THE CANADIAN ACADEMY OF ENGINEERING
L'ACADÉMIE CANADIENNE DU GÉNIE

NEWSLETTER / COMMUNIQUÉ

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A newsletter for the information of the Academy, and a record for other engineering academies and organizations

Inside this issue:

President's Message

P. Kim Sturgess, FCAE, P.Eng.

Welcome to all the fellows of the Canadian Academy of Engineering. It is a great honour to serve as your President for this next year. Thanks to everyone who participated in the Annual General Meeting and Symposium in Vancouver. The enthusiasm of the current Fellows and especially new Fellows was palpable and I look forward to working with you over the coming year.

At the Annual General Meeting I outlined several areas of focus for my term. I have divided these focus areas into three concrete deliverables and three enabling activities. These will guide my activities over the next year and I look forward to hearing your feedback and input on our direction.

First, as you all know, the Academy has entered into a partnership with the Trottier Family Foundation and the David Suzuki Foundation to engage in the Trottier Energy Futures Project. This project has been underway for a year now. It is absolutely vital that we engage in this project in a positive and helpful way to ensure that the outcomes reflect the very best input that our talented Fellows can provide. In addition, it is vital that we clarify the role of the Energy Pathways project and commit the resources that we need to support this excellent work to its conclusion. Stability in leadership by the Academy in both of these projects is essential to optimizing the value that we can add. To this end, we will be meeting as a new

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Special Events

2011 DINNER, INDUCTION OF NEW FELLOWS, ANNUAL GENERAL MEETING AND SYMPOSIUM ON "CANADA AS A SUSTAINABLE ENERGY SUPERPOWER: REALIZING THE VISION"

The 2011 Annual Meeting of the Academy was held in Vancouver on June 2nd and 3rd. It brought Fellows and guests together for the Dinner on the evening of June 2nd and for the Symposium on June 3rd. The Annual General Meeting was held prior to the Symposium on June 3rd.

The evening began with a reception at the Sutton Place Hotel

The Dinner took place in the Le Versailles Ballroom in The Sutton Place Hotel attended by 130 people; the highlight of the event was the induction and welcome of the new Fellows. Twenty-five of the forty-five newly-elected members were able to attend the Induction ceremony. After dinner, Lorne Trottier gave an overview of the

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President's Message (cont'd)

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board early in my term to confirm our governance of these very key projects that are consuming a good portion of our time and resources over this year.

Second, given that we have been almost exclusively focussed on energy issues over the last few years, it is vital that we expand our horizons into other areas that are critical for engineering in Canada. By the end of my term I want to launch at least one new collaborative project. Innovation and labour issues are two possibilities. To action this, we will be re-energizing the New Directions and Public Policy Committee and tasking its members with developing themes for projects and their implementation plan.

Third, over the last several years there has been a decline in the participation of industry members and companies in Academy activities. For those who reviewed the financial statements, it should come as no surprise that the current financial model for the Academy does not allow for growth and new initiatives based on membership dues alone. It is critical that we find ways to engage more industry participation in the Academy's initiatives. This will be driven by expanding our industry membership. Axel Meisen has graciously agreed to follow up on the excellent work that he and his task force did over this last year on diversifying our membership, which includes recommendations around attracting new Fellows from industry.

To action these aggressive goals, we need to enable our members and our Academy support organization to contribute to the Academy more than ever before.

First, we need to stabilize the Academy office. As you know, Michael Ball gave his notice to retire as Executive Director of the Academy. Michael has graciously continued to serve in his position until a suitable replacement is found. We cannot depend on Michael's generosity indefinitely. It is a key deliverable for this year to identify and recruit a new Executive Director, and allow for an orderly transition from Michael to the new Executive Director. This is a high priority for this year. You have received a request for suggestions on possible candidates for Executive Director. Please respond with your ideas and suggestions.

Second, we need to clarify, confirm and leverage our relationships with our sister organizations and potential partner organizations. These include the Council of Canadian Academies (CCA) and the other CCA member academies – The Royal Society of Canada and the Canadian Academy of Health Sciences; the Canadian Engineering Leadership Forum (CELF) members, namely, Engineers Canada, the Engineering Institute of Canada, the Association of Consulting Engineering Companies – Canada, the National Council of Deans of Engineering and Applied Science, and the Canadian Federation of Engineering Students; CAETS Member Academies, the Canadian Society of Senior Engineers, and others. Specifically, this year I want to focus on strengthening our relationship with the CCA. They are our landlords and we are one of three member academies of the Council. We can build on a strong base to find more opportunities to engage our Fellows in the good work of the Council.

Third, we need to engage our members in all of the activities outlined above. The strength of the Academy is in its membership. To that end, I plan to launch regionally based programs so that more of our members can engage personally with other Fellows to share ideas and interests. This could be as simple as organizing regular dinner meetings in each of the major cities. Any suggestions in this area are most welcome.

Finally, we need to enhance the visibility of the Academy. The year 2012 is the 25th Anniversary of the Academy. This is a year to celebrate and position ourselves for the next 25 years. I look forward to working with all of you to make this next year a great one.

P. Kim Sturgess, FCAE, P.Eng.

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New Fellows 2011

First row (seated): Said Easa, John M. Beck, H. N. (Hank) Edamura, Catherine Karakatsanis, John Bianchini, Anthony Rosati, Anton Ellis Davies, Dennis E. Becker, Dawn Tattle, Weihua Zhuang

Second row (standing): W. J. Murray Douglas, David Sego, Gerry Price, Wenyuan Li, Thomas Tiedje, Mohamed Lachemi, Louis Cloutier, H. I. H. Saravanamuttoo, J. Douglas Dale, Andreas K. Athienitis, Jacques A. de Guise, Jean Paris, Thomas Oxland, Robin Drew, Peter Halsall

New Fellows not in attendance: Richard Boudreault, Ron Britton, Allan I. Carswell, Luichen Chang, David Colcleugh, George A. E. Cook, Elizabeth A. Edwards, Tom Fahidy, John Goldak, Ani Gole, Tom Jenkins, Tibor Kokai, John Lee, Martin D. Levine, John McPhee, Arun K. Misra, Gino Palumbo, Robert Schober, Sirish L. Shah, Christopher Young

Review of Federal Support to Research and Development

The Government of Canada has launched a comprehensive review of federal programs that support business innovation. A six-member expert panel will provide recommendations on maximizing the effect of federal programs that contribute to innovation and create economic opportunities for business, see http://rd-review.ca.

The Academy made a submission to the Expert Panel which can be accessed from the above website. A Summary of the Academy's submission follows:

Canadian federal support for business research and development (R&D) would, we believe, be more effective if the engineering design component of innovation were supported more explicitly and strongly. Design is an essential part of R&D, coming into the process where researchers have largely handed off to engineers, and continuing as a key creative element of D (development) all the way downstream to the introduction of the final product into the market. Since design takes into account the needs and constraints of the customer, recognizing and supporting engineering design as an essential part of the process of innovation will bring Canadian innovation closer to meeting the needs of the market. This is essential since an innovation will succeed and create wealth only when the new product or service receives market acceptance.

Are You Aware?

Academics for Higher Education and Development (AHED) is a relatively new group dedicated to helping universities in developing countries strengthen their program offerings. More information is available at www.ahed-upesed.org and the Chair and Executive Director, Steven Davis, can be contacted at sdavis@ahed-upesed.org. Fellows drawn from the academic community may wish to explore opportunities to participate.

Fellows in the News

Cristina Amon, Dean of the Faculty of Applied Science & Engineering at the University of Toronto was awarded, May 18, the prestigious YWCA Toronto Woman of Distinction Award. The annual award honours recipients who work to improve the lives of girls and women in their community. Dean Amon was being acknowledged in the science and engineering category. Over the years, she has been a tireless advocate for increasing diversity in the engineering profession and developing engineering outreach programs for under-represented groups. Her past achievements stretch far beyond her time at U of T Engineering and include being twice named one of America's most important Hispanics in technology. She was also recognized by the American Society of Mechanical Engineers, the American Society for Engineering Education and the Canadian Academy of Engineering.

Norman C. Beaulieu, Professor and *i*CORE Research Chair in Broadband Wireless Communications at the University of Alberta was invited by the School of Electrical & Computer Engineering, University of Tehran to participate in a departmental seminar series titled "Next Generation Wireless Networks: Trends & Enabling Technologies" conducted by invited distinguished international researchers. During his visit, Dr. Beaulieu reviewed multiple new Electrical and Computer Engineering Laboratory courses at the University of Tehran. He also met with Professors and researchers to discuss new research ideas and funding opportunities. By popular student demand, Dr. Beaulieu met with Graduate students at the University of Tehran to give an additional afternoon workshop titled "How to successfully publish a research paper in the IEEE Journals." Dr. Beaulieu's visit was fully funded by Mobile Communications Company of Iran.

Norman C. Beaulieu was selected as Distinguished Visiting Fellow for "sharing first-hand in-sight into world-class cutting-edge knowledge, recognising excellence, and inspiring the next generation," by the Royal Academy of Engineering in the United Kingdom. The aim of the Distinguished Visiting Fellowship program is to provide funding to enable an academic engineering department in a United Kingdom university to be a host to a Distinguished Visiting Fellow from an overseas academic center of excellence. The object of the program is to access global centers of excellence in engineering research and teaching, with a view to strengthening UK capacity and international standing. During his travel as a Distinguished Visiting Fellow in the United Kingdom, Dr. Beaulieu gave Distinguished Lectures on Ultra-Wide Bandwidth Wireless at the University of Warwick and King's College London as well as Distinguished Lectures on Cognitive Radio at Southampton University, Manchester University and Heriot-Watt University. Dr. Beaulieu also met with students and faculty members at these institutions to discuss new research ideas, joint proposals and funding opportunities.

Ron Crotogino has been awarded the 2011 John S. Bates Memorial Gold Medal, the highest honour offered by the Pulp and Paper Technical Association of Canada, in recognition of long-term scientific and technological contributions to the pulp and paper industry. Dr. Crotogino has been associated with the forest products industry for more than 50 years, as a student, researcher, consultant, and teacher. He is currently the network director, president and CEO of ArboraNano, the Canadian Forest NanoProducts Network. The award was presented during PaperWeek Canada in Montreal.

Wagdi G. Habashi has been selected as the recipient of the 2011 CASI McCurdy Award by the Canadian Aeronautics and Space Institute. The Award was introduced in 1954 by the Institute of Aircraft Technicians, one of the aeronautical groups that amalgamated to form CASI, to recognize outstanding achievement in the science and creative aspects of engineering relating to aeronautics and space research. It is one of five CASI Senior Awards. Presentation of the 2011 CASI Senior Awards took place in Montreal during the CASI AERO 2011 Conference and 58th Annual General Meeting from April 26 to 28, 2011.

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President's Report to the 2011 Annual General Meeting

Submitted by Michael E. Charles — June 3, 2011 in Vancouver, British Columbia

It is my pleasure to present the Report of the President to the Annual General Meeting of Fellows of our Academy.

The year commenced with the Symposium "Low Emission Electricity Generation, Distribution and Use in Transportation" held in Toronto following our 2010 Annual General Meeting. The goal was to highlight the inevitable trend towards electrification of energy systems with the concomitant priority to minimize the output of carbon dioxide during the generation of electricity by using non-fossil renewable sources and by capturing and sequestering carbon dioxide produced from burning fossil fuels. Large scale grid expansion is not only a technical matter for it depends on gaining access to rights-of-way with the concurrence of local communities spread out over considerable distances. The use of electrically driven vehicles and trains will do much to reduce carbon dioxide and other emissions from the transportation sector. The Symposium closed with a long-term look at the prospects for electricity generation from nuclear fusion.

During the Symposium, Past President Axel Meisen announced the launch of the Trottier Energy Futures Project (TEFP) under a partnership between the David Suzuki Foundation, the Trottier Family Foundation and the Canadian Academy of Engineering. This announcement was followed by a formal press conference and the distribution of background documentation at the World Energy Congress held in Montreal in September. Key goals of the TEFP are to show how Canada could become a model for the sustainable generation, distribution and use of energy, and could reduce greenhouse gas emissions by 80 per cent by 2050 -- an enormous challenge. Consistent with the charter of the TEFP, your President serves on the Project Board and Michael A. Ball as Executive Director of our Academy serves on the Management Board. Both of us have spent considerable time working with our counterparts in the David Suzuki Foundation and Lorne Trottier to put the TEFP on a sound course. Several other Fellows of our Academy, including Bob Evans, John Leggat, Richard Marceau, Clem Bowman, and Axel Meisen have provided invaluable advice during the year. Tom Gouldsborough initially served as Project Manager and has been succeeded by Ralph Torrie.

In parallel with the TEFP, Academy Fellows Richard Marceau and Clem Bowman, and colleagues continue to pursue initiatives flowing from the work of the Energy Pathways Task Force. One of these initiatives is to refocus on the potential for expanding the Canadian grid with emphasis on east-west connectivity.

In an attempt to broaden the activities of the Academy, a working group is exploring the potential for collaboration with Innoventures Canada (I-CAN) which is a national consortium of Canada's top research and technology deployment organizations, including the National Research Council. Technical areas being actively explored are infrastructure and water supply for mid-size and small communities, particularly in Northern Canada. This is another example of how the expertise of our Fellows could potentially be brought to bear on matters of some urgency by engaging with another organization having similar goals.

Our Academy continues to enjoy good relations with the Council of Canadian Academies (CCA) with former Presidents John McLaughlin and John Leggat serving on its Board, and Tom Brzustowski serving as Chair of its Scientific Advisory Committee. We help identify candidates for expert panel assessments on matters referred to the CCA by Federal departments. Furthermore, under a new agreement, the Academy's head office is now co-located with that of the CCA.

We continue to participate in the Canadian Engineering Leadership Forum (CELF) and in the Partnership Group for Science and Engineering (PAGSE) which arranges regular presentations for parliamentarians over breakfast. Academy Fellow Denis Mitchell spoke recently on "Failure is not an option: lessons for making Canada's buildings and bridges safer".

Following the Convocation in Calgary in 2009 of the International Council of Academies of Engineering and Technological Sciences (CAETS), John Leggat served as its President through to the 2010 Convocation held in Copenhagen on the theme "Sustainable Food Systems - Toward Food for All" which was attended by your President and Executive Director. Robert Evans represents the Academy in the CAETS project "Deployment of Low Emissions Technologies for Electric Power Generation in Response to Climate Change". The 2011 CAETS Convocation will be held in Mexico City on the theme "Engineering Analysis and Management to Reduce Risks" in July. Our Academy will be represented by Past President Axel Meisen.

Our Academy provided modest financial support for the workshop arranged by the Canadian Committee on Women in Engineering (CCWE) to mark the 20th Anniversary of its founding. The chair of CCWE is Academy Fellow Monique Frize who has pressed relentlessly for a stronger presence for women in our profession. She has recently published the book "The Bold

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Deceased Fellows

The Canadian Academy of Engineering offers its condolences on the death of the Fellow listed below. If you are aware of the passing of a Fellow not listed, please contact Valérie Broadfoot at vbroadfoot@acad-eng-gen.ca.

Robert L. Papineau, elected in 2000, deceased March 23, 2011.

In Memoriam

Robert L. Papineau passed away on March 23, 2011 at the age of 67.

Already holding a BA and a MA in mechanical engineering from the University of Sherbrooke in 1967, Robert Louis Papineau also obtained a PhD in "Industrial and Systems Engineering" from the University of Florida in 1974. Having devoted his career largely to the training of engineers, he first taught at the University of Sherbrooke and the University of Québec at Trois-Rivières, where he also was Director of Engineering, Associate Dean for pure, applied and health sciences, and finally, Dean of undergraduate studies. He entered the École de technologie supérieure in 1986 as director of education and research and was appointed CEO of ETS in 1988. His most significant contribution is undoubtedly to have brilliantly orchestrated the transformation of a school training technologists into a fully accredited school of engineering which subsequently offered the graduate (master's, doctoral) degrees as well as the possibility of performing research. It is also under his influence that the co-op system of training fully showed its relevance and increased the ETS's relationship with industry, conferring to the School its signature brand of "engineering for the industry".

In 2002, he became Executive director of the École Polytechnique de Montréal, a position which he held until his retirement in 2007. His vision, markedly aimed towards the future, industry and internationalization, has had lasting effects on the growth of the institution. The renewal of the entire bachelor programs, started in 2003, gave fresh impetus to engineering education. It was also during his term that some major construction projects were completed at the Polytechnique, such as the Lassonde Pavillion, the first university building in Canada to achieve LEED Gold certification from the U.S. Green Building Council.

Highly regarded in his community, he was chairman of the National Council of Deans of Engineering and Applied Science and of the Canadian Engineering Accreditation Board. His brilliant achievements have earned him numerous honours, including the title of Officer of the National Order of Quebec, that of Fellow of the Canadian Academy of Engineering, the Gold Medal from Engineers Canada, as well as honorary degrees from Sherbrooke and Concordia universities. He served on several boards, including those of the Sainte-Justine Hospital, the Collège Édouard-Montpetit, the Angus Development Corporation, and the United Way Campaign Cabinet.

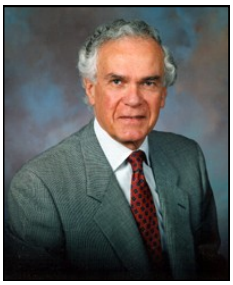
CAETS 2011 Annual Meeting

The 19th Convocation of the International Academies of Engineering and Technological Sciences (CAETS) with the theme *Engineering Analysis and Management to Reduce Risk*, took place in Mexico City, Mexico June 27 – 30, 2011. The CAETS Council Meeting took place on July 1, 2011. The CAE was represented by Axel Meisen. Visit the CAETS website at www.caets.org for additional information and copies of the presentations, the CAETS Executive Committee and Board meetings and the CAETS Council meeting.

The 2012 CAETS Annual Meeting with the theme *Urban Development and Public Transportation - Improved understanding of the interdependencies*, will be hosted by the Swiss Academy of Engineering Sciences (SATW) in Zurich, Switzerland, August 29-31, 2012.

CAE Board of Directors 2011/2012

Fellows in the News (cont'd)



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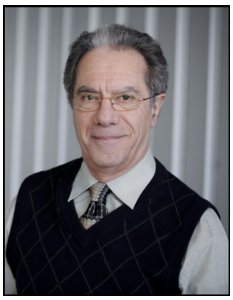
Norbert R. Morgenstern, Distinguished University Professor (Emeritus) at the University of Alberta received the 2011 H. Bolton Seed Medal from the American Society of Civil Engineers on March 13, 2011. The Medal was awarded for exceptional contributions and outstanding productivity in education, research and consulting that have profoundly enhanced engineering practice in slope stability and dam design. On the occasion, Dr. Morgenstern delivered the 2011 H. Bolton Seed Lecture on the theme of "Risk and Reward – Geotechnical Engineering and the Alberta Oil Sands".

Élie Saheb, Hydro-Québec's Executive Vice President – Technology, was awarded the medal of the Académie des technologies at the official ceremony in Paris for members elected in 2010. His medal was presented to him by Academy President Bruno Revellin-Falcoz, an aerospace and civil engineer and former vice president and general manager of Dassault Aviation. This mark of recognition underscores Mr. Saheb's significant contribution to the field of technology in the course of his successful career. The Académie des technologies, founded in 2000, is a public establishment that comes under the French department of higher education and research. It is the leading institution in the field of technology and serves as an intermediary between the world of research and socioeconomic actors in technological matters. With its 270 members of varied backgrounds—researchers, engineers, industrialists, agronomists, economists, physicians, architects, sociologists—the Academy is a think tank devoted to addressing the major technological challenges facing society. — *Photo: Bruno Revellin-Falcoz (left) and Élie Saheb (right)*

Herb Saravanamuttoo, former professor and chair of Carleton's mechanical and aerospace engineering department, was celebrated on June 24, 2011 with the opening of Carleton University's new laboratory to foster research and teaching in the area of gas turbines. The new laboratory is named after Saravanamuttoo, to honour his outstanding contribution to this field, and is housed in the university's new engineering building, which opened in January 2011. Finding solutions to real-world problems, such as energy generation and sustainable technology, is a key commitment for Carleton. The new gas turbine laboratory will play a key role in finding these real solutions both for Carleton students and for engineering scholars across Canada. — *Photo courtesy of James Park*



Lotfollah Shafai has been awarded the 2011 Killam Prize for engineering. Acknowledged as one of the world's most innovative antenna researchers, Dr. Lotfollah Shafai's ground-breaking research has led to a range of developments that are already in wide use in the broadband wireless and satellite communication industries. In recent years, Dr. Shafai's work has focused on the electromagnetic mapping of Arctic sea ice. His research has provided critical data for understanding the effects of climate-warming trends and more accurate predictions of the seasonal behavior of Arctic ice. Dr. Shafai is Canada's leading expert in the field of applied electromagnetic and radiating systems. His early work led to the development of the first generation picoterminals for the Canadian Hermes satellite – ultra-small fully portable satellite ground stations with antennas now in use around the world. — *Photo courtesy of the Canada Council for the Arts - photographer Mike Latschislaw, University of Manitoba*

Bert Wasmund, Executive Director of Hatch Ltd., received an honorary doctorate of engineering from the University of Toronto on June 15, 2011. Wasmund, who received his PhD in chemical engineering from the university in 1966, is credited with transforming the metallurgical industry through a series of technical innovations that reduced energy consumption and harmful emissions while improving workplace safety and productivity. — *Photo: Michael E. Charles (left), Bert Wasmund (centre) and Hon. David Peterson, Chancellor of the University of Toronto (right)*

CAE Fellows Honoured by the National Academy of Engineering

The National Academy of Engineering (U.S.A.) has elected 68 new members and nine foreign associates. Election to the National Academy of Engineering is among the highest professional distinctions accorded to an engineer. Academy membership honours those who have made outstanding contributions to "engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education." Among the nine foreign associates elected, there are four Canadians, each of them a Fellow of the CAE:

- **M. Elizabeth Cannon,** president, University of Calgary, Calgary, Alberta. For innovative use of GPS data for a wide range of applications and for pioneering the field of geomatics.
- **Prabha S. Kundur,** president, Kundur Power Systems Solutions Inc., Toronto. For contributions to modeling and control techniques to enhance the stability and reliability of large electric power systems.
- **Jacob H. Masliyah,** University Professor Emeritus, department of chemical and materials engineering, University of Alberta, Edmonton. For advancing the science and technology for recovery of bitumen from oil sands.
- **Jonathan Scott Rose,** professor, department of electrical and computer engineering, University of Toronto, Toronto. For contributions to research and engineering of field-programmable gate array architectures and computer-aided design tools.

Two CAE Fellows Receive APEGGA awards

Two Fellows of the Canadian Academy of Engineering were honoured by The Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) at the prestigious Summit Awards® Gala on April 14 held at the Calgary TELUS Convention Centre. Dr. Murray R. Gray, FCAE, is the recipient of the APEGGA Centennial Leadership Summit Award®, and Dr. Nigel G. Shrive, FCAE, is this year's recipient of the APEGGA Frank Spragins Technical Summit Award®.

Nigel G. Shrive: *The Frank Spragins Technical Award, for recognized integrity, expertise and outstanding accomplishments*

Dr. Nigel Shrive, P.Eng., has applied his civil engineering expertise in structural mechanics to a variety of research areas with ground-breaking results. His work investigating the structural behaviour of the cardiovascular system is challenging the current paradigm of understanding regarding how pressure and flow work in the aorta. Dr. Shrive is a professor in the Department of Civil Engineering at the University of Calgary's Schulich School of Engineering, adjunct professor of surgery and kinesiology at the U of C and adjunct professor in the University of Alberta, Faculty of Engineering's Department of Biomedical Engineering. In addition to all of this, Dr. Shrive is also a masonry expert who has been called upon to assess the structural capabilities of the Parliament Buildings in Ottawa and investigate why the walls of one of Parks Canada's historic forts are starting to fall.

Murray R. Gray: *Centennial Leadership Award, for highest distinction as an executive or director of a continuing enterprise*

Over the past 33 years, Dr. Murray Gray, P.Eng., has become a world-renowned expert in the area of petroleum processing, and has acquired a truly outstanding research record in the area of upgrading heavy oil and bitumen. Recognizing that sustainable development of the Canadian oil sands requires technological breakthroughs to create economically viable and environmentally conscious methods for mining, extraction and upgrading, he was involved in the development of the multi-disciplinary and multi-university, Centre for Oil Sands Innovation (COSI). He is now the first director of COSI.

Proposed By-Law Amendment Withdrawn

The proposed amendment to increase the number of New Fellows that can be elected in a year from fifty to seventy-five, which the CAE Board of Directors were going to take to the CAE 2011 Annual General Meeting for approval was withdrawn pending further consultation with members.

Three CAE Fellows Honoured by Engineers Canada

Presented annually since 1972 to recognize outstanding Canadian engineers, teams of engineers, engineering projects and engineering students, the Engineers Canada Awards highlight engineering excellence, as well as contributions of Canadian engineers to their profession, their communities, and to the safety and well-being of Canadians. This year's award recipients include three CAE Fellows:

Yusuf Altintas – Gold Medal Award

Professor Yusuf Altintas is recognized worldwide as the leading authority in the field of machining and machine tools. He has contributed significantly to manufacturing engineering literature with the highest citation record in the field, particularly his theory of kinematics and chatter vibration stability in milling. He is the founder and president of Manufacturing Automation Laboratories, which distributes practical application of his state-of-the-art research to more than 140 companies and universities worldwide. Professor Altintas's passion for machining technology, and his dedication to the manufacturing industry, has inspired hundreds of researchers, engineers and students around the world to dedicate their careers to machining technology.

Darrel J. Danyluk – Meritorious Service Award for Professional Service

Darrel Danyluk has been a strong and consistent voice of the engineering profession, having served as president of Consulting Engineers of Alberta, APEGGA and Engineers Canada. He is also the vice-president of the World Federation of Engineering Organizations, and has been a driving force at the United Nations Commission on Sustainable Development and the UN Framework Convention on Climate Change. His technical expertise developed from the design and delivery of infrastructure projects is in the water and transportation sectors. His exceptional professional contributions and tireless dedication to enhancing his professional field and community make him an outstanding member of the engineering community.

Colin E. Smith – Meritorious Service Award for Community Service

For decades, Colin Smith has provided exceptional community service at local, provincial and national levels. In the past year, Mr. Smith accepted two additional community service appointments: director of the Victoria Airport Authority Board, and British Columbia Government House Foundation trustee. He is the immediate past-chair of the 1,500-memberWest Coast Railway Association and has served as one of three directors of the 625 Powell Street Foundation in Vancouver. Mr. Smith's service to the profession has also been extensive, including lengthy committee service and terms as president of APEGBC and of Engineers Canada.

CAE Fellows Recognized by the Engineering Institute of Canada

The Engineering Institute of Canada has announced the 2011 recipients of its honours, awards and fellowships. The senior awards of EIC are the highest distinctions made by the Institute and are awarded to members of its technical societies. Five senior medals recipients were presented at the 2011 Awards Gala in recognition of outstanding achievement or service to the engineering profession. In addition, 20 engineers were inducted as Fellows of EIC for their exceptional contributions to engineering in Canada. EIC President Tony Bennett presented the recipients at the Institute's Annual Awards Banquet at the Westin Hotel in Ottawa on Saturday evening, 5 March 2011, an event that helps mark Canada's Engineering Week. Among the 2011 senior award recipients are the following Fellows of the Canadian Academy of Engineering:

- **Gordon Slemon** - recipient of the *Sir John Kennedy Medal* (the senior award of the Institute for outstanding service rendered to the engineering profession or noteworthy contributions to the science of engineering)
- **Ken Putt** - recipient of the *John B. Stirling Medal* (for leadership and distinguished service at the national level within the Institute and/or its Member Societies)
- **Arthur Heidebrecht** - Fellow (For exceptional contributions to engineering in Canada)
- **Andre Ivanov** - Fellow (For exceptional contributions to engineering in Canada)
- **Jin Jiang -** Fellow (For exceptional contributions to engineering in Canada)
- **Shiping Zhu -** Fellow (For exceptional contributions to engineering in Canada)

President's Report to the 2011 Annual General Meeting (cont'd)

(Continued from page 5)
and the Brave: A History of Women in Science and Engineering". She received the 2010 Ontario Professional Engineering Awards (OPEA) Gold Medal.

Nominations of outstanding engineers to Fellowship in the Academy are made in the late Fall each year. The Fellowship Committee, currently ably chaired by Michael Avedesian, reviews the full documentation submitted with each nomination. With over seventy nominations in the last cycle, the Committee held three meetings by teleconference to complete its work. At the present time, our by-laws limit the number of Fellows that may be admitted in any one year to a maximum of 50. Given the outstanding quality of the nominations, the Committee selected fifty nominees to be placed on the ballot to be completed by existing Fellows of the Academy. Forty-five received the required two-thirds positive votes from those actually voting and were invited to attend the Gala Dinner here in Vancouver yesterday evening. Given the relatively large number of outstanding nominations received during the last two cycles and the growing pool of engineering talent in Canada, the Board, acting on the advice of the Fellowship Committee, has recommended that the maximum number that may be admitted in any one year be raised to 75.

Having served on the Fellowship Committee for two cycles, I have become concerned that a number of nominations highly rated by the Committee do not receive sufficient positive votes from the Fellowship to be accepted. In the ballot process, Fellows do not see a full nomination and are asked to make their decision on the basis of a citation submitted as part of the nomination. I urge nominators to make sure that the citations they provide do reflect the full extent of the attributes of their nominees, so as to avoid such a "disconnect" in the future. Since two-thirds of the votes cast must be positive for a nomination to be approved, abstentions, however motivated, essentially count as negative votes.

The Fellowship Committee and your Board are conscious of the need to maintain an appropriate balance in our membership, as among the regions of Canada, men and women, and industry, government and academe. The Ad Hoc Committee on Membership Balance chaired by Past President Axel Meisen with Michael Avedesian, John Leggat, Moyra McDill, Ravi Ravindran, and Michael A. Ball has explored these issues and has just completed a report with recommendations which the Board has received and reviewed.

In February, 2011 the Academy made a submission to the Expert Panel leading the Review of Federal Support to R&D, a panel looking at support for industry/business oriented research and development with a view to improving Canada's performance in innovation. We emphasized the importance of engineering design in the innovative process and recommended that it be included in eligible activities under the SR&ED tax credit.

A related issue in my mind is the widespread use of the term "science and technology", rather than "science and engineering". Technology is inanimate in that it exists and can be used. Engineering is the process by which technology is developed and involves men and women designing equipment, facilities, services and devices, and making difficult decisions around sustainability, economics, safety and security. We need to work hard to gain recognition for creative engineering being an essential component of the innovation chain.

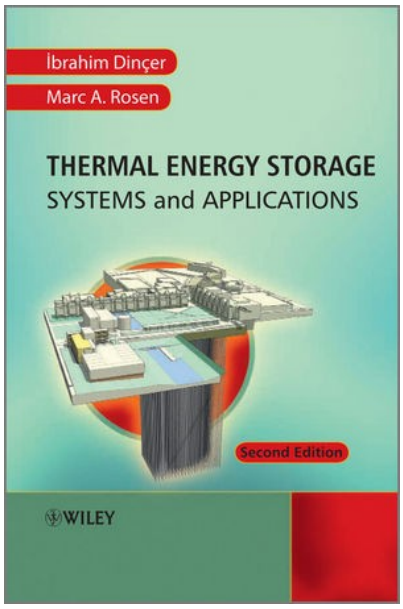
Part of the problem may be a lack of engineers in prominent leadership positions who are able to command media attention in the context of discussions of the positive engineering contributions to wealth generation for society. So much is taken for granted until something goes wrong and engineers find themselves in a defensive mode while people who have little appreciation of the need to balance risk and cost in the design process find it easy to criticize. In an attempt to overcome this shortcoming, Academy Fellow Douglas Reeve, who is Director of the newly formed Institute for Leadership Education in Engineering at the University of Toronto has developed a proposal on "Leadership by Engineers in Business Enterprises" with the goal of developing a new breed of engineers who are at ease in speaking out publicly on important issues. His plans already have support from the corporate sector and more will be communicated to Fellows of the Academy in the future.

I am not unique among Presidents in concluding that our Academy falls short of its potential. Over the years, we have seen a series of ambitious strategic plans developed and endorsed by the Board. However, we have simply lacked the capability to follow through while making sure that our basic processes are protected and acted upon. We need to find ways to increase our resource base and to engage our Fellows more broadly in issues that affect the future of Canada.

The predominant source of income to the Academy continues to be the annual dues of our Fellows. This income, even

(Continued on page 11)

New Publication



Early in 2011, the 620-page hardcover book *Thermal Energy Storage: Systems and Applications* (2nd edition) was published by Wiley. It is co-authored by CAE Fellow Marc A. Rosen and Ibrahim Dincer, both of whom are professors at University of Ontario Institute of Technology. Dr. Rosen is also Past President of the Engineering Institute of Canada.

The book describes the ability of thermal energy storage systems to facilitate energy savings, renewable energy use and reduce environmental impact, all of which have led to a recent resurgence in interest in this technology. The authors address real-life technical and operational problems, enabling the reader to gain an understanding of the fundamental principles and practical applications of thermal energy storage technology. The book offers up-to-date coverage of recent energy efficient and sustainable technological methods and solutions, covering analysis, design and performance improvement as well as life-cycle costing and assessment. The book is suitable as a graduate text and reference.

Beginning with a general summary of thermodynamics, fluid mechanics and heat transfer, this book goes on to discuss practical applications with chapters that include TES systems, environmental impact, energy savings, energy and exergy analyses, numerical modeling and simulation, case studies and new techniques and performance assessment methods.

President's Report to the 2011 Annual General Meeting (cont'd)

(Continued from page 10)

augmented by the earnings on our invested funds, now no longer quite covers the essential operating expenses of the Academy, primarily our head office in Ottawa with just two staff – the Executive Director and the Office Manager. Both work hard to keep costs as low as possible in carrying out the essential business of the Academy, but with little scope to plan and promote new initiatives. In my view, we have to give serious thought to putting in place a corporate support program with the goal of at least doubling our annual revenue.

We have a large country with obvious regional differences and priorities. With the steady increase in the number of Fellows, we now have the potential to form groupings of Fellows who could meet between annual meetings and formulate projects of regional or national importance which would attract financial support. The Energy Pathways initiative has been, and still is, a fine example.

Today's Symposium "Canada as a Sustainable Energy Superpower: Realizing the Vision", ably organized by a committee led by our President Elect, Kim Sturgess will continue the theme of the collision between energy and the environment, including climate change. It will incorporate progress and perspectives on the Trottier Energy Futures Project.

I close by thanking the Members of the Board for their support and contributions to the discussion of issues facing the Academy; in particular, I thank Axel Meisen, who as Past President is leaving the Board and has worked hard in the best interests of our Academy. I also thank the members of the Fellowship Committee who spent many hours reviewing the nominations for Fellowship in our Academy; in particular Robert Evans and Ian Jordaan who are both leaving the Committee after several years of service. I am grateful to Richard Marceau, as chair of our New Directions and Public Policy Committee who has given generously of his time. And I must recognize our Executive Director, Michael A. Ball, who having indicated a year ago that he wished to step down from the position has, in the absence of a successor, continued to provide outstanding service. Similarly, our Office Manager, Valerie Broadfoot is dedicated to providing prompt and efficient support.

Finally, it has been an honour to serve as President. I wish my successor, Kim Sturgess all the very best in her role as our new President. I know she is enthused at the prospect of advancing the best interests of our Academy. Please respond positively to her calls for support.

Respectfully submitted

Michael E. Charles, FCAE, FCIC, FEIC, PhD, P.Eng

Opinion Piece It's time to talk more systematically about innovation in Canada

by Tom Brzustowski, O.C., FCAE, FRSC, PhD., P.Eng., RBC Professor, Telfer School of Management, University of Ottawa

On June 28, the federal Science Technology and Innovation Council (STIC) presented its second public report on the "State of the Nation 2010, Canada's Science, Technology and Innovation System" under the title, "Imagination to Innovation, Building Canadian Paths to Prosperity". Unfortunately, the state of the nation that it presents is disappointing. We are generally holding our own, or slipping only slightly, in the international rankings on education and research, but we continue to see a disconnect between these enabling conditions and the productivity of our economy. The reason is familiar – the Canadian private sector is lagging in innovation. There are some notable exceptions, and they are very exciting, but overall the performance lags our competitors.

The STIC report is just the most recent of the many reports that have said the same thing. Frequent conferences on one or another aspect of innovation have sounded this theme for years. Recommendations have been made, recipes for success proposed, speeches delivered, support programs introduced, but all that seems to have produced little action and less effect. We can't afford to go on like this; something must change.

For one thing, it would probably help if we talked about innovation more systematically and precisely than we do today. We do a good job discussing the technical details, but not the business aspects. All too often, innovation seems to be portrayed as a desirable but vaguely unusual activity that has something to do with business and the economy, or maybe not, and that needs to be defined anew – all too often differently – at every conference and in every report where it's discussed. And we are sloppy in the use of language. The federal agency that helps provide universities with big instruments and infrastructure for research features "Innovation" in its name. Our largest trade fair of innovation is called "Discovery". And the clumsy phrase "commercialization of research" only compounds the confusion.

So here's a proposal for some small steps to improve clarity. First, let's focus our attention on the innovations described by the well-known "equation": **innovation = invention + commercialization**. In practice, this is not all that much of a limitation, since the relation captures most industrial innovation in products and processes, in both goods and services. Secondly, let's recognize that an invention can be research-based, defined as a new use of new knowledge, or it can be design-based, defined as new use of existing knowledge. Third, let's recognize that some inventions are commercialized by established firms, and others by new ventures. And fourth, let's divide the innovation space into four quadrants, based on whether the invention is research-based or design-based, and on whether it is commercialized by a new venture or by an established company. The resulting quadrant taxonomy, or two-by-two table if you prefer, provides a systematic framework for discussing the issues of financing, policies and support programs for innovation. (See diagram)

Design-based New venture **(D-N)**	Research-based New venture **(R-N)**
Design-based Established firm **(D-E)**	Research-based Established firm **(R-E)**

The reason why this new quad taxonomy of innovation might improve clarity is that the business issues, policy issues and time scales of innovation are distinct in the four quadrants. Consider the R-N quadrant (research-based inventions commercialized by new ventures). Start-ups arising from research in universities, hospitals and government labs lie in this space. They are always short of time and money. Their products, customers, markets, and the right business model need to be developed at the same time that the companies may have to deal with change that is frequent, rapid and deep. Risk is high, and not many of the R-N innovations succeed, and yet they seem to receive the bulk of policy and public attention, and carry the greatest weight of government's expectations of economic benefits.

The D-E quad (design-based inventions, established firms) describes most industrial innovation. It is largely incremental, and has traditionally been part of what established firms must do to stay competitive. D-E innovation has always had a large economic impact, but it has generally been below the radar of public policy or media attention, to the extent that at a recent conference incremental innovation was treated by some as a new insight.

(Continued on page 13)

It's time to talk more systematically about innovation in Canada (cont'd)

(Continued from page 12)

The R-E quad includes the very tightly regulated pharmaceutical sector, where the length of IP protection is a major issue since the products become commoditized as soon as the patents expire. It also includes parts of the ICT sector, whose IP issues are also significant, but have more to do with the validity of patents issued in the first place than with the duration of protection.

The D-N quad is all about design boutiques, high-end fashions, furniture, specialty restaurants, video games, smart-phone apps, other entertainment products, and various services. Just as in the R-N quad, the risks are high and the D-N companies are short of time and money. They are SMEs and they don't get much policy attention beyond that, but media attention is important to their success.

These four quadrants are described in greater detail in a forthcoming paper "A new business-based taxonomy of innovation" by this writer, to be published in the Internet journal *Optimum Online* in September 2011. The hope is that this new taxonomy might start to be used as the framework for systematic conversations on the funding, policies and support programs for innovation. If it is, the results are likely to be more focused, consistent and free of contradictions, and better targeted to meet the real needs in Canada's innovation system. And that might, finally, lead to actions that will improve its performance.

Women Wanted for Study of Engineering

by Susan Hickman, reprinted with permission from Editor Julie Carl, researchworks.carleton.ca

Monique Frize, FCAE

Photo by Brigitte Bouvier

By the time Monique Frize graduated with a degree in electrical engineering in 1966, she had learned to be "one of the boys."

Nearly fifty years later, women engineers are not such an oddity and, according to Frize, can maintain their femininity in the male-dominated field. A professor at both Carleton's Department of Systems and Computer Engineering and the University of Ottawa's School of Information Technology and Engineering since 1997, Frize says progress has been made in attracting women to the field of engineering, but there has been some ground lost.

In April, Frize chaired the national Canadian Committee on Women in Engineering's CCWE+20 workshop in Ottawa on the 20th anniversary of the first CCWE report, *More Than Just Numbers*, that made ambitious recommendations for attracting women into the fields of mathematics, science and engineering. About 70 key stakeholders, decision-makers and students discussed the accomplishments of the past two decades, assessed differences between today's young generation and that of 20 years ago, and developed strategies to increase the participation of women in engineering study programs, as professors, in the workplace, and in the governance of professional associations of engineers over the next five years.

The murder of 13 female engineering students at l'École Polytechnique in Montreal in 1989 and a new national Chair for women in engineering jolted the contemplation of the status of women in the profession. Today, universities hire more women professors, the "macho" climate has improved, and the industry has harassment policies. Nevertheless, says Frize, "We have not seen a lot of societal progress, and many women leave the profession between years 5 and 10."

The profession hopes to see women make up 30 per cent of engineering students and 15 per cent of professionals by 2016.

Less than one in five engineering undergraduate students are female and less than one in four study at the master's and doctoral levels. One in 10 becomes a professional engineer.

Frize suggests that stereotyping, a lack of role models, biased attitudes and isolation discourage girls and young women from pursuing science and math.

"How do we dispel entrenched, hero-style and geek-style engineering myths and replace them with a team-building, collaborative reality?" asks Frize, who hopes conference attendees will return home and follow up with some of the recommendations by 2016.

Special Events (cont'd)

Lorne Trottier, FCAE

(Continued from page 1)
vision behind the Trottier Energy Futures Project. This was followed by the Keynote Speaker Roland Clift's presentation – *An Engineering Approach to the Ethics of Energy Generation and Consumption.*

Roland Clift, CBE

The Sutton Place Hotel was also the location of the Annual General Meeting and Symposium. The President's Report to the AGM is reported on page 5 of this Newsletter. Draft Minutes of the AGM Business Meeting will be posted on the Members Section of the CAE website.

The Academy has in recent years focused on energy issues through, for example, its Energy Pathways projects and more recently the work of the Trottier Energy Futures Project, a partnership with the Trottier Family Foundation, the David Suzuki Foundation, and the Academy. Continuing the energy theme the 2011 Symposium focused on "Canada as a Sustainable Energy Superpower: Realizing the Vision". The program appealed to engineers from all disciplines as well as other professionals engaged in high level business and public policy decision making and indeed attracted over one hundred participants.

Session 1 – "The Tension: Energy Superpower and Sustainable Environment/Society?" was moderated by Elizabeth Dowdeswell, President, Council of Canadian Academies. On the premise that Canada is an energy superpower, blessed with huge reserves of oil, natural gas, coal plus hydroelectric sites and as-yet unnumbered renewable energy sites. Canada has the engineering knowledge infrastructure to implement new technologies needed both to affordably reduce our national carbon footprint and to generate national wealth by exporting high-value-added clean energy. However, maintaining quality of life and making substantive progress toward carbon reduction targets will require engineers to understand societal preferences, and society to understand the inevitable technical/economic trade-offs. This session explored how the challenges can be framed in order to advance those understandings as a foundation for technically sound public policy.

Session 1 Panel (from left): Jim Carter, Peter Robinson, Elizabeth Dowdeswell and Eddy Isaacs

Eddy Isaacs, FCAE, CEO, Alberta Innovates – Energy and Environment Solutions, set the stage addressing the Energy and Environmental Challenge. The Social

(Continued on page 16)

Fellows Appointed to the Order of Canada

Congratulations are due to the following Fellows of the Canadian Academy of Engineering who have recently been appointed to the Order of Canada:

John D. McLaughlin
(Member)

"For his contributions to cultivating innovative public policy discussions in New Brunswick and for his leadership as president of the University of New Brunswick."

Gwyn Morgan (Member)

"For his contributions as a business and community leader and as a philanthropist."

News from the Council of Canadian Academies (CCA)

The Council of Canadian Academies had a productive 2010 and continues its important work into 2011. Most recently, the Council released its three-year strategic plan, *Insight & Impact 2011-2014*. This document sets a clear direction for the Council and provides a foundation for the organization to become an invaluable science resource.

In 2010, the Council launched two new assessments – *Canadian Taxonomy: Exploring Biodiversity, Creating Opportunity*; and *Honesty, Accountability and Trust: Fostering Research Integrity in Canada*. Work on several more assessments continues, with the report on approaches to animal health risk assessment set to launch this September.

The report by the Expert Panel, comprised of experts from across Canada, the US and the UK and chaired by Dr. Alastair Cribb from the University of Calgary, will cover topics such as best practices in approaches to risk assessment, prioritization of risk assessments, and integration of animal-human health research.

Additionally, the Council is undertaking a follow-up assessment on the State of Science and Technology in Canada. The new assessment on S&T will build on the Council's inaugural report, *The State of Science and Technology in Canada*, released in 2006.

Lastly, the Council would like to thank John McLaughlin, FCAE, for his three-year term on the Board of Governors. Dr. McLaughlin brought a great deal of wisdom and insight to the Board. The Council's continued thanks also goes out to the CAE members serving on its expert panels and as report reviewers. Their commitment and support for the Council's mandate, to provide science advice in the public interest, is greatly appreciated.

For more information on the Council's assessments, or to access the strategic plan, visit: www.scienceadvice.ca.

Comment Climate–Change Advocacy Needs a Change of Direction

by Bernard Etkin, FCAE, Professor Emeritus, University of Toronto

In the Netherlands, 55% of the land lies below sea level and is in constant danger of being flooded. Holland has faced problems of flooding for centuries, and over that time has evolved ways of dealing with them (dikes, pumps, floating houses) that have been eminently successful. It now has in place a government centered planning process for flood control, built on its long experience that includes provision to respond to the sea-level rise that will result from climate change. It is a plan for proactive adaptation (action taken in advance) to climate change, not for prevention of climate change nor for reactive adaptation (action taken afterwards). While supporting the long-range goal of reducing emissions of greenhouse gases (GHG's) to delay and reduce climate change, the Dutch have recognized the danger of relying on that alone to save them from floods.

The people of The Maldives, a Muslim country of fewer than half a million people living on more than 1000 low-lying islands in the Indian Ocean, are threatened by inundation as a result of rising sea level. The Intergovernmental Panel on Climate Change predicts that this will happen by the end of the present century. The democratically-elected government of the Maldives takes that threat seriously enough to make plans to cope in case it happens. It has decided to raise enough money to buy land elsewhere, in Sri Lanka, India, or Australia, on which to resettle its population if needed. This too is a plan of proactive adaptation to a consequence of climate change, not an attempt to prevent it.

The people of Holland and The Maldives aren't waiting for the reduction of GHG emissions to solve their problems, what about the rest of the world?

The major focus of advocates around the world for action on climate change has been on a global policy goal-to reduce the world-wide emission of GHG's-notably carbon dioxide from the combustion of fossil fuels. Many specific proposals have been made -from taxing carbon use to subsidizing green energy projects-most of them highly controversial and costly. The importance of reducing GHG emissions for slowing climate change and alleviating energy shortages should not be underestimated. However, the great difficulty of achieving global political agreement has led to inaction. Our international councils have not even succeeded in getting global agreement on reducing the rate at which we are adding to greenhouse gases!! Kyoto, Copenhagen, and Cancun have presented us with powerful and convincing evidence that meaningful political action on a global scale simply will not be taken in time to stop very damaging future changes in climate. Politically, the here and

(Continued on page 17)

Special Events (cont'd 2)

(Continued from page 14)

Challenge was tackled by Peter Robinson, CEO, David Suzuki Foundation. The Prosperity Challenge was presented by Jim Carter, FCAE, Chair, Alberta Carbon Capture and Storage Development Council.

Session 2 Panel (from left): Brenda Kenny, Axel Meisen, Robert L. Evans and Keith Hipel

Keith Hipel, FCAE, Professor, Systems Design Engineering, University of Waterloo moderated Sessions 2 & 3 – "Canada's Role: Opportunity and Responsibility". As an energy-rich nation, Canada has both the motivation and the means to use and produce energy wisely. Within the sweep of visionary leadership lies the necessity of first steps, initial successes, gaining momentum toward audacious goals. This session outlined four ways in which progress is being made or step-change potential assessed to affordably reduce carbon. All are propelled by engineering innovation. An R&D report card assessed Canada's trajectory toward GHG reduction goals. The directions, goals and synergies of the Trottier Energy Futures Project were also presented. An extended discussion period allowed audience members to interact with the expert presenters to explore perspectives, questions and insights. Ideas were sought about what and how the CAE can contribute to technically sound public policy and to fostering substantive, timely first steps.

Session 3 Panel (from left): Tom Heintzman, Ralph D. Torrie and Katherine Albion

Specifically, Session 2 featured Robert L. Evans, FCAE, Professor, Clean Energy Research Centre, University of British Columbia who presented "Four Ways to Combat Climate Change"; Axel Meisen, FCAE, Chair of Foresight, Alberta Innovates - Technology Futures presented "Novel Ways to Reduce GHGs: Unconventional Large-Scale Sources of Energy; and Brenda Kenny, FCAE, President & CEO, Canadian Energy Pipeline Association presented "People, Policy and the Role of Technology". During the lunch break delegates had the opportunity to view the Poster Session put on by graduate engineering students from UBC, Simon Fraser University, and the University of Victoria.

Session 3 featured Tom Heintzman, President, Bullfrog Power Inc. presentation on "Changing the Consumer's Energy Consumption Paradigm", this was followed by Katherine Albion who presented on behalf of Clement W. Bowman, FCAE, CAE Energy Pathways Task Force, "Measuring Progress – Our R&D Trajectory", the final presentation of the session, "Bridging the Tension: Building Upon the Work of CAE and the Work of DSF to Create the TEFP Work Plan" was given by Ralph D. Torrie, Project Manager, Trottier Energy Futures Project.

The Symposium closed with a summary of the key points by Kim Sturgess, Elizabeth Dowdeswell and Keith Hipel.

The full program and several of the presentations are available on the Academy's website www.acad-eng-gen.ca.

The Academy is grateful to the Symposium Program Committee composed of Tyseer Aboulnasr, Michael A. Ball, Clem Bowman, Michael E. Charles, Robert Evans, Eddy Isaacs, Richard Marceau, Axel Meisen, Larry Staples and Chair Kim Sturgess for putting together such an interesting program.

Several students from local universities participated in the Poster Session

(Continued on page 17)

Special Events (cont'd 3)

(Continued from page 16)

The Annual General Meeting, and Symposium in particular, would have not been possible without the generous support of our sponsors:

Climate–Change Advocacy Needs a Change of Direction (cont'd)

(Continued from page 15)

now will always trump the far away in the future. The action needed now to slow down climate change to a meaningful degree just will not happen. As Ann Landers (a former syndicated columnist) would have said, "Wake up and smell the coffee!" GHG emissions reduction cannot be relied upon to prevent the consequences of climate change, as the people of Holland and the Maldives have understood. And time is of the essence. There is already enough greenhouse gas in the atmosphere that will stay there for a very long time, to produce considerable climate change in the future, even if we do not add one single kilogram more! So what should be done about climate-change policy?

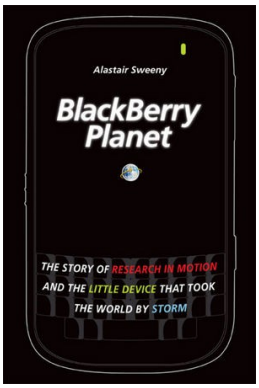
We need to change direction from what does not work to what does - from focusing on the global attempt (as in Kyoto, Copenhagen and Cancun) to slow down and reduce global climate change, and pay a lot more attention to local, regional, and national planning for dealing with it before it comes -to proactive adaptation. Each political jurisdiction needs to know what and when to expect-as in Holland and the Maldives-whether it be sea level rise, flooding, drought, rainfall, ice melting, heat waves, unusual storms, etc. so that it can plan for it. Each should be actively seeking that information. Where is all this vital information to come from? There is only ONE possible source — from the Earth science community, particularly the computer climate models now being worked on. The current models are not yet capable of providing the needed information at the required levels of detail and political credibility, and need improvement.

I am quite convinced that this is an achievable goal, but will need more intellectual and economic capital allocated to it. A concerted effort will be needed by the Earth science community to produce, with field and theoretical research, more information about the interactions within the Earth system (the atmosphere, the oceans, the ice caps, and living matter), and better theories for weak areas of modeling, such as the effects of aerosols. Bigger and faster computers will certainly be developed that can reduce the grid size and the time taken in the computations. This work can lead to regional predictions of the needed accuracy. Such predictions could be the basis for local, regional, and national planning of adaptation measures. Time is of the essence, since responses such as moving whole communities and constructing major works such as dams and dikes requires much lead time. The economic cost of doing what I have described would be small compared to the costs that would ultimately be incurred if hasty and ill-considered responses were suddenly forced upon us by environmental events for which we were not adequately prepared.

Have You Read?

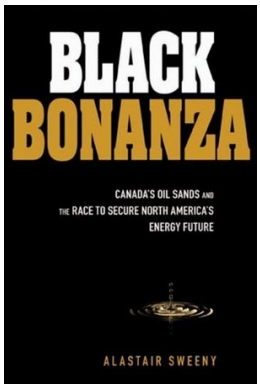
Note that the following titles are listed for the interest of members; they are not endorsed in any other way by the CAE.

Blackberry Planet: The Story of Research in Motion and the Little Device that Took the World by Storm
by Alastair Sweeny — Published by Wiley, October 2009



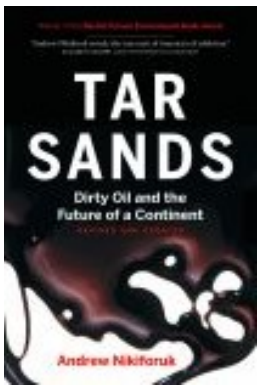
BlackBerry Planet tells the behind-the-scenes story of how Research In Motion's little device has become the machine that connects the planet. Starting with the early years of Mike Lazaridis' founding of RIM at age 23, it details his drive to innovate, developing what was a glorified pager into the essential corporate communicator, used by everyone from dealmakers to the Queen of England, from movie stars to the entire US Congress. Since 1992, Lazaridis and co-CEO Jim Balsillie together have been the driving force behind the RIM story. With access to senior staffers and former RIM employees, *BlackBerry Planet* details the branding and marketing success of the BlackBerry, from its use during 9/11, which earned RIM a reputation for security and reliability, to the cultural adoption of the iconic device as a must-have symbol, to the backlash against the addictive properties of the "CrackBerry," and the various patent suits RIM has had to fight off - including the five-year court battle that resulted in the largest technology patent settlement in US history. As the incredible story of the BlackBerry unfolds, users, fans, investors and competitors can look to *BlackBerry Planet* for the insight and context of where they've been, to try and predict where they're going.

Black Bonanza: Canada's Oil Sands and the Race to Secure North America's Energy Future
by Alastair Sweeny — Published by Wiley, April 2010



What if Canada 's so-called environmental nightmare was really an engineering triumph and the key to a stable and sustainable future? For years, Canadians have been hearing nothing but bad news out of the Athabasca Oil Sands. From 20th Century economists decrying it as a perpetual money-loser in the face of more easily-extracted foreign oil to green groups around the world declaring it the world's worst industrial enterprise, sometimes it seems as though no good could ever come from this so-called dirty resource. But what if developing Canada's Oil Sands was the key to bridging the gap between current petroleum-based economies and the alternative energies that aren't ready for market yet? What if it meant eliminating the threat of Peak Oil and providing economic stability not just for Canada and the rest of North America, but for the world? And what if the environmental costs of the resource were both not nearly as dire as some would have you believe, but currently better than many other options with the industry already making huge advances in sustainability, energy use and water reclamation? That's exactly the case that Alastair Sweeny, author of *BlackBerry Planet*, argues is at the core of the Athabasca Sands: a bright future. By digging into the past, present and future of oil sands technology, Sweeny cuts through the hype and hysteria and makes a solid and engaging case that the Sands aren't the environmental boogeyman set to destroy humanity, but rather our best hope for a truly stable and sustainable future.

Tar Sands: Dirty Oil and the Future of a Continent
by Andrew Nikiforuk — Published by Greystone Books, September 2008, updated March 2010



In *Tar Sands*, journalist Andrew Nikiforuk exposes the disastrous environmental, social, and political costs of the tar sands and argues forcefully for change. Combining extensive scientific research and compelling writing, Nikiforuk takes the reader to Fort McMurray, home to some of the world's largest open-pit mines, and explores this twenty-first-century pioneer town from the exorbitant cost of housing to its more serious social ills. He uncovers a global Deadwood, complete with rapturous engineers, cut-throat cocaine dealers, aimless bush workers, American evangelicals, and the largest population of homeless people in northern Canada. He also explains that this micro-economy supplies gasoline for 50 percent of Canadian vehicles and 16 percent of U.S. demand. Readers will learn that oil sands:

- burn more carbon than conventional oil,
- destroy forests and displace woodland caribou,
- poison the water supply and communities downstream,
- drain the Athabasca, the river that feeds Canada's largest watershed, and
- contribute to climate change.

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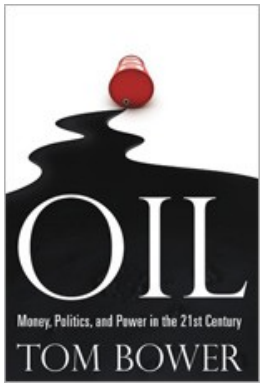
Have You Read? (cont'd)

(Continued from page 18)

Oil: Money, Politics, And Power In The 21st Century
by Tom Bower — Published by Grand Central Publishing, June 2010



Twenty years ago oil cost about $7 a barrel. In 2008 the price soared to $148 and then fell to below $40. In the midst of this extraordinary volatility, the major oil conglomerates still spent over a trillion dollars in an increasingly frantic search for more. The story of oil is a story of high stakes and extreme risk. It is the story of the crushing rivalries between men and women exploring for oil five miles beneath the sea, battling for control of the world's biggest corporations, and gambling billions of dollars twenty-four hours every day on oil's prices. It is the story of corporate chieftains in Dallas and London, traders in New York, oil-oligarchs in Moscow, and globe-trotting politicians-all maneuvering for power. With the world as his canvas, acclaimed investigative reporter Tom Bower gathers unprecedented firsthand information from hundreds of sources to give readers the definitive, untold modern history of oil . . . the ultimate story of arrogance, intrigue, and greed.

Start-up Nation: The Story of Israel's Economic Miracle
by Dan Senor and Saul Singer — Published by Grand Central Publishing, November 2009, updating September 2011

Start-up Nation addresses the trillion dollar question: How is it that Israel -- a country of 7.1 million, only 60 years old, surrounded by enemies, in a constant state of war since its founding, with no natural resources -- produces more start-up companies than large, peaceful, and stable nations like Japan, China, India, Korea, Canada and the UK? With the savvy of foreign policy insiders, Senor and Singer examine the lessons of the country's adversity-driven culture, which flattens hierarchy and elevates informality-- all backed up by government policies focused on innovation. In a world where economies as diverse as Ireland, Singapore and Dubai have tried to re-create the "Israel effect", there are entrepreneurial lessons well worth noting. As America reboots its own economy and can-do spirit, there's never been a better time to look at this remarkable and resilient nation for some impressive, surprising clues.

SAVE THESE DATES – Mark your Calendars!

The 2012 CAE AGM, Induction of New Fellows and Symposium will take place in Ottawa on June 21 – 22, 2012

With our successful 2011 AGM and Symposium in Vancouver now over, planning has begun for the 2012 event.

We have a working theme of ***Canada in Aviation and Space***: ***Past, Present and Future***.

With that in mind, the Induction of New Fellows and Dinner will be held on the evening of June 21st at the Canada Aviation and Space Museum among the collection, and the Symposium will be held all day on June 22nd in the new auditorium at the museum.

The 2012 AGM Business meeting is scheduled for the early afternoon of June 21st, the specific location to be confirmed.

The Canada Aviation and Space Museum

Executive Director's Report

As the saying goes "much water has flowed under the bridge" in recent months as you will see when you read this newsletter, specifically Past-President Michael Charles's report to the Academy's 2011 Annual General Meeting. Our new President Kim Sturgess' message outlines the areas she wishes to focus on during her term and many initiatives are already underway to achieve her goals.

In May I attend two events of interest; on May 5th Engineers Canada held a workshop – "The Globalization of Engineering Education and Practice Workshop", for the Workshop Summary Report and presentations go to www.engineerscanada.ca/e/en_boards_int_memb.cfm. The second event, held on May 6th was the Ontario Centre for Engineering and Public Policy (OCEPP), 2011 Public Policy Conference – "Engineering a Better Ontario", to view the conference presentations go to members.peo.on.ca/index.cfm/ci_id/53628/la_id/1.htm.

The Trottier Energy Futures Project (TEFP) is progressing with a new Managing Director (Project Manager) Ralph Torrie who has developed a new work plan. The CAE representative on the TEFP Project Board is Richard Marceau who has taken over from now Past-President Michael Charles. CAE Fellows who are interested in becoming involved in this project, who have not already done so, are encouraged to contact me. See also www.trottierenergyfutures.ca. Under the continuing leadership of Clem Bowman, plans are underway for the CAE Energy Pathways Task Force to collaborate with others in developing new projects aimed at achieving the vision of Canada as a sustainable environmentally sound energy superpower.

I draw your attention to the "Opinion Piece" on page 12 and "Comment" on page 15. Hopefully these will spark interest, provoke comment, and maybe generate some action! With regard to the CCA follow-up assessment on the State of S & T in Canada (see page 15), you may receive an invitation to complete a 'closed' survey being conducted by EKOS on behalf of the CCA. The next PAGSE Bacon & Eggheads Breakfast - Bringing Power to the People – Smart Grids and the Future of Renewable Energy by Liuchen Chang, FCAE, University of New Brunswick, is scheduled for 7:30AM (EDT) on Thursday September 29, 2011 at the Government Conference Centre in Ottawa. Visit www.pagse.org/en/breakfasts.htm for more information.

As mentioned elsewhere in this newsletter, 2012 marks the 25th Anniversary of the founding of the Academy whose first meeting was held in Montreal on May 20, 1987. We are planning to recognize this milestone with some specific activities during 2012.

I remind Fellows that the deadline for submitting nominations for candidates for Fellowship is **October 31, 2011**. Please visit the Members Section of the CAE website www.acad-eng-gen.ca where you will find the guidelines for nominations and a nomination form. The search continues for a new Executive Director, if you are interested in the position or can recommend a possible suitable candidate, please contact me at maball@acad-eng-gen.ca.

Michael A. Ball

Ontario Professional Engineers Awards

The 2011 Ontario Professional Engineers Awards will be presented on November 12, 2011 at the International Centre, 6900 Airport Road, Toronto, Ontario. The following CAE Fellows are among the award winners who will be honoured:

Gold Medal – Michael E. Charles, FCAE, P.Eng.

Engineering Medal: Research and Development – Elizabeth A. Edwards, FCAE, P.Eng.

Engineering Medal: Research and Development – Douglas Perovic, FCAE, P.Eng.

Engineering Medal: Research and Development – David Zingg, FCAE, P.Eng.

Engineering Medal: Management – Anton Davies, FCAE, P.Eng.