



Photo by Jennifer R. Smith

Chris McNeil

Engineer by day...

You may have seen the image on television: muddy cyclists, running for all they're worth up a steep embankment with a bike tossed over their shoulders. You may have thought, why would anyone do that? Doesn't the bike mean you don't have to run?

Welcome to the world of cyclo-cross—a combination of off-road racing and marathon running that's usually held in winter conditions over wood trails, soggy meadows, and short, steep hills. It's also the world of Chris McNeil, a 22-year-old St. John's native and engineering student who is the only Newfoundlander ever to place on the podium at the Canadian National Championships for cyclo-cross.

Cyclo-cross is about getting off, running around, and getting back on. It's a test of stamina, agility, and intelligence, a three-kilometre odyssey of gruelling effort that tests fitness and ability to strategize. But to McNeil, it's just fun.

Chris *page 9*

Engineering alliances



Top to bottom: Hal Stanley, Albert Peach, Andrew Adams, Frank Davis and Earl Ludlow

It wasn't always this way. Once upon a time, engineering educators designed their curriculum around the basics—motors, mechanisms, bridges, and the like, and assumed their students then had what they needed to make a contribution to society and succeed in the workplace.

Well, the times they are a-changin'.

Recently Memorial's Faculty of Engineering and Applied Science initiated an ongoing consultation process with what they've termed their external Advisory Council—21 representatives of industry and government whose input they are actively seeking to help inject new solutions—and new questions—into engineering programs. But it's more than a proactive discussion group; it's a change of culture, too.

"The purpose of the advisory council is to act as a window to the outside world, because the faculty needs to engage in constructive alliances with others," R. (Sesh) Seshadri explained. "Their views are important for us in the sense that they reflect, in part, what our graduates are going to do, and they come in contact with lots of people. Therefore, it's important for us to link with their circles."

With technological devices and ethical themes rapidly transforming the field of engineering education, it makes sense that the faculty would access this incredible resource of those who have succeeded as engineers, educators, and icons of industry.

With representatives from the oil patch, power, pulp and paper, mining, petrochemicals, aerospace, and auto industries, the Advisory Council is well-designed. "Our stakeholders are individuals in the private sector who are adding value or creating wealth in a technological sense," Dean Seshadri said, "yet with a full understanding of the political and social implications of their activities."

An example of this can be seen in the Council's Subcommittee on Offshore Petroleum Engineering. "Oil and gas is not just a matter of consulting on curriculum; it's a question of targeted and strategic research and development, of how we at Memorial

Alliances *see page 14*

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Message from the dean

Last year we celebrated the 25th anniversary of our bachelor of engineering program. Because my predecessors had the wisdom to make co-operative work-terms part of this program, that's 25 years of graduating engineers who are enjoying successful careers. Now we are in the midst of unprecedented social and technological change, change particularly evident in the fields of information technology, advanced materials, manufacturing, industrial automation and controls, and biotechnology. What foresight will carry us successfully for another quarter-century?

Educational institutions must keep the curriculum relevant, so over the past six years we have introduced undergraduate options in computer and communications, manufacturing and robotics, and environmental engineering. Last summer, we obtained strong accreditation for all of our undergraduate programs, and more recently, we revised the C&C option to a new program of computer engineering. But to perform in a knowledge-based global economy, our graduates must also have that added something—entrepreneurial skill, the ability to enhance economic performance. We have responded to this need by creating several outreach centres that enable students, faculty, staff, and industry to work collaboratively in an environment receptive to fresh ideas. Our Manufacturing Technology Centre has a state-of-the-art rapid prototyping machine, integrated manufacturing cells, and intelligent robots, and boasts a steady stream of industrial stakeholders exploring product options and designs to increase their competitive appeal. Our most recent addition, an instrumentation, controls, and automation laboratory, commences operation this May. We have also set up a liaison group composed of key individuals from industry, government, the university, and faculty, to provide perspective on our activities. The Engineering and Applied Science Advisory Council (EASAC), is chaired by Hal Stanley, president and CEO of the Canada Newfoundland Offshore Petroleum Board.

So what about the future? Right now, the faculty is considering program options in oil and gas engineering to enable students to gain skills germane to the growing industry off our coast. These options would apply to all engineering disciplines and be supplemented by at least two co-op placements within industry. M.Eng. and PhD programs with specialization in oil and gas would also be offered. It's a very exciting time to be in engineering, particularly in Newfoundland and Labrador. There is considerable optimism given the activity in the offshore sector and the Lower Churchill Falls project, and with steady increases in our student enrolment reflecting growing demand for our programs, our long-term prospects look excellent. Where will we put our new students for co-op work term placements? What can we learn from industry that will enhance these students' curriculum and facilitate their success? What needs to be done to support and maintain the burgeoning oil and gas industry, as well as other industries, in this area?

I am confident that together we can find these answers. Together we can look forward to another successful 25 years, and more. And I hope that this newsletter can help us achieve these goals by keeping our lines of communication open and our alliances active. Welcome to *Benchmarks*.



R. (Sesh) Seshadri



What's in a name?

Dr. Mary Williams participated in a ceremony in Okpo, South Korea, recently to name the vessel that will produce oil from the Terra Nova field. As "vessel sponsor", Dr. Williams cut the cord and wished the *Terra Nova FPSO* (Floating Production Storage and Offloading) good luck and safe passage in all its endeavours. Dr. Williams was chosen for this role not only because Petro-Canada is the largest owner of the Terra Nova Development and the industrial sponsor for the Atlantic region Chair for Women in Science and Engineering, which Dr. Williams holds, but also because of the importance of her research (ice forces on ships and structures) to the oil and gas industry. *Terra Nova FPSO* is the first of its kind designed to operate in the wind, wave, and ice environment of the Grand Banks.



Dr. Mary Williams cuts the cord to officially unveil the name of the Terra Nova FPSO. Onlookers include: Alan Bodie, PCL Constructors Inc.; Dr. Christopher Williams, IMD; Doug Annable, AGRA Monenco Inc.; and Ash Bakshi, Brown & Root.

AUV grant

A team of researchers from IMD, C-CORE, University of Victoria, Terra Nova Alliance, International Submarine Engineering, Geo-Resources, and MUN Engineering has won an NSERC strategic grant totalling almost \$800,000 to develop an intelligent and autonomous underwater vehicle (AUV) for environmental monitoring around oil and gas platforms like Hibernia. Although the project is scheduled to take place over five years, a test bed vehicle (designed by Dr. Chris Williams of IMD and his work-term and graduate students) is ready to go, and the team is anxious to see how innovations in marine propulsion



Some research team members: (standing l-r) Dr. Chris Williams and Dr. Neil Bose, (kneeling l-r) Tim Curtis and Doug Perrault.

and control—namely, the addition of an intelligent instrumentation package controlling horizontal and vertical thrusters—will facilitate this AUV's maneuverability. An AUV on the offshore heralds potential cost savings because the technology could be launched from a platform and carry out pre-programmed data collection, eliminating more costly methods using ships. Dr. Neil Bose, director of Memorial's Ocean Engineering Research Centre and a professor of Ocean and Naval Architectural Engineering, is excited about the project because environmental monitoring of the emergent industry here is vital to its growth and success. "We're developing something for the industry that if it were there today, it would be used today. It has a genuine, environmental, important use."



Engineering students Dave Bursey and Adam Reid with their creation.

Students save time

Memorial Engineering talent was showcased nationally on the morning of New Year's Eve as student engineers Dave Bursey and Adam Reid helped CTV's *Canada AM* celebrate the millennium. The morning newsprogram had called the faculty just as exams were ending in search of a time capsule for their New Year's Eve telecast at Greensleeves Pub on George Street in St. John's. Design challenges like this are crucial to engineering education because they introduce students to realistic conditions while giving them hands-on experience, and with only a list of things that might go into the capsule, Bursey and Reid came through just in time. The students found materials and created a four-foot-tall aluminum cylinder which *Canada AM* filled to the lid with items like a Gretzky jersey, a cellphone, a beer, maple syrup, a videotape of the 1972 Canada Cup match, and newspapers. Bursey and Reid signed the underside of the lid just before sealing the capsule, and are pleased that they had this part to play in the millennial celebrations.

Engineering to win

Adam Stanley, a fourth year student studying Ocean and Naval Architectural Engineering, took top honours in the Editorial Communications division at the Atlantic Engineering Competition in Halifax recently. His 30-minute presentation, Technology and society, addressed the impact that technology has on our believe systems and way of life, and advised that engineers consider the social impacts of change before developing products.

His teammates included Rob Pilgrim, who attended as a judge, and Nic Rivers, Andrew Murdey and Michael Wrinch, who competed together in the Senior Impromptu design category, creating a water-powered alarm clock out of a bag of junk in under four hours. Although they didn't win, the students did learn about the increasing

importance of presentation and marketing strategy in engineering.

This was the first representation by MUN at the AEC in several

years, and the team hopes their experience can convince more students to attend in future to showcase MUN Engineering talent. The AEC is devoted to testing student skills in categories as varied as entrepreneurial design, corporate design, editorial communications, explanatory communications, extemporaneous debate, and junior and senior impromptu design. This year's competition at DalTECH Feb. 11-13 saw over 130 students competing.



Working with what they've got: Andrew Murdey, Nic Rivers and Michael Wrinch.



Students Adam Stanley, Michael Wrinch, Andrew Murdey, Rob Pilgrim, and Nic Rivers.

Making connections

Engineering students represented the university at the 16th Annual Bridge Building Competition at Concordia University in Montreal recently. This was the first time in six years that Memorial attended the competition, which we won in 1991.

Overwhelming interest meant ten students from the civil engineering program went to the March 3 contest: Kim Babstock, Daniel Bourgeois, Kris Clarke, Chris Connolly, Gary Davis, Rodney Keats, John Lambe, Dion Lewis, Anne Stapleton and Dan Whiffen.

Each of the 31 teams participating in the competition worked for months ahead of time to design and build a bridge with a minimum one metre span and a deck 150 mm off the ground, that allowed for continuous traffic, and could be subjected to a mid-span point load—using only popsicle sticks, toothpicks, white glue and dental floss! In Montreal, the students had just two hours to assemble their creations.

Bridges were judged on aesthetics and originality of design, then assessed for weight before heading to the 'crusher' for testing. Although Memorial's designs were unique from the majority of the competitors, when the splinters were tallied, Vermont Technical College was declared the winner and a new record of over 5,000 pounds was set by the University of Calgary.



Bridge builders: Front row: (left to right): Daniel Bourgeois, John Lambe, Kim Babstock, Anne Stapleton, Dion Lewis, Gary Davis, Rodney Keats; Back Row: Chris Connolly, Kris Clarke, Dan Whiffen.

A word about the Engineering and Applied Science Advisory Council (EASAC)

BY H.H. STANLEY

When I was approached to serve on the Engineering and Applied Science Advisory Council in early 1999, I readily agreed. In my role as chair of the Canada-Newfoundland Offshore Petroleum Board, I participate in the evolution of a significant new industry in the province—offshore oil and gas development. Daily, I am reminded of the key role that Memorial University in general and this faculty in particular must play in ensuring the people of this province are provided with the educational background necessary to avail of career opportunities in this sector. I also see the opportunities for the university to build its research capability to address the challenges of developing this industry in the hostile environment of the North Atlantic. I know the other members of the council see similar opportunities in their respective areas of activity, and we recognize that our collective role is to support the dean and faculty in meeting their challenge: to produce the best possible graduates to meet the changing needs of the diverse engineering marketplace.

As an interface for the faculty with the industry community and the private sector, the Advisory Council assists in maximizing educational opportunity for engineering students and staff by supporting a curriculum that is relevant and evolving. To this end, our three priority initiatives are:

1. Guidance and advice in furthering program development in petroleum engineering and related facets.
2. Guidance and advice on the broader aspects of engineering education and in particular, the profile of the future engineer.
3. Exploration of approaches to faculty development through exchanges and collaboration with the engineering community outside the university.

The work of the subcommittees who are addressing these issues in creative and substantial ways will be highlighted when the council meets again later this spring. At that time, we hope to meet with representatives of the engineering student body, too, so as to better appreciate their perspectives on how we can provide the best support for faculty and program development, and, ultimately, educational success.

I believe that the work the Engineering and Applied Science Advisory Council is doing is an appropriate and timely measure that will benefit all participants—perhaps especially the students upon whom we rely to continue the hard work of industrial and economic enterprise in our province—and I am pleased to be part of it.

Hal Stanley is chair of the Canada-Newfoundland Offshore Petroleum Board (C-NOPB), which is responsible, on behalf of the Government of Canada and the Government of Newfoundland and Labrador, for petroleum resource management in the Newfoundland offshore area.



Building a safer industry

For a province starting down the road to an oil and gas industry, the news could not be better. First, we have one of the world's foremost environmental engineers in our midst, a professional whose specialty is oil site environmental protection and remediation. Second, he's just won a considerable research contract to develop a technology that will help to ensure oil-field environmental safety for sites around the world.

Dr. Tahir Husain has received a research contract in the amount of approximately \$300,000 from Saudi Aramco. The Memorial civil engineering professor will perform a three-year study on the development of a risk based corrective action (RBCA) computer model to assist in site remediation, or oil field cleanup.

The technology Dr. Husain is working on is important to the industry abroad and locally because exploration, transport, and refining activities usually mean some amount of site contamination. With Hibernia in production, Terra Nova on the horizon, and White Rose waiting in the wings, environmental considerations of the burgeoning oil industry are crucial to the sector's continuing success in the province. Dr. Husain's model will determine the extent of contamination, associated risk, and availability of remediation technologies in order to target site-appropriate solutions and optimize extent of cleanup. With the aid of a database enabling site prioritizing and information tracking, the MUN professor hopes his work will make the process of risk assessment faster, more effective, and more economical.



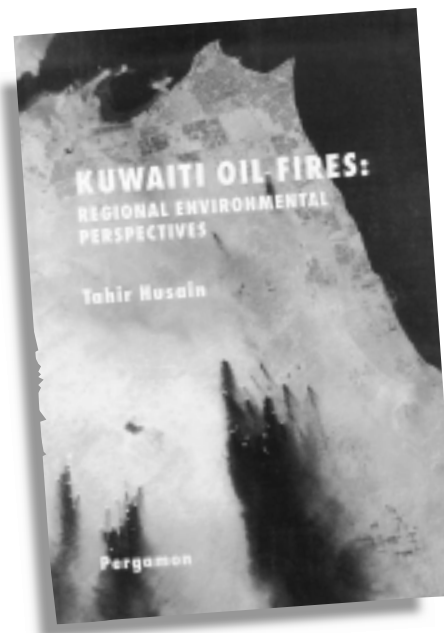
Dr. Tahir Husain

Dr. Husain's background makes him an ideal candidate for this enterprise. Working for King Fahd University of Petroleum and Minerals in Dharhan, Saudi Arabia, from 1979 to 1995, Dr. Husain interacted frequently with Saudi Aramco, and, since moving to St. John's, has been invited back as a guest speaker at conferences. Dr. Husain was also project manager for the Kuwaiti Oil Fires study, and wrote a book about his

experience, the foreword for which was contributed by Prof. John S. Evans of Harvard University. Dr. Husain credits these experiences with helping to inspire this research project. "Especially after the Gulf War, with seven to eleven million barrels of oil spilled and more than 700 wells on fire, there is a lot of awareness now on environmental cleanup and environmental restoration."

The technology transfer between Saudi Aramco—the world's largest and longest-running oil company, with production of between six to nine million barrels per day (compared to 100,000 from Hibernia), and Newfoundland and Labrador heralds what many

hope will be just the first of many links between the burgeoning local industry and the more established Saudi one. "It is really a very nice way to transfer technology," Dr. Husain said. "I feel that this is a somewhat unique project, and a very positive way to move the faculty, the university, and the province into the international oil and gas market."



Wearable computers

BY LI-TE CHENG

Thanks to recent advances in smaller, cheaper, and more powerful electronics, wearable computers have become an emerging area of research, allowing people to perform computer-related tasks (such as email, note-taking, scheduling, and video) while on the go. Examples include tiny laptops, handheld organizers, and sophisticated cellphones with Internet connectivity.

One of the research challenges in this area is user interface—creating easier ways for the user to operate the computer. For example, a paramedic performing first aid may find a wearable computer that can understand voice commands more effective than a keyboard. The interface must minimize the weight and space used by any additional special equipment while still operating quickly, and despite the limited speed available on such tiny devices.



I am investigating user interfaces for wearable computers using a thimble-sized video camera with see-through display, both of which attach to the user's head and connect to a tiny computer only slightly larger than a paperback novel. The camera allows the computer to see what its owner is seeing, and the display presents graphics that may be helpful. Because the display is transparent, the user can see the real-world in addition to the computer graphics.

My research focuses on developing faster ways for the wearable computer to 'see' with the video camera, and has produced two applications demonstrating this work. The first application is an aid to memorizing piano music. Using a video camera, the wearable computer senses when the pianist is looking at his or her hands and shows sheet music on the head-worn display. This application lets the pianist concentrate

on practicing from memory by sensing when help is needed (through the movement of looking down at the hands), thereby encouraging learning. The second application is a device to assist in learning ballroom dancing. Similar to the piano system, this application is intended for a novice practicing alone and shows the proper dance motion only when the dancer is looking down at his or her feet. In this way, the dancer can focus on the steps in the proper stance, and can summon help from the wearable computer by looking down at the feet (a common situation when learning to dance).

In addition to my interest in wearable computers, the Multimedia Communications Lab conducts a wide variety of research in face recognition, ubiquitous computing, and computer vision. Anyone with questions about these technologies should contact Dr. John Robinson at john@engr.mun.ca.

Li-Te Cheng is a PhD candidate in electrical engineering at the Multimedia Communications Lab. He can be contacted at lcheng@engr.mun.ca.

Engineering education and research

BY RAY GOSINE

The primary focus of most Canadian engineering programs is technology, and current programs are very good at providing students with the fundamentals necessary to take a technical problem and produce an engineering solution. However, the focus of engineering practice is society: social needs drive technological innovation, and opportunities happen in a business and technical context.



To address this difference, engineering education must continue to evolve so that graduates can work effectively in the increasing job market of small or medium-sized enterprises (fewer than 500 employees), because these companies represent the base for technological innovation. Although our programs are highly regarded (because of regular external review by the profession and responsive revisions to program content), engineering education must be enhanced so that engineers are able to communicate with clients, customers, financiers, public, and staff; because ultimately, success or failure will depend largely on an engineer's ability to deal effectively with people. In addition to building on recognized program strengths, I believe we also need to look for linkages, internal and external, to create innovative professional programs, such as engineering-business and engineering-law—programs that respond to the needs of society. Co-operative engineering programs, at both the undergraduate and graduate levels, represent one such linkage and are extremely valuable to participating students.

Another challenge in engineering education today is to create mechanisms that will attract the best students into graduate studies and research, removing the disincentives of extended time commitment and lower funding. Canadian graduates often have

lucrative offers from employers long before graduation, so an additional 24 months to complete an advanced degree is not attractive, even when the graduate research is exciting and well-connected with national and international industry. It is important that we give our undergraduates a sense of understanding and ownership of the research activities of their faculty, such as by integrating faculty members' research projects into undergrad courses, so that students can develop an appreciation

of the significance of engineering research to Canadian industry. This relationship can also provide students with additional motivation and spark their interest in graduate studies.

There is also an opportunity for the engineering profession to play in raising levels of technological literacy, so that society can make informed decisions about technology. Effective cross-campus program collaboration could address this need—collaborations such as minors in engineering, technology courses for non-engineers, and joint appointments (such as a Chair in Technology and Society), and benefit the collaborators in the process. Engineering research differs from research in science, but that difference heralds a considerable potential for increased collaboration between scientists and engineers. Collaboration with industry and end-users would assist in the identification of research priorities, the execution of research programs, and the transfer of technology to industry, addressing the longer-term needs of industry while providing regular interaction and starting points for research projects between faculty and industry—interaction which also provides opportunities for research funding, as we see in the NSERC Research Grant programs. I see an opportunity for faculties to lever NSERC grant success into success in collaborative

granting council programs that require public/private sector funding. Moreover, NSERC Research Grants can be used to seed research projects that attract industrial sponsorship and improve research and funding opportunities for graduate students.

Therefore, engineering faculties should be more aggressive in their pursuit of industry—not just its money but its niche research opportunities, and faculty members must be prepared to demonstrate their expertise in a form that is relevant to industry. We need high visibility as proficient, dedicated, and effective collaborators. Engineering faculties must be more open to industry, both in terms of being interested in its longer term R&D needs, and being capable of securing and executing significant research projects in a professional manner. To achieve this receptivity, universities should look closely at the mechanisms, such as industrial chairs, outreach centres, arms-length R&D units, secondments to/from industry, and university-industry technology parks, that could be used to create an effective engineering research enterprise. It is important for faculty and university administrators to encourage, support, and reward the pursuit of engineering research.

The faculty at Memorial must continue to play a central role in underpinning the development of expertise and advanced technologies that will allow our industries to be internationally competitive. We must educate highly qualified, innovative graduates who are prepared for careers that will challenge them to consider technology in the context of both social needs and business climates. Innovative and effective collaboration is essential for our faculty, and new opportunities for industrial chairs and other research enterprises must be identified and pursued.

I am very proud to be a graduate of the engineering program at Memorial and, as a member of faculty, I hope that our current graduates will look back and recall us as a team characterized by high standards in teaching and by broadly defined and engaging research activities that included a strong component of basic research underpinning the vigorous pursuit of applied, collaborative research opportunities.

Dr. Ray Gosine is an associate professor in electrical engineering and director of Intelligent Systems at C-CORE. He won the Petro-Canada Young Innovator Award in 1998-99.

Chris *cont'd from page 1*



“I love cycling. Actually, I love every event I do—road racing, mountain biking, cyclo-cross. I love them all.”

Initially reluctant to race, McNeil’s first medal win in Pippy Park got him hooked, and now his interest in cycling plays a part in his career decisions—even his choice to pursue engineering. “I’d always been into the technology side of cycling, because especially in competition, if you don’t have the

right equipment, you can’t compete. And I love to design things, so mechanical design completely suited me.”

McNeil uses his engineering work terms to fund his cycling habit. His sponsorship from Trek Bicycles and Canary Cycles in St. John’s is crucial—bikes can run around \$6,000 each. “He’s been a big influence on me,” McNeil said of shop owner Joe Planchat, whom he’s the first to call after a race.

Being a part-time cycling champ and a full-time engineering student is no easy ride, but despite the workload, McNeil finds an hour a day to train and eight hours for sleep. In the off-season, he stays off his bike and tries new things, like cross-country skiing and running, weight training, and swimming.

During a move to Ottawa for work term last November, McNeil raced twice a week—in addition to riding to and from the competitions—and it paid off. Within a 10-day span, he did the best racing of his life, placing second in his age group in a local race, then winning silver at the nationals in St-Sauveur, Quebec—Newfoundland and Labrador’s first elite Canadian championship medal. McNeil returned to Ottawa only to leave again almost immediately for a business trip to Toronto, all the while trying to figure out how he’d get to Chicago the *next* weekend for the American National Race Series Super Cup, one of the largest and most competitive race series in North America. “I wanted to know just how well I’d fare against the next level of competition. Because if I didn’t go, it’d always be in my mind, ‘How would I have compared?’” Of course, McNeil compared extremely well, placing 10th in his age category against riders from all parts of America, Canada, and Europe. He then hopped a plane back to race the next day at the Ontario Provincial Championship in Oshawa—where he won!

Ranked at 103rd in the world—the third highest-placed Canadian, McNeil is grateful for his success and has surpassed goals he didn’t even imagine he could set, but remains philosophical about his skills in both cycling and engineering. “You have to train so hard to do well in the races, and you have to study so hard to do well in your exams. And everything that goes along with training, the same things apply to studying: you have to eat right, you have to get your sleep, you have to study hard all the time.” McNeil hopes to return to Ottawa this summer to push both his design skills and his racing to newer heights.

Discipline Update

Civil

Civil Class of 2001 took part in the 16th Annual Bridge Building Competition at Concordia University in Montreal in March. Participating students were Kim Babstock, Daniel Bourgeois, Kris Clarke, Chris Connolly, Gary Davis, Rodney Keats, John Lambe, Dion Lewis, Anne Stapleton, and Dan Whiffen. After months designing and constructing bridges out of popsicle sticks, toothpicks, white glue, and dental floss, the students had just two hours to assemble their creations. This was the first time in six years that Memorial attended the competition, which we won in 1991. *See story page 4.*

Dr. Leonard Lye, Chair of Civil Engineering, was invited to attend the Tetra Society of North America Special Orientation Meeting and Conference in March. The Tetra Society is a volunteer organization consisting of engineers, technicians, and health professionals who design and build assistive devices for people with disabilities, recognizing that people are not handicapped by their disabilities but by obstacles or barriers in their living environment. Many faculty members are proud volunteers for the group, and Dr. Lye is the founder of the Newfoundland Chapter and the local coordinator.

Electrical and Computer

Think of all the stationery that'll get redone. The Electrical Engineering discipline has undergone a name change and will now be known as Electrical and Computer Engineering. The first class of students will convocate in 2002. Dr. Venkatesan, chair of the discipline, says that the name change was mandated to reflect the fact that the discipline offers these two different programs at undergraduate and graduate levels.

CDHAR is a hotbed of activity these days. Launched last spring, the new Centre for Digital Hardware Applications Research is consolidating and enhancing existing strategic facilities in digital hardware and ASIC design at MUN, and is hoping to share its expertise and resources with local industry. The current research focus of CDHAR is on application areas of switch fabrics for integrated broadband communications networks, quality of service issues in ATM networks, encryption systems for computer and communications security, and encoders for error control codes. The centre has excellent hardware and software facilities and is working with an extensive team of expert personnel, including three electrical computer engineering professors, a computer science professor, a post-doc fellow, two PhD students, five masters' students and several Term 8 project students.

The centre began a weekly seminar series last fall to discuss selected issues on broadband communications networking, and has attracted encouraging participation. Seminars continued this winter until the first week of March, with meetings held every Thursday afternoon. The presenters included Prashant Mehrotra, Howard Heys, and Li Cheng, and covered topics such as IP quality of service, network security, and multicasting on IP over ATM networks. For information on upcoming seminars, please visit: www.engr.mun.ca/~cdhar/

CDHAR is planning a short Continuing Engineering Education course on Quality of Service in ATM and IP for this May or June, and will post information on the Web site when it becomes available. The centre also proposes to deliver a tutorial on Quality of Service in Internet at the Canadian Conference on Electrical and Computer Engineering, to be held in Halifax May 7-10, 2000. In exploring expansion and alliances with local industry, CDHAR invites contact from anyone with current or future plans for ASIC design and digital hardware development. E-mail CDHAR@engr.mun.ca

Ocean and Naval

Good news on the research front came in January in the form of an NSERC strategic grant for the AUV project. The work aims to improve assessment and management of environmental impacts of offshore oil and gas operations, with a major focus on designing and operating robotic submarines to carry out specific missions, such as taking water column samples around a platform. The flexibility afforded by a small submarine may result in more and better information, helping improve analytical modeling efforts. Three-quarters of the over \$1 million funding comes from NSERC. Congratulations to the team: Dr. Chris Williams (IMD), Dr. Brian Veitch and Dr. Mahmoud Haddara (ONAE-MUN); Dr. Tahir Husain, Dr. Siu O'Young, and Dr. Michael Hinchey (MUN); Dr. Charles Randell (C-CORE); and Dr. Meyer Nahon (U. Vic). *See story page 3.*

Students continue to find great work-term jobs from Helsinki to Houston and from St. John's to San Francisco. Tracy Dawe, a senior ONAE student, spent her sixth work term in Vancouver with the design firm Robert Allan Ltd. Ms. Dawe worked on the design of a fast catamaran ferry for Alaskan owners, an experience she found thoroughly enjoyable. The cumulative experience of six work terms is part of the reason why the ONAE program at MUN is regarded highly among employers.

Oceanic Consulting Corporation is a local engineering firm specializing in performance evaluation of naval architectural and ocean engineering systems for international clients. As an alliance venture between the private sector, IMD, and Memorial, Oceanic is the commercial front door to one of the world's most comprehensive collections of ocean engineering facilities, including our wavetank. At last count, 14 of the 21 people working with Oceanic were MUN graduates, and of nine engineers, seven are ONAE graduates and four of those have MUN graduate degrees. The alliance has also seen ONAE faculty serve as scientific advisers on Oceanic's commercial projects, and the commercialization of software originally developed by faculty researchers, such as the ship motion software by Don Bass. Oceanic is also a regular co-op employer and its growth has had a major positive impact on all facets of the ONAE program.

Memorial is home to one of 22 student sections of the Society of Naval Architects and Marine Engineers, or SNAME. An international professional society with over 12,000 members, SNAME is dedicated to advancing the practice of naval architecture and marine engineering. One of the ways its members do this is through local section meetings, which are becoming a regular feature in our community. This semester's meeting at the end of February featured a presentation titled Design and Construction of the Terra Nova FPSO, by Bob Dunsmore, FPSO project manager with the Terra Nova Alliance.

A group of six people from our community attended the SNAME annual meeting in Baltimore this year. Oceanic Consulting's Dan Walker and Noel Murphy headed up the Oceanic booth in the exposition, while Dr. Brian Veitch and Dr. Neil Bose presented papers, along with Shawn Searle, who is now with Oceanic. Krista Lewis, an ONAE student at MUN, took part in the student congress where the team project was to design, build, and test a model submarine and present the results—all in one morning! Ms. Lewis was sponsored by the Faculty of Engineering and Applied Science and the Newfoundland and Labrador section of SNAME-CAS. SNAME undergraduate scholarships were awarded this year to ONAE students Corwyn Moores and Andrew Murdey. Congratulations!

There's a lot going on in ONAE! Check out our Web site links: www.engr.mun.ca/OERC/, www.oceaniccorp.com/, and www.engr.mun.ca/Naval/

Mechanical

With the faculty developing a petroleum option for all disciplines, the mechanical group is busy working on ways to ensure that all mechanical students who take this option continue to get a good understanding of basic mechanical engineering. In addition to this new initiative, the department already has separate options in design and manufacturing, which are in the process of being combined into a single option.

Mechanical Engineering continues to be the focus of the outreach program. In fact, all but two of the dozen or so work term students hired by IOG have been mechanical engineering undergrads. Our students tend to work in and around the Structures Lab and the Rapid Prototyping Lab. Demand for mechanical work term students and graduates also continues to be strong in the oil industry, a major employer both locally and overseas, especially in the U.K.

The Canadian Society of Mechanical Engineers (CSME) has been keeping a low profile in recent years, and there is a movement afoot to make it a more effective society. Norm Jeffrey, who works within the faculty as special science and technology advisor to the pro vice-chancellor, is leading this effort. Jeffrey is the president of CSME.

Engineering at Memorial: Some history (and a little philosophy)

By G. R. Peters



I suppose one would expect that in the inaugural edition of *Benchmarks* there would be an article with a title like this one. As a veteran around the place (although I officially retired in 1996), I could hardly refuse a request (and an opportunity) to reminisce about the early days and the development of our faculty.

Engineering and Applied Science at Memorial University goes back to 1931—back to before we even *were* a university—and the three-year engineering diploma program established at that time ran for nearly 40 years. Graduates usually went on to the Technical University of Nova Scotia, with whom Memorial had a formal agreement, to complete their degrees. As the years passed these engineers (and a sprinkling of others) laid the foundations of the profession in Newfoundland and Labrador. The building that now houses the faculty is named for the first and only engineering dean of that period, Dr. S. J. Carew. Sad to say, another pioneer of the period and someone known to the whole university community, Prof. Jack Facey passed away in February.

In the late sixties, Memorial decided to establish a full professional degree program in engineering. The new dean was a young professor from the University of Waterloo, Dr. Angus Bruneau. Waterloo had been the first university in Canada to set up a co-operative engineering program—one in which students undertake paid work terms in industry as part of their education. With some innovations of our own, the Waterloo example became the model that Bruneau and his colleagues used for the new programs at Memorial, and in 1974 the 74 students of our first class were granted degrees. In 1975 we got a new building (the present one) and we were finally able to accommodate the expanded undergraduate and new graduate programs and establish research facilities necessary for the developing faculty.

In order to set up the co-operative side of the program, the first director of the Division of Cooperative Education was recruited from industry. Peter Young was identified with our co-op programs for many years, and, working with Dean Bruneau and a few colleagues, he initiated an ambitious undertaking to recruit industrial partners all across the country for student work placements. It was a challenge—our program was hardly known then and co-op students were a relatively new phenomenon; Memorial was only the third institution to set one up, and Waterloo had started it all just four or five years earlier. But in that small beginning was the start of an industry outreach and alliance relationship.

By any judgment, our cooperative educational system has been very successful, and we often hear glowing reports from students and industry about the benefits. However, what is perhaps not said often enough is that when employers provide opportunities for students in their companies, they are becoming involved in the educational process. The experience our students gain on work

terms is a vital part of their education, and they bring the results of this experience back to the classroom. It is therefore true to say that industry is a key partner in the education of engineering students.

Another innovative approach taken in the early days was the choice of an area for academic research and development. Under Dr. Bruneau's leadership, we decided to build an R&D program that was particularly relevant to the province and practically undeveloped in Canada at the time—ocean engineering. This was the beginning of a strong local capability in offshore and ocean engineering which continues today. Of course, we have also developed many other strengths over the years, and there is now research and graduate study to the PhD level in all the disciplines, as well as centres for specialities such as multimedia communications, biomedical engineering, manufacturing technology, and industrial process automation.

There is probably no doubt in anyone's mind that education in any form has economic value. But in a field such as engineering, the links should be especially strong. I think Memorial's engineering programs can take some pride in what has been accomplished in this regard.

The first link between Memorial Engineering education and economic development is through our graduates—the area where we begin to see the economic fruits of the educational process. Although we often hear the concern expressed that our educational effort is ultimately wasted if many people choose to leave this province, you might be surprised to know that many of our graduates either don't go away or don't stay away. There is very good data to show that over the long term, more than 60 per cent of our graduates work here, and they stay or return to work for the very best of reasons—because they want to and because they can make a living here. It is also a mistake to think of engineering graduates only as job seekers; many turn out to be job creators, as even a cursory examination of local engineering firms will show.

The second important link relates to the technological components of the economy—an economy that we all know is becoming more and more knowledge-based. For example, at this university, and associated with it, there is some of



the world's best infrastructure for dealing with marine R&D, including the Ocean Engineering Research Centre, C-CORE, and the NRC Institute for Marine Dynamics, with its first-rate ice tank and sea-keeping basin. Another economic benefit, which is often not sufficiently appreciated, is that these (and other) technological research centres generate businesses which can successfully detach themselves from the institutions and become spin-off or independent enterprises. In the St. John's area alone we've seen remarkable growth of R&D based high-tech companies over the past few years, and some have roots in the institutions described here.

For those of us who have been involved in engineering education, research, and development at MUN over the last 30 years, it is rewarding to see the progress that has been made. There is no reason to think that it should not continue as we move from strength to strength.

Dr. G. R. Peters retired in 1996, after 33 years with Memorial. He served as dean of Engineering and Applied Science from 1982 to 1992, and is still teaching part-time.

can add value to the local and national enterprise. When the oil and gas activities taper off, we'd like to have a legacy here that will be such that our people will be able to participate fully in opportunities elsewhere, on an advisory basis. So we'll still have the talent, opportunities, experience, and the jobs here, because the infrastructure will be here."

As helpful as the council is, however, it is certainly not participating entirely out of charity. "It's an iterative process," Dean Seshadri elaborated. "We also diffuse technology to industry. We have strong accreditation here for all our programs, and we have discovered that we're doing a lot of things right."

The Advisory Council's reach extends to many facets of the faculty's operation, including considerations of faculty

development, the future engineer, and emerging technologies. To this end, the council has created a subcommittee on faculty development, a tool of the department to enhance the academic professional culture of the unit by exposing faculty to a broader worldview. It's an idea that began in Germany, where many engineering professors are intricately connected to a university and an industrial complex.

Dean Seshadri believes this outreach initiative will be beneficial to the university, the faculty members, and especially the students. "It's good for our students to see these things. They see a culture of success emerge right in front of their eyes and they get confident. It's a very subtle process."

EASAC is:

- Chair: Hal Stanley, chair and CEO, Canada-Newfoundland Offshore Petroleum Board
- Vice-Chair: Albert Peach, Senior-President, Agra-Monenco Inc.
- Chair of Subcommittee on Engineering Education and the Future Engineer: Frank Davis, vice-president—Technology and Service, Newtel Communications Inc.
- Chair of Subcommittee on Faculty Development: Earl Ludlow, vice-president operations, Newfoundland Power
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- Bruce Hollett, deputy minister, Industry, Trade, and Technology
- Dave King, president and CEO, Seabright Corporation Limited
- Dennis Klein, manager of development, Syncrude Canada Ltd.
- Tom LeFeuvre, director general, National Research Council—Institute for Marine Dynamics [IMD]
- Wallace Read, president, Remas Inc.
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- Max Ruelokke, general manager, AGRA—Brown and Root
- Lee Shinkle, executive vice-president, AMI Offshore Inc.
- Murray Thomas, regional manager, ABB Automation
- William Wells, president and CEO, Newfoundland and Labrador Hydro
- Judith Whittick, president and CEO, C-CORE
- R. (Sesh) Seshadri, dean, Faculty of Engineering and Applied Science
- Evan Simpson, vice-president (academic), Memorial University
- Mahmoud R. Haddara, associate dean, Undergraduate Studies, Faculty of Engineering and Applied Science
- Gary Sabin, associate dean, Graduate Studies and Research, Faculty of Engineering and Applied Science
- Neil Bose, chair, Ocean and Naval Architectural Engineering
- Leonard Lye, chair, Civil Engineering
- Michael Hinchey, chair, Mechanical Engineering
- R. (Venky) Venkatesan, chair, Electrical and Computer Engineering
- Paul Batstone, program manager, Engineering Co-operative Education
- Barbara Elliott, executive secretary, Faculty of Engineering and Applied Science

What's new with CWSE



(L-R) Dr. Mary Williams and CWSE assistant Carolyn J. Emerson.

The NSERC/Petro-Canada Chair for Women in Science and Engineering (CWSE), which works to increase the participation of women at all levels in engineering and science, has had a busy past few months and will have an even more exciting time ahead.

The five regional NSERC Chairs for Women in Science and Engineering met early in 2000 in Laval, Quebec, for discussion of national initiatives. Then, in March, Dr. Williams gave a presentation titled *Access and Merit: the Debate on Incentive Programs* as part of the Women's Studies Speakers' Series.

At the top of the agenda, however, is "New Frontiers, New Traditions—a National Conference for the Advancement of Women in Engineering, Science and Technology" to be held in St. John's, July 6-8, 2000. Two hundred and fifty delegates from across Canada and other countries will meet to advance the participation and leadership of women in engineering, science, and technology. This conference, the eighth in a series of increasingly popular national ones, is organized by CWSE and the community organization, WISE (Women in Science and Engineering) Newfoundland and Labrador. Chairholder Mary Williams serves as program chair, and CWSE assistant Carolyn J. Emerson is the conference chair.

"New Frontiers, New Traditions" promises a rich program that will provide participants with new research results, techniques to enhance their work and career success, and examples of actions which achieve positive results. Work sectors featured will be oil and gas, information technology, environment, and academia, among others. Keynote speakers include: Dr. Anita Borg,

CWSE see page 16



Student Melanie Doyle and former IDE Peter Saturley with MTC's Fused Deposition Modeler.

Industrial Outreach Group

The Faculty of Engineering and Applied Science's Industrial Outreach Group, or IOG, is experiencing phenomenal growth. Since the initiative formally began in September of 1998, the IOG has been successfully providing timely and responsive industrial support services to the province via dedicated project engineering personnel and specialized facilities and capabilities.

IOG's team of highly-skilled Industrial Development Engineers, or IDEs (differentiated from traditional staff research engineers), are dedicated not only to organizing client project activity but also to ensuring goal-achievement and customer satisfaction. The IDEs, Jeff Wells and Pascal Milford, are supported in their work by two to four engineering co-op students each term. In addition, the IDEs avail of the expertise of the 12 staff technicians who work directly with the lab facilities.

To date, the Industrial Outreach Group has completed approximately \$200,000 worth of project activity, in addition to many non-funded inquiries, tours, and other liaison. The faculty anticipates that ongoing commitments, repeat clients, and enhanced marketing activities will translate into significant increases in project activities, over and above the increases experienced this year. IOG currently has more than fifty clients on file, and that list is constantly growing. The diversity of clients is considerable, ranging from individual

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Outreach *cont'd from page 15*

entrepreneurs starting with little more than an idea to established manufacturers seeking to expand their product base through design innovation or testing.

A key component in this growth has been the addition of two rapid prototyping machines in the Manufacturing Technology Centre (MTC), technology much in-demand for its revolutionary impact on product development, cost, and time efficiency. Essentially, the prototypers generate 3-D models of computer model files, saving clients from complex tooling, fixturing, or mold development, and troubleshooting design prior to final fabrication. Product applications range from local crafts to underwater sensors to special guitar acoustic design.

The second main area of client interaction has been in structures and materials testing. With the unique facilities and capabilities of the Faculty significantly augmenting the locally-available suite of services in this field, clients are now able to access more timely data and services that otherwise would be serviced by out-of-province firms.

IOG Coordinator Andy Fisher looks forward to the continued expansion of the faculty's industrial outreach and its increased participation in specialized client projects. He can be reached at: afisher@engr.mun.ca

CWSE *cont'd from page 15*



prominent computer scientist and founder of the Institute for Women and Technology; Kathy Sendall, vice-president of Technology and Engineering at Petro-Canada and chair of the Canadian Engineering Memorial Foundation; and Kathy Penney, vice-president of Jacques Whitford Environmental. Information and registration forms are available at www.mun.ca/cwse.

In other CWSE news, the Office of the Chair, the Newfoundland Science Centre, and WISE Newfoundland and Labrador partnered with the Girl Guides of Canada to participate in a provincial Guiders' conference in Gander in October of 1999, attended by 360 Guide leaders. The GGC represents a key audience for the CWSE as Guiders interact with 10,000 girls throughout the province. Carolyn Emerson reports, "Great hospitality and prominence on the program highlighted our presence at the conference, and we had many opportunities to meet with the participants. Those formal and informal interactions carried the messages of the importance of science in our everyday lives, the broad spectrum of career choices available to young women, and the leadership of women." There were also lots of fun, hands-on activities to provide resources to assist Guiders in delivering the science component of their program to their Sparks, Brownies, and more senior girls. That trip continued further west with a visit to the Abitibi Consolidated Paper Mill in Grand Falls-Windsor, and meetings with administrators and faculty at Sir Wilfred Grenfell College in Corner Brook.



Maritime Trivia

from Dr. Brian Veitch,
assistant professor,
Ocean & Naval
Architectural Engineering

Are you steeped in maritime lore?
Test your knowledge here.

- 1) What is a dolphin striker?
- 2) What is a poop deck?
- 3) Name the French admiral who was Nelson's opponent at the Battle of Trafalgar.

[Answers on back cover]

Program delivery using mandatory co-op

BY PAUL BATSTONE

When the faculty was established in the late 1960s, it was with a decision to offer the bachelor of engineering program using a mandatory co-op model. It is a decision that has had immense ramifications on our graduates, curriculum, faculty and community.

In those early years, the market for work term opportunities was wide open, the concept was relatively new, and there was little or no competition locally or regionally. The new faculty was faced with a number of significant challenges, including hiring teaching and technical staff, developing a curriculum, expanding graduate programs, establishing new research programs, and of course, supporting the small co-op staff in creating a work term program and employer base.

Newfoundland and the other Atlantic provinces were not highly populated or industrialized compared to Ontario and Quebec, so a substantial effort was required to develop the first work term jobs. Even former Premier Joey Smallwood, in *I Chose Canada* (1973), warned of the ever-present danger created by this difference when he wrote:

“We are so far removed from the corridors of power, so far from the massed population and power of Canada, so far from the main Canadian market, so much out of the minds of Canada’s principal captains of industry and finance, that we could easily be wasted down the drain. It will require our most stubborn determination to defeat the force of megalopolis.”

However, in spite of our geographical isolation, the faculty received solid support from business, industry, and government, and the result has been an exceptionally successful engineering program. Our combination of a strong curriculum of more than 10 academic terms coupled with two years of work experience has produced graduates who are sought after upon graduation and who continue to make a valuable contribution. In recent years, this reputation has even been extended to the international level.



Although employment opportunities over the past 30 years have cycled and there have been a few periods of unemployment, even economic downturns have not seriously impacted the co-op program to the point where we would question its viability. Mandatory co-op continues to be a key ingredient in our success, and an important component in our graduates’ prospects; in fact, in recent years we have witnessed an increased demand for engineering education here at Memorial. Even as this faculty enjoys its successes, we are working to accommodate by providing additional methods of entry, such as bridging programs from community colleges and fast-track entry directly from high school.

As pleased as we are to increase our enrolment in these ways, however, these greater numbers do present challenges. Currently, we have an all-time high level of students at work (over 250 this semester), and to keep pace with these numbers, we need to expand our employer base for providing work term placements. Particularly for Term 1 & 2 students who—while not as technically advanced as more senior students—are nevertheless extremely enthusiastic and adaptable, employment work term shortfalls are reaching a critical level. To meet this challenge, we are making greater diversification in our employer base—not only within the province, but nationally and internationally, and across many industrial sectors—a paramount target.

So if you have a position or task within your company that could benefit from the expertise of a Memorial engineering co-op student, or if you’d like to hear from other employers who have benefited from their co-op experience with us, please contact me anytime: batstone@enr.mun.ca

Paul Batstone is the program manager for Co-operative Education in the Faculty of Engineering and Applied Science.

Notables

Barbara Elliott has rejoined the faculty as an administrative Assistant. Former senior secretary to the dean, Ms. Elliott worked for the faculty from 1986-1999 before taking leave to fulfill the role of executive assistant to the director



general, NRC-IMD. Her return in January brings increased responsibilities, including secretary to Faculty Council, executive secretary to EASAC, Faculty Infrastructure, liaison for APEGN, CCPE, CEAB, NCDEAS and external interfaces, support for fundraising, and assistance to the dean on academic process. Ms. Elliott has a diploma in business administration from Memorial and is currently working towards a bachelor of commerce.



Dr. Khaled El-Rayes joined the faculty in August in the role of assistant professor in the Department of Civil Engineering. Dr. El-Rayes has a Ph.D. in construction engineering and management (1997) from Concordia University in Montreal. An excellent teacher, he is currently instructing several undergraduate and graduate courses, and pursuing research into the applications of information technology and computer modeling in construction engineering and management.

Carolyn Emerson, assistant to the chair, Women in Science and Engineering was given honorary membership into APEGN at the association's conference in November. The award is for individuals who are eminent in the professions of engineering or geoscience, or who are outside these professions but have achieved unique distinction.

Faustina Hwang, a masters' student in electrical engineering, has been awarded a full scholarship to undertake doctoral studies at the University of Cambridge in the United Kingdom. The award by the Canadian Cambridge Trust enables some of Canada's most promising students to pursue graduate studies at Cambridge. Hwang is conducting research on intelligent systems at C-CORE, and will be one of the first graduates of the faculty's fast track program, under which exceptional students are registered simultaneously for an undergraduate and graduate degree.



Dr. John Molgaard and **Michael Bruce-Lockhart** were recognized with teaching awards at the APEGN annual conference for exemplary contributions in the area of engineering and/or geoscience education. Dr. Molgaard has been teaching for 30 years and is the longest serving full-time professor in the faculty. Prof. Bruce-Lockhart has been a member of the faculty since 1971. He was MUN's first professor to specialize in computer and digital technology.

Dr. Glyn George was elected secretary of the Newfoundland and Labrador Federation of School Councils for the 1999-2001 term of office. He is also chair of the School Council at Booth Memorial High School for 1999-2000 and serves as a community representative on that council.



Dr. Jim Sharp has received an award for research excellence from the National Environmental Protection Agency of China. Dr. Sharp won the award for work done



in collaboration with former MUN engineering post-doctoral student Dr. Zhenren Guo on the use of marine outfalls for disposal and natural treatment of domestic and municipal wastes. Dr. Sharp was a visiting professor in Hong Kong in 1999 and is an honorary professor of Shandong University of Technology, China.

Dr. B. P. Sinha of electrical and computer engineering recently presented at the International Conference on Recent Advances in Microwave Technology '99, in Malaga, Spain. Dr. Sinha's invited paper was on Tri-Band Vehicular Antenna Design for Land Mobile Communication. He also chaired a technical session on antennas and served on the technical program and international advisory committees.

Dr. Mary Williams of Ocean and Naval Architectural Engineering gave a presentation March 9 titled Access and Merit: the Debate on Incentive Programs, as part of the Women's Studies Speakers' Series. Earlier that same week, Dr. Williams also chaired a panel for International Women's Week.

From the editor

Software engineering. There. Someone had to be the first to say it. But now that I've said it, can we move on with other things, please? Rather than rehash old opinions, I want this inaugural issue to focus elsewhere. There are other topics, other changes in the works, and it's time to pay attention to the many other exciting, worthwhile projects and people making things happen around here.

Of course, it may be hard to deal with this change, but every now and then a shake-up is crucial. Even if the act of rocking the foundations of what we believe sometimes bring those pillars crashing down around us, it is often only through extreme challenges that we can change our minds and learn something new.

If you believe, as I do, that an open mind is not the same as an empty one, then you may also agree that the key to learning and growth is curiosity. That's why my understanding of my role here as the faculty's information officer is simple — I am here to learn: to learn what is happening in engineering here at MUN, locally, and beyond; to learn what is it about our curriculum, technology, and research that makes this program an important link in the international economy; and to learn about the people who push the action, about what they do when they aren't in the halls or the labs, and how that makes them better at their profession.

In the same spirit, I am encouraged by the curiosity expressed by the faculty's creation of the new Advisory Council. The recognition that diversity of views is a valuable tool in creating a more powerful program provides a great starting point from which to launch other learning initiatives and build community.

So as trite as it may sound, I'm hoping this newsletter can introduce us to different perspectives and other ways of thinking. At the end of the day, you may not feel altered in any significant way and, in fact, what you see here may only confirm ideas you already hold. But if you do read something provocative, see a side of an issue you didn't already know about or hadn't looked at from a particular perspective...that's where the process of understanding starts. You never know, we might even surprise you, give you that feeling of absolute and total compulsion that made you a learner, a thinker, a doer, in the first place.

It's an incredibly fertile time to be involved in engineering and there's a whole new frontier out there of uncharted territory to be mapped and explored and enjoyed. There's oil and gas under our water, there's power coursing down the mountains, and there's nickel and gold in them thar hills! So take a deep breath, release the past ... and let's go.



Susen Johnson



Sent to:



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Alumni News

John Kean, B.Eng. (Hons.) 1957, special adviser to the president and CEO of the Canadian Standards Association International, has received the ASTM William T. Cavanaugh Memorial Award in recognition for his outstanding leadership in standards development and as a pacesetter internationally in the shaping of standards in North America and globally. ASTM is a management system for the development of voluntary consensus standards for materials, products, systems, services, and the promotion of related knowledge.

Garry Briffett, B.Eng. 1984 (mechanical) is living in Traralgon, Australia, and working with Australian Paper's largest mill there. After 13 years working with Paper Machine Manufacturer and Automation throughout Australia, Finland, Spain, Mexico, and across the U.S. and Canada, Briffett, a native of Glovertown, says he and his family—wife, Denise, and daughters Allison, Jennifer, and Stephanie—are enjoying their new home very much.

Paul Griffin, B.Eng. 1987 (electrical) has been appointed vice-president, Business Development for NewTech. An AMI Group Company, NewTech is an electronics contract manufacturer operating in the telecommunications, defence, and aerospace industry sectors.

Answers to Maritime Trivia:

- | | |
|--|--|
| 1: A dolphin striker is a small spar used on a bowsprit to counteract a jib sail load using a tensioned chain or rope. | 3: Villeneuve was Nelson's opponent at Trafalgar. Nelson was killed aboard his flagship Victory during this battle, on October 21, 1805, from a shot fired from the French ship Redoubtable. |
| 2: A poop deck is a super-structure or deck at the after end of the ship above the main deck. | |

Score:

0 Hangashore, 1 Swabby, 2 Sailor, 3 Master.

Alumni:

We want to hear from you! Whether it's a promotion, new business, baby, marriage, traveling the world in a kayak, or an invention—share your great news with us, and let your fellow students know how they can get in touch with you. Contact the editor, Susen Johnson, at one of the addresses indicated on the bottom of this page, or e-mail susen@engr.mun.ca.



Attention all educators, students, policy makers, and human resource reps:

"New Frontiers, New Traditions", a national conference for the advancement of women in engineering, science, and technology will be held this July 6-8 in St. John's. Keynote speakers include Dr. Anita Borg, Kathy Sendall, and Kathy Penney. For information on the program of events and registration, visit www.mun.ca/cwse or e-mail cwse@morgan.ucs.mun.ca

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