THE MANITOBA
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August, 1994
APEM

MCI's Award-Winning Bus is the New Standard

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

Manitoba has been unusually fortunate in having a thriving, competitive bus building industry. While most of Canada doesn't have any bus builders, we have two major manufacturers right in Winnipeg. Motor Coach Industries (MCI) is our entry in the inter-city coach market, and it's a major player in the North American market and beyond. Besides seeing their products on our streets and highways, one cannot watch a movie depicting bus travel without seeing an MCI bus. As a student, I spent many nights on MCI buses heading home for holidays and long weekends. It's been some years ...ce I've ridden on one, so it's a revelation to see ...w the design of these vehicles has progressed.

MCI has a tradition of innovation. In the last few years they have designed two buses with major improvements for disabled persons. Last March, MCI's design team received a Certificate of Engineering Achievement from the Association in recognition of its work on the 14-m, Fully Accessible Inter-city Coach. While this design had major improvements in accessibility, there were significant advances in fuel efficiency, ventilation, handling, and ride quality. MCI's intention was to develop a new standard in inter-city coach travel.



In the Beginning.....

MCI began with an unsolicited proposal to Transport Canada, which was interested in many of the objectives proposed by MCI. The result was that several initiatives from different agencies were combined into one project. Transport Canada contributed 70% of the cost of design, development, and testing, while MCI covered the cost of building the coach. The project incorporated initiatives by the Urban Transportation Development Centre (UTDC), which had separately planned to develop a simulation model for bus suspensions and to perform a study of air quality on buses. This and other initiatives were rolled into one to become the Fully Accessible Inter-city Coach project.

...vatory Design

Anyone who has ridden a bus knows that using the traditional bus washroom is an adventure in itself. The cramped quarters, road irregularities, and olfactory sensations can dull one's appreciation for this mode of transportation. What are inconveniences to the able-bodied become major obstacles to the disabled or handicapped person. Some of the most obvious functional improvements are in MCI's design of the lavatory and the wheelchair lift. Both of these items had to be integrated for a satisfactory solution.

MCI called on Rutenberg Design Inc. (RDI) of Montreal to provide expertise in the ergonomics of lavatory use. The criterion was broad, as it had to integrate the needs of people of both sexes, including the elderly, handicapped, and wheelchair users.

For evaluation purposes, three dimensional, full-size mockups were created. The designers simulated passengers with a variety of appliances; canes, walkers, and wheelchairs, and attempted the various maneuvers necessary in using the lavatory. From this it was established that an area of 1.52 m x 1.98 m would be adequate for all users.

Two major groups of design alternatives emerged, one using an existing wheelchair lift (called the EL-Lift) with the washroom located at the centre of the bus. The second alternative placed the lift and the washroom at the back of the bus.

Midships vs Rear of Bus

The midships location had major problems. With the washroom occupying real estate at the middle of the bus, the driver's sight-lines to the rear of the vehicle were disrupted. This created a safety problem and an inconvenience for rear seat passengers who had to walk around the washroom. Additionally, wheelchair passengers needed a clear line of travel to the washroom to make it convenient for them to use the facility. The midships designs made these requirements difficult to achieve.

By the process of analysis and elimination, the design settled at the rear of the bus. The lavatory would occupy the tail end, with wheelchair passengers sitting directly in front of the lavatory for-

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Engineers in the News

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

Dr. Jack Cahoon, P.Eng., U of M Mechanical Engineering Professor, recently received the 1994/95 American Society of Metals (ASM) Canada Council Lectureship Award. As recipient of this award, Dr. Cahoon will be travelling across Canada, lecturing at meetings of each of the ASM Chapters.

Dr. Jim Graham, P. Eng., U of M Civil and Geological Engineering Professor, recently received the Dr. and Mrs. H. H. Saunderson Award for excellence in teaching. According to one of his nominators, Dr. Graham "exemplifies the modern professional engineer and continually tries to instill those qualities in his students." □

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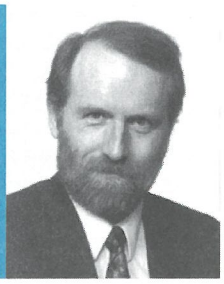
WE HAVE LOST CONTACT. MAY WE HAVE AN ADDRESS?



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President's Message

Dr. D.G. Chapman, P.Eng.



The CCPE and You

For most members of APEM, contact with CCPE consists of an occasional letter from an insurance company, outlining a group insurance plan. Others may be aware of a message in each edition of the Manitoba Professional Engineer from the President of the CCPE (look in this MPE for a message from the new President of CCPE, Dr. Garland Laliberte). Those who attend an Annual General Meeting may be more aware of the work of CCPE through contact with its President or Executive Director.

Having recently attended a meeting of the CCPE, I felt it worthwhile to devote this column to a brief outline of the work which CCPE is doing on behalf of the engineering profession and the engineers of Canada.

Given that there are twelve provincial and territorial engineering licensing bodies, each with its own act and bylaws and its own history, the work CCPE does to encourage consistency among the associations and ordre (the Quebec association) in registration matters is both complex and important. Recently, at the annual meeting of CCPE in Saskatoon, all associations except one (Alberta) signed an agreement on inter-provincial mobility. This agreement binds the associations to accept, with a minimum of formality, transfer of membership from one association to another. There are some restrictions – the person transferring membership must have been a member in good standing, with a clean discipline record, for at least five years. That person may still have to write an exam on the act and bylaws of the local association and may have to demonstrate language proficiency, but these requirements are far less than has been imposed by some associations in the past. This agreement is an important first step in increasing reciprocity among the associations and in developing confidence levels within each association.

While CCPE was successful (after several years) in achieving this agreement, it is still at the early stages in a process to develop an agreement under NAFTA dealing with the reciprocity of professional registration (and perhaps, standards) among Canada, Mexico and the Unites States. In this group of three countries, there are three different approaches to the licensing of engineers. Canada, because of the work of CCPE and its Canadian Engineering Accreditation Board, licenses most engineers without examination (assuming an accredited degree). The profession is self-governing. In the United States, State-appointed boards perform the registration function and all require the passing of two eight-hour examinations before registration. Mexico has limited licensing of some engineers, by a federal agency. Before there can be true reciprocity, the representatives of each country must understand the processes the other countries use, must recognize the areas of equivalency and may have to make some compromises. A committee of CCPE has taken on the task of negotiation for the engineers of Canada as a member of the NAFTA Forum on Engineering Registration and Practice. From information made available in Saskatoon, some small steps have been taken and there is optimism that a fair, consistent agreement may be possible.

The CCPE operations are funded primarily by a per-capita assessment on each association. Last year, that assessment was, and likely will be this year, $8.65 per engineer. CCPE also receives money from the federal government for performing preliminary evaluations of potential immigrants and from the insurance companies which are endorsed by the CCPE. APEM is represented on the Board of CCPE by a CCPE Director (currently Pat Feschuk, a Past-President of APEM) and the Board ratifies the CCPE budget and per-capita assessment.

"A task force from the CCPE has also been quite busy lately in negotiations with the Natural Scientists Council of Canada regarding the model definition of professional engineering in Canada."

Most of the work of CCPE is performed by volunteer boards (as described below) with very dedicated members.

The Canadian Engineering Accreditation Board (CEAB) accredits engineering courses at Canadian universities. Accreditation does not lead to uniform programs across Canada. It does, however, ensure a standard for engineering education which is accepted by all provincial associations and, increasingly, by other national bodies (such as the bodies in Great Britain, Ireland, New Zealand, Australia and the United States). Bob Foster, a Past-President of APEM, is on this Board from Manitoba.

The Canadian Engineering Qualifications Board (CEQB) is primarily concerned with ensuring consistent standards for admission to the profession, both in experience and in academic training. It is also concerned about the mobility of engineers and was the group which worked on the current agreement. Dr. Digvir Jayas is on this Board from Manitoba.

The Canadian Engineering Human Resources Board (CEHRB) was recently reconstituted to examine how engineers are used in the workforce in Canada, to determine what the supply of and demand for engineers will be, and to document that current workforce. In previous years, this board had produced forecasts of supply and demand which were not always found credible. The new board intends to spend considerable time on the development of realistic models before any forecasts are made. Ken Buhr, also a Past-President of APEM, is on this Board.

A year ago, CCPE created the Canadian Engineering Public Awareness Board, to raise the profile of engineers in Canada in the eyes of both the public and the governments in Canada. Despite being in operation for only a short time, it has produced several interesting initiatives, including a Canadian Science and Engineering Hall of Fame and a national contest for students. Ralph Bullock, an APEM member, serves on this Board.

The CCPE is also performing a useful role in coordinating discussions with Engineering Technologists and Technicians, Natural Scientists and Architects. A standing committee of CCPE, the Permanent Staff Officers Committee (PSOC), comprising the senior staff of each association, provides a useful vehicle for discussion of items which are of mutual interest or concern.

A task force from the CCPE has also been quite busy lately in negotiations with the Natural Scientists Council of Canada regarding the model definition of professional engineering in Canada.

The CCPE has an Executive Committee comprising five members representing four regions (Ontario, Quebec, one for the provinces east of Quebec and the provinces and territories west of Ontario). As mentioned above, this year, Dr. Garland Laliberte, Dean of Engineering at the University of Manitoba and also a Past-President of APEM, is a member of that Committee and is President for 1994/95.

For those of you who wish to know more about CCPE, contact Dave Ennis or myself, or consider attending the open functions at the next Annual Meeting of CCPE, to be held in Winnipeg in the spring of 1995. □

Manitoba Engineer to Head CCPE

By: B.A. Dobran, P.Eng.

Garland E. Laliberte, Dean of the Faculty of Engineering at the University of Manitoba for the past five years, has been chosen by the Board of Directors of the CCPE to be the new CCPE President. In his May, 1994 acceptance speech, Garland shared some of his thoughts. Highlights will be presented here.

"Times have changed so much and the profession must be responsive to change. Our profession has no choice but to re-examine the basis on which it licenses engineers. There will have to be a preoccupation over the next few years with the issue of how we ensure our continuing competence".

"Engineering education should stress the development of analytical skills; educational updating should be more accessible."

Globalization of the engineering marketplace is a change affecting the business of engineering. "This change in the way of doing business makes it mandatory for the engineering profession to facilitate the international mobility of Canadian

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Zebra Mussel Threat Explained

By: D.R. Strang, P.Eng.

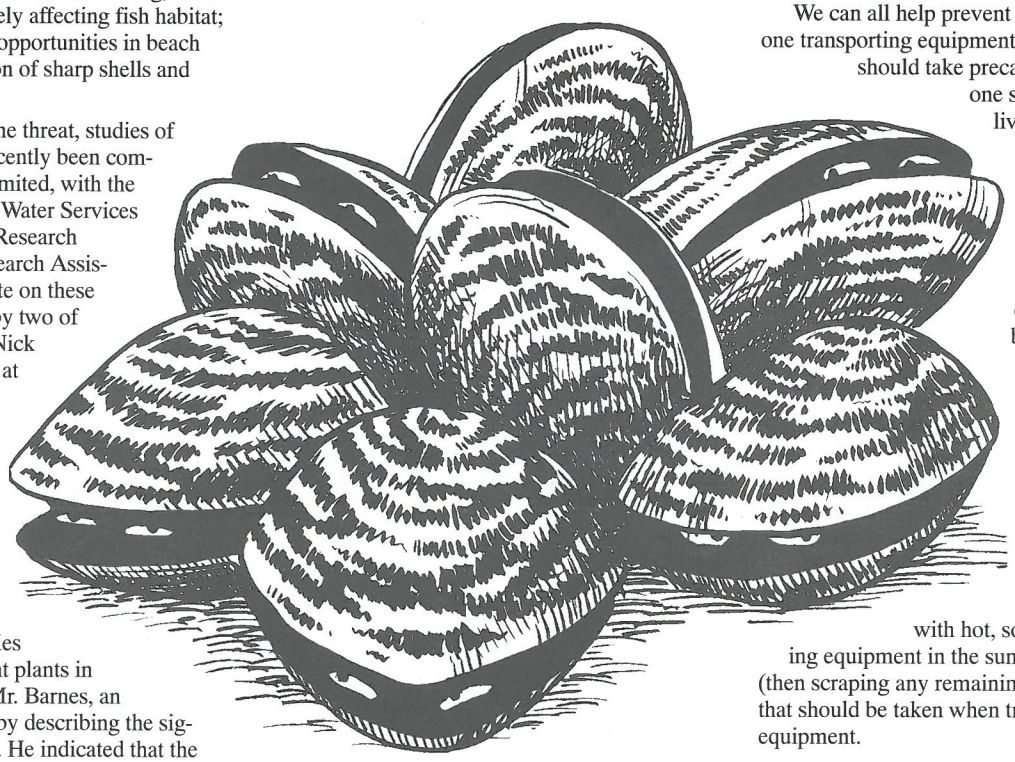
A new threat to all water-use industries has recently emerged in eastern Canada and appears to be heading toward Manitoba. Zebra mussels are small, clam-like organisms that were accidentally introduced to North America several years ago. As they have spread, the mussels have caused millions of dollars in damage in the Great Lakes region of Ontario and the United States. Typical damage includes plugging of the intake systems for water used for drinking, cooling and industry; adversely affecting fish habitat; and reducing recreation opportunities in beach areas due to accumulation of sharp shells and foul odours.

In order to mitigate the threat, studies of control methods have recently been compiled by M.M. Dillon Limited, with the support of the Manitoba Water Services Board and the National Research Council's Industrial Research Assistance Program. An update on these activities was provided by two of the project researchers, Nick Barnes and John Ewing, at the May 11, 1994 luncheon meeting sponsored by the Research and Development Committee.

The presentation provided an overview of potential impacts and control methods as well as several case studies involving water treatment plants in Ontario and Manitoba. Mr. Barnes, an aquatic biologist, began by describing the significance of the problem. He indicated that the mussels, which are native to Europe, were accidentally introduced into North America in 1986 when a ship discharged ballast from a European freshwater lake into Lake Erie. First discovered in Lake St. Clair in 1988, the mussels have now invaded water bodies as distant as Quebec, Minneapolis, New Orleans, and Thunder Bay (less than 150 kilometres from waters that drain into Manitoba). The mussels' tendency to attach to hard surfaces, reproduce quickly, and survive in cool water makes control strategies very difficult, and often costly. Indeed, the costs for the Great Lakes alone are expected to exceed five billion dollars in the next decade.

A zebra mussel begins life as a microscopic, somewhat mobile, larva. However, as it becomes an adult, it absorbs calcium to form a hard shell and secretes fibres which allow it to attach to hard surfaces, including other zebra mussels. These attributes result in a colonial lifestyle, with the density of colonies often exceeding 700,000 individuals per square metre. The adults are quite tolerant of desiccation (they are able to survive two weeks out of water). This can result in rapid dispersion through attachment to boats, float planes, and other objects which move between bodies of water.

Mr. Barnes indicated that a search for control methods is underway in Ontario and the United States. Several alternative control methods have been used with varying effectiveness. However, each method has its drawbacks. One of the most popular methods, especially in water-treatment plants, is chlorination at the water intake. This method effectively prevents the mussels from migrating inside the plant and clogging internal equipment. However, the altered chemistry of the water has led to concerns about toxicity and has made the method unsuitable for use in some industrial processes. In addition to chemical control methods, other methods, such as biological, physical, and mechanical control, are being used with some effectiveness.



Although zebra mussels have not yet been spotted in Manitoba, many habitat parameters in the prairies appear to be suitable for infestation. Most surface waters have the12-degree-Celsius temperature required for reproduction, many lakes have plantation concentrations similar to the Great Lakes, and calcium levels are more than adequate in most areas.

With these facts in mind, Mr. Ewing presented the audience with a number of case studies, including an overview of the City of Winnipeg's water-supply system. He indicated that, although zebra mussels have not yet arrived at Shoal Lake, the site of the city's water intake, the city is acting on both short-term and long-term protective measures. The short-term strategy involves chlorination at the headwall with re-chlorination facility provision at Hadashville. The long-term strategy sees managers focusing on alternative oxidants and monitoring the most promising technologie

Mr. Ewing concluded the presentation with a description of various control methods currently being researched, including the use of a variety of chlorine compounds, non-toxic coatings, and antagonistic micro-organisms. Having a wide variety of alternative strategies available increases the chance that the impact on Manitoba waters will be controllable. However, the preferred solution is simply to arrest the zebra mussels' advance into Manitoba.

We can all help prevent the migration. Anyone transporting equipment from infested water should take precautions. For instance, one should never transport live bait fish from infested waters to other bodies of water, as microscopic zebra mussels may be transported. Also, equipment such as boats and motors should be cleaned thoroughly when being transferred from infested water. If surfaces feel rough, young zebra mussels may be attached. Scraping grainy surfaces, washing equipment with hot, soapy water, and drying equipment in the sun for three to five days (then scraping any remaining mussels) are steps that should be taken when transporting such equipment. □

Manitoba Engineer to Head CCPE

(Cont'd from page 3)

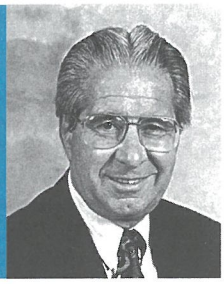
Engineers". This is exactly what one of the CCPE priorities will be in the coming year. CCPE will try to extend the mutual agreements, which now are limited to accreditation, and extend them to cover the whole process – academic as well as experience.

Also tying into the new economic reality, there will be a review of accreditation criteria. A review committee, with representation from engineering schools, associations, business and government, is expected to produce a balanced outcome.

Another CCPE objective is to improve the mobility of engineers within Canada. Discussions are continuing with the objective of achieving endorsement by all provinces and territories by November,1994.

With all these important items on Garland's agenda, I'm sure we all wish him and the CCPE well. □

CCPE President's Message



Dr. Garland E. Laliberte, P.Eng.

Looking Ahead at the Business of Engineering Practice

It occurs to me there is a parallel between the patterns of the kaleidoscope and the constantly changing character of engineering practice. Engineering practice is a reflection of a number of factors...the economy, technology, political and social contacts and many more. All of these factors are very complex phenomena in themselves. They are interdependent and are almost always changing. Just as previous patterns of the kaleidoscope are unlikely to be repeated, it is highly improbable that the conditions which gave engineering practice its character yesterday will ever repeat themselves again. Predictions of the character of engineering practice more than a few years into the future is a difficult endeavour.

Notwithstanding the pitfalls of trying to predict complex phenomena like engineering practice, studies are being undertaken which, if they do not produce blueprints for planning that can be used with absolute confidence, are at least expected to give some insights into the possibilities and the probable impacts of several individual factors.

The Association of Consulting Engineers of Canada (ACEC), with the support of Human Resources Development Canada, launched one such study last fall. The purpose of the study is to define the current and longer-term human resource needs of the consulting engineering sector in Canada. Pierre Franche, ing., President of the ACEC, says that the ACEC hopes that, as a minimum, the study will "enable the consulting engineering industry to develop creative approaches aimed at strengthening and assuring its human resources into the 21st century."

Based on a two-round Delphi survey, preliminary results of the investigation are now available. The study has identified several major business trends that are shaping the demand for consulting engineers. There are resulting implications for human resource management. The ACEC has recently released the following preliminary findings:

"Continuing restructuring and re-definition of the consulting engineering industry. Further rationalization and consolidation of the consulting engineering industry will occur in response to intense competition, low profitability, and increased exposure to U.S. and offshore consulting engineering firms. Services offered by the industry are also expanding and overlapping with those provided by management consultants, systems integrators, and environmental specialists."

"New opportunities for innovation and value-added. The development of new custom designed materials, including 'smart' materials, will result in changes to the design, construction, operation, and maintenance of new structures and equipment. Down-sizing in government and private industry and an increasing amount of contracting-out by in-house engineering groups will continue to create opportunities for consulting engineers."

"Increasing importance of international markets. The globalization of business and the formation of international trading blocks is re-defining the way firms do business and increasing the importance of international linkages and alliances. Canadian demand is expected to remain relatively static while infrastructure needs in developing countries are expanding. Canadian firms looking for significant growth will be increasingly reliant on international work."

"New organizational and ownership structures to better respond to client needs. In order to provide total solutions to client needs and to motivate employees, firms are moving to new ownership structures involving employee ownership in small and medium firms and public or third-party ownership in larger firms. Changes in structure can facilitate firms' access to, or development of, the types of services involved in turnkey projects."

The Delphi participants in this study included over 100 consulting engineering firms, clients, educational institutions, professional associations and government agencies. The participants identified a number of human resource management initiatives which appear to be desirable for the industry and for individual firms. These include:

"developing and sustaining corporate cultures based on employee involvement, empowerment and teamwork while planning for, and managing, new types of employee relationships;"

"strengthening the linkages between firms in the industry and educational institutions to facilitate on-going skills development and redefining the role, content and delivery of continuing education programs;"

"providing compensation and reward systems that are linked to both individual performance expectations and business goals or philosophies;" and

"improving the image, positioning and professionalism of the industry in order to attract the best quality people".

The next phase of the ACEC study consists of two-round table workshops which are being held at the end of June, 1994. The study will be finalized in the fall. It will make an important contribution toward identifying some of the complexities of the business of engineering practice. Perhaps the identification of these complexities will illuminate the kaleidoscope of factors which give the business of engineering practice its character. □

Shirley Matile Wins Award

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

The YM-YWCA Women of Distinction Award is a truly prestigious award, and this year five Winnipeg women were selected from a group of 27 nominees. The APEM Women in Engineering Advisory Committee's (WEAC's) nominee, Shirley Matile, P.Eng., was so awed by the impressive credentials of the other nominees (and humble about her own), she decided that preparation of a speech was not necessary! Oops! On May 10, 1994, surrounded by an enthusiastic group of loyal fans, Shirley was honoured as a 1994 YM-YWCA Woman of Distinction.

The awards are based on three criteria:

- individual achievements;
- contributions to the well-being of the community; and
- contributions as role models for other women.



Shirley's success as a woman in a traditionally male profession impressed the selection committee. Prior to her current position as Director of Admissions at APEM, she worked for 13 years in consulting in the municipal engineering area, and was a partner at G.A. Pratt and Associates.

Most APEM members are aware of Shirley's many contributions to the engineering profession: her extra efforts in committee work, frequent contributions to this publication, and tireless promotion of engineering to the public. She also implemented gender-neutral documents at APEM, catalyzed the formation of the Women in Engineering Advisory Committee, and voluntarily tackled the tedious process of sifting through years of APEM council minutes to generate the first directory of women engineers in the province. These contributions are in addition to her position as primary evaluator of applications to this association, and orchestrator of the wholesale re-vamping of the entire admissions and EIT processes.

This award recognizes that Shirley Matile's visibility as a successful and respected professional is vital, and presents a positive image of engineering to the public.

Way to go, Shirley! □

Winnipeg Hosts Canadian Society for Civil Engineering

By: W.G. McKay, P.Eng.



John Glanville (right) receives CSCE Fellowship

The highly successful 1994 Annual Conference of the Canadian Society for Civil Engineering was held at the Westin Hotel in Winnipeg from June 1 through June 4. Organized by approximately 20 Manitoba professional engineers, the Conference served as a showcase for Manitoba engineering accomplishment.

On Wednesday, June 1, approximately 80 people attended a program of pre-conference courses on "Construction Estimating", "On-Site Remediation of Hydrocarbon Contaminated Sites", and "Use of Geosynthetics in Civil Engineering". For the first time in CSCE history, participants earned Continuing Education Units (CEUs), which have been registered with the Engineering Institute of Canada. Conference participants were able to record Professional Development Hours (PDHs) for attendance at the technical sessions.

Thursday, June 2 was Manitoba Day at the Annual Conference which featured two associated specialty conferences – the CSCE Environmental Engineering Conference and the CSCE Engineering Mechanics Symposium. Following an early morning "Riverwalk" from The Forks to the Legislative Building, the conference opening featured a keynote address by Premier Gary Filmon, P.Eng., who described Manitoba's leading role in the field of sustainable development. Norm Brandson, P.Eng., Manitoba Deputy Minister of Environment, was the speaker at the Manitoba Day luncheon. During the day, the 375 delegates from all parts of Canada and a dozen foreign countries heard 120 technical presentations, a number of them dealing with projects executed by Manitoba engineering organizations. The day concluded with a dinner cruise on the Red River.

Friday and Saturday, June 3 and 4, featured an additional 160 technical presentations covering a variety of civil engineering fields. Included were keynote presentations by Dr. R.W. Newbury – "Rivers and the Art of Stream Restoration", by Dr. D. Mavinic – "Environmental Engineering – is it a Maturing Profession", by Dr. P. Selvadurai – "Nuclear Waste Management" and by Dr. S. Mirza – "Durability and Service Life of Infrastructure". Also featured was a program of six papers by undergraduate and graduate civil engineering students.

At the Friday evening Awards Banquet, CSCE fellowships were conferred upon 21 long-time members, including Professor John Glanville of the University of Manitoba. The evening concluded with entertainment by the Glenlawn Collegiate State Band, one of the top high-school bands in Canada, despite an October 1993 fire that destroyed their music facilities.

The concluding event of the conferences was a ceremony in Juba Park, designating the Shoal Lake – Winnipeg Aqueduct a CSCE National Historic Site.

School Outreach Program Continues to Impress

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

For four years, now, this Association's Public Awareness Committee has been supporting the Fort Garry School Division's Engineering Awareness Project.

Conceived and developed by the school division's science co-ordinator, Leslie Wurtak, the Engineering Awareness Project introduces elementary-school students, and, more recently, teachers, to the profession of engineering by having them attend a fun-filled, yet educational, program hosted by the Engineering Faculty at the University of Manitoba.

Each year, the project increases in size and scope. This year, the number of participants increased considerably: 12 students and one teacher from each of the eleven schools in the Division attended. On June 15, 1994, they were greeted by Dean Garland Laliberte, who prepared them for the three-hour program by getting them to think, and talk, about what engineers do. Then, they were sent off, in groups, to three of nine stations where engineering professors and graduate students demonstrated such equipment as the High Voltage Power Transmission Lab (unfortunately, this year, without the artificial lightning bolts!); computer circuit boards and a talking computer; and the Structural and Materials Lab, where they were able to witness the tensile-strength testing of steel specimens.

Next came a "problem-solving" activity. All of the groups were re-united and re-subdivided into smaller groups for the "Bio-Bridge" project, where the challenge for each group was to build the longest " bridge" between two wooden blocks using spaghetti, masking tape, thumb tacks, "push" pins and corrugated cardboard. This activity was interrupted by a fire alarm, which didn't appear to dampen the enthusiasm of any of the students (and which Ray Hoemsen probably orchestrated to ensure that there **would** be time to assemble the participants in front of the Administration Building for a group photograph!)

Once back in the building, the students all received certificates of participation and, as a reward for their good behaviour, ice cream. Four lucky students also received scholarships to the engineering module at Mini-University (courtesy of Mini-U).

The event was co-ordinated, as usual, by Leslie Wurtak, who looked after the schools, and Ray Hoemsen and Irene Mikawoz, who organized the activities at the university and co-ordinated the many professors, graduate students and Mini-U staffers who volunteered their time and expertise. As usual, it was a huge success, and I was pleased and proud to be present as a guest and observer. □



Spaghetti bridge construction during Engineering Awareness Day.

APEM and the 1994 Manitoba Schools Science Symposium

By: C.A. Nieuwenburg, P.Eng.

On the first weekend in May, nine volunteer judges and I represented APEM and the Public Awareness Committee at the Manitoba Schools Science Symposium (MSSS), held at the University of Winnipeg. APEM's continued sponsorship of the symposium consists of award offers for three enrollments in the engineering module of the University of Manitoba's Mini-U program, and one $500.00 scholarship to the University of Manitoba's Faculty of Engineering. APEM also provides funds to the MSSS Organizing Committee to cover some of the costs for the event. The APEM judging began with a review of the project titles for the over 700 projects that were to be entered in the symposium. Projects placed in the Engineering and Technology category by the MSSS Organizing Committee, or whose title hinted at an engineering-related topic, were divided among the ten APEM judges. These 150 projects were then previewed on the Friday evening, and students interviewed on Saturday morning, to determine who would receive our awards.

Unfortunately, there was no project entered by a Grade 12 student who planned on taking engineering at the University of Manitoba: therefore, the $500 scholarship could not be presented. This allowed the judging team, however, to award two additional Mini-U enrollments, for a total of five.

While most of the students we interviewed were keen and eager to tell us about their topics, the following five students displayed something special and were the recipients of Mini-U enrollments: Mark Gojkovic of Valley Gardens Junior High for his project entitled "Infra-red Detection Unit"; Kristina Koenig of Edmund Partridge Junior High for her project "Solar Water Purification"; Mark Grant of Acadia Junior High for his project entitled "Liquid Mirror Telescope"; and Dean Medeiros and Garth Hilderman of Meadows West School for their "Enviro-Bricks" project. These five students each received APEM and MSSS certificates at the Major Awards Ceremony on Sunday. In addition, eighteen other students received "Outstanding Achievement Ribbons", created at the suggestion of last year's judging team in order to further recognize and encourage students' interest in engineering.

Many thanks to judges David Alexander, Terry Armstrong, Richard Bernhardt, Mike DeWiele, Catherine Foster, David Grant, Kelly Hunter, Jim Linnen and Brian Trenholm. APEM greatly appreciates the time and expertise you volunteered in representing the Association. □

CALL FOR NOMINATIONS

MEMORIAL FOUNDATION CORPORATE AWARD

The Canadian Engineering Memorial Foundation is now accepting nominations for the Canadian Engineering Memorial Foundation Corporate Award. This award, presented in 1992 to Wardrop Engineering of Winnipeg, Manitoba, and in 1993 to SaskPower of Regina, Saskatchewan, is presented annually to Canadian companies in recognition of their promotion and advancement of women in engineering.

Nomination forms are available from Lorlei Scott, Managing Director, Canadian Engineering Memorial Foundation, 401-116 Albert Street, Ottawa, K1P 5G3 (Tel. 613-232-2474). The deadline for submission of nominations is October 1, 1994.

Marathon Results

By: M.D. Vanderpont, P.Eng.

Sunday, June 19, Father's Day, was cool, cloudy and humid: perfect for running. Four APEM relay teams took to the streets to participate.

Team #1 posted our fastest time of three hours, three minutes, or just under seven minutes per mile. Where I live, that's fast. They even managed to shave two minutes off last year's time which was good for a silver medal in the corporate male category. Team #1 consisted of Ark *(the Spark)* Tsisserev who made a special trip in from Vancouver to take part, Julien *(the Flying Frenchman)* Lavergne from Smith Carter Architects & Engineers, Elliott *(Captain)* Garfinkel, also from Smith Carter Architects & Engineers, Bob *(not that family)* Partridge from Dominion Bridge, and Alan *(Meep Meep)* Aftanas from the Seagram Company.

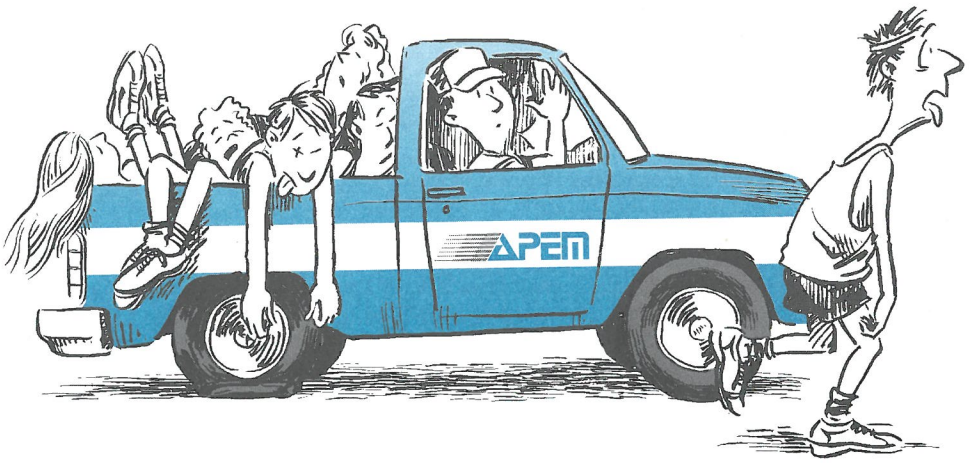
Team #4 was the dark horse that really gave Team #1 a run for their money. They turned in a very impressive time of three hours, seven minutes. This excellent performance came in spite of the whining from Dave *(Godfather)* Ennis from APEM about his poor conditioning. Bill *(short [illegible] please)* Penny of Motor Coach would also have me believe that many months of rehab therapy would be required if he had to run a step over 4.5 miles. Some are saying that three rookies to the APEM team relay carried the day. Dashing Dave Whitmore of Vector Construction, Hustling Henri Carrierre of Roberts, Sloane & Assoc. and Rapid Rob Blanchard of M.M. Dillon were those rookies.

Team #2 featured Captain Mike Dewiele of Conviron running lead and his son, Derek, running the second leg. Mike also completed the full marathon distance of 26.2 miles. Rick *(the Rocket)* Shand, also from Conviron, Roger *(the Dodger)* Sawatzky of BioClear Technologies, and Tony *(the Terminator)* Victor of Manitoba Hydro rounded out this team. Their time was a very respectable three hours, 50 minutes.

Team #3 was led by Jumping Jim Bailie who again ran the full distance. Joanne *(Jack Rabbit)* Isfeld ran second. They let me run third. Jim *(Transporter)* Terris ran fourth. Tim *(Super)* Starodub brought it home. This team is all UMA, ex-UMA or works in UMA's building. Our time was three hours, 42 minutes. Not bad.

A number of other APEM members also took part. I know Reid Crowther had a team because Todd Smith blew by me around mile 13. Ad Zerbin of AECL was there in the full marathon. Congratulations to all. A special thanks to Joanne Isfeld for getting us those exclusive APEM PROFESSIONAL ENGINEERING track tops.

Thanks again to everyone who took part. I hope to see you again next year. New runners are always welcome. I'm wanting to hear from you. Give me a call at 453-4903. □



Council Reports

May 9, 1994

By: J. Lucas, P.Eng.

AT WHICH COUNCIL APPROVES SPECIAL FUNDING FOR SURVEY ON WOMEN IN ENGINEERING

With the normal items cleared away, Council reviewed the latest balance sheet. Projections are "break-even" for year-end. This is good news for a non-profit organization – especially in these recessive times.

Council had the opportunity to review a proposal by CCPE to prepare a national salary survey. Our President will be attending the May CCPE meeting and will gather further information on this opportunity. The value of a salary review was also discussed and determined to be of benefit both as a check for members and in terms of serving to protect the Public by offering some guidance on reasonable costs and charges.

Council received a proposal from the Professional Practice Examination Task Force and closely examined recommendations and potential options. Potential application of course modules was questioned with explanations and options given by Shirley Matile. The overall proposal was well-received, and adopted in principle. Further evaluation is suggested to cover funding, remote site servicing and video-taped presentations.

A special expenditure of $2,500 to participate in an upcoming national survey on women in engineering was presented to the Council and approved. (Editor's Note: Professional Engineers Ontario (PEO) is conducting the survey and APEM's participation will involve all female engineers in Manitoba as well as an equal number of male engineers. The objectives of the study include enhancement of the current database on the distribution of women engineers, evaluation of current programs aimed at women, and collecting information on preferred initiatives for the future. Joining this survey saves APEM a great deal of the cost and effort required to create and analyze a Manitoba survey on women in engineering.)

President Chapman asked for reports from Councillors on the status of their long-range action plans. It appears that action is taking place, but final proposals are not developed to date.

Don Osman presented a capsulated comment on the April 1994 PEO Annual General Meeting which he, and Dave Ennis, attended. One highlight was his review of "The Tetra Society of North America" which utilizes volunteer technical people to help the disabled resolve individual obstacles. Mr. Osman was supported by Council for this personal interest.

Don will be forwarding further information to the MPE for possible publication.

Shirley Matile presented a report on her attendance at the April 1994 meetings of the Foreign Engineering Qualification Committee and the Canadian Engineering Qualifications Board. It was noted that the topics were both timely and international in scope.

Individual Councillors reported on their participation as Liaison Councillors to the various committees. In addition to Council work, all of these people are very active, providing input and support to the Association's various committees. It should be noted that the membership is getting very good value for the salaries paid to all Councillors! □

June 13, 1994

By: B.A. Dobran, P.Eng.

AT WHICH COUNCIL ADDRESSES THE QUESTIONS OF SELF-INTEREST, PROFESSIONAL DEVELOPMENT, AND MOBILITY.

In the summertime, when all the fields and trees are green, one's thoughts turn to...the golf course? Well, only momentarily, because there were a lot of important items on the agenda.

Vice-President Don Osman called the meeting to order at precisely 12:30 p.m. Dave Ennis, Executive Director & Registrar, presented a healthy financial statement for the period ending April 30,1994. (Perhaps it is time for a team of professional engineers to enter federal politics to manage our nation's finances?) Mr. Ennis reported that registered letters had been sent to 170 persons whose dues had not yet been received, as requested, last year, by Council. Shirley Matile, Director of Admissions, stated that the registering of the letters had taken considerable staff time. It was agreed that the decision to send the final notices by registered mail should be reviewed.

The Registration Board Report of applications accepted on May 25, 1994 (EIT Members, Registrations, Transfers and Licences) was received. Council then adopted the Publication Committee's recommendation that inserts in each "Manitoba Professional Engineer" mailing be limited, where possible. The Publication Committee will be asked to co-ordinate and prepare a single sheet of events (seminars, breakfast meetings, etc.) to be included with each mailing.

Council then accepted the resignation of Councillor Eva Rosinger, who will be taking up a position with OECD in Paris, and thanked her for her service to the Association. Her Council position, which will be vacated immediately, will not be filled. Council also accepted the resignation of Councillor Mel Cornell, who will also be out of the country for an extended period, and thanked him. Past-Presidents Feschuk and Anderson were asked to commence the process of selecting a replacement lay councillor. Mel will be able to continue on as a Council member up to the date of the October Annual General Meeting.

Council then re-visited the question of a policy on self-interest. Councillor Cathy Stewart presented a report, including a "litmus test", namely, a sheet of criteria for use in judging whether APEM should (or should not) undertake a particular activity. There was discussion on APEM's mandate, its priorities and its resources. I am certain that all the councillors were heartened when Mel Cornell, a lay councillor, who essentially is a representative of the Public, said that in the two years or so of APEM meetings that he has attended, he hasn't seen anything that smacks of self-interest on Council. That certainly speaks well of our professionalism.

Council then considered "Proposed Policy Requirements for Development of a Business Plan" put forward by Doug Chapman. Council agreed to adopt the document, with minor re-organization of paragraphs to convert it into an official Business Plan.

The next portion of the meeting was held in camera, and I was not allowed to observe.

Council then received a presentation from Doug Kramble, Chair of the Professional Development Committee, on a report from the Committee on mandatory reporting of Professional Development activities. He discussed, in great detail, the report, the concept of continuing competence, the concept of mandatory reporting and the legal implications of receiving the information. The conclusion was that the Association would determine all legal implications of mandatory continuing professional development reporting before proceeding further.

Three motions were then passed, in regard to the mobility of engineers under a recently signed Canadian Council of Professional Engineers agreement. Firstly, for non-Manitoba-resident applicants who are members of other Associations, Council will accept verification of confirmation of degrees and engineering work experience from other Associations, where available, as the evidence required under the Engineering Profession Act, rather than require the submission of transcripts by, and references on behalf of, the applicants. Secondly, the standing policy that the transcripts of all applicants be reviewed was amended to "accept, without review, the five-year-plus members of other Associations who have either moved to Manitoba, or whose Associations are able to provide confirmation of their academic qualifications". Thirdly, applicants who are members of APEGGA, which did not sign the agreement, are to be treated the same as applicants who are members of Associations which are signatories to the CCPE agreement. □

MCI's Award-Winning Bus is the New Standard

(Cont'd from page 1)

ward partitions. There was room for two wheelchair passengers; and if no wheelchair passengers were present, regular passenger seats took their place, with no loss of passenger capacity. This was made possible by using folding seats which slid forward and nested together to make room for the wheelchairs when required. This concept would make use of the lavatory space both for boarding wheelchair passengers and as a lavatory.

The bus structure and lavatory designs were completed at approximately the same time. As can happen in engineering, the unexpected occurred when the toilet ended up over a major structural member. The designers had to develop an innovative solution or face the expensive prospect of a major structural update. Innovation won the day by moving the toilet slightly to avoid the structural member and adding a rotating feature to the toilet to allow transfers of wheelchair passengers from either left or right hand positions. An extendible wash basin was added so that wheelchair passengers could conveniently wash their hands in the seated position.

To top off the lavatory design, many new features were added: powered sliding lavatory doors, automatic infrared faucets, and a two-piece folding partition to block off both the lavatory during loading and the wheelchair access door during road operation.

Wheelchair Lift

The lift design began with a survey of units currently on the market. After reviewing 20 products from various manufacturers, MCI opted to design their own, as no offering had all the necessary features.

A major consideration was the height of the lift: 1.3 m. This required substantial safety railings and smooth operation to give the occupant a feeling of security. Major federal, provincial, and state regulations for safety and operation also had to be met. A lift that could be stowed above the coach floor was desirable, to keep it away from the corrosive effects of road salt and dirt. Finally, the lift had to deploy and travel on the outside of the bus structure, because this configuration was cheaper to manufacture and did not encroach on other vehicle components.

MCI made the decision to follow California regulations for the wheelchair lift. Their proposed legislation was the most stringent, so if one could meet their requirements, all other jurisdictions would likely be satisfied.

Wheelchair users were surveyed after initial testing of the lift. Comments from the handicapped groups were uniformly enthusiastic; "very smooth" and "very stable" were common remarks. One of the great strengths of the lavatory/lift design was the input received from user groups. MCI incorporated their suggestions throughout the design process, which explains their success in meeting the users' expectations.

Ride And Handling

The UTDC was contracted to produce a computer simulation of the bus suspension using the finite element method. On-road testing was used to verify the results of the computer simulation. The computer model looked for structural resonances and their characteristic modes of displacement. For the computer analysis, the bus body was assumed to be a rigid member. This approach greatly reduced the complexity of the model.

For the testing phase, the bus body was outfitted with accelerometers and a vibration analyzer. Predicted and actual acceleration values were measured and found to be accurate for frequencies below 8 Hz. Above that level, reality and theory diverged. It was thought that the simplifying assumption of a rigid bus body was responsible for the discrepancy. It's possible that at frequencies above 8 Hz, the flexing of the bus body contributes to overall system dynamics.



The results of the vibration tests were plotted against ISO standards for ride quality. These standards take into account the tolerance of the human body to acceleration at different frequencies. ISO curves for 2.5-and 4-hour rides were used. The final suspension configuration produced a noticeable improvement in ride at the rear of the coach. To increase the roll stiffness of the suspension, the airbags were moved further outboard. The resultant increase in space allowed the use of front disc brakes.

Regulatory Considerations

The innovations with the lavatory and wheelchair lift extracted a price in overall vehicle length. The maximum allowable length of an inter-city coach is 12.5 m, whereas the new design was 14 m. Upon close examination, there was no rationale for a 12.5 m limit; it was just a number pulled out of a hat sometime back in history. The only possible reason might be the extra time required to overtake a longer vehicle, but 23 m tractor trailers and 18.5 m articulating buses were already permissible, so there was no logic in a 12.5 m limit. Other than length, the new coach meets all Canadian Motor Vehicle Safety Standards.

Conclusion

The fully accessible inter-city coach project demonstrated that a 14-m coach was feasible and provided significant improvements in service and comfort to both handicapped and able-bodied passengers. For the bus operator, the coach provided increased cargo-carrying capacity, plus lower fuel consumption per passenger-kilometer. It is expected that a fully loaded coach will deliver a 10% reduction in specific fuel consumption.

For us in the engineering community, MCI is an example of an aggressive and innovative Manitoba-grown company; one that provides a standard of excellence which we all should emulate.

(The author would like to thank Glen Naylor and Brent Thatcher for their assistance in writing this article.) □

Thompson News

By: D. D'Amour, P.Eng.

On April 12, 1994, the Thompson Chapter held its spring meeting. Fifteen members turned out for the event at the Hub Restaurant. A chapter activity report was presented by Rodger Blunden. The Thompson Chapter certificate will be prominently displayed in the City Hall. Future activities of the chapter include the ever-popular, Texas-scramble golf tournament later this summer (held in conjunction with CIM), and the Annual General Meeting, scheduled for October, 1994.

Cathy Stewart reported on the activities of the APEM Council. She covered the APEM response to the issue of self-governance versus state governance. In addition, she discussed the implementation of the four-year work experience requirement for an EIT registering after December 30, 1994. Cathy also welcomed new members Cecile Kelly and Alix Peterson.

Following dinner, Rodger introduced Milton Goble, the guest speaker for the evening. Milton is the Superintendent of Special Projects at Inco Ltd., Manitoba Division. The presentation was entitled "Search for a manageable solution to a tailings impoundment problem at Inco's Thompson operation". The talk reviewed the challenges presented by the existing tailings impoundment, and the methodology used to recommend the most cost-effective solutions. □

Engineering Endowment Fund Advisory Committee

By: R.H. Russell, P.Eng., Chair

This advisory committee has now been in operation for approximately six years. As most readers will be aware, the make-up and terms of reference of the Engineering Endowment Fund Advisory Committee were originally established by the Endowment Fund, Fund-Raising Committee. Its purpose is to invite and review applications for grants from the Engineering Endowment Fund and recommend those projects that it considers should receive support.

The committee consists of 13 members drawn from engineering academic staff members, engineering support staff, engineering undergraduate and graduate students, and engineering alumni. Members are appointed by the Engineering Executive Committee from a list of individuals nominated by the constituent donor groups and approved by the Engineering Faculty Council. Over the last six-and-a-half years, the committee has met approximately four times a year, with sub-committee meetings held as required. It has worked continuously to improve the procedures for soliciting proposals and the standards for properly documenting proposals. The format for proposals, included with the invitation issued to constituent donor groups, has also been better designed to assist applicants in submitting their best proposal. Over the six-year period, the quality of proposals has improved greatly, from the initial proposals that were very brief, not-well-documented, and informal, to the more-formal, well-documented ones.

Continued on page12

Admissions Update

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

Changes continue to take place in the Admissions area of this Association at an exponentially-increasing rate.

Council has approved the proposal of the Task Force responsible for the development and implementation of the Professional Practice Examination regarding the contents and formats of the examination and preparatory seminar. I am very pleased to report that lawyers Linda Kerr, Wells Peever and Richard Swystun have agreed to serve as instructors, as have patent expert Adrian Battison and our own former President Dick Johnson, P. Eng. These course instructors are presently hard at work in the preparation of course notes. Meanwhile, the Task Force is busy developing specific entrance "exams" for applicants for EIT membership and temporary licensure.

The Experience Review Board is now fully operational, meeting monthly to determine the acceptability of the work experience of applicants for registration. A Task Force, whose members include three members of the Experience Review Board, has been established to develop criteria for the implementation, by the Board, of the four-year work-experience requirement. The end result of the work of this Task Force will be an operations manual for the Board, the preparation of which has just commenced.

In April, in response to a "petition" from the Co-op civil engineering class at the University of Manitoba, which will be graduating in February and will therefore miss the January 1 deadline, Council expanded its grandfathering provision regarding the four-year-work experience requirement to include students who will be completing their studies, exams and theses in 1994 but who will not be convocating until February, 1995. In order to qualify for registration under our current "two-year rule", these students will have to make application to this Association for EIT membership before December 30, 1994 (although their applications will not be processed until we receive transcripts of their marks).

In May, President Chapman signed, on behalf of APEM, an interim Inter-Association Mobility Agreement; and Council, in June, adopted a number of policies which will allow us to finalize the implementation details of this agreement. (By the time you read this, those details should have been ironed out, and the process for dealing with applicants from other Associations, whether Manitoba residents or not, should have been implemented.)

The Registration Board, which is now the final approval authority for all applications for membership in APEM, is now also fully operational, although it is still short one member, whom we are attempting to recruit from the geoscientific community. (If you are a geoscientist who is registered as a professional engineer, and if you are interested in both playing an important role in the operation of this Association and helping set the stage for the inclusion of geoscientists in this Association, please call me at 942-6481. We have a job for you!)

The Registration Board is currently considering its first appeal from an applicant against the decision of the Experience Review Board.

The proposed EIT program will be heavily dependent on the Professional Practice Examination/Seminar and the four-year work-experience requirements. Until the work of the Task Forces dealing with these issues has progressed a little further, therefore, the specific terms of reference for the Task Force to address the components of the proposed EIT program cannot be formulated. The Task Force is expected, however, to be operational by August. □

Golf Tournament a Success!

By: B.W. Biglow, P.Eng.

The annual APEM golf tournament was held on June 8, 1994 at the world-class Falcon Beach Golf Course. The event was almost sold-out, with 117 golfers competing under blue skies, at a 24°C temperature, on some of the best greens in the province. Rounding out the day, the golf-course staff expertly prepared a steak dinner with all the trimmings, and prizes were awarded to many skilled (or lucky) entrants.

New this year, the event was set up as a Texas Scramble best ball, which required team strategy. Don Osman, Vice-President of APEM, awarded the Landon Cup to the winning team of R. Cotterill, K. Skaftfeld, D. Kingerski and R. Schmidtke. This group finished up with a score of 66 (six under par). The team that got the most for their money took 98 strokes for the round (26 over par).

Also new this year, several companies agreed to sponsor individual holes. In exchange for contributing to the prize pool, their company names were prominently displayed at their selected tee boxes. Many thanks to the following hole sponsors: Roberts, Sloane and Assoc.; Geokwan Engineering; Reid Crowther & Partners Ltd.; Manitoba Telephone System; Wardrop Engineering; Armtec Construction Products; Smith Carter Architects and Engineers; and National Testing Laboratories.

Thank you to the following companies who also contributes prizes: Delcan Western Ltd.; Canadian Portland Cement Assoc.; Acres International; DS-Lea Consultants; HBT Agra; and Dillon Consulting Engineers.

Many of the golfers leaving the 18th hole participated in a putting contest, run by the KidSport Fund children's charity. A total of $400 was raised, and Gord Koch went home with a fancy new golf bag to store his hot putter in. Thank you to everyone who participated! □



Don Osman presents the Landon Cup

Professor Jan Oleszkiewicz Addresses Treatment of Contaminated Soil and Groundwater

By: E.E. Lach, P.Eng.

The featured speaker at the APEM luncheon on February 23, 1994 was Professor Jan Oleszkiewicz, Ph.D., Environmental Engineering Division, Department of Civil and Geological Engineering, University of Manitoba. Dr. Oleszkiewicz is also adjunct professor of microbiology at the University of Manitoba. The luncheon was organized by the Research and Development Committee.

Dr. Oleszkiewicz introduced the widespread problem of contamination of soil and groundwater with trichloroethylene (TCE), often combined with other contaminants, and noted that in spite of the numerous technologies now available, the optimum solution is still elusive. The major difficulty lies in assessing the underground distribution of the contaminant.

TCE is a chlorinated organic solvent which has been used over the past fifty years by various industries such as metal-processing, electronics, dry-cleaning, paint, pulp and paper, etc. Over that period of time there have been numerous spills resulting from sloppy storage and handling with subsequent seepage to groundwater. In many cases, the concentrations in groundwater are in excess of accepted levels for drinking water.

Using an effective array of slides, the speaker identified the three types of underground environment: the vadose, saturated zones and bedrock, and described the transport of the contaminant in the underground environment. Understanding the properties of the contaminant is a prerequisite to assessing the underground distribution from a spill event. TCE is known to have a high density, high viscosity (rate of flow is twice that of water), high solubility, high volatility, high wetability (sticks to soil), and strong capillary force. These properties can and do result in easy vertical movement in the subgrade, good retention in the unsaturated zone and easy seepage into bedrock. TCE degrades to dichloroethylene and vinyl chloride, which are highly undesirable.

A number of soil-cleaning technologies were presented, including containment, in-situ treatment, and ex-situ, or above-ground, treatment, and references made to specific projects. The above-ground loop of extract-treat-return is normally accepted but not very effective, in many cases resulting in costs in the millions of dollars and in some cases giving up on this solution and resorting to containment. Biological stimulation of resident microbes through the addition of methane and oxygen in the pump-and-treat methods has been used, but there is a problem with too-low temperatures and hostility of the underground environment. The US Environmental Protection Agency is involved with innovative technology using biological remediation of the soil. NATO's study on remedial activities identified thermal technologies as effective but costly, and noted developments in soil-vapour-extraction technologies.

The presentation also reviewed the technologies being used to treat contaminated groundwater, including ex-situ, on-site, in-situ, and passive. Whereas biological remediation looks to be the most effective, it is still unproved.

According to Dr. Oleszkiewicz, much remains to be done before we reach a complete solution. What is the extent of soil and groundwater contamination, what are the risks to life and the environment, and what is society prepared to pay in order to reduce the risks to some (as yet undecided) acceptable level? There are numerous technologies readily available for treatment of contaminated soil and groundwater, but proper delineation of the extent of contamination in the vadose and saturated zones and bedrock remains the main problem responsible for the disappointing record of the full-scale remediation efforts so far. A comprehensive approach that combines the pump-and-treat technology and in-situ remediation with particular emphasis (development work) on biological processes as the least-cost alternative, is advocated. □

APEM Hosts Engineering Students on Cross-Canada Promotion of Profession

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

On May 15, 1994, three university engineering students – two from British Columbia and one from Ontario – arrived in Winnipeg – with an extraordinary amount of luggage! – to promote engineering and science to high-school students.

Janet Gaskin, a fourth-year engineering student at Queens University and the 1993 winner of the Canadian Engineering Memorial Foundation's $5,000 final-year scholarship for a student in her final year of a Canadian engineering program, Cathy Mortin, a first-year engineering student at Simon Fraser University and winner of the Foundation's $5,000 entrance scholarship, and Chris Sorenson, Canadian Federation of Engineering Students' Vice-President, Education,



Chris, Cathy and Janet on Cross-Canada Tour

who is a fourth-year engineering student at Simon Fraser University, arrived in Winnipeg as part of their cross-Canada "Explore Engineering" tour to "turn on" high school students to engineering and science.

This tour was conceived and organized by the students in response to the receipt of the scholarships. (It was a condition of the scholarships that the recipients would, to the best of their ability, act as Foundation spokespersons, promoting women in engineering and science to young people in general.) It was sponsored by Simon Fraser University, Queen's University, Motorola Canada Ltd. and MPR Teltech Ltd.

APEM played a significant role in the threesome's Winnipeg leg of the tour by hosting and providing accommodations for the students, as well as organizing visits and accompanying them to four Winnipeg schools. Janet, Cathy and Chris addressed classes ranging in size from 26 to 146 grade 9 and 10 students, and their presentations were, by all accounts, very well-received (as were the custom-designed T-shirts they presented to the teachers of the classes visited)!

There is no doubt that Winnipeg students are more aware of engineering as a result of the "Explore Engineering" tour. To Janet, Cathy and Chris: your considerable efforts were very much appreciated, and we are glad you decided to make Winnipeg a part of your tour. Our Public Awareness Committee, in particular, thanks you all! □

Practice Note –
House Inspections

By: C.R. Bouskill, P.Eng.

During the past few years there has been an increasing number of complaints before the Investigation Committee arising out of inspections and reports on the structural condition of single-family houses. Some of these inspections have been pre-purchase-related, while others have been to identify deficiencies and recommend remedial work.

In its desire for understandable and reliable reports, the public has become more interested in knowing the significance of the potential impact of various conditions which it has observed, or which have been noted by the engineer during an inspection. As an example, many lay people do not understand the difference between, or the significance of, a crack in a wall resulting from a structural stress or fault as opposed to a crack which is essentially cosmetic in nature.

It is important for a professional engineer who undertakes house inspections to determine, in advance, what the client expects from the inspection and report, and for the engineer to ensure, as far as possible, that the client clearly understands what services will be provided.

As the majority of engineers conduct their business with other professionals or business people, house inspections provide the professional engineer with a unique opportunity to interface with the public and demonstrate to it the value of the engineering profession to society. For many people, a house inspection is one of the few opportunities to communicate with an engineer about the professional's area of expertise.

The Investigation Committee recommends that each engineer engaged to undertake a house inspection take care to observe and act on the following suggestions. These suggestions have resulted from complaints that have been directed to the Committee in recent months. As you can see, these suggestions seem to be common sense and good courtesy. They are intended to assist the engineer to uphold and enhance the honour, integrity and dignity of the engineering profession.

1. Communicate effectively with each client in a timely and effective manner during the course of any investigation and reporting, particularly if the matter relates to a civil action arising out of the construction of a residence.
2. Exercise prudent and proper care and consideration to provide a standard of service that is at least that which can reasonably be expected of a prudent engineer of average skill and ability in the areas of expertise required – particularly as it relates to foundations.
3. Take care to explain to each client what engineering services are offered and the fees associated with each of the services.
4. Treat each client with respect, respond to the client's questions as clearly and concisely as possible, and take care to explain the possible ramifications of abnormal conditions observed during an inspection.
5. Determine the client's wishes by listening to the client's directions, by asking appropriate questions, and by guiding the client responsibly, and then provide the services as agreed upon.
6. Provide the agreed-upon services in a timely manner.
7. If it is determined that more extensive work is necessary, after having agreed upon the services to be provided and the fee for those services, notify the client of the conditions which have given rise to the more extensive work deemed necessary, together with a revised estimate of the fees, and obtain approval before proceeding to undertake the extra work and to bill extra fees.
8. Prepare and retain adequate notes of the conditions observed during the inspection, particularly abnormal or suspicious conditions.
9. Report the significant findings of the inspection fully, factually and concisely, and describe the extent of the inspection, indicating any limitations or restrictions which relate to the inspection, all in language that will be understood by the public. For example, state that the inspection is a visual inspection only and does not involve removing wall panels and/or insulation for a more detailed examination of the condition of such things as concrete foundations, electric wiring, water pipes, etc.

Copies of the Professional Engineers Code of Ethics are available from the Association office. □

Engineering Endowment Fund Advisory Committee

(Cont'd from page 10)

All contributors to the Engineering Endowment Fund are eligible to submit applications for grants from the fund.

The size of the fund has now reached approximately $1,257,000 with an additional $273,000 received in pledges during 1993. It should be noted that of the total of $451,000, roughly 35% is from student contributions. To date, $1,684,000 has been pledged to the Faculty of Engineering Endowment Fund.

The funds available annually for project grants come from the interest earned on the investment of the Engineering Endowment Fund. In the initial year, the grant money available was approximately $14,000. With the growth of the fund, the annual amount of grant money available is now in the range of $60,000 – $80,000. Applications are accepted following a Request for Proposals in March and grants are awarded in the fall.

As one might expect, the number of requests for project support has exceeded the funds available. Over the six-year period, 116 applications have been received. Of these, 61 were recommended for full or partial support. The total value of grants recommended has been approximately $179,400.

The activities and projects supported include research and scholarships, teaching needs, activities of various types, equipment and facilities, special library needs, academic and support staff assistance and community outreach projects.

With the reduction in government funding to the University resulting in pressure to reduce costs in all areas, the number of applications for grants from the Endowment Fund will undoubtedly continue to increase.

The descriptions of all projects recommended by the committee and approved by the Dean are publicized in the Engineering Newsletter of the Faculty of Engineering and other appropriate publications such as the Manitoba Professional Engineer. □

Engineering Endowment Fund Applications

Applications for the Engineering Endowment Fund Competition for 1993-1994 are being accepted until October 17, 1994.

For more information, contact Irene Mikawoz, P. Eng., Director of Student Recruitment, U of M., phone 474-9806, fax 275-3773.

Coming Event

WESTERN CANADA WATER AND WASTEWATER ASSOCIATION

46TH ANNUAL CONFERENCE

October 4-7, 1994
Holiday Inn Crowne Plaza, Winnipeg
Contact: Jim Warrener, P.Eng.
Phone: 334-4795

Position Wanted

Manufacturing Engineering

Skills:

- 28 years experience in manufacturing environments including 6 years supervising multi-plant engineering department.
- Areas of proven abilities include capital budget, installations, expansions, efficiency improvements, maintenance, quality (S.P.C.), Health and Safety.
- Working knowledge of computers (MS D EXCEL, WP5.1 etc.).

Prefer: Full-time work
Analytical, Thorough, Loyal, Willing To Adapt
Contact: Kevin R. Jones, P. Eng.
Phone: (204) 261-9475