

INTERFACES

CHEMICAL ENGINEERING AND APPLIED CHEMISTRY, UNIVERSITY OF TORONTO



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You should never let your schooling
get in the way of your education.

Mark Twain

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It has been an honour to serve as Chair of the Department for the past five years. I have been invited to serve a second five-year term starting July 1, 2006 and look forward to the opportunity. I am indebted to the many colleagues, staff, alumni, and students in whose fine company I have been privileged to work. As I approach the next five years, I will take some time to reflect.

I believe that the progression **language–leadership–citizenship** is an important evolutionary path for engineering education and the engineering profession. Engineers must step up to the challenges of public policy in a world beset with so many potential technology-driven perils. The U.S. National Academy of Engineering report *The Engineer of 2020* asserts that, if engineering is to continue to be a positive force, it is necessary to produce generations of young professionals “...who are broadly educated, who see themselves as global citizens, who can be leaders in business and public service, and who are ethically grounded.”

The progression **language–leadership–citizenship** is also an important evolutionary path for my own scholarly efforts. It has become clear to me that pursuing it is vital to the future of engineering in society, indeed vital to the future of society. Further, this endeavour is well suited to my experience and capabilities, and I am passionate about it. I have come to see the ultimate expression of leadership as citizenship and, with this realization, I have become

concerned with the lamentable weakness of active citizenship in the community of engineering professionals and in engineering education. I believe that we need to redirect our efforts toward bringing more of engineering’s capability for analysis, problem solving, design, and technological understanding to the realm of citizenship and public policy.

There are great challenges ahead!



DOUG REEVE

*Professor and Chair,
Department of Chemical Engineering
and Applied Chemistry*

A Passion for Engineering

Torino Winter Olympics bronze medalist **Jeff Buttle** is taking stock of his life. Empassioned by figure skating, he nonetheless realizes that professional competitors are considered “old” by age twenty-eight, so he must develop a second career. Fortunately, he has another passion: chemical engineering. Inspired by his dad Peter, an electrical engineer, Jeff is pursuing his B.A.Sc. in hopes of becoming a biomedical researcher.

Jeff has decided to remain a part-time student so that he can try to surpass his Torino performance at the 2010 Vancouver Olympics. This involves a gruelling training regimen with coaches Lee Barkell in Barrie, Brian Orser and Tracey Wilson in Toronto, and Rafael Aruturian in Lake Arrowhead, California. For Jeff, who started skating at age two, the discipline required to practice six days a week is well established.

His parents were surprised when figure skating did not segué into hockey, but they never wavered in their support. Without their financial and emotional help, along with mom Lesley’s organizational skills, Jeff could not have made it to the top. What enables him to withstand the “clash of egos” in the world of professional sport is that he has a vision: he knows how to set goals that will enable him to reach the next level; he is

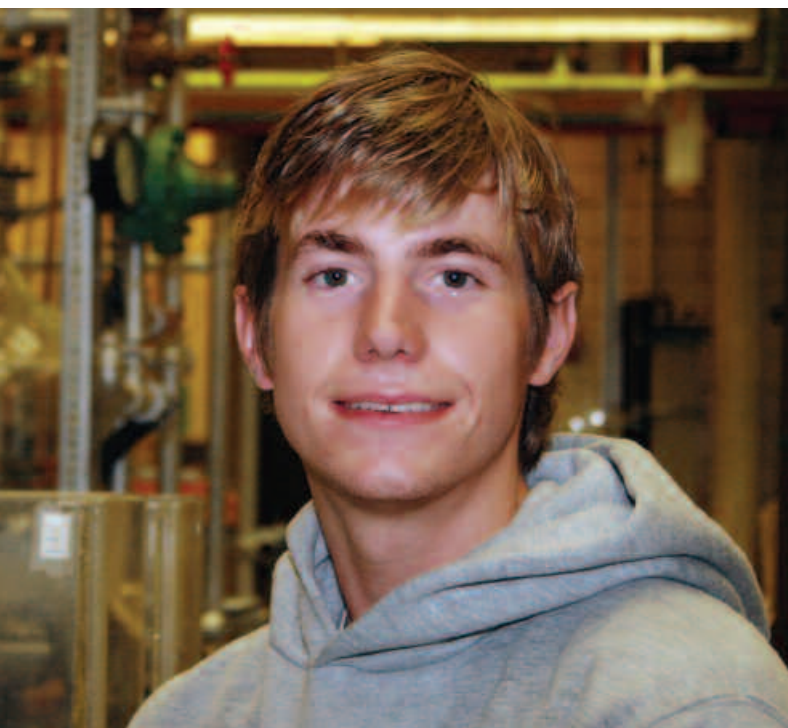
also self-critical. These leadership qualities will serve him well in chemical engineering. For updates on Jeff’s achievements, see www.jeffbuttle.com

Stepping Up Through Leadership Development

The spectacular success of the Department’s pioneering Leaders of Tomorrow program inspired Vice Dean **Greg Evans** and Department Chair **Doug Reeve** to suggest rolling out a student leadership initiative across the Engineering Faculty. In partnership with the Engineering Society and the Office of Student Affairs, Professors Evans and Reeve submitted a proposal to the Academic Initiatives Fund (AIF) in December, 2005. In March, the Provost announced that it would receive full funding: \$815,000 over four years, with a commitment of \$200,000 base funding for a fifth year. Professors Evans and Reeve will continue to play a vital role in this undertaking.

In recent years, there has been a paradigm shift in the notion of “leadership”: it can no longer be defined as a set of traits or behaviours. New ways of leading include collaboration, teamwork, and the ability to transform followers into leaders. This is especially true in engineering, where groups and teams have the potential to bring multiple approaches to a single problem or challenge.

Embracing the paradigm shift, the Department’s LOT program was conceived as a means of helping students acquire the necessary skills by offering structured hands-on learning opportunities: workshops, career panels, talks by leaders, focus groups, working group meetings, alumni/ae engagement, and alumni/ae/student interaction. The Troost endowment has spearheaded the drive to establish scholarships and awards that recruit, encourage, and recognize leadership.



Enhancing Student Experience Through Leadership Development, the Faculty initiative, extends LOT into a broader arena. The immediate goals are to develop a new senior level course called Technology Leadership and Public Policy and an enrichment course in leadership skills; to build on the robust tradition of student activity by supporting leaders in a wide range of clubs focussing on outreach, orientation, publications, and culture; and to appoint a Leadership Development Professor whose mission will be to implement and guide the program.

This last goal has already been accomplished, with the appointment by Dean **Cristina Amon** of Chemical Engineering alumnus **David Colcleugh** (Chem 5T9; M.A.Sc., 1960; Ph.D., 1962) to a three-year term, effective July 1, 2006. Dr. Colcleugh, former CEO, President, and Chairman of DuPont Canada, will share the vision, values, and expertise he acquired in his years in industry with the students of today—the leaders of tomorrow.

Chemical Engineering Dinner

Because Hart House could no longer accommodate the event, the 21st Annual Chemical Engineering Dinner was held in a new venue. This year, over four hundred guests brought the ballroom of the 89 Chestnut Residence to life. As they relaxed over drinks, they were entertained by the Engineering Stage Band, directed by **David Lee** (Eng Sci 0T7). The highlight was a performance of Santana's *Smooth* by singer **Prithwin Varghese** (Chem 0T7).

Graced by appearances by outgoing Dean **Tas Venetsanopoulos** and his successor **Cristina Amon**, the first woman dean of the Faculty, the event honoured the classes of 5T6 and 8T1 as they prepared for their fiftieth and twenty-fifth reunions. Retiring Professors **Stephen Balke** and



From left to right: Rachel Castelino, Padma Mahadevan, Melanie Bailey, Bill Troost, and Kathleen Troost.

David Boocock were celebrated for their stellar contributions, and the generosity of the corporate donors was acknowledged by Chair **Doug Reeve**. This year, there were nineteen sponsored tables, up from sixteen last year.

However, the focus was on the Department's exceptional undergraduate students, whose achievements were recognized with a panoply of awards. Of particular interest were the LOT (Leaders of Tomorrow) Awards. **Bill Troost** (Chem 6T7), founder and President of Peel Plastic Products, and his wife **Kathleen** have pledged \$25,000 a year for ten years as base funding for the LOT program, which will give hundreds of students the opportunity to enrich their skills and university experience.

The serious tone of the awards ceremony was interrupted by the announcement that **Mei Ling Chen** (Chem 0T7) had just been elected President of EngSoc. The ballroom exploded with cheers and good wishes.

Look for information about the 22nd Annual Chemical Engineering Dinner on page 16 and in the spring edition of INTERFACES.

Leaders of Tomorrow Award Winners

Stephanie McTague (Chem0T7) has won the Leaders of Tomorrow Award endowed by the class of Chem 5T9 in honour of their fiftieth anniversary. An all-round athlete who has participated in field hockey, flag football, lacrosse, and rugby, Stephanie has been coach of the Women's Intramural Rugby team and has organized men's and women's rugby tournaments involving teams from various Ontario university engineering faculties. In 2005-2006, Stephanie was Women's Director of the Engineering Athletic Association. She also set up the 2006 Chem Chariot Race Committee, and her skill as a recruiter helped ensure the team's victory.

Stephanie's academic record matches her achievement in sports. She is pursuing the Collaborative Environmental Engineering option, and last year, after finishing the requirements for



the Preventive Engineering Certificate, she made the Dean's List. Her goal is to become a process engineer in the petroleum industry, applying preventive engineering principles to innovate environmentally friendly production techniques. Stephanie loves to dance the highland fling, which she learned from her mother.

Jennifer Sauks (Chem 0T8) is the recipient of the Leaders of Tomorrow James W. Smith Award. Already the winner of the 2004 Enwave Leadership Award, which recognizes the achievements of

beginning students, she was one of the few first-year students to participate fully in the 2005 summer leadership program. Her academic achievements are complemented by her involvement in



sports. A member of the UofT Triathlon Club, she is striving to qualify for the Canadian Age Group National Triathlon Team. She is also a member of the Varsity Rowing Team and, last fall, won a gold medal at the Ontario University Athletics Championships. Jennifer loves sport so much that she could never give it up.

Jennifer's father, the local doctor, and her mother, an artist, run a hobby farm in Owen Sound, where the animals are pasture-fed or given organic grains. Interacting with nature from an early age, Jennifer developed an awareness of ecological issues that she hopes to instill in others. She is pursuing environmental engineering, with a focus on environmental remediation.

CSCHE Student Chapter Wins Distinction

The University of Toronto CSCHE Student Chapter is the 2006 winner of the Student Chapters' Merit Award of the Canadian Society for Chemical Engineering. The selection was made by members of the Society. A plaque will be presented during the Awards Luncheon at the 56th Canadian Chemical Engineering Conference in Sherbrooke on October 16, 2006.

Making a Contribution

Allison Waller is a fourth-year Ph.D. student. Her supervisor, Professor **Elizabeth Edwards**, studied contaminated soil from a site near Kitchener which contains trichloroethylene (TCE), an industrial degreaser. During degradation, it is partially dechlorinated, and a toxic intermediate, a known carcinogen, builds up. Professor Edwards observed that the TCE in this sample was completely dechlorinated to ethylene and realized that a naturally occurring bacterium, *dehalococcoidis*, can dechlorinate TCE without oxygen.



Allison studies the genes expressed during dechlorination of TCE with the ultimate goal of developing biomarkers that can verify whether complete dechlorination with *dehalococcoidis* is possible. She uses custom DNA microarrays which contain the DNA of the whole culture from the Kitchener site. Her contribution is statistical verification that the microarrays work.

Allison and her husband, Sasha Necakov, a Ph.D. student in medical genetics, recently had a son, Kieran. Allison now works on data analysis at home, and her understanding supervisor comes to meetings at her house.

Stéphane Lévesque is completing a Ph.D. with Professor **Molly Shoichet**. Building on pioneering work which made scaffolds for tissue grafts from the synthetic polymer PEG, Stéphane's idea was to use a different polymer to

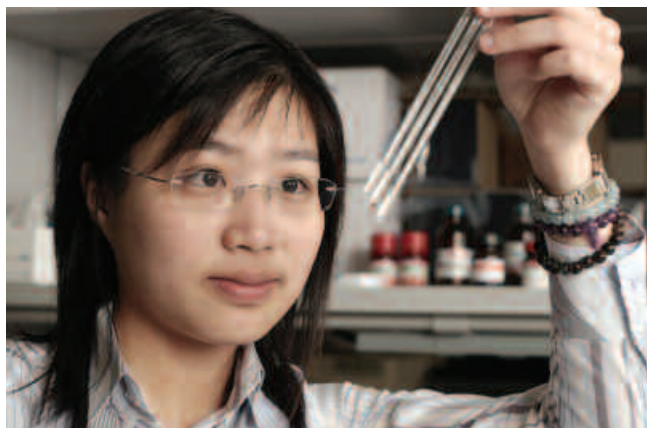


produce a scaffold that is enzyme degradable. He chose the polysaccharide dextran, which was already employed in drug delivery. Despite suffering intense grief after the death of his father, Stéphane persevered and showed that the use of dextran makes it possible for neurons to grow inside his scaffold.

Involved in academic research for over a decade, Stéphane feels that he needs a new challenge. He hopes to become a consultant in the biotech or pharmaceutical industry.

Laura Yu, a third-year Ph.D. student who also works with Professor **Shoichet**, is attempting to create an immobilized concentration gradient of nerve growth factor (NGF) to guide axon growth in the regeneration of transected nerves.

Previously, NGF had been physically entrapped in a polymer, forming a concentration gradient; neurons extended axons to the higher end. The next step was to entrap NGF in a biodegradable material such as chitosan.



Laura's contribution was to modify chitosan to incorporate a crosslinker, making it possible to chemically attach NGF. Applying cells to the material, she found that they survive within the culture, but after they are extracted, survival is poor. Laura will use the chemical attachment of NGF to chitosan as a tool for improving cell survival, either by increasing NGF concentration or by allowing it to be uptaken.

Laura volunteers at the Math Institute of Scarborough, where she herself learned the Kumon approach. She now helps the next generation master mathematics.

Meng Shi, another third-year Ph.D. student in Professor **Shoichet's** group, has developed biodegradable nanoparticles for targeted and controlled delivery of anti-cancer drugs.

She has successfully synthesized a polymer which self-aggregates into nanoparticles with a functional group on the surface, confirming by Diels-Alder chemistry that the particles can bind maleimide modified antibodies with high efficiency. The resulting immuno nanoparticles, containing an anti-cancer drug, are a good size for intravenous drug delivery. They can recognize specific types of cancer cells that overexpress antigens.

Meng's eleven-month-old daughter Bo Ning has been living in Buffalo with her dad, a Ph.D. student in civil engineering. Meng perseveres with her research despite having to commute each weekend to see them.

Kyla Augustine is an M.A.Sc. student who studies financial process engineering. Although her undergraduate thesis investigated air pollution, she welcomed the challenge of working with Professor **Joseph Paradi**, who is "not afraid to try anything".

Kyla's project involves modelling the wire payment service at a major Canadian bank as an



analogue of a chemical engineering process. The goal is to compare two strategies for managing overdraft accounts using a modified version of a software package developed for the pulp and paper industry. Tanks with inlets and outlets represent accounts and cash flows. The package is not yet hooked up to the bank's system in real time, but Kyla makes monthly reports on the results of her analysis.

This summer, she taught the interactive DEEP course "Engineering on Bay Street" to gifted high school students, introducing them to the economic side of engineering.



Raheem Peerani, a Ph.D. student cosupervised by Professors **Peter Zandstra** (Chemical Engineering) and **Eugenia Kumacheva** (Chemistry), is trying to understand signalling in embryonic development.

His project considers the patterning of mouse and embryonic stem cells on a two-dimensional surface. Raheem asks whether it is possible to manipulate spatial organization and signalling patterns so that more robust control can be directed over cell fate by mimicking the interactions in the embryo. He uses a “potato stamp” to print proteins onto a 2D surface with microscale features. Cells attach to the proteins specifically, creating spatial organization.



Raheem's premise is that based on the geometry, stem cell self-renewal and differentiation can be controlled.

Ultimately, Raheem would like to generate a mathematical model that explains what happens at the signalling level. This tool could be used to study how to activate pathway change. The potential applications are almost limitless.

Raheem is a volunteer grade eight math and science tutor at ITREB, an Ismaili religious and cultural education centre. He helps recently arrived immigrants, many of whom have been in refugee camps, adapt to Canada.

Leaders of Tomorrow—Graduate Initiative

In September 2005, six graduate students from ICEGSA launched an initiative to enhance professional development and hone leadership skills, presenting popular seminars on project management and gaining P.Eng. status and a panel discussion on careers in academia. Graduate students were encouraged to become involved in an impressive list of projects that foster team skills through hands-on experience. **Catherine Kang** organized a group that participated in educational outreach programs for high school students, **Doug Baumann** led a team which wrote a brief guide for new graduate students, and **Angela Tran** and **Olive Li** are carrying out the organization and fundraising for the summer 2007 technology tour to California. At the same time, **Nick Coulthard** and his team are investigating ways to improve sustainability in the Wallberg Building, **Kyla Augustine** and **Andrea Chan**, inspired by Engineers Without Borders, are working with the Faculty to promote engineering social awareness, and **Zoë Coull** and her team are exploring the possibility of revitalizing the Graduate Common Room into a centre for professional activities.

Graduate Alumni/ae Dinner

Sonia De Buglio (Chem 9T4; M.A.Sc., 1998), the Department's Manager of External Relations, plays a key role in organizing the Annual Chemical Engineering Dinner. At this year's event, she realized that the undergraduates took centre stage and decided that the Department needs a separate occasion on which to fête its graduate students and alumni/ae.

The Graduate Alumni/ae Dinner will make its debut on October 27, 2006 at the Faculty Club. Research groups are encouraged to appoint representatives. For more information, please contact Sonia at (416) 978-7880, or e-mail her at debuglio@chem-eng.utoronto.ca

An Environmentalist at Heart

Professor **Donald Mackay** obtained his B.Sc. (1958) in Chemical Engineering from The University of Glasgow and his Ph.D. (1961) from The University of Glasgow and The Royal College of Science and Technology, now The University of Strathclyde. He was awarded an NSERC to come to the Department to work with Professor **Olav Trass** on



reactions in shock waves, continuing with the project for three years before moving to Imperial Chemical Industries (Petrochemicals Division). In 1967, he received an offer from then Chair Professor **Breckenridge**, who said: "I have no idea what the salary will be, but it will be enough to live on." A true academic, Professor Mackay accepted the position, remaining at UofT until 1995, when he took early retirement to assume an Industrial Research Chair at Trent University.

Professor Mackay has always recognized the importance of environmental issues. Over the years, he became less interested in chemical engineering in the context of industrial processes because it was already well done, and he thought he could contribute better by bringing engineering principles to bear on environmental problems. Throughout his teaching career, he tried to communicate his fascination with both physical chemistry and applied chemistry to his students and felt that most of them perceived it.

During his working life, Professor Mackay observed a radical change in the profession. He recalls that, in the early days, processing engineers were hostile to environmental issues, viewing environmental constraints as a "nuisance" because they were counterproductive in terms of profit. It took quite a few decades to change this attitude, and Professor Mackay is gratified that chemical engineering has now fully taken up the challenge.

A recent contribution to the new direction has been the five volume *Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals*, coauthored with **Wan Ying Shiu, Kuo-Ching Ma, and Sum Chi Lee**. The first edition, which came out in 1992-7, incorporated about twenty years' worth of data, and the second edition added everything up to 2005. The inspiration for the *Handbook* came from Professor Mackay's postdoc Wan Ying Shiu, who ran his laboratory, conducting numerous projects on physical-chemical properties of organic chemicals and modelling information. It was her idea to collect the resulting data and data from other sources. She was aided in this task by her husband Kuo-Ching Ma. Professor Mackay's former graduate student Sum Chi Lee (M.A.Sc., 1992) played a key role in computing data for the second edition, and research colleague **Sally Paterson** was responsible for much of the computer modelling. The *Handbook* has become a standard reference for dealing with environmental contamination, providing the information required for effective remediation. It is Professor Mackay's gift to the future.

Professor Mackay hung up his lab coat for good in 2005. His current passion is the cottage he and his wife bought on Canning Lake. After working for many years to preserve nature, Professor Mackay will now have the leisure to enjoy its beauty.

An Academic at Heart

The Department welcomes Assistant Professor **Krishna Mahadevan**, who specializes in computational models for biological systems. A graduate of the Madras Indian Institute of Technology (B.Sc., 1997) and the University of Delaware (Ph.D., 2002), he completed a postdoc at a small start-up company in San Diego called Genomatica. After only eight months, he was made a research scientist and began collaborating with Professor **Lovley** at the University of Massachusetts, Amherst to develop models for a family of metal breathing bacteria. These microorganisms breathe heavy metals the way we breathe oxygen, degrading them and precipitating them from solutions. In addition to their potential for cleaning up pollution, their ability to generate electricity from organic waste makes them good candidates for use as catalysts in microbial fuel cells.



Professor Mahadevan decided to return to academia because he wanted to establish the basic science underlying the modelling of microbial systems. He feels more comfortable on a university campus, where intellectual exploration is encouraged. However, he is grateful for his experience at Genomatica, which helped him acquire a good sense of commerciality.

The models Professor Mahadevan has worked

on so far are deterministic, with no stochastic element. He wants to expand them into more sophisticated models that consider multiple cells, multiple interacting species, or complex environments such as groundwater with microorganisms, a flow element, and speciation. Eventually, he would like to engineer microorganisms to make a range of environmentally friendly products, in particular, wood degrading fungi. A long-range goal is to develop these types of models for human metabolism, perhaps illuminating the mechanism underlying diabetes or obesity.

Through the exploration of biotechnology, Professor Mahadevan hopes to use his skills and talents to reach as many people as possible. Microbial fuel cells, for example, could address the dichotomy between rich and poor worldwide. With his wife, Deepa, a microbiologist obtaining her Ph.D. at Oregon State, he indulges in his favourite pastime: visiting national parks. His ambition is to see the Grand Canyon. These serene and peaceful environments are reminders that there are “things beyond us”.

Retirements

Professor **Stephen Balke** received his B.Eng. in chemistry (RMC, 1964). After three years in the Royal Canadian Air Force, including two at the Defence Research Board, he obtained his Ph.D. in chemical engineering (McMaster, 1972). He joined the Department from the Xerox Research Centre of Canada in 1984 with a strong desire to help students achieve their full potential. Professor Balke brought his polymer course to life by presenting the fundamentals and then illustrating them in terms of industrial processes. He taught statistics from the perspective that chemical engineers are “universal engineers” because of their ability to interpret any type of data correctly, despite the presence of variability. Intent on encouraging his students to enjoy and use statistics, he devised experiments



that could be performed without a laboratory, such as determining whether an ink droplet would spread or finding the value of a spring constant: “anything to get them measuring.” His interest in statistics expanded to include data mining, which played an important role in his graduate courses and research.

Professor Balke supervised fifteen Ph.D. and twenty-nine M.A.Sc. students working on projects involving plastics processing, plastics analysis, and in-line monitoring. He emphasized the need to pay equal attention to molecular property analysis and the chemical engineering process, as well as the importance of statistics. The ultimate goal was to develop useful mathematical models by identifying the dominant mechanisms present in a complex process.

Professor Balke and his students worked in close collaboration with many companies. Currently, he represents Canada on the governing board of the International Symposia for Polymer Analysis and Characterization (ISPAC), and he is also a consultant and expert witness in patent litigations for several major industries. He is a cofounder of iSmartsoft Inc., a

company specializing in adaptive machine learning. When Professor Balke was asked to characterize his years in the Department, his response was one word: “fun”. He greatly appreciates the assistance he has received from students and colleagues over these twenty-two years. Retiring will give him more time to spend with his family, including his two young grandchildren, and to explore new opportunities.

Professor **David Boocock** is retiring after more than thirty years. A winner of the Faculty Teaching Award (1987-88), he likens teaching to stage activity. He is a natural showman, fondly remembered for the Mickey Mouse ears he wore at the Open House magic show. Having found that teaching is “exhausting if done well”, he will continue to take on fourth-year thesis students, but his focus will be on research and his graduate students.

A chemist by training, Professor Boocock received his Ph.D. (1967) from Imperial College, London. He accepted a postdoc at the Synvar Research Institute in California, where he became interested in applied research. However, the lifestyle was too freewheeling for an Englishman, so he decided on Canada as a compromise. In 1974, he was offered a position in the



Department by then Chair **Bill Graydon**. Boocock turned it down and almost immediately regretted the decision. Fortunately, Graydon came back with a better offer.

Hired at about the same time as **Michael Sefton** and **Donald Cormack**, Boocock joined forces with them to help build the Department. This meant assuming administrative duties along with a heavy teaching load. Over the years, Professor Boocock served as Undergraduate Coordinator, Graduate Coordinator, Associate Dean and Chair of First Year Studies at the Faculty, and Chair of the Department (1996-2001).

Through it all, he made a conscious effort to keep his research going. After working on deriving fuels from biomass, Professor Boocock became intrigued by a project involving liquefying sewage sludges, from which he learned that pyrolysis of lipids produces good oil and pyrolysis of proteins produces bad oil. When he studied the literature on making biodiesel, he realized that something was not right. All previous work had ignored the fact that methanol and vegetable oil do not mix: the reaction is not one phase, but a two-phase system. Professor Boocock compares the discovery of this research area to “going into an old gold mine and finding the ore still there.”

With the help of the University's Innovations Foundation, investors were found, and the spinoff company BIOX was formed. BIOX purchased Professor Boocock's technology, an inert cosolvent to make the reaction become one phase and to make it continuous. He hated the name BIOX, thinking it sounded like a laundry detergent with enzymes, but its impact helped the technology achieve commercial success. BIOX has now built a 60 million litre per year plant in Hamilton.

A passionate amateur genealogist, Professor Boocock is proud to be descended from Yorkshireman Jeremiah Bulcock, who, in 1766, fathered a child with his wife's sister Mary Tate. She is described in the parish register of Almondbury as a “Strumpet and a Jade”.

Fond Farewell

It is with regret that the Department announces the resignation of Professor **David Kuhn**, effective August 31, 2006. Professor Kuhn has accepted the position of Head, Department of Mechanical Engineering and Manufacturing at the University of Manitoba. He has served the University and the Department well for the past fifteen years as teacher, researcher, and administrator. He will be deeply missed. All of us who have had the pleasure of working with him join in wishing him every success in his new post.



Honours

Professor **David A. I. Goring** will be inducted into the Paper Industry International Hall of Fame at the twelfth annual induction ceremony on September 28, 2006 at the Radisson Paper Valley Hotel in Appleton, Wisconsin. Recipient of the 1986 Gunnar Nicholson Gold Medal Award and the 1995 John S. Bates Memorial Gold Medal, the highest award for pulp and paper research in Canada, he was selected for the Hall of Fame, along with five other paper industry leaders, in recognition of achievements that span five decades.



From 1955 to 1985, Professor Goring filled the gamut of scientific and administrative positions at PAPRICAN while simultaneously teaching and conducting research. Upon his retirement, he accepted Professor **Howard Rapson's** invitation to become a professor in the Department. For the next twenty years, he nurtured students and enriched intellectual life at the Pulp & Paper Centre. Professor Goring's impressive body of research on wood science straddles the theoretical and applied domains, but, in the words of colleague and biographer **Norman Lewis**, he has not "been a man riding two horses: applied and fundamental research. Instead, he has been riding one—that of good science!"

Professor and Chair **Doug Reeve**, Professor Emeritus **Jim Smith**, and Dr. **Larry Seeley** were appointed to the Canadian Academy of Engineering on June 16 during the Annual General Meeting in Ottawa.

Doug Reeve has directed his research toward reducing the environmental impact of organochlorine produced by the pulp and paper industry. He is a master communicator, skilled at making scientific ideas accessible to the broader community and at teaching this art to young scientists.

Jim Smith, Chair from 1985 to 1996, is renowned for having built the Department's academic staff. He recruited eighteen new faculty, including four women and members of visible minorities. The author or co-author of over 100 publications and holder of over 30 U.S. patents, Smith is President of Apollo Environmental Systems Ltd, a supplier of gas-liquid contactors for the environmental control of hydrogen sulphide in natural, industrial, and bio-gases. He is also Chair and Director of Thor Technologies Corp., which is engaged in the development of a high-shear technology for reducing the viscosity and increasing the solids content of Kraft process black liquor.

Larry Seeley (Chem 6T6, M.A.Sc. 1968, Ph.D. 1972) has been recognized for outstanding entrepreneurship. After building the highly successful SGS Research, he launched a second venture, ArgentoPlata Metals Ltd.

Taking Care of the Hard Science

Michael May was a student (Chem 9T1; Ph.D., 1998) in Professor **Michael Sefton's** tissue engineering lab, working on microencapsulation. Another doctoral student, **Julie Babensee**, participated in a collaborative in vivo experiment in which blank control polymer microcapsules were implanted in rats. She analyzed the blood vessels that were observed to have formed around the polymer.

This single serendipitous observation suggested that the inevitable reaction to polymers could in fact be therapeutic. Thus arose the idea of Theramers™, medical polymers that have biological activity in and of themselves, without the use of drugs. Unlike inert biomaterials, Theramers™ are regulated as devices, a key advantage which reduces the timeline and cost to market. Their versatility lies in the possibility of tailoring their responses; moreover, they act locally without systemic consequences.

Always entrepreneurial, May was not interested in becoming an academic, but Professor Sefton warned him that it would be extremely difficult to get a job as a biomedical researcher in Canada. May, however, was

determined not to cross the border, so he created a job for himself. Trading on his childhood experience as sole proprietor of Mike's Cool Delights, an ice cream bar at soccer games, he found a niche: instead of a product, he would take academic research to the market. In 2000, he and Professor Sefton launched **Rimon Therapeutics**. Sefton's son Ari chose the name, which is the Hebrew word for pomegranate, since the internal structure of the pomegranate resembles polymer beads surrounded by blood vessels.

From the outset, Professor Sefton emphasized the importance of taking care of the hard science first, and, as he predicted, the focus on research paid off. Today, Rimon's lead technology is an MMP (matrix metalloprotease) inhibiting chronic wound dressing designed for use in the treatment of diabetic ulcers and bed sores. High concentrations of MMP in chronic wounds cause tissues to degrade faster than they can heal; Rimon's product MI-sorb™ normalizes MMP levels so that healing can occur. Human clinical trials are now being conducted in collaboration with Dr. **Gary Sibbald**, a world renowned dermatologist at Women's College Hospital and a member of the University of Toronto teaching faculty.



As an undergraduate, Michael May was co-chair of Chem Club and CEGSA. He is now on the Department's Board of Advisors, and Rimon supports a table at the Annual Dinner. The strength of Rimon is its strong ties with Toronto's Discovery District, including the MaRS facility, which enable the company to operate with low overhead on campus and in hospitals. Chemical Engineering plays a crucial role: Rimon leases its polymer synthesis lab from the Department and has licenced technology from some of the other labs, notably a thermoreversible gel developed by Professor **Yu-Ling Cheng**. Perhaps most important, Rimon Therapeutics draws its pool of talent from Chemical Engineering. Its research staff are all graduates of the Department, forming the basis of a symbiotic relationship which Rimon hopes to nurture.

Rimon has recently been designated by BIOTECCanada as one of the country's two most promising emerging biotech companies. According to Chief Operating Officer May, it is remarkable that this small Canadian company has managed to survive for six years, increasing its base from one to five technologies and growing from one to ten employees. However, Rimon's greatest achievement is that it has succeeded in getting a product into human trials. This is in no small part due to May's vision and courage and the support he has received from Professor Sefton and the Department.

To find out more about Rimon and investment opportunities, visit www.rimontherapeutics.com

Honourary Doctorate for Frank Dottori

On June 12, 2006, Chair **Doug Reeve** had the honour of asking the University to confer the degree of Doctor of Laws, *honoris causa*, upon Department alumnus **Frank Dottori** (Chem 6T3).



From left to right: Dean and Professor Emeritus Michael Charles, Frank Dottori, and Doug Reeve.

Frank set new standards for corporate citizenship when, in 1972, he saved the pulp mill town of Temiscaming, Quebec from certain demise. A major international company had closed the mill, and within days, five hundred employees had been laid off. Frank, then a thirty-three-year-old chemical engineer, developed a vision of "a company of people building their own future." He and his colleagues took over the mill and, through his leadership, turned a fledgling company into Tembec, Inc., an international forest products giant.

Frank was President and CEO of Tembec from 1979 until his retirement earlier this year. Under his guidance, the company evolved socially responsible policies, forged links with unions, First Nations, local business, and environmental groups, and committed to third-party certification for responsible management of its forest lands. Tembec has also given longstanding support to the Faculties of Forestry and Engineering, endowing a chair in each. Frank's legacy is his transformational vision: he has shown us how great things can be accomplished through the commitment of a single individual.

Baby Chemistry

Vishal Ahuja (M.A.Sc., 2001) and his wife Priti rejoice in announcing the birth of their daughter Diya Raj Ahuja on February 8, 2006. She weighed 7.3 lb.



Congratulations to **David Schryer** (Chem 0T0; M.A.Sc., 2005) and his wife Maris Eigi (M.A.Sc., 2004) on the arrival of their daughter Debi Schryer, who was born on February 18, 2006, weighing 8.8 lb.



Livia Lau (Chem 9T9) and husband **Garros Fung** (Ind Eng 9T9) are thrilled to announce the birth of a baby girl on January 17, 2006. Gianna Fung weighed 7 lb, 7 oz.



Rainey Wang (Ph.D. candidate) and his wife Cindy had a baby boy on April 6, 2006. Matt weighed 7 lb, 15 oz at birth.



Elizabeth Da Costa (Chem 0T1) and her husband **Alex Damjanoski** (EE 0T1) welcomed their daughter Isabella Damjanoski on January 21, 2006. She weighed 6 lb.



Mark A. Smith (M.A.Sc. candidate) and his wife Simone are pleased to announce the birth of Matthew Justin Smith, who was born on April 23, 2006, weighing 9 lb, 3 oz.



David Balke (Chem 9T1; M.A.Sc., 1994; Ph.D., 2006) and his wife Heidi welcomed Lauren Elizabeth Balke, a sister for Matthew. Born on April 19, 2006, Lauren weighed 8 lb, 6.2 oz.



Olive Yuan (Ph.D. candidate) and her husband Freeman Yufei Huang had a baby girl on May 13, 2006. Cynthia Xinyuan Huang weighed 7.1 lb at birth.

Congratulations to **Paul Jedynak** (Chem 9T5) and his wife Marian on the birth of their son on May 17, 2006. Peter Thomas Jedynak weighed 9 lb, 10 oz.



Kevin Zhang (M.A.Sc., 2004) and his wife Tracy Yang are the proud parents of Charles Sheng Hao Zhang, who was born on June 21, 2006, weighing 8 lb, 1 oz.



Isabelle Bourgeois (Chem 0T2) and her husband Ryan Morris joyously announce the arrival of their daughter Audrey Marie Katherine Morris, who was born on July 8, 2006 and weighed 7 lb, 14 oz.



Congratulations to **Ayan Chakraborty** (Ph.D. candidate) and his wife Sritama, whose son Ayush was born on December 13, 2005.



Edward Yee (Chem 9T4) and his wife Brenda became the parents of a baby girl on January 9, 2006. Brianna weighed 6 lb, 13 oz at birth.



Bonding

Monika Chmiel (Chem 0T5+PEY) and Chris Skonieczny are thrilled to announce their engagement.

Rami Abouatallah (Chem 9T7; Ph.D., 2002) and Sonja Atkins were married in Toronto on October 15, 2005.



To contribute family news, please contact Sonia DeBuglio.
Telephone: 416-978-8770
Email: debuglio@chem-eng.utoronto.ca

Upcoming Events

Mark your calendar. These events are the perfect venue for expanding your mind or reuniting with classmates and professors.

September 2006 to April 2007

The Department will host a series of superb talks: **LECTURES AT THE LEADING EDGE**. We hope you will join us to learn about a broad spectrum of international cutting-edge research. For more information, visit our website at: www.chem-eng.utoronto.ca

October 27, 2006

The Department will hold its first **Graduate Alumni/ae Dinner** on Friday, October 27, 2006. The event will bring together former graduate students and their supervisors, as well as former members of each research group. Please join us for an unforgettable evening of reminiscing with old friends. Meet the generations of students that have passed through your lab, network, and reengage with the Department.

If you would like to organize a get-together or exchange information, contact Sonia De Buglio at debuglio@chem-eng.utoronto.ca or (416) 978-8770.

November 2, 2006

Dr. **Bert Wasmund** (Ph.D., 1966), Executive Director of Hatch Associates, and Professor Emeritus **Jane Phillips** (Chem 5T3), former President of the PEO, will be inducted into the Engineering Hall of Distinction at the **Engineering Alumni Association Annual Alumni Awards Night**. For more than thirty-five years, Dr. Wasmund has been recognized as an international expert in metallurgical and chemical processes for smelting metals. With the Hatch team, in 1989, he revolutionized platinum

smelting with the design of a novel electric furnace. Professor Phillips, a researcher in the area of catalysis, has a history of extensive involvement with professional and scientific societies. She has also been a mentor to students, serving as a role model to female students in Chemical Engineering.

The dinner will be held in the Grande Ballroom at 89 Chestnut Street, Toronto. For more information, contact Mary Butera in the Engineering Alumni Office at (416) 978-4941 or butera@ecf.utoronto.ca

November 18, 2006

The annual **Professional Engineers Ontario Awards Gala**, which celebrates best practices among engineers in the province, will be held on November 18, 2006. This year, alumnus **Phillip J. (Rocky) Simmons** (Chem 6T4; M.A.Sc., 1965; Ph.D., 1968), President and CEO of Eco-Tec Limited, will receive the Engineering Medal in the Entrepreneurship Category. Professor **Masahiro Kawaji** will receive the Engineering Medal in the Research and Development Category.

The Gala will take place at The Carlu, Toronto. For more information, visit the PEO website at www.peo.on.ca

March 23, 2007

The **22nd Annual Chemical Engineering Dinner** will take place on Friday, March 23, 2007 at 89 Chestnut Street in Toronto. All alumni/ae are welcome as we honour the graduating classes of 8T2 and 5T7. We hope you will bring your classmates. For information about arranging a class reunion or sponsoring a table, contact Sonia De Buglio at (416) 978-8770 or debuglio@chem-eng.utoronto.ca

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