve productivity. His 350 tonne prototype dump truck became the standard in mining. With the assistance of the Canada Centre for Mineral and Energy Technology, he invented and patented a form-coking process that served a higher-value niche market in the electric furnace field. He expanded the markets for Canadian coal into Asia (China and Japan), South America, and Europe.

STANFORD, DR. JAMES
(Petroleum '60, LLD [Hon] '00) PEng



was appointed to Canada's outstanding CEO of the year advisory board for 2004.

STANLEY, DR. STEPHEN
(Civil '86, MSc Civil '88, PhD Civil '95) PEng



has been appointed president, EPCOR Water Services Inc. (EWSI). During Dr. Stanley's tenure as vice president and general manager of EWSI, he was instrumental in gaining North American recognition of EPCOR's expertise in water quality, including EPCOR's use of ultraviolet disinfection systems. Stanley also served as an advisor for New York City on ultraviolet systems and was principal investigator on two American Water Works Association Research Foundation projects concerning automation of water treatment plants. Stanley's other accomplishments include instituting performance-based rates for the City of Edmonton and serving as the lead technical expert for the North Battleford water inquiry. Stanley was also the science component leader for the Northern River Basin Study.

SYMINGTON, WAYNE
(Mechanical '78) PEng

has been appointed vice president and general manager, operations for ATCO Power Ltd. in Calgary. Mr. Symington started with ATCO Group in 1979 as production licensing engineer with Alberta Power in Edmonton. He held progressively senior management positions with Alberta Power and ATCO Electric until his recent appointment as vice president, Ontario with ATCO Power.

VAN DEN CAMP, PAUL
(Civil '76) PEng



has been appointed vice president, operations for ATCO Noise Management. Mr. Van Den Camp joined ATCO Noise Management in 2000, and has been manager, projects and general manager, U.A.A., and, most recently, manager, projects and engineering. Van Den Camp has over 20 years experience with major Canadian construction companies in both technical and general managerial roles. ATCO Group is a Canadian group of companies, Alberta-based with 7,000 employees actively engaged in utilities, power generation, and global enterprises.

WILKINSON, RON
(Chemical '76) PEng

has been appointed senior vice president, North America Wholesale for Agrium Incorporated. Mr. Wilkinson has more than 25 years of engineering operations and business management experience within the petrochemical industry. Wilkinson joined Agrium in 1996 through the acquisition of Viridian Inc. and has since held numerous senior positions with the organization including vice president, operations and technology; director, technical services; general manager, South American operations; general manager of operations and projects, Asia Pacific; and manager of transportation.



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Agreement No. 40051128

Return undeliverable
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& Learning Complex
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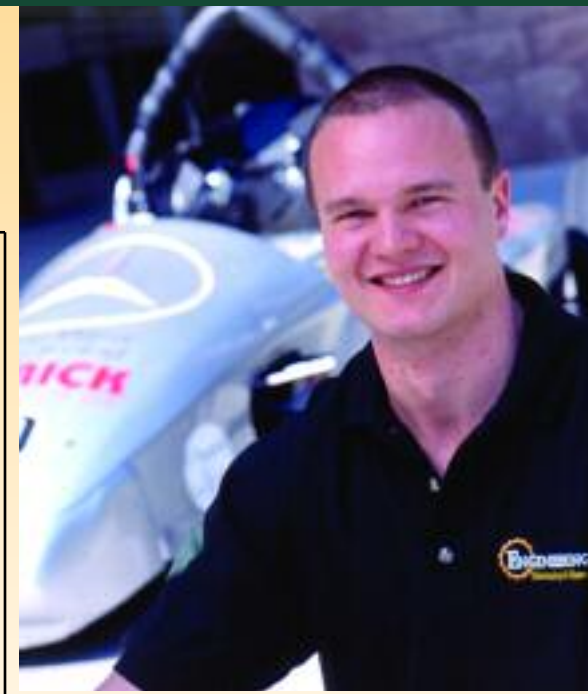
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The Formula SAE is one example of an undergraduate student project you could support as a donor. This project provides students with valuable hands-on experience applying their textbook education to a real-world engineering design problem. The skills acquired not only include engineering design, drafting, and optimization, but also project administration, communication, cooperation, problem solving, time management, and mentorship. Costs of this project are considerable; thus, project sponsors become an essential component of the team's success. Sponsors not only provide the team with much-needed funds and mentorship, but also provide product, technical advice, and public exposure.

For further information contact:

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Tel: 780.492.5080
Fax: 780.492.0500
e-mail: david.petis@ualberta.ca



I wish to make a gift of:

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

cheque (made payable to the University of Alberta) VISA MasterCard

_____/_____/_____/_____/ expiry date: _____

Name (please print): _____

Signature: _____

I have also enclosed:

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

If you were an Alberta resident on December 31, 2004 and have already given \$200 elsewhere, your combined income tax savings will be:

Your donation to the U of A	\$100	\$500	\$1,000	\$2,500
Your tax savings for your gift:	\$42.00	\$209.00	\$418.00	\$1,045.00

* To best meet Faculty of Engineering's needs, donations may be directed to endowed funds.

I would like my gift to support:

\$ _____ Faculty of Engineering in support of undergraduate student projects, new educational initiatives in all disciplines, and general student life enhancement activities.

\$ _____ Chemical and Materials Engineering Fund*

\$ _____ Civil and Environmental Engineering Fund*

\$ _____ Electrical and Computer Engineering Fund*

\$ _____ Mechanical Engineering Fund*

\$ _____ Mining and Petroleum Engineering Fund*

\$ _____ The Patrick Kent Memorial Endowment Fund*

\$ _____ The Bev Snyder Engineering Academic Excellence Scholarship*

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

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

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

Please return to: Office of the Dean, Faculty of Engineering, University of Alberta,
E6-050 Engineering Teaching & Learning Complex, Edmonton, Alberta T6G 2V4

FG4