

Professional Engineer



MCI's New "E" Coach Arrives

By: A.N. Kempan, P. Eng.

The view from the "fish bowl" is impressive. From this glass-enclosed lookout on the second floor of the nondescript building on Clarence Avenue you see engineers, designers, and drafters huddled together around desks and tables in small, intense groups. Between them are numerous mockups: power modules, drivers' areas, structures. The walls are covered with colourful charts, illustrations, and graphics depicting the progress and goals of the team. Computer workstations glow on many desks. This is where Motor Coach Industries is designing its revolutionary "E" Coach.

In order to maintain its pre-eminence in the highway coach market, MCI decided that a fresh and appealing product was essential, so in May of 1994 they launched the "E" Coach project. The way to ensure that the "E" Coach was indeed new and fresh was to design it away from the distractions and dampening influence of the old products. An entirely new group was formed from the best talent in and out of the company, and they were set to work in a separate building. To initiate the project, Lucas Engineering of England acted as consultant. The team was organized into "zones" – small design groups with multi-disciplinary talent. Design engineers, manufacturing engineers, and purchasing agents worked together. Not only was there a new coach to design, but the factory and production processes were to be designed with it. Their goal was to use half the factory space and about half the build hours of the old coach. The new coach would have fewer parts and fewer factory work stations. Suppliers, customers, and drivers were involved in extensive consultation before the design work began.

During peak development, up to 90 people worked on the project. In keeping with its high-tech approach, the "E" Coach made extensive use of CAD and finite-element analysis. The major CAD tool used was Unigraphics (releases 10 and 11). The "E" Coach team used it to design a complete 3D solid model of the bus to check for interferences, and as the platform for finite-element models. The resulting CAD model was so complete that it could be used for a virtual "walk-through" of the coach. Three prototypes were built, and fifteen demonstrators placed in high-mileage fleets.



A key feature for the manufacturing crowd was the development of a single, modular, add-only bill of material (BOM). Here, the term "single" means there's one BOM for engineering and manufacturing. The customer options offered created a staggering number of manufacturing com-

binations. The add-only feature allowed manufacturing to create these bills simply and quickly so that internal manufacturing and suppliers could be scheduled for timely parts-delivery. Suppliers of high-volume items were to stock the assembly

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To Rank or Not to Rank:

Macleane's, Engineering and the University of Manitoba

By: Dr. B. Stimpson, P. Eng.

Francis Galton, most widely known as the father of the dubious "science" of eugenics, was obsessed with the idea that such "things" as human intelligence, beauty, and boredom could be measured and then ranked on a scale. According to his "beauty" map of the British Isles, London had the most beautiful women and Aberdeen the ugliest. He achieved this "scientific" result by observing women as they passed by and noting whether they were "attractive," "indifferent," or "repellent." He also attempted to determine the efficacy of prayer, probably out of a need for assurance of divine protection should he ever visit Aberdeen again! Fortunately, the limitations and potential for bogus conclusions from such surveys are more widely appreciated today than in Galton's time. Nonetheless, there is still great fascination and interest in ranking. Which of us does not feel a sense of national pride to find Canada ranked first among nations in quality of life?

Galton would, no doubt, be pleased that *Macleane's* also believes in the enterprise of ranking – in this case, the ranking of Canada's universities. According to *Macleane's* scale of "ugliness", the University of Manitoba is the "ugliest" (15th out of 15 schools in *Macleane's* Doctoral/Medical Category). Should we believe this and vow never to advise attendance at the University of Manitoba, this being the equivalent of suggesting to a young man that it may not be wise to date a woman from Aberdeen? Just as the ranking of Aberdeen's women depended on the selection of Galton's criteria for beauty (after all, isn't beauty in the eye of the beholder?), so *Macleane's* ranking of universities depends on the associated criteria and weightings given to each.

In the magazine's survey, three factors, together worth 30% of the total weighting, have a

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Opinions expressed are not necessarily those held by the APEM or the Council of the APEM.



Westman Chapter News

By: S.M. Trivett, P.Eng.

The Westman Chapter of the APEM held their first dinner meeting of the year at the Royal Oak Inn in Brandon on November 27, 1997. The meeting was presided over by Brian Townes, P.Eng., Chair of the Westman Chapter. Thirty members were in attendance, and enjoyed a hot buffet dinner and good company! After dinner, Shirley Matile, P.Eng., APEM Director of Admissions, gave a most informative presentation on the MPDP program currently being developed and tested via a pilot program. □

RESIGNATIONS AT DECEMBER 31 1997

D.E. Andres	G.K. Klause
J.T. Atchison	M. Kocalka
S.L. Baldwin	K.M.A. Koshelanyk
A.P. Barsalou	V. Kukoraitis
A.T. Bicol	R.K. Kumar
D.C. Brooking	D.L. Lazar
D.J. Browne	E.H. Lazar
J.C. Chang	K.A. Lenz
S.B. Clarke	W.J. Litvinchuk
J.D. Close	D.G. Lunder
G. Cnoop-Koopmans	S.D. Macswain
A. Contant	J.E. McClung
K.M. Corbett	E.C. McRoberts
D.G. Delaney	D.M. Nagasaka
A.M. English	C.A.J. Paul
L.G. Farrant	E.G. Plett
R.D. Farrell	O.A. Rutar
A.R. Forbes	J. Schnabl
J.A. Fox	D.J. Selleck
N.E. Garrioch	H. Sperber
A.E. Gibb	D.A. Stanbury
R. Girulski	T.R. Studer
D.R. Goehring	D.L. Surdu-Miller
M.K. Goel	L.R. Swift
C.J. Goodwin	K.R. Switala
M.N. Gray	H.E. Thiessen
L.P. Haberman	J.S.P. Toye
W.A. Hansen	R.J. Wheeler
R.E. Harrison	J.R. Wonnacott
T.L. Heisler	R.J. Wreford
G.M. Hoffman	W.R. Yip
W.D. Hurst	B.H. Young
J. Jackson	G.G. Yuen
S.R. Janzen	G. Zhang
T. Jensen	

EIT RESIGNATIONS AT DECEMBER 31 1997

B.G. Beyer	S.K. Ostermann
G.F. Boddy	S.J.J. Peter
H. Gehrer	R.J. Scruten
A.D. Hymers	C.S. Skrynyk
T.R. Mackinnon	B.P. Station
J.D. Miller	



Steve Trivett thanks Shirley Matile.

RETIRED JANUARY 1 1998

D.S. Estey	W. Naumko
K.J. Fallis	A.L. Parres
G.A. Filmon	J.P. Patterson
E.W. Frehs	W.D. Pooles
G.F. Gillespie	R.T. Quenett
R.E. Gottfred	D.E. Render
R.A. Johnson	R.E. Scouten
A.N. Kempan	F.R. Scrase
K.J. Kramer	J. Shewchuck
T.B.J. Kruselnicki	D.B. Sigurdson
J.N. Lewak	A.H. Soliman
E.I. Lexier	V.H. Wiens
W. H. Mitchell	L.K. Wong

EITs ENROLLED NOVEMBER & DECEMBER 1997

S. Anand	K. McTaggart
L.N. Anderson	T.P. Meier
K.J. Barrett	K.J. Moore
G.K. Bazinet	W.D.M. Morrical
J.C. Bewsky	M.W. Morrison
E.H.E.M. Bloomer	P.C.Y. Ng
L.J. Brown	J.S. Pacak
G.V.R. Cadieux	M. Patel
J.K. Cuddy	K.M. Perris
D.J. Desveaux	J.S. Radford
G.F. Drouin	J.I. Reagan
P.T. Elefsiniotis	B.S. Ryall
E.R. Ferbers	H.S. Saggi
P.M. Frank	J.S. Sagoo
T.J. Giesbrecht	K.B. Spent
D.J. Gillich	S.M. Stoller
K.M. Girard	K.A. Sutherland
D.M. Goertzen	J.V. Thomson
R.E. Haller	K. Tran
G.J. Handziuk	R.J. Tremblay
F.K. Hashemian	J.M.E. Webb
D.G. Illerbrun	D. Wilmot
M.A. James	R.M. Winton
L.J. Kmita	S.F. Wright
R.R.J. Laurin	L.G. Wytrykush
M.R. Liu	D.O. Yemane
H.J. Louka	P.C. Zuk
D. Lourenco	

NEW MEMBERS REGISTERED NOVEMBER & DECEMBER 1997

L.K. Alexanderson (AB)	D.A. Epp
A.D. Asmundsson	D. Fournier (PQ)
L. Audet (PQ)	D. Georgiou (ON)
K. Bielunska-Perlikowski	K.S.G. Halayko
C.G. Coey	R.C. Hannah
J.N. Crang	H.A. Katz
A. Dhawan	J.D. Keil
S.B.W. Diachun	A.P. Lehman
A. Duda	R.V. Parsons
L.V. Ens	R.G. Stanger (SK)
	J.P. Theriault
	A.K. Tomtene (SK)

LICENCES ISSUED NOVEMBER & DECEMBER 1997

A.A. Altaee (ON)	P. Landry (PQ)
J.A. Axelson (WI)	D.B. Lepage (AB)
J.E. Burson (TX)	C.K.S. Lin (AB)
P.G. Keith (AB)	G.V. Nagel (MN)
P.B. Kulkarni (TX)	M. Toth (ON)

President's Message

P. Washchyshyn,
P.Eng.



By the time you read this message, professional engineers will have celebrated Christmas and the holiday season to the fullest, made numerous *New Year's resolutions*, or for some people, *revolutions*, and embarked on the challenges that the New Year will bring. We trust that you will all have enjoyed the holidays and wish each and everyone of you the very best in 1998. Have a Happy, Healthy and Prosperous New Year!

At APEM, life goes on. At the December Council Meeting, Councillors dedicated a significant amount of time to reviewing the pilot Mandatory Professional Development Program. Councillors completed the necessary forms in

advance and discussed them openly at the Council meeting. The purpose was not to formulate opinion or consensus but rather to be aware of the program and be able to be responsive to membership inquiries. Members are urged to contact their Councillors in this regard.

We are proceeding, however slowly, with negotiations towards Memoranda of Understanding with the land surveyors and the landscape architects in support of the proposed Engineering and Geoscientific Professions Act. Negotiations are continuing with the Manitoba Association of Architects (MAA) in hopes of obtaining their support for our Act. Meetings have been scheduled with respective ministers in January to forward the process.

As stated in my message in December, I believe that the APEM must appear to be relevant to its membership. To foster that awareness, I intend to visit the Chapters of APEM early in 1998. We will be in touch and schedule sessions to obtain the most meaningful dialogue that the occasions can afford.

Once again, on behalf of the Council and staff at the APEM, I wish each and every member the very best in 1998. □

MCI's New "E" Coach Arrives

(Cont'd from page 1)

line on the Kanban principal. At full production, MCI planned to build six "E" Coaches per day, with the bus shell fabricated in Winnipeg, and final assembly in Pembina, ND.

Last summer was the debut of the "E" Coach. What did \$30 million (US) in development bring to MCI? The coach is impressive with its sloped front profile, distinctive circular entrance stairway (both patented features), and smooth sides. It has a 470-HP Detroit Diesel Series 60 engine coupled to an Allison 6-speed automatic transmission, all-wheel ABS and disc brakes, steerable tag-axle, 20 microprocessors, roof-mounted LED brake lamps, electronic suspension, under-floor cooling system, and seating for 54 – 60 passengers. Customers paid up to \$350,000 US to be the first to own these vehicles.

The "E" Coach design team received a special distinction in March when they were co-winners of the Structural Dynamics Research Corporation/Machine Design Magazine Concurrent Design Engineering award. This competition had 21 entries and four finalists. Winners in previous years were Chrysler Corporation and General Dynamics. MCI is the first non-US winner of this award.

The "E" Coach story is the special achievement of a dedicated group of MCI employees, and for that we congratulate them. However, all Manitobans can be proud of their accomplishments. It shows that we have, in this province, a very talented and creative technical community.

(I'd like to express my thanks to the following people who helped in writing this article: M. Sealy, Project Leader, B. Couch, Project Manager, and P. Phillips, P.Eng., Power Train Zone Leader.) □

Automated Highways

By: T. Pietrafesa, EIT,
assisted by W. Pietrafesa, EIT

Highways have become the lifeblood of industrialized nations, but in many places they have become overburdened. The solution to this problem is more complex than just adding more lanes and new highways. New highways are enormously expensive to build in urban areas, and are often opposed by both environmentalists and the public.

A possible solution is the automated highway. An automated highway may be a lane, or highway, in which specially equipped vehicles would travel together under computer control. But



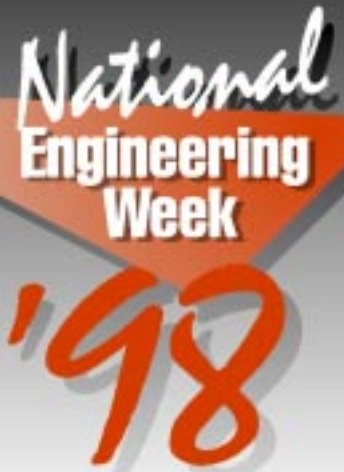
before automated highways can become mainstream, they must overcome several obstacles such as cost, public distrust, and accident liability.

An automated highway may be the least expensive way of dealing with increasing traffic demands. The theory behind the automated high-

way is rather simple. You would drive a car to the on-ramp of the automated highway, and then enter your destination in the on-board computer. The traffic-management computer of the automated highway would take this information, merge the car onto the highway, and drive the car, in co-ordination with other vehicles, to its destination. This approach could very well maximize safety, highway capacity, and efficiency, while reducing congestion. A typical highway lane can handle 2,000 vehicles per hour, but a lane equipped with automatic equipment could handle 6,000 vehicles per hour.

The automated highway itself would be a normal highway with sensors embedded in the roadway to track vehicles, and a computer to monitor and coordinate vehicles on a given stretch of road. The cost to modify a given stretch of high-

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NEW People Wanted

By: R.H. Bernhardt, P.Eng.

Preparations for National Engineering Week (March 5-8, 1998) continue. As with any large endeavour undertaken solely by volunteers, extra helping hands are always appreciated. In particular, individuals willing to give approximately three hours of their time during NEW to staff a display area in Polo Park Mall are being sought. Any P.Eng. or EIT is welcome. Retired members willing to share their engineering experiences with the general public are particularly asked to help.

In a related area, individuals or businesses willing to give or lend materials for the display area are also being sought. The desired material includes promotional information (brochures, posters, etc.), tangible items (final products or parts), and/or VHS videotapes.

If you wish to volunteer your time, or provide display materials, please contact Richard Bernhardt at 788-2969 or John Rooney at 788-5438. □

U of M Faculty of Engineering offers Students Two Options: Direct Entry or Engineering after University 1

Reprinted with permission from "The Bulletin", a University of Manitoba publication.

The engineering faculty bristles at the suggestion it is subverting University 1 by offering entering students two options into Engineering: direct entry into a five-year engineering program or four years of engineering after University 1.

Although the expected entry into engineering, as with other faculties, will be University 1, Senate approved engineering's request for direct entry to the faculty for high school students with an average grade of 85% or higher in one mathematics and two science courses.

Faculties and schools were given a choice of opting in or out of University 1. Engineering decided to take the middle ground and offer both.

A three-year trial period for the new direct-entry process will begin September 1998 and end no later than September 2000. The faculty was asked to report on its direct-entry experience to Senate by September, 1999.

Engineering wants to ensure it continues to attract top students and enlarge the window of opportunity for all students. The faculty's market for direct entry is a cohort of students who decide in high school that they want to study university engineering. Engineering is concerned that if

these students are required to take University 1 before a four-year engineering degree, they may study at another university.

In a memo to Dave Burton, Chair, University 1 Council, Engineering Dean Don Shields presented the scenario that entering students with high averages "may find themselves in University 1 and realize that, should they decide to proceed into engineering, they could be short credits." The result would be that their program to the engineering degree would take longer than would have been the case if they had used their 85% averages to go directly into engineering. By taking engineering courses, in addition to their University 1 program, they would keep in step with the "engineers".

Shields said that if Engineering counselled students to take University 1 and then insisted students follow a prescribed curriculum "we would be undermining the purpose of University 1."

"Engineering invented 1+4 and 1+Engineering," added Shields. "We are believers in University 1, but as the President has said, 'It is really up to University 1 to sell itself to students as the route for them to take'."

"Three years from now, with the experience of

dual entry under our belt, we will be in a position to review the evidence to see if dual entry is really necessary, and if University 1 has been the success we all hope it will be," concluded Shields.

Engineering will adhere to its original plan to offer University 1 students the opportunity to catch up to engineering students by taking courses in intercession if enrollment figures are warranted.

Senate's executive committee noted that public information should clearly identify University 1 as the preferred route for university entry. The committee also expressed the concern that direct entry may have an adverse effect on University 1 by diverting some of the better students away from participation in the new University 1 program and lead to a perceived difference between students entering the faculty through different routes.

Dr. Richard Lobdell, Associate Vice-President (Programs) noted that Engineering's exception was "a novelty" and that other faculties are proceeding with the core first-year program.

Senate members expressed concern that Engineering may set a precedent: entering students should know before they are admitted what courses they will have to take, and entering students who had less than 85% in their marks might go elsewhere anyway.

Dr. Douglas Ruth, Engineering Associate Dean, told Senate the last academic year recorded approximately 400 new admissions to the faculty, 130 of whom had high-school marks of 85% or more, 100 were transfer students from Arts, Science and other institutions, and the remainder had marks below 84%. □

Meet Your New Councillor – Allan E. Ball, P.Eng.

By: V.L. Dutton, P.Eng. (Ret.)

With some 3,000 members eligible to vote, how important was Allan's "platform" when we marked our X's – well, our 1's, 2's, and 3's – last Fall? Following my interview with Allan, I searched for my copy of the platforms of the candidates, and found that it had been blue-boxed. (Isn't it great how English expands – a brand new verb – and you first saw it

in the MPE!) The one thing Allan did mention at the interview was "Professional Development". As the interview continued, I became aware that the manner in which Allan became a P.Eng. qualifies him eminently to address this subject. You see, he came through the Association's examination system.

Following graduation from Churchill High, Allan went through the Diploma Course in Mechanical Engineering Technology at Red River Community College, and then worked for three years for Crippen-Acres.

He then moved to Honeywell and was a Systems Designer for three years. Following that, he joined Wardrop, and it was here that he registered for the Association's Examination program in 1982. With 16 examinations facing him, he ultimately realized that it would make sense to take some courses at the University, so he spent the spring and fall terms of 1988 as a full-time student in Mechanical Engineering.

Finally, in 1990, he registered with the Association.

That would also have been when he joined the Publication Committee on which he served until his election to Council. He also served on two ad-

hoc committees for the APEM, and two for the Association of Consulting Engineers of Manitoba (ACEM).

Having come "through the ranks", Allan has worked hard at providing for his family. His technology training has given him the ability to maintain his car in a way that at least one P.Eng. I know can't. He also did much of the building of the Ball home which, he told me, is in a state of "almost continuous construction".

It was when I started to ask Allan about his family and community activities that I began to get the real measure of the man. He gave one winter to Junior Achievement. With my own daughter having spent a winter in Junior Achievement, I know how much time the advisors give to these young people, investing in our youth.

The Balls have a daughter, Alanna (18) in Nursing at the University of Manitoba. Their second daughter, Melanie (16) plans to become a veterinarian, while their son, Christopher (12) is involved with computers and science. All three of the Ball children have been in French Immersion. Allan's wife, Susan, is a care-giver at the St. Amant Centre. The family are active members of the Richmond Gospel Fellowship, on Pembina Highway, where Allan is currently the Council Chairman.

It would appear that the affairs of our Association will continue to be directed by competent Councillors. □



New Councillor Allan E. Ball, P.Eng.

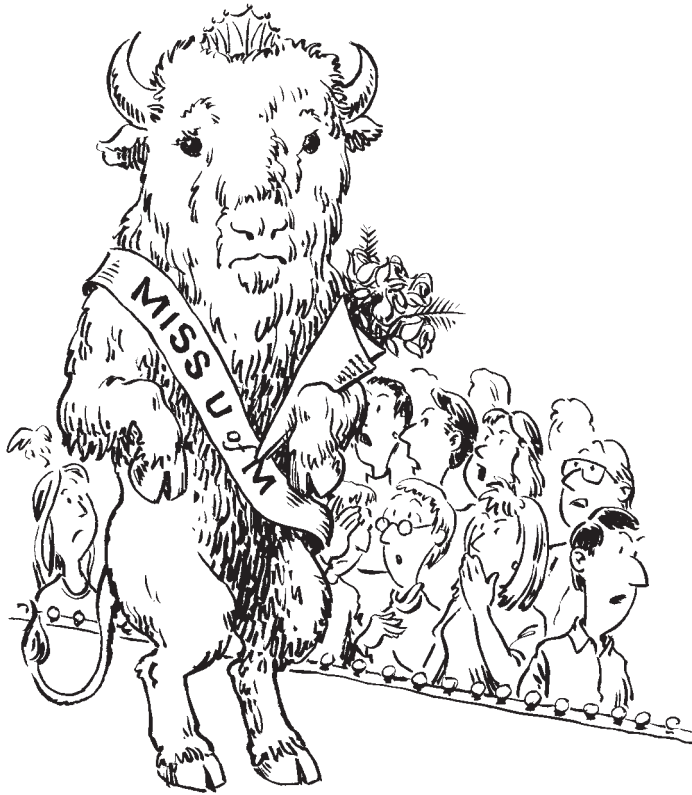
Mclean's, Engineering and the University of Manitoba

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particularly negative impact for the University of Manitoba. They are deemed by *Maclean's* to be a measure of "quality." (Note: last place earns 1 mark, second-from-last receives 2 marks, etc.). The U of M ranks 14th out of 15 medical/doctoral universities on the basis of average high school entering grade (12% weighting), which is about 10% below that of the top university, and last on the proportion of entering students with an average high school grade of 75% or greater (3% weighting). The University of Manitoba has steadfastly maintained a policy of accessibility, given that a student turned away may not have any alternative within the Province. In provinces like Ontario and Quebec, the university system is more stratified and the well-established schools such as McGill, Queen's, and Toronto are able to select the students with top grades, knowing that there will be places in other universities for those who cannot jump their entrance hurdles. What is surely more important, given the variability of high-school grades, is how students perform once they enter university. To *Maclean's* credit, the survey does incorporate a Value-Added Category (based on comparing average entering grade with graduation rate and success at winning national awards). In this category, the University of Manitoba ranks second among the medical/doctoral schools after the University of Ottawa. Unfortunately, the weighting given by *Maclean's* to this attribute is 0%. This is curious, given the emphasis in Canadian business on the importance of "value-added" production.

It is noteworthy that, despite the second-lowest average high-school entrance grades of any medical/doctoral university in Canada, the University's top students are extremely competitive. For example, U of M students have won significantly more special corporate awards than any other university in Canada. Of the 11 Corporate Awards for Canada Scholars in Science and Engineering presented to U of M students in 1997 (second place, but first in 1995 and 1996), four were given to engineering students (Krystal Park, Electrical and Computer Engineering, 2 awards; Natalie Rizkalla, Civil and Geological Engineering; and Brea Williams, Civil and Geological Engineering).

A further 15% weighting is given to the Reputational Survey, in which a questionnaire is sent to over 3500 guidance counsellors, business executives, and university leaders across Canada, asking them to evaluate the reputations of about 45 universities. Responders are not asked to indicate the type and sources of information about the 45 universities on which they have drawn to make their assessment, but one must surely wonder how many of this group really have sufficient knowledge to make a credible judgement. It is conceivable that the only "information" some



may have about the University of Manitoba is that it ranked at the bottom in *Maclean's* survey the year before. Also, some schools are perceived as more worthy than others on the basis of a long and early tradition that no longer holds true. Last fall, I visited one of *Maclean's* top three universities, where one engineering program had been given a 1T (one year followed by termination) by the Canadian Engineering Accreditation Board (CEAB). Reputations tend to have a long life, independent of what may actually be taking place in the institution. It would certainly be interesting to know how many respondents simply refused to answer this question because they recognized the flimsiness and subjectivity of their knowledge base.

Might I suggest that an annual survey of newsstand magazines be conducted by an enterprising school of journalism. It might include

such varied magazines as *Maclean's*, *Atlantic Monthly*, *The New Yorker*, and *The Economist*. What survey questions would be used to assess "quality"? Number of cartoons? Number of journalistic awards? Average length of an article? Foreign reputation? If *Maclean's* ranked last, what would that really mean? Would you stop buying it and subscribe to *Atlantic Monthly* instead?

While the University is correct in pointing out where the survey's criteria of quality and associated weightings are questionable (the interested reader is advised to read the November 20, 1997, edition of the U of M's *Bulletin* for guidance on how to read the *Maclean's* survey), or are not favourable for the U of M because of their particular bias (e.g. U of M's policy of accessibility), it is imperative that measures be taken, where possible, to improve the University's ranking. The state of health of the University and its perceived quality are of salient importance to the province's reputation as a place of art, culture, science, and modern technology. Recently, through articles, and local and national newspaper advertisements,

the University has been presenting its side of the story so that people at least have the opportunity to reflect on the nature of the survey and what it really means.

The *Maclean's* ranking is a global one, applying to the entire institution. Consequently, in the absence of further information, the temptation is to rank all constituent schools and faculties similarly. This is equivalent to assuming that all Aberdeen women are "ugly" because Galton ranked the city last. For undergraduate Engineering schools, a separate ranking, based on 18 criteria, is published by the National Education Standards Organization of Los Angeles, California. (See Figure 1)

Sixty Canadian Universities are also ranked. The University of Manitoba is placed 9th (or 6th among *Maclean's* Medical/Doctoral category). The same caution must be exercised in reading

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Figure 1.

The two most recent rankings (1993 and 1996) place the Faculty of Engineering's Programs at the University of Manitoba as follows:

Program	Ranking			
	Canada		North America	
	1993	1996	1993	1996
Biosystems	1 out of 7	1 out of 7	4	4
Civil	12 out of 25	12 out of 24	25	24
Computer	3 out of 11	5 out of 15	11	12
Electrical	9 out of 26	8 out of 30	22	16
Geological	7 out of 11	6 out of 11	11	9
Industrial	4 out of 8	4 out of 8	11	15
Mechanical	4 out of 24	5 out of 25	13	15

Research & Development

APEM Luncheon Meeting, November 6, 1997

CTN – The Canadian Technology Network

By: A.J. Pollard, P.Eng.

The Canadian Technology Network (CTN) is a linked network of federal and provincial government labs and agencies, universities, community colleges, industry associations, technology centres, and economic development agencies. In short, the CTN is an invaluable source for expertise, advice, information, and referrals aimed at small- and medium-sized businesses. Alfonz Koncan, the CTN Regional Coordinator, described the benefits and opportunities of this resource for a widely varied audience.

The CTN provides a wealth of connections that can help an enterprise grow. It brings together in one place access to just about everything needed to do business in the technology sector. The CTN provides information on over 60 Mem-

bers in Manitoba, alone, and hundreds more in other parts of Canada. The members are organizations like the Electronics & Information Association of Manitoba (EIAM) and the Prairie Agricultural Machinery Institute (PAMI), which provide direct advice and assistance in technology as well as general business-related services.

The CTN is available on the Internet, and can be searched by region, by field of expertise, by name of organization or by name of contact. In one place, you can have access to experts in many technological fields without needing to know much about the technology. Each member has a listing, including the logo and mission of the organization, as well as contact information including telephone, e-mail, and web site.

CTN also provides training opportunities in technology areas such as how to use and search the internet, and how to create and maintain a web presence. CTN runs a number of networking events both for CTN members and for the general business population.

Alfonz described some significant CTN success stories in Manitoba with the Alliance of Manufacturers & Exporters Canada, the Industrial Technology Centre, and PAMI.

CTN has a strategic plan to continue to improve its already enviable client satisfaction by fostering an integrated approach to client service, and exploiting the potential of electronic media and tools for member and client benefit. They will promote membership services and raise awareness of activities, as well as providing networking opportunities. They are also working to develop and improve access to international science and technology resources.

As part of this plan, Alfonz closed his presentation by inviting the participation of APEM in CTN, to continue the growth and success of technology in Canada.

For more information about the CTN, please see <http://ctn.nrc.ca>, e-mail to alfonz.koncan@irap.nrc.ca, or call Alfonz Koncan at 984-1147. □

First D.R. Grimes Graduate Fellowship Awarded

By: C.R. McBain, P.Eng. (Ret.)

Mr. Haney J. Louka, a student in the M.Sc. Program in Structural Engineering at the University of Manitoba, is the first recipient of the D.R. Grimes Graduate Fellowship. The 1997 award was in the amount of \$6,300. Mr. Louka was honoured at a luncheon on October 30, 1997, where his accomplishment was recognized and where he had the opportunity to meet Mrs. Grimes (Liz) and three of the four Grimes children (Bruce, Michael and Wendy).

The luncheon was hosted by Mr. Lloyd McGinnis, P.Eng., Chairman of Wardrop Engineering Inc., and Mr. Clyde McBain, P.Eng. (Ret.), Chair of Ancast Industries Ltd. Dr. Sami Rizkalla, P.Eng., of the Faculty of Engineering, under whom Mr. Louka is studying; Mrs. Elaine Goldie, Director of Private Funding at the U of M; and Mr. Bo Gulay, P.Eng., President of Wardrop Engineering, attended. Also present were Mr. Dave Ennis, P.Eng., APEM Registrar; and Dr. Glenn Morris, P.Eng., now retired from the Engineering Faculty; both of whom were associated with the creation of the Fellowship.

Lloyd McGinnis reviewed Doug Grimes's career, touching on his contributions to engineering, to APEM, to the university, and to the community. Elaine Goldie brought the welcome news that the campaign to fund the Fellowship has been very successful, with 23 corporate and 457 individual donors contributing in excess of \$87,000, with a further \$3,000 in pledges outstanding. With the University's contribution of \$60,000, there is in excess of \$147,000 in the

fund, with the likelihood that it will exceed \$150,000 when all pledges are completed. Of the 457 individual donors, it is believed that approximately 400 are engineers, indicative of the great esteem in which members of our profession held Doug Grimes.

Sami Rizkalla told the group about Mr. Louka's studies which involved research in the new "smart" bridge at Headingley, Manitoba. Mrs.

Liz Grimes congratulated Mr. Louka and thanked the committee for establishing the Fellowship in Doug's name. Mr. Louka thanked the committee for the award, and expressed his pleasure at meeting the Grimes family and learning about the life and contributions of the late Doug Grimes.

The committee members who conceived this memorial to Doug are extremely pleased with the marvellous response to the request for donations to fund the Fellowship, and wish to extend their thanks to all who helped and contributed. For those whom the appeal did not reach and who would like to contribute, it is as simple as sending a cheque to the Department of Private Funding, University of Manitoba, and directing the gift to the D.R. Grimes Graduate Fellowship. □



From left to right: Michael Grimes, P.Eng., Mrs. Wendy (Grimes) Krovats, Haney Louka, Mrs. E.C. (Liz) Grimes and Bruce Grimes.

Changes to Engineering Profession Act Proposed

(First in a Three-part Series)

By: H. Lobo, EIT

Since 1972, there has been a movement to incorporate Group Practice Licensing in the Engineering Profession Act, but it wasn't until 1987 that an ad hoc committee seriously pursued the issue. During this process, the opportunity was also taken to review the complete Act, update it, and incorporate numerous other provisions. After an arduous process with many com-

mittees, a draft which incorporated Group Practice Licensing was initially submitted by the Legislation Committee to Council in 1992.

By 1993, a new player arose: the Geoscientists. The Legislation Committee was authorized by Council to review the existing Act to incorporate Geoscientists. As this was developing, the Law Reform Commission reported on self-regulating professions, CCPE worked on defining the profession, and issues within other Provincial Associations were also considered.

The Legislation Committee, after consideration of the responses from the various internal groups, submitted a revised draft to Council in 1996 for review. Some key issues at hand were the regulation of Geoscience, monitoring the practice of Professional Engineering and Geoscience within Corporations, and Mandatory Professional Development. It is important to note that, at this time, the definition of engineering changed from an exhaustive list of individual disciplines to a generic one, to ensure that all future disciplines of engineering fall within the Act.

It was anticipated that the proposed Act would be introduced and passed by the Provincial Legislature during the 1997 spring session.

So where are we? Government influence and lobbying from various external stakeholders, including the Manitoba Association of Architects (MAA), the Manitoba Association of Landscape Architects (MALA), Association of Manitoba Land Surveyors (AMLS), and the National Body of Physicists, Chemists, Biologists (natural scientists), have influenced the progress and, on occasion, stopped its forward movement, as will be described later in Part Two of this series. The Legislative Counsel has completed a review of the proposed Act and has submitted a draft entitled "Possible Legislation Regarding Engineering and Geoscientific Professions" to the Minister of Labour.

Is there an end in sight? The new Act should be passed by the Legislature during the summer of 1998, thus ending the once insurmountable task. This will bring about the beginning of a new era which will see all associated professions working together to better safeguard and ensure the protection of the public interest. □

Mclean's, Engineering and the University of Manitoba

(Cont'd from page 5)

too much into these rankings as in considering the *Maclean's* survey. In the latter, the primary issue is weighting of responses. With the former, the issue is unknown information-gathering and scoring methods.

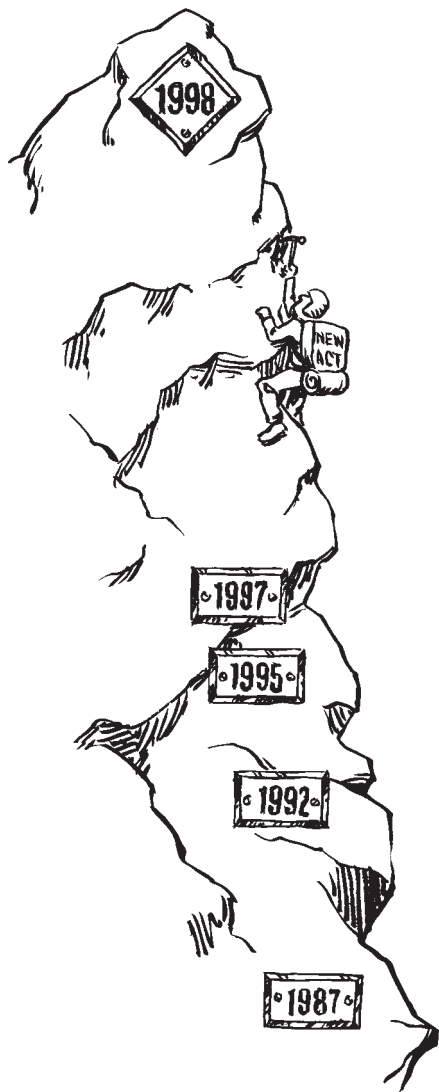
It is to the credit of the engineering profession in Canada that the effect of the Canadian Engineering Accreditation Board has been to develop a generally high quality by establishing rigorous minimum standards for accreditation. Therefore, over the past 20-30 years, the differences between Canadian engineering schools have been less marked than in the United States. A comparison of the columns for Canada and North America in the table suggests that Canadian engineering programs rank near the top on the continent. However, more Canadian engineering programs are running into difficulties with accreditation as prolonged cuts in government funding are taking their toll. Universities cannot readily reallocate available funding quickly enough to prevent accreditation problems without undermining the programs from which those resources might be taken. At the moment, all six continuing engineering programs at the University of Manitoba (Geological Engineering has been placed into the "not currently offered" category because of resource constraints) have full 6-year CEAB accreditations. It is anticipated that this exemplary situation will be tested during the next accreditation visit (1999) because of budget cuts that have been imposed since the last accreditation visit.

The Canadian Engineering Accreditation Board (CEAB) policy of establishing minimum acceptable standards is preferable to the dubious practice of ranking. I hope I have shown that it is important to examine the assumptions behind the questions that lead to rankings, and that the U of M's engineering programs have, to date, maintained a good quality that is, unfortunately, in danger of being sullied and compromised by the *Maclean's* survey, as well as by continuing resource cuts.

In closing, it is sobering to note that the first known incidence of assigning marks to measure "quality" occurred at the hands of an engineering professor. In 1792, Prof. W. Farish proposed that students' papers at Cambridge University be graded. Here we see the beginnings of the idea of quantifying human thought as if it were a thing like a steel test piece with a measurable yield strength. Can we reduce reality to a single number? Whether this is a good or stupid idea I leave the reader to decide, but please remember the story of the statistician who drowned because he was convinced that he could wade across a river whose average depth was 1 metre. □

Acknowledgements

Although this article is a personal viewpoint and I remain accountable for the views expressed, I wish to thank the following university colleagues for their comments and corrections: President Emöke Szathmáry, Dean Don Shields, Associate Dean Doug Ruth, and Prof. Carol Shields.



Engineers in the News

By: S.M. Matile, P. Eng.

Dr. Digvir Jayas, P. Eng., Head of the Biosystems Engineering Department at the University of Manitoba, recently received a University Outreach Award for his contribution to, among many other things, the engineering profession at both the provincial and national levels.

Dr. Jayas is an active member of, and contributor to, both this Association's Board of Examin-

ers and Experience Review Board. He also serves on the Canadian Engineering Qualifications Board, where he has developed a national guideline for the treatment of applicants who do not hold CEAB-accredited engineering degrees, and is currently chairing the committee developing the 1998 national syllabi of examinations.

Congratulations, Digvir! You are a most deserving recipient! □

Council Reports

Tuesday, November 18, 1997

By: C.P. Gray, P.Eng.

AT WHICH COUNCIL OPPOSES MANDATORY SERVICE ON APEM COMMITTEES

Executive Director Dave Ennis reported on a recent meeting with The Certified Technicians and Technologists Association of Manitoba (CTTAM) and advised that there was an agreement to establish a joint board immediately so that the board would be in place when the new Act is passed. Three members are required and Council discussed desirable work experience and training for the positions.

President Peter Washchyshyn recently met with Manitoba Association of Architects President, Stephen Cohlmeier, to discuss the new Engineering and Geoscientific Professions Act and the Joint Board. MAA requested that APEM support an objection to the City of Winnipeg design-build proposal for the Glenwood Community Centre. APEM Council has referred the mat-

ter to APEM's representatives on the Joint Board with MAA for review in accordance with the Act and By-Laws. MAA has also requested that APEM co-sign a letter, to the City of Winnipeg and other jurisdictions in Manitoba, advising them of the Memorandum of Understanding (between APEM and MAA) and the Joint Board in case of a dispute between the two professions.

In addition, MAA has requested that APEM co-sign a letter to the City of Winnipeg Planning Inspection Department asking for a delay in issuing further building permits for 25 DeBaets Street until appropriate professional involvement can be resolved through the Joint Board. The matter has also been referred to the Joint Board representatives for their recommendation.

A proposal for mandatory professional service on APEM committees was discussed at length and it was agreed that it be dropped from Council's list of Vision Strategy Issues. It was believed that the Mandatory Professional Development Program will encourage members to serve on APEM committees, and so a mandatory professional service requirement is somewhat redundant.

Admissions Director Shirley Matile reviewed the recommendation from the Legislation Committee on Geoscience titles. Rick Lemoine, the Chair of the committee of geoscientists dealing with registration issues, has requested that Council revisit a motion passed at the October meeting. Council is to consider the matter again at its December meeting. □

Tuesday, December 9, 1997

By: A.N. Kempan, P.Eng.

WHERE ALL MEMBERS ARE PRESENT AND THE PRESIDENT CASTS A RARE TIE-BREAKING VOTE

The meeting began most propitiously when all Councillors were present for the meeting. It is most unusual when 12 schedules mesh given that you are dealing with 12 busy, hard-working engineers.

Overall, this meeting had a similar tenor to ones I've covered recently. A bit of background is in order here - as members may or may not be aware, the provincial government is preparing to enact a new Engineering and Geoscientific Professions Act. This will redefine how our profession and the technicians, technologists, architects, land surveyors, landscape architects, physicists, and natural scientists will co-exist. All parties are seeking agreements with one another to delineate their professional interfaces. As Robert Frost said, "Good fences make good neighbors." By working out the details now, there are better chances for peaceful co-existence in the future.

The burden of monitoring the legislative process for the new act falls on our Executive Director, Dave Ennis, P. Eng. He presented to Council a document outlining the status of agreements with the other stakeholders. Some negotiations are proceeding well, and some require further fine tuning.

Next, Council engaged in a very interesting exercise in democracy for regulating our co-existence with our geologic brethren. Rick Lemoine, P.

Geol., has attended several Council meetings to get to know us and to forge mutually acceptable wording for the definition of the practice of geoscience. Rick suggested a tripartite motion regarding the registration of geoscientists. Council acted on the suggestions for each item separately. Things became interesting when the second item, regarding the geoscientific titles that should be protected, ended in a 4-4-3 stalemate. This hadn't happened in recent memory and it fell to our President, Peter Washchyshyn, to break the tie. He voted for the motion and moved the process along to the great relief of Mr. Lemoine. While this vote didn't settle all issues with the geoscientists, great progress has been made.

A matter of internal governance was next when Council filled the positions of President-Elect and Executive Member. These positions are filled from Council by a vote of Council. Ron Britton, P. Eng., and Doug Kramble, P. Eng., were nominated for President-Elect, with Mr. Britton emerging victorious. Allan Ball, P. Eng. and the same Mr. Kramble locked horns for the position of Executive Member. It was second-time-lucky for Mr. Kramble who is now Executive Member.

You must give Council credit for sampling their own handiwork when they worked through the exercise of self-assessment as part of the proposed mandatory professional development program. Most members found it to be quite user-friendly and they discovered that most of their PD requirements were filled in the normal course of work, either through practice, study, or reading.

Director of Admissions Shirley Matile, P. Eng., presented to Council a draft policy regarding retired membership. Ms. Matile felt that a necessary condition of retired membership should be retirement from the workforce. Under the current policy, those members who sell real estate or insurance could avail themselves of retired membership, thereby reducing their membership fees accordingly. Council engaged in lively debate and their opinion was that requiring members to be retired from the workforce was unnecessary and unfair to retirees who might have other pursuits, but still wanted to be affiliated with the profession. The requirement for retirement from the workforce was turned down.

Council dealt with several more internal governance issues to close the meeting. I think members should be aware that APEM has, underway, a process for re-organizing the workings of the Association. This will define the committee structure and working groups of the Association, who are responsible for much of the work of APEM. The Governance Policy will define, among other things, to whom a committee reports, the size of the committee, and issues addressed. □

Meet Your New Council – 1997-98



Back Row (from left): Kelly Olishefski, Alan Pollard, Ertrice Eddy, Kathy Pratt, Bonnie Thomson, Allan Ball, Mal Symonds, Doug Kramble. Seated (from left): Carol Roberts, John Hosang, President Peter Washchyshyn, Ron Britton.

MTS: A New Look

By: S.D. Spicer, EIT

The changing face of Manitoba Telecom Services (MTS) was the topic of discussion presented by Bruce MacCormack, CEO of MTS Advanced. Mr. MacCormack has a Bachelor of Engineering from McGill University and an MBA from York University. He began his career with MTS Advanced in January 1996.

The 42 people in attendance at the Norwood Hotel for the Professional Development breakfast meeting on October 23, 1997 were delighted by MacCormack's flair and passion.

The presentation focused on the privatization of the company, the products and services offered by MTS, and the future direction of the telecommunications industry.

Telephone companies of the past provided unaffordable capital products to the mass public for their use. The life cycle of the products was relatively short (3-5 years), and the barriers to entry (knowledge of communication systems, and technological information) that existed kept many people from entering the marketplace. Hence, a monopoly was formed.

Today, those barriers are obsolete due to the dissemination of information. Cable companies and Hydro companies have started to provide competition. As well, government regulations have been relaxed.

MacCormack asks, "How do we (MTS) reinvent ourselves to stay competitive?" The answer is simply to constantly change. According to Bruce, "the challenge is to take technically complex products and make them useable for everyone in their everyday life." Also, keeping up with the incredible pace of innovation, which many times is faster than the time required to obtain patents for design, is necessary in today's competitive marketplace.



Bruce MacCormack, CEO of MTS Advanced

A new structure was born

MTS Advanced, the new media arm of MTS, is one of four companies that have been created from the large conglomerate: Manitoba Telecom Services. The others are MTS Net, MTS Com, and MTS Mobility. The old dinosaur is trying to get rid of the government procedures that inhibited decision-making in the past, and is creating an environmental culture of trust and innovation.

MTS Advanced specializes in prototyping and marketing advanced new media products and services. MacCormack states that "cross-training people across industries can create new products and services from existing infrastructure". This is their "advantage". He used the example of the phone company's best product, the Yellow Pages, to illustrate how MTS Advanced is changing for today's marketplace. The Yellow Pages, known to everyone, is a medium of exchange for con-

sumers and merchants. MacCormack says, "although a best seller, it is a boring read."

Two models are used to illustrate how MTS Advanced is working for its customers. First, the *Depth Model* is used to build relationships among the existing customer base, and to help existing customers find their customers. The other, *Breadth Model*, provides products and services to customers and enables the service company to build those relationships.

The other expanding medium being used extensively is the Internet, which is "an intensely local medium" according to MacCormack, (local in the sense of geographic location and interest).

MTS Advanced will create value by enabling transactions between merchants and consumers in multiple media. One goal of this organization is to set everyone up with an e-mail address, to make e-mail as universal as using the telephone. Another role is to connect/introduce innovative small companies with leading edge technology to large companies with capital and marketing expertise to bring new products and services to consumers.

I'm confident that MTS will continue to grow to be a leading telecommunications company, and they will meet their objectives of providing products and services to customers to enhance communications. This breakfast meeting was a winner! Many thanks to Bruce MacCormack for a very informative presentation. □

New Wood Truss Design Procedures

The Canadian Wood Truss Association and the Truss Plate Institute of Canada (TPIC) would like you to know that the Canadian wood truss industry has begun the process of converting to new design procedures based on changes to the National Building Code of Canada (NBCC) and CSA standards. As of January 1998, the Limit States Design methods will be the recommended approach for all wood design in Canada.

New sawn lumber design methods for wood trusses were adopted by the Canadian Standards Association's CSA 086 Technical Committee on Engineering Design in Wood at a meeting held in November 1996. The new methodology brings design of metal plate-connected wood trusses into conformance with the principles of Limit States Design. It also makes the basis for truss design more consistent with provisions of the CSA Standard.

The TPIC has issued the new edition of Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses, which contains TPIC's engineering provisions as well as the updated CSA design methods.

Further information may be obtained from:
The Canadian Wood Truss Association
Tel: (613) 247-7077. □



Research & Development

Science and Technology for the New Century

By E.E. Lach, P.Eng.

Dr. Jon Gerrard was eminently qualified to address the luncheon meeting topic of "Science and Technology for the New Century: The Federal Science and Technology Strategy". Dr. Gerrard served as Secretary of State (Science, Research and Development), from 1993 to 1997, and one of his major objectives was the development and implementation of a science-and-technology (S&T) strategy for the nation.

Dr. Gerrard began his presentation with a brief perspective on research and development in Canada. In 1993, of the G-7 countries, Canada, at 0.7% GDP (compared to Japan at 2% GDP), was at the bottom of the group in terms of expenditure on R&D. Also, leading research in Canada tended to flow elsewhere in the world for commercialization and economic benefit. The new government of the day was faced with a \$500 billion debt and, outside of some immediate actions like the information highway, the space program, and environmental programs, did not have a consensus on an S&T strategy.

The development of a national science-and-technology strategy began with a local Community Consultations Program in 1994. Then, in February 1996, the Government 'rolled out' the Federal Science and Technology Strategy.

The Federal Science and Technology Strategy had three major goals: 1) to ensure that Canada is among the best in the world in applying and commercializing S&T for sustainable job-creation and economic growth, 2) to ensure that Canada applies S&T to improve the quality of life for its

citizens through the creation of fulfilling jobs and through the most effective social, environmental, and health-care programs in the world, and 3) to create in Canada world centres of excellence in scientific discovery, and to build a broad base of scientific enquiry to foster Canadian participation in all major fields of S&T, ensuring that new Canadian and world knowledge can be acquired and disseminated widely.

To move toward the first goal, Dr. Gerrard advised that the government had taken the following steps: a) launched an all-out effort to move Canada forward on the information highway, b) developed and implemented an environmental-industry strategy, c) developed and implemented a second Canadian Long-Term Space Plan, d) maintained Canada's R&D tax credits, and e) launched a number of new programs including Technology Partnerships Canada, the Canadian Medical Discovery Fund, the S&T Growth Fund, STRATEGIS, the Technology Partnerships Program, and Agriculture Canada's Matching Industry Initiative. In Western Canada, during his term as Secretary of State (Western Economic Diversification), Dr. Gerrard pointed out that the government also made available some \$400 million in new loan investment funds, primarily in S&T, initiated the Western Clusters Strategy, and initiated the Western Medical Technologies Strategy.

To advance the second goal, the government launched the Health Services Research Fund to improve the quality and cost-effectiveness of health-care delivery programs, funded HEALnet (a Network of Centres of Excellence in Applied Health Care), and funded five centres of excellence in Women's Health. The Government also implemented the Data Liberation Initiative to provide easier and less-costly access for Canadian scientists and educators to Statistics Canada data, funded the Telelearning Network (a Network of Centres of Excellence to pilot and test the use of new learning technologies), and revamped the Unemployment Insurance Program to retain only those re-employment measures which were proven to be effective.

To promote and advance the third goal, the government made The Networks of Centres of Excellence a well-funded permanent program, and introduced the Canada Foundation for Innovation (CFI). The final result, according to Dr. Gerrard, is that

major programs are in place to apply and commercialize S&T better in Canada, and the CFI is there to upgrade Canada's research infrastructure. The next step is to move forward in increasing the budget of the three granting councils to improve the availability of operating grant support. The latter must be addressed by the new Secretary of State (Science, Research and Development).

Within Manitoba, according to Dr. Gerrard, there is need for a major effort at the local and provincial levels to match the Federal Government's new efforts. R&D is a shared federal and provincial responsibility. While federal expenditures on R&D are more than 0.4% of Canada's GDP, Manitoba's expenditures on R&D are only about 0.06% of the provincial GDP (compared to Quebec with a 0.14% GDP expenditure). Dr. Gerrard believes that Manitoba's paltry effort will continue to put the province at a major disadvantage nationally, and create difficulties in building the new economy in this province.

As the Secretary of State (Science, Research and Development), Dr. Gerrard was pleased with having been able to fund ISIS Canada and The Canadian Network of Centres of Excellence (which is headquartered in Manitoba), and to launch initiatives in Manitoba centred around the development of medical technologies, nutraceuticals, environmental industries, value-added agricultural research, and new road- and bridge-technology, and to begin discussions in the area of freshwater technology development and new media. Manitoba's S&T base in areas like medical research, health care, wireless communication, GPS, the environment, transportation, value-added agriculture, ISIS Canada, etc., should provide opportunities for competitiveness in the global economy.

Whereas Dr. Gerrard is now working at the Children's Hospital, Winnipeg, his first-hand involvement in the development of the Federal Science and Technology Strategy will, I expect, ensure that he keeps his eyes on when, and how well, the expected fruits of these efforts are realized in Canada. □



Bob Hamlin (r) thanks Jon Gerrard.

Jobs Wanted

Greg Bouchard, P.Eng., experienced with transportation projects and information systems. Seeks consulting or full time employment. Grade design, surveying, reports, quality control, quality assurance and y2k seminars. I can be reached at 453-0126.

Civil Engineer-in-Training seeking employment. Willing to work at minimum wage to gain experience towards attaining professional status. Broad range of experience covering civil engineering and computer-related fields. Contact Tony at 667-6822.

Professional Development

A New Generation of Bridges and Structures

By: M.E. Baril, EIT

The breakfast seminar organized by the Professional Development Committee on November 26, 1997, was a presentation entitled "A New Generation of Bridges and Structures" given by Dr. Sami Rizkalla, P. Eng. Dr. Rizkalla is the President of ISIS Canada (Intelligent Sensing for Innovative Structures). He began his talk with a brief background of ISIS. ISIS is a program which is "charged with the challenge to find solutions to the massive problems associated with the deterioration of steel-reinforced concrete, as well as developing integrated fibre-optic sensing technologies that will allow engineers to monitor a structure from a remote computer location." The program involves a team of 202 researchers located in 12 Canadian universities.

Dr. Rizkalla then described some different types of sensors used to record actual "live" reactions to the imposed loading of the structure. The data accumulated can be processed to create "smart reinforcing" (optimizing reinforcement locations and quantities).

Dr. Rizkalla then changed topics slightly to describe the different types of fibre-reinforced plastic (FRP) currently available, and some of their different uses. Their use is being investigated for a variety of different structures (transmission towers, ground anchors, antennae, concrete reinforcement, etc.) and applications (concrete-structure repair, steel-section strengthening, etc.). The material known as FRP is a composite material of a fibre (glass, carbon, Aramid) in a matrix (epoxy, polyester, vinyl ester). FRP's appeal to designers is multi-faceted: non-corrosive, lightweight, high-strength, non-magnetic, unlimited section capabilities. Its drawbacks

include its sudden failure (i.e. no yield prior to failure) and its deterioration due to direct UV light.

The final part of Dr. Rizkalla's presentation was on the Taylor "smart" Bridge across the Assiniboine River in Headingley, MB. The bridge was constructed using CFRP (carbon fibre) pre-stressing tendons and shear reinforcing in some of the girders, and GFRP (glass fibre) in the traffic barriers. The bridge is being monitored by 65 fibre optic sensors and 23 strain gauges incorporated into the structure. All the data collected by the sensors and gauges are forwarded to a central data-collection centre where the information is transferred, across the telephone lines, to the university and the consulting engineer. Prior to the actual construction of the bridge, scale models of the girders were tested extensively at the University of Manitoba in the ISIS laboratory.

Dr. Rizkalla's talk was of interest to all disciplines of engineering, as the use of FRP technology in structural design will allow other disciplines to realize benefits to their designs as well. □



What Continuing Ed. Engineering Courses Would You Like Offered?

By: S.M. Matile, P. Eng.

The University of Manitoba's Faculty of Engineering, in conjunction with the University's Continuing Education Division, is interested in offering continuing education programs for engineers.

What types of courses, or subject areas, would YOU like to see offered? The Faculty is prepared, given sufficient interest, to offer courses in bio-systems (agricultural), civil, computer, electrical, environmental, geological, industrial, and mechanical engineering subjects.

This is a new initiative on behalf of the Engineering Faculty. Don't let the opportunity slip away! Become part of the decision-making process! Make your professional development requirements known!

Please contact Dr. Doug Ruth, Associate Dean of the Faculty of Engineering, by calling 474-9809, faxing 275-3773, or e-mailing druth@cc.umanitoba.ca

This is an opportunity not to be missed! □

University News

By: B. Stimpson, P.Eng.

Department of Civil and Geological Engineering

New appointments, effective January 1, 1998:

Ahmad Shalaby (Pavements), Ph.D. (Carleton), B.Sc. (Alexandria) Teaching: pavement design, transportation, materials. Research: asphalt concrete, mechanistic methods, long-term pavement performance, seasonal effects.

Cathy Valeo (Water Resources), B.Sc. (Toronto), Ph.D. (awaiting defence). Teaching: hydrology, water resources, systems. Research: GIS applications in water resources and hydrology.



Students

Over the past three years, University of Manitoba students have been awarded more Corporate Scholar Awards than any other Canadian University. In 1997 U of M Engineering students won four awards: Pratt & Whitney Canada Award: Krystal Park (Electrical), Natalie Rizkalla (Civil); GE Canada Award: Krystal Park (Electrical); Governor General's Scholarship in Environmental Engineering: Brea Williams (Civil). □

News From Other Associations

By: S.C. Alford, P.Eng.

Ontario

While the APEM Council and the Professional Development Committee seem determined to implement a mandatory professional development program (MPDP), it is interesting to note the current status of a similar initiative within the Association of Professional Engineers of Ontario (PEO).

Within PEO, considerable debate has taken place about the role of their association in monitoring and regulating the professional development of members. The PEO Task Group, charged with developing their Professional Excellence Program, has made several recent changes to their proposed program. They appear to be taking a less heavy-handed approach than

was originally being proposed. The current Ontario proposal would only have members report on PD activities every three years. In addition, PD activities would be more broadly defined, and would include active practice and employment.

These changes may appease some of those PEO members opposed to their Association deciding what is and isn't an acceptable level of PD for engineers. It should be noted, however, that this proposal still has not been finalized, and there remains significant opposition to this type of program.

What is happening in Ontario is food for thought as the APEM continues work on making your PD activities its business. □

Coming Events

Canadian Geotechnical Society (CGS)

Contaminated Site Remediation – Regulations and Technologies

8:00 a.m. to 4:30 p.m., February 19, 1998,
University of Manitoba. For more information
contact Rob McLean at (204) 489-2964 or by fax
at (204) 489-3014

Women in the Workplace – A Conference for Engineers, Scientists, Technologists and Mathematicians.

May 21 to 23, 1998, Vancouver, B.C.

For more information call the DAWEG voicemail
(606) 878-7755 or check the CCWEST web page
(www.cwest.org)

**Canadian
Council of
Professional
Engineers**



**Conseil
Canadien
des
Ingénieurs**

CCPE National Scholarships 1998 Call for Entries

The Canadian Council of Professional Engineers announces a Call for Entries for 1998 CCPE National Scholarships. Six cash prizes totalling \$50,000 will reward excellence in the Canadian engineering profession and support advanced studies and research.

To be eligible, candidates must be registered as full members with one of Canada's provincial or territorial professional engineering associations/ordre.

The following scholarships will be awarded:

- Three **CCPE – MANULIFE FINANCIAL** Scholarships valued at \$10,000 each provide financial assistance to engineers returning to university for further study or research **in an engineering field**. **Candidates must be accepted or registered in a Faculty of Engineering.**
- Two **CCPE – MELOCHE MONNEX** Scholarships of \$7,500 each support engineers returning to university for further study or research **in a field other than Engineering**. **Candidates must be accepted or registered in a Faculty other than Engineering.** The field of study should favour the acquisition of knowledge which enhances performance in the engineering profession.
- A **CCPE – ENCON Endowment** of \$5,000 will be awarded to a professional engineer pursuing studies in the area of engineering failure investigation, risk management, and/or materials testing. This area of engineering is concerned with analyzing the causes of materials failure and preventing accidents in the industrial, manufacturing, or construction sectors.

Deadline for applications in all categories is May 1st, 1998.

Scholarship application forms are available from your provincial or territorial professional engineering association/ordre or from:

CCPE National Scholarship Program
Canadian Council of Professional Engineers
401 - 116 Albert Street, Ottawa, Ontario, K1P 5G3.
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Automated Highways

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way would not be a major expense, and would require little maintenance.

Cars traveling on the automated highway would require special equipment to guide them. It is possible that the equipment needed could be slowly introduced into new cars. Such equipment as advanced cruise control, which automatically applies the brakes when an obstacle is detected by a radar sensor (currently being sold in Japan), and cars with stability control, are available today. Also, communication between vehicles and the control station could pass via the current cellular-phone network. Therefore, the cost of additional equipment for automation may not prove prohibitive, because new cars may acquire most of the needed electronics, anyway.

The technology required is currently being developed and tested, but real-world performance is unknown. The systems placed on the vehicle would be required to perform flawlessly in extreme conditions, with little or no maintenance. Everyone has postponed repairs on their vehicles to save money, especially now, when most disposable incomes have dropped. So, whatever is installed on a vehicle to make it compatible with the automated highway must be inexpensive, with low operating costs.

One concern of introducing automated highways is public acceptance. The automated highway would require passing control of our vehicles to a computer which, for some, is not a desirable option. The system must prove extremely reliable and have a safety system that would take control if a problem arose. One must remember that if an accident were to occur, it might involve many vehicles. This type of accident would be used by critics of the system to argue that it was inherently unsafe, even if the overall accident rate were reduced. (One example where loss of public acceptance can be dangerous is airbags. A few years ago, the public wanted cars with airbags, but now some people view them as more of a danger than a life-saver. It is therefore important that public officials provide strong and stable support for an automated highway system.)

The final issue is accident liability. Properly engineered, automated vehicles and roadways could be significantly safer than present-day highway travel, so overall liability costs would be reduced. But the proportions borne by various parties would shift: the driver's share of these costs would presumably decline, whereas the portion paid by manufacturers and highways departments would rise. The shifting liability burden, therefore, would require regulatory changes to adequately address the concerns of all parties. This would be a time-consuming and complicated process.

It is most likely that the automated highway is further in the future than most people think. The changes needed to highways, vehicles, and liability laws will require much research and considerable debate before people are willing to pass control of their vehicles to a computer. □