

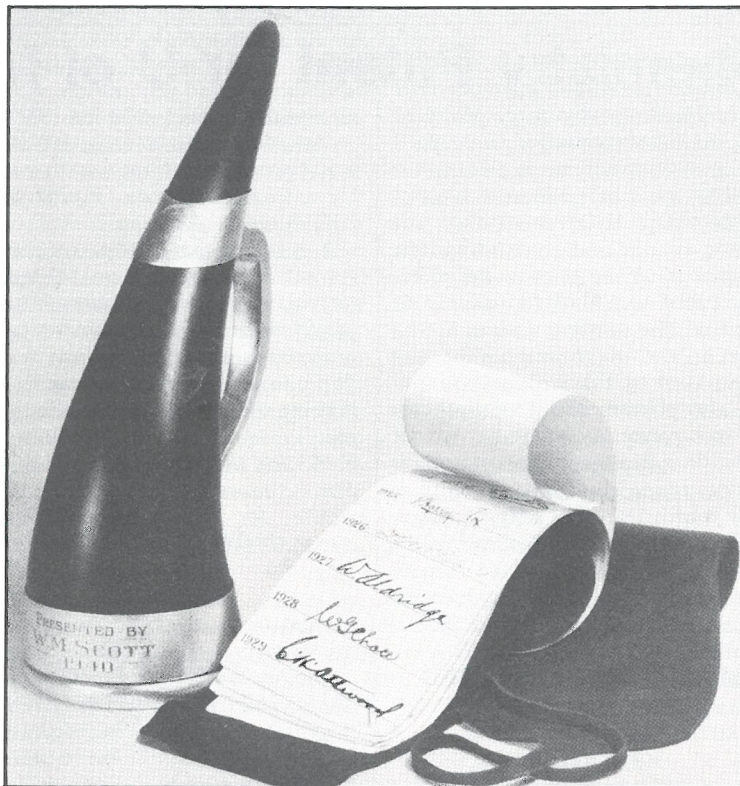
Professional Engineer



February, 1989

The President's Gavel

by W.G. McKay, P.Eng.



THE "SCOTT GAVEL".

At the annual meeting last October the Gavel, symbolic of the office of President, was transferred from President Bud Christie to incoming President Garland Laliberte. This Gavel is not of the usual style and has several unique features including its history. The following excerpt was taken from the 25th Anniversary Year Book of the Association published in 1945.

* * *

The Scott Gavel

P. Burke-Gaffney

There is no one who has manifested a more sustained interest in the administration of the Association of Professional Engineers of the Province of Manitoba than W.M. Scott, now Commissioner of the Greater Winnipeg Water District and doyen of the Engineering Profession of Manitoba. He was instrumental in founding this Association, was its first Chairman, and has been the liaison between the University of Manitoba and the Association for the twenty-five years of its existence.

Some ten years ago he deplored the absence of some symbol of continuity, of

something which could be handed down to future generations as a link with the past. He recalled that it seems inherent in the nature of men when organized successfully in society to adopt some tangible object which would serve at once as a symbol and nexus of authority, citing as examples the coronation stone of England, and iron crown of Lombardy.

In 1938 he conceived the idea of having fabricated a gavel which would serve this dual purpose. Taking his time in the design and in the accumulation of the necessary materials, he presented what is now known as the "Scott Gavel" to the Association at its Annual Meeting in 1940.

The gavel is a buffalo horn, eminently appropriate since a buffalo is the symbol of the Province of Manitoba. The horn is equipped with a silver handle and massive silver base, enabling it to furnish as a gavel. The base is removable, giving access to the interior of the horn. Accompanying the gavel is a parchment on which is inscribed the signatures of

all the presidents to date in chronological order, with space for the signature of future presidents up to one hundred years. This parchment is of size and shape that it can be rolled and lodged in the interior of the horn.

In presenting the gavel to the Association, Mr. Scott stipulated that it remain in the possession of the President of the year as a symbol of his office and that he in turn pass it on to his successor, having first inscribed his name on the parchment, thus preserving a perpetual tangible link with the founders of the Association. Geo. E. Cole and Dean E.P. Fetherstonhaugh, M.C., devised a touching little ceremony for the transfer of the "Scott Gavel" from the retiring president to the president-elect, which has become a feature of the annual meetings of the Association.

While it was not part of the donor's plan to attach his name to the gavel, it has fortunately come to be known as the "Scott Gavel"; fortunately, because it will perpetuate in the minds of generations of Manitoba engineers, as yet unborn, the name of a modest gentleman, the first Chairman of their Association, and will keep before them the tradition of unassuming interest in its welfare which he has established.

* * *

A little history about the donor of the Gavel and about the Author of the above article.

W.M. Scott, B.Sc. 1895 McGill, Member of the Engineering Institute of Canada, Member of the American Waterworks Association, Member of the New England Waterworks Association, Member of the Canadian Institute of Sewage and Sanitation, Chairman of the Provisional Council of the Association 1920, Member of Council 1921, 1922, Association Distinguished Service Medal, 1940, Lecturer in Civil Engineering, University of Manitoba, Chairman of Commissioners Greater Winnipeg Water District, Chairman of Commissioners Greater Winnipeg Sanitary District.

Mr. P. Burke-Gaffney, B.A. 08, B.Sc. Maths 11, BE 12, National University of Ireland, joined APEM in 1921, was a member of Council for three two year terms. Registrar in 1924 and 1925, Councillor to Dominion Council of Professional Engineers for seven years commencing 1939, President of APEM 1938, President of the Dominion Council of Professional Engineers 1945, and was the District Engineer for Canadian John Manville Company located in Winnipeg. □

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Correction

In the article "Geological Engineering at the University of Manitoba Celebrates 50th Anniversary", December 1988 Issue, it should read as follows:

"Instruction in Geohydrology commenced during the 1978-79 term with the first instructor being Mr. Frank Render, P.Eng. from the Manitoba Water Resources Branch (and a graduate of 1961). Rock Mechanics instruction commenced during 1980-81 with Mr. Charles Steed, P.Eng. of Tanco Mines, commuting once a week from Bernic Lake to offer the course. The Department was given space in the northeast wing of the old engineering building for offices and future laboratories, temporarily used as a home classroom for Geological Engineering Students."

Apologies to the author Mr. A. Baracos, P.Eng. for the omission. □

Northern Telecom Gift to U of M

Northern Telecom has donated an MCT 6603 Micro-Reflow Soldering System to the University of Manitoba's Faculty of Engineering via the Institute for Technical Development. The unit is worth about US \$4250.

The soldering system employs a precise, pulse-ignited microjet of hydrogen gas to achieve quality, high-speed microsoldering on ceramic and alumina hybrid circuits. The regulated flame of hydrogen gas is applied directly against the bottom surface of the substrate, quickly heating a specific area on the circuit to solder-melting temperatures.

This unique process of reverse-side heating protects the circuit from solder-tip contamination, electrical transients and oxide formation.

Problems of dissolving thin metalization, thermal shock and component overheating are minimized, and multilead chips, chip components or semiconductor die may be attached or removed rapidly, without affecting adjacent parts. The high-temperature capability of the MCT 6603 permits the attaching of gold/silicon and gold/tin semiconductor die to substrates, without the excessive heat typically required. □

Chemistry Patent for U of M

University of Manitoba chemistry professor Dr. H. D. Gesser has received a patent for a process which uses a polymeric coating for the removal of gaseous pollutants such as formaldehyde, SO₂, H₂O, and NO_x. The coating is non-volatile and contains specific functional groups which react to the pollutant when sprayed on a filter in a forced air heating system. The polymer does not contribute gases to the environment, nor is its reactivity impaired by the presence of other gases. It is also possible to incorporate this technology into paint.

In one test (in a two-storey house) a fibre-glass filter was treated by spraying the filter (20"x25"x1") with 150 ml of a 50% solution of the polymer in water and allowing the filter to dry. When installed in the furnace and used for one week, formaldehyde in the

air was determined to be less than 0.001 ppm — initial levels had ranged from 0.030 to 0.100 ppm over a three month period due to Urea-Formaldehyde Foam Insulation (UFFI).

A primary market for the process is the forced air heating systems of buildings and mobile homes which incorporate UFFI or particle board in their construction, although numerous other applications are possible. The new process is easier to apply. A licensee is being sought to utilize this innovative process.

F.M.I. on this or any other U of M Innovation, contact: Ray Hoemsen, P.Eng., Institute for Technological Development, phone (204) 474-6200, (204) 261-3475 (FAX). □

NEW MEMBERS REGISTERED DECEMBER '88 AND JANUARY '89

K.G. Boese	E.G. Lopez
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B.J. Boley	J.W. McLean
I. Boyd	B.J. Mills
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R.J. Friesen	T.J. Stephens
G.D. Gowryluk	Y. Sthankiya
K.R. Lane	H.J. Waedt
A.P. Lawless	

Congratulations to **B.H. Boley** who achieved 100% on the professional practice examination.

CANNOT LOCATE

Clark, A.	McCann, T.J.
Fry, B.	Rampaul, R.
Gadzella, G.M.G.	Somerville, K.R.
Husain, H.	Soneff, S.
Lion, J.R.	Taylor, I.A.

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P. Champigny (Que.)	D.F. Matheson (B.C.)
P.F. da Silva (Ont.)	G.C. McPhee (Alta.)
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C.R. Lees (Ont.)	

ENGINEERING GRADUATES DECEMBER '88 AND JANUARY '89

E.J.S. Duncan	D.M. McCartney
J.B. Martino	D.B. Towells

Farewell & Bon Voyage!

By the time this publication is in the mail, Vera Toth of the Association Staff will likely be in Prince George, where Don is employed with Kilborn Engineering on a new project.

Vera has been with the Association for three years and has been a valuable member of the Publication Committee. We shall miss her and wish her and Don and their family every good fortune. □

*With Deep Regret,
The Association Records the Passing Of
Robert A. Harris*

President's Message

G.E. Laliberte, P.Eng.



The Engineering Profession Act reflects the public trust in those who would practice engineering in Manitoba. The Act establishes the framework within which we endeavour to provide a high quality of engineering for the benefit of all Manitobans. It is curious therefore that, despite this fundamental consideration, The Act makes no reference to the interest of the general public except in a non-central clause dealing with the exemption of personal work.

Recently D.A. Ennis, the Association's Act Administration Officer, and I were contemplating possible amendments to The Act which would redress this shortcoming. We agreed that, considering its cardinal importance to the governance of the profession, the public interest should figure prominently in The Act. It seemed reasonable to conclude that this principle could appropriately be reflected in the definition of the "practice of professional engineering" in Clause 1 of The Act.

Briefly, The Act presently defines the practice of professional engineering as "the carrying on . . . of one or more of the . . . branches of engineering . . . and . . . includes the reporting on, advising on, valuing of, measuring for, laying out of, designing of, engineering inspection of . . . or the construction, alteration, improvement or enlargement of, works and processes . . . by reason of their requiring . . . the skilled or professional application of the principles of mathematics, physics, mechanics, aeronautics, hydraulics, electricity, forestry, chemistry, geology or metallurgy . . ."

In searching for the right amending phrase to reflect the interest of the general public in this matter, we came to realize that there was an even more fundamental consideration. Does an engineer's responsibility require the simple assurance of the safety of the public through sound engineering practice? Or is there a greater responsibility which requires the engineer to reflect the public interest in a more comprehensive way?

To put the matter into (an admittedly oversimplified) perspective, let us consider the matter of the planning and design of a major bridge in the City of Winnipeg. One can regard the safety of the public as having been reflected in the bridge design if the proper geotechnical and hydrological studies are carried out and if structural and other safety considerations are adequately taken into account. However, it is possible to argue that the engineer's responsibility goes much further. Is it not in the public interest to consider

The Public Interest

the social, cultural, environmental and political impacts of the bridge? If the bridge opens up an area to a different element of society (escaped convicts, for example), does the public not have an interest in the siting of the bridge, and does the engineer not have a responsibility to take those social and cultural factors into consideration? If the bridge results in permanent economic hardship for commercial interest and residents at either end of the bridge, is the interest of at least an element of the public not at stake and does the engineer not have at least a shared responsibility for the choice of the location? And what about the environmental considerations such as increased traffic noise? Even political considerations are possible if the ideological makeup of an area is affected because of the construction of the bridge. Admittedly some of these considerations go beyond the realm of engineering, but perhaps the example serves to illustrate the broader public interest.

The Association of Professional Engineers of Ontario (APEO) has accepted and supported several axioms which, the Association's President W.J. Kerr, P.Eng. maintains, should underlie regulation of the engineering professional by a licensure regime. These axioms are:

- that the sole justification for licensing is that it is necessary to serve and protect the public interest;
- that the scope of the licensure requirement should exclude engineering work which creates no risk to the public;
- that the essence of professional practice lies in the taking of professional responsibility for engineering work, rather than in the actual performance of the work; and
- that there should be no arbitrary barriers to entry to the profession.

In an 8 December 1988 letter to F.S. Miller, P.Eng., Chairman of the Ontario Task Force to Study Engineering Technology, President Kerr explained that each of the above principles is embraced in APEO's 1984 Act and Regulations. He explains in his letter that the scope of licensure under the Professional Engineer's Act in Ontario was considerably broader under the former Act than it is under the 1984 Act. He states that the present narrower definition of the practice of professional engineering "includes only that engineering work which does not hold

risk to the public". He expresses the view that the 1984 Act provides a model for similar Acts throughout the other provinces.

President Kerr goes on to mention that one of the realities of the 1984 Act is "the very wide range of engineering work that may legally be undertaken by unlicensed persons, engineers included, and the great latitude and flexibility which employers now have in deploying their technical personnel without contravening the Act". He reiterates a principle expressed by the Professional Organizations Committee which was established by the Ontario Legislature in 1976, namely, that "flexibility in the substitution of non-professional for professional manpower must give away at some point to those third party concerns which generate demand-side requirements for licensed professionals." Clearly, the narrower definition has had important ramifications for the practice of professional engineering in Ontario.

It is significant, however, that APEO's 1984 Act, in defining the practice of professional engineering, utilizes the phrase "wherein the safeguarding of life, health, property or the public welfare is concerned". Evidently, engineering work in which the public welfare is concerned is regarded as within the scope of licensure. The term "risk to the public" in the second axiom above is, therefore, not intended to be interpreted in the narrowest sense. If this analysis properly reflects the APEO intention, it is encouraging that the scope of engineering in Ontario as provided for under the 1984 Act is consistent with the findings of the CCPE Task Force on the Future of Engineering. These findings have proposed a greater social relevance in engineering work to complement current technical elegance. They also encouraged increased involvement of engineers in public decision-making where engineering is concerned. To me, that broader interpretation is the more appropriate one.

Mr. Ennis and I are contemplating proposing an amendment to The Engineering Profession Act in Manitoba which would incorporate a limiting phrase in the definition of the practice of professional engineering, specifically, "where the safeguarding of life, health, property or public welfare is concerned." Any views that members might have on this matter would certainly be welcomed. □

U of M Faculty/APEM Council Meeting

Vish Gupta, Chairman of the Association's University Liaison Committee, welcomed those present and proposed five items for discussion: 1) interaction between the Association and the graduating class, 2) alignment of engineering programs with needs of industry, 3) continuing education, 4) funding of engineering programs and 5) women in engineering.

Introduction of the Graduating Class to the Association: In the past APEM has

organized an annual dinner for the graduating class for the purpose of introducing them to the Association. Cost was one factor in the discontinuation of these dinners. Since students appreciate meeting and interacting with practicing engineers, it was suggested we explore the possibility of increasing the interaction at the Iron Ring Ceremony and annual EIC student dinner. At the present time, very little is said about
(continued on page 4)

Technology & Innovation in Non-Hazardous Waste Recycling

by M.S. Kauldher, P.Eng.

The Research and Development Committee held its first meeting from a series it intends to organize concerning the environment. This meeting was held in the form of a panel discussion on recycling of non-hazardous waste. The panel discussion was held on January 24th, 1989 in the CIIT building on Ellice Avenue, and more than 75 persons including the media were in attendance. The panelists were: The Honorable Ed Connery, Minister of the Environment, Work Place Safety and Health; Bob Fenton, Ph.D., University of Winnipeg, Past President of

Recycling Council of Manitoba; Ken Church, President Faroex Ltd., Gimli; and Hadi Husain, Ph.D., P.Eng., Wardrop Engineering. Bob Hamlin, P.Eng., Chairman APEM R&D Committee, acted as a moderator.

The Honorable Ed Connery was the first speaker. He emphasized that recycling is a very important issue for the present government; though Winnipeg, has more than 40 years of dumping space available for its garbage, other cities in North America are rapidly running out of dumping space. No community wants the garbage dumps in their

vicinity. In Mr. Connery's riding of Portage La Prairie, they have to go 17 miles to dispose of the city's garbage. Due to the society's current attitude of using disposable goods and the plastic technology for packaging, the amount of garbage has doubled in the last decade. According to Mr. Connery " . . . I don't think that the solution is bigger garbage trucks and more garbage dumps. We need to find ways of reducing the amount of garbage we produce".

The Manitoba Government has been experimenting at a small scale in waste recycling in the area of paper, aluminum cans and automobile lubricating oil. The government has been supporting the Recycling Council of Manitoba recycling depots. Mr. Connery stressed that " . . . One of our goals is to heighten public awareness and appreciation of recycling." Mr. Connery announced his intention to establish an Advisory Committee on Recycling. This committee will be holding public hearings on the subject of recycling with the intention of developing a comprehensive plan for the Government to follow in developing a program for the reduction, reuse, recovery and recycling of non-hazardous waste in Manitoba. The interested APEM members will have opportunity to participate in presenting their recommendation to the task force. The findings of the Advisory Committee will be discussed in a symposium in the fourth quarter of this year.

Bob Fenton of the University of Winnipeg talked about the various aspects of the waste recycling program. In addition to the four R's of waste recycling, namely recycling, reduce, recover, and reuse; he added three more (residual, rethinking and responsibility). The term "residual" has a neutral connotation as compared to the negative for the term "waste". Prof. Fenton will like us to consider garbage of one process as input to another. Prof. Fenton is actively involved in the "Paper Grower" program at the University of Winnipeg. The paper from the University of Winnipeg is collected and sent to a Montreal firm for reprocessing. Instead of paying a hauling company \$40 per ton to remove the paper, the University is earning \$25 per ton for the raw material for a recycling paper processing mill in Quebec. In addition to feeling good about the contribution to the preservation of our environment, the University of Winnipeg is earning \$65 per ton from their garbage. I am wondering when the University of Manitoba will follow suit to recycle its paper waste.

It should be noted that all our garbage cannot be recycled. For us to have a sustainable recycling industry, it must make economic sense. The recyclable raw material must be clean, sorted, and require minimum handling by the recycling plants. Prof. Fenton suggested, that the products should be standardized with recycling in mind. Also, the companies responsible for manufacturing the product that ends up in the garbage dumps, should be assessed some kind of levy that

(continued on page 6)

Faculty/Council Meeting (continued from page 3)

the Association at these occasions. Another suggestion was to organize a social instead of a dinner. There was agreement, in either case, that practicing engineers should take more active part in implementing the exchange. Dr. Laliberte stated that he was Co-Chairman of the 1989 Engineering Student Night Dinner and that, at the organizing committee's next meeting on November 28, he would suggest that APEM organize a special seminar on the profession in conjunction with the Dinner.

Alignment of University Programs with the Needs of the Industry: Industry spends a considerable amount of money training newly employed engineers. It expects that the students should be taught more skills and be able to take work responsibility without any further training or expenditure on the part of the industry. On the other hand, argument was made for teaching more engineering science and the turning out of engineers who are capable of acquiring knowledge which keeps changing at a fast rate with developments in the technology. Continuing education is one avenue, which could be used to update industry engineers. The basic consensus was to produce graduates who have a focus on fundamentals and an attitude towards keeping current and acquiring knowledge on their own. The diversity of the engineering jobs which graduates have during their career makes it unnecessary to educate a skill-oriented engineer. Engineers equipped with fundamentals can adapt to changes but glorified technicians can not adapt as required for the years down the road. The Canadian Council of Professional Engineers Task Force on the Future of Engineering suggests three kinds of engineering graduates may come out of the universities: generalists, specialists and management-oriented engineers. The generalists would have a broader knowledge base to serve needs of the diverse industry. Specialists would be educated in the narrowly defined subject areas and the management-oriented engineers would be educated in business procedures. To respond to these perceived needs, universities can act in various ways. For specialists, a postgraduate degree beyond a generalist's undergraduate degree or specially designed continuing education courses are

possible ways to deliver it. For management-oriented engineers, an M.B.A. could be integrated with the undergraduate degree program. Co-op programs are another way to fulfill requirements for generalists and specialists.

Continuing Education: The Association's Professional Development Committee and the Dean's Office should continue to work on the development of such programs.

Funding of engineering programs — lack of funding: University funding has continued to deteriorate. A smaller budget does not mean the collapse of a program but requires administrators to be more imaginative. Apart from the Faculty of Medicine, Engineering is doing better than other faculties in the matter of funding. Industrial chairs can be funded to increase specialization in certain directed areas. Industry provides money which is matched or double-matched by the Natural Sciences and Engineering Research Council of Canada. The profession should try to persuade the provincial government to provide more direct funding to the engineering faculty since sound engineering is the key to a strong economy. Joint efforts by the Manitoba Research Council and the Faculty of Engineering should be explored. The initiative to increase Faculty resources should come from the Faculty with APEM acting as catalyst.

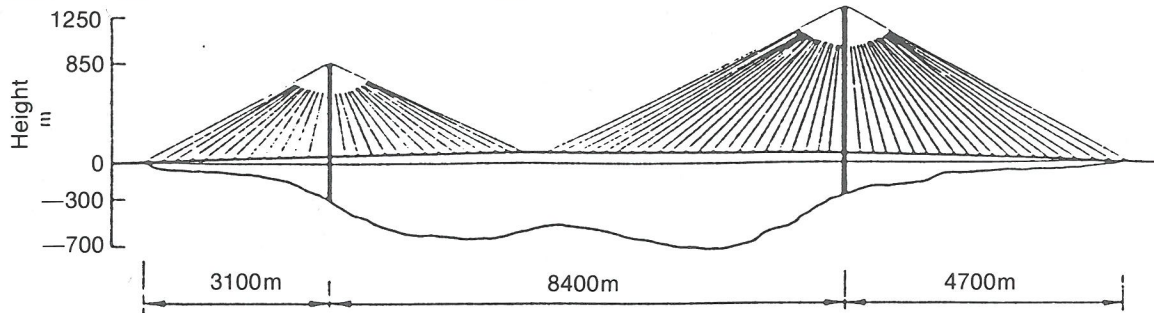
Women in Engineering: This issue merits serious consideration but, due to the limited time left, it was tabled until the next meeting. Dr. Garland E. Laliberte, P.Eng., current APEM President, proposed that this item be the first agenda item at the next meeting.

Dean Ed Kuffel thanked the Association and the engineering community for the verbal and moral support given him in his efforts to upgrade the Faculty. He advised the assembly that he is stepping down as Dean in June 1989. He mentioned provincial support and explained how he had faced strong challenges in his first five years but the second five years were relatively easy.

Dr. Laliberte thanked Vish Gupta and the Dean for organizing the meeting and members present for their participation in the discussions. He expressed his hopes for more continuing dialogue between the Association and the Faculty of Engineering. □

Bridging With Imagination

by V. L. Dutton, P.Eng.



Proposal for a CFRP bridge across the Strait of Gibraltar at its narrowest site; since tower foundations deeper than 350 m are not possible, a maximum span of about 8400 m is necessary.

Every once in a while, an article appears that makes me marvel at the sheer audacity of the writer's imagination. U. Meier's article *Proposal For A Carbon Fibre Reinforced Composite Bridge Across the Strait of Gibraltar at Its Narrowest Site* seems, on the surface, to be so crazy that one wonders how it found space in the Institute of Mechanical Engineers' Proceedings of their conference on "Fibre Reinforced Composites 1986".

Mr. Meier's paper, based on work that has been going on at the Swiss Federal Laboratories for Materials Testing and Research, contains some very interesting comparisons of steel, GRP (glass fibre rein-

forced plastics) and CFRP (carbon fibre reinforced plastics). Considering the downward movement of the price of CFRP, the author concludes that "... super structures with main spans in the range of 4000 m and greater will be the domain of advanced composites."

It is difficult to comprehend a structure of the magnitude proposed in the paper, with a main span of 8,400 m and an overall length of 16.2 km. While the project is unlikely to be built in the near future it is nevertheless a distinct possibility. To visualize the proposal from a Winnipeg perspective, imagine a tower for a cable-stayed bridge at the corner

of Portage and Main ten times the height of the Richardson Building and another just north of the intersection of Bishop Grandin and Pembina Highway. This would represent the main span. The approach span would pick up traffic north of the intersection of Main Street and Redwood and the other end would discharge traffic on to Pembina Highway just inside the Perimeter. Such a bridge, if built over Winnipeg, would certainly eliminate the problems of traffic congestion for those University students living in the North end.

These are exciting times in which to be a young engineer. □

Light at the End of the Tunnel

by D.A. Ennis, P.Eng.

Given the conventional speculation is that the "half life" of the technical component of a Bachelor's Degree in engineering is from 5 to 8 years, and realizing how much is distilled in the statement "Education is what remains after the information that has been taught has been forgotten" in his book "The Learning Society" by R.M. Hutchings, one might think it difficult to see the light at the end of the tunnel labelled Progress in Engineering Education.

Such was not the case for those who attended the Professional Development Committee Breakfast Meeting on November 30th, 1988 to hear Glen Morris's presentation on "Trends in Engineering Education". The stalwarts who assembled at 7 a.m. soon came to the realization that the movers and the shakers at the centre of engineering education have not been oblivious to the engineers in the work-a-day world who mutter about the deficiencies of an engineering education. Those of us who have occasion to mutter (usually grey heads) tend to assess the situation on the basis of the course content at the time we took it and often without an appreciation of the current funding restraints.

The facts are:

1) The curricula for the four year program are full, the average student currently takes 4.7 years to earn a degree.

2) Emphasis has shifted from one of a vocational instruction in current teaching practice

to the teaching of fundamentals and engineering sciences to help the engineer deal with the ever increasing rate which new knowledge is being created.

3) There has been increased emphasis on communication and management skills.

4) There are links between the Faculty and industry through innovations such as the undergraduate co-op programs and interaction programs where staff spend leave in industry and engineers in industry spend time in the university environment.

5) There is a cross fertilization at the international level through CIDA on international projects. The University of Manitoba has been involved in a variety of them.

6) There is a healthy research program at the University of Manitoba. Research grants and contracts have grown from \$600,000 in 1979 to \$4 million in 1987.

7) The resources of engineering faculties have been stretched. The average annual cost to the taxpayer of an engineering education in Canada has decreased from \$5,500 to \$4,000 between 1980 and 1985. This compares to \$23,000 at MIT. The student/teacher ratio in Canadian engineering facilities is almost 22 as compared to seven in Japanese universities and 8 to 12 in some British and American universities.

The trends are that:

1) The rate of growth in the Canadian population is decreasing. The population is aging at an unprecedented rate, and the enrollment in engineering faculties will

decline.

2) The curriculum will become broader in the areas of fundamentals in engineering sciences and management skills making it necessary for the engineer to acquire specialized technical engineering knowledge at the graduate level or through continuing education.

3) As the population ages, governments will shift financial support from education to health care and services for the elderly, and engineering faculties will have to make greater efforts to market continuing education programs and contract research capabilities and facilities.

Dr. Morris rightly points out that, given the "half life" situation and the fact that engineering faculties cannot teach everything needed for a forty year career in a four year program, it is essential for engineers to engage in career-long education. He quickly zeroed in on an issue which faces the profession as a problem and also represents an opportunity to the engineering faculties. The issue is that presently there is no nationally co-ordinated system for the accreditation of program consistency and quality of continuing education programs and very little in the way of a system to co-ordinate academic credits by way of CEU's.

Perhaps the time has come for CCPE to draw together the resources of the profession, technical societies and the engineering faculties to assure that the knowledge that remains after what has been taught and forgotten keeps that light burning brightly. □

Interview with APEM President G.E. (Garland) Laliberte, P.Eng.

by D. Jayas, P.Eng.



Dr. Garland E. Laliberte, P.Eng. was installed as President of the APEM during the 1988 Annual Meeting. Prior to becoming President, Garland had wide experience with APEM. He has been a member of the Council for four years and the Council Executive for three years. He was Vice-President in 1987-88 and Chairman of the Admission's Review Board the same year. I recently had an opportunity to find out about Garland's background and his views on some of the key issues facing the engineering profession.

Dr. Garland E. Laliberte, P.Eng. was born, raised and educated in the Roblin, Manitoba area (he called it "God's Country"). He graduated from Roblin high School at age 15 and was awarded the Govern-

nor General's Medal. His love of mathematics and science attracted him to Engineering. After two years of engineering at the University of Manitoba, he decided to pursue a career in Agricultural Engineering. Because the University of Manitoba did not offer a program in Agricultural Engineering at that time, he had to transfer to the University of Saskatchewan where he received his B.E. in Agricultural Engineering in 1956. After graduation, he worked for five years with Prairie Farm Rehabilitation Administration in Vauxhall, Alberta, where he met his wife Audrey. He worked in the area of irrigation and drainage engineering, taking charge of land levelling for border dyke irrigation systems. At this point, he decided to go back to the University of Saskatchewan to pursue his M.Sc., a task he completed in 1961. He returned to Alberta with the Research Branch of Agriculture Canada in Lethbridge. After working three years with the Research Branch, he went on to further studies at Colorado State University, and received his Ph.D. in 1966. He returned to the Lethbridge Research Station and a year later joined the Department of Agricultural Engineering at the University of Manitoba as an Associate Professor. His leadership qualities were recognized by the university administration and 18 months later he was promoted to Professor and appointed as the Head of the Department of Agricultural Engineering. He provided continued leadership to the Department for 17 years and stepped down from the headship in August 1986 to return to full time teaching and research.

Garland has been heavily involved in many professional organizations and has provided

extensive leadership to these organizations. He has served as President of the Canadian Society of Agricultural Engineering (CSAE), and of Association of Faculties of Agriculture in Canada (AFAC). He was honored by the CSAE in 1981 with the Society's highest honor, the Maple Leaf Award, and again in 1984 with a Fellowship. In 1983, he was elected a Fellow of the Agricultural Institute of Canada. He served a six-year term on the Canadian Engineering Accreditation Board (CEAB) and was its Chairman during 1986-87, the Engineering Centennial year. During his Chairmanship, the Board completed a review of its mandate and began review of all procedure manuals and the accreditation questionnaire, a tremendous effort on the part of Board and himself. He has participated in seven accreditation visits and has chaired five of them.

The first issue I raised with him was on the role of APEM in continuing education of its members. Garland feels that, in the first instance, all practicing engineers have a personal responsibility towards upgrading their knowledge, not only by attending formal courses but also through other avenues such as participation in conferences and discussions with peers and reading published research articles and books. Our Code of Ethics puts the responsibility on us to maintain our competence. He sees the Association in a co-ordinating and facilitating role. He also believes that the organizers of the continuing education activities should capitalize on the knowledge and experience of both the academics and practicing engineers in the Province. Learning is always enhanced by two-way communication.

His views on the future of engineering education and the profession were reported in his President's Message in the December 1988 issue of the Manitoba Professional Engineer. Briefly, the Task Force on the Future of Engineering, set up by the Canadian Council of Professional Engineers, has given us an excellent picture of the needs for the next 10 to 20 years as seen by employers of engineers. Basically, the task force recommends some improvements in people, communication and managerial skills without any loss in technical content. The employers see need for specialists (the experts in narrowly focused areas), generalists (the engineers dealing with more wide technical areas) and managers of technology with capabilities to evaluate the social relevance of engineering solutions. These recommendations put an increased responsibility on the profession and on the educational institutions. As an academic and an active practicing engineer, he considers these directions encouraging and feels it is possible to produce these future engineers. The leadership in the educational institutions and the profession will decide the pace of achievement and change.

He feels positively about an encouraged interaction between practicing engineers in industry and academics in the university. The

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Non-Hazardous Waste Recycling

(continued from page 4)

could be applied towards the recycling of their waste.

Ken Church gave his views from the view point of the waste recycling processing industry. The Faroex Ltd. of Gimli uses waste plastic material from U.S. along with virgin plastic material to manufacture enclosures for raising piglets. Faroex employs 35 persons on regular basis. A sister company manufactures window frames from recycled plastic. Mr. Church said that without the help of the Federal Government's R&D Tax Credit program, Faroex could not have stayed in business. He stressed that the recyclable raw material should be clean, sortable and inexpensive to make economic sense, and to ensure the safety and well being of its employees. Concerning the biodegradable plastic bags, Mr. Church iterated that they contribute nothing to its recyclability. Moreover, the biodegradable plastic bag's property of disintegrating into tiny particles, after the starch it contains is eaten away by the bacteria, makes it impossible to separate it with ordinary means. Thus the biodegradable plastic bags pose larger environmental danger than the ordinary plastic

bags.

Last speaker, Dr. Hadi Husain, Manager of R&D for Wardrop, talked about Wardrop's activities in waste reduction, reuse, recycling and production of marketable products from wastes. Wardrop has focused on food waste as this industry is of a crucial importance to Manitoba's economy. The company has focused on three projects:

- Recovery and drying of whey from cheese plants using innovative concentration and drying technologies.

- Production of ethanol from Carnation's solid and dilute liquid wastes. The Carnation plant makes french fries and other products from potatoes.

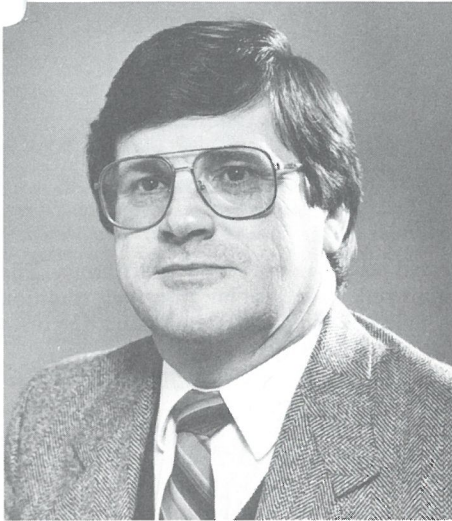
- Development of the microwave rendering process to improve the value of meat industry by-products.

In all cases, the projects have involved cooperation between Wardrop, industry, provincial and federal governments and Manitoba Hydro's R&D program.

Our next panel discussion will be held on March 8th, 1989 at the CIIT building and the topic is Technology and Innovation in Hazardous Waste Management. □

Interview with APEM Vice-President K.A. (Ken) Buhr, P.Eng.

by W.G. McKay, P.Eng.



Kenneth A. Buhr was born in Manitoba, raised in Altona as one of a family of eight children. Ken graduated from the University of Manitoba in Civil Engineering in 1967 and of the family is one of three engineering brothers, one of whom is Larry who is the Manitoba Manager of M.M. Dillons Ltd.,

and the other Allen with Dominion Bridge Wpg. Having worked during the summer for Water Resources upon graduation he joined the Department under Frank Penner, specializing in the geotechnical field. In 1974 he obtained a Masters Degree majoring in Soils.

Ken found the departmental work interesting and had a special assignment on a northern project for 5 years. The opportunity arose for a change to another government service and he joined the Manitoba Water Services Board in ground water and lagoon design. Although a government operation, the board was sufficiently small to be closely associated with all of its staff and the projects. It was also his first introduction to the services of consulting engineers.

In 1978 with the Board relocating its operation to Brandon there was some reluctance to make this move. Having known Al Poetker as the Chief Engineer of the Board and who had started his own practice, Ken joined Alf in 1978 as a principal and partner. In discussion with him on the change from public to private sector he indicated that it was a matter of changing the pressure of the job in the government for the pressure of client relations, staff relations and management in the consulting field.

Ken's wife Lou-Anne is a Senior Administrator in the Department of Education and has been involved in continuing education on an international basis. The children, a daughter with a good athletic record is in high school and the son is in first year university leading to an actuarial career. As an artist Ken says that he would like to renew this activity as well as use a set of golf clubs currently collecting rust.

Ken's involvement on the APEM Council commenced in 1985 and in 1988 he was appointed to the Vice-President's position. Like many others who enter Association activities, he was also surprised at the scope and industry of the Association. He is pleased to see the activity of many committees in particular the professional development committee for which he was the initial chairman. While for the most part he has noted dedication by engineers to their association activities, with some disappointment he has also noted that some members have given less than their commitment.

From the interview these are indications of an engineer who has shown commitment both to his employers, to the public for whom he provides an engineering service and to his Association. □

President Laliberte

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Association can act as a catalyst in this process through the efforts of the University Liaison Committee and through the active participation by members of both groups in Association activities. By working on various Association committees, members make contacts and are exposed to ideas for future interactions. Garland encourages all members to get involved in Association activities.

The enrolment in engineering programs is on a downward trend. He feels it can be turned around provided we concentrate our efforts in recruiting, particularly for female students, a source which has not been fully exploited. Statistically, only 12% of engineering student enrolment and a little over 2% of the practicing engineers in Canada are women. There is no reason that women should not make up 50% of the profession. He believes that both the university and the profession must take the responsibility to encourage women to come into engineering.

Whenever he finds some spare time from his responsibilities at the university and involvement in various professional organizations, he enjoys that time by hunting and playing the fiddle (not at the same time of course). Garland is blessed with a charming wife, Audrey, who is the Co-ordinator for Summer Session courses offered by the Continuing Education Division of the University of Manitoba, and two daughters Tracy, an interior designer with the Manitoba Telephone System and Marnie, studying for a degree in fine arts at the University of Manitoba. □

Interview with APEM Councillor W.M.A. (Bill) McDonald, P.Eng.

by J.W. Bogan, P.Eng.



The Publication Committee presents this interview to allow the membership to become familiar with those representing them.

Councillor McDonald was recently appointed to Council when one of the candidates elected during the last election advised he could not serve due to other commitments.

Mr. McDonald began his career at Dominion Bridge, Winnipeg in 1966. He has worked in the heavy construction field from Quebec west to British Columbia. In 1980, Mr. McDonald moved to a position with the Energy and Mines Department, Province of Manitoba, as a Senior Engineer. He was then appointed Director of Conservation and

presently is Director of Energy Management.

Mr. McDonald has been active in community organizations. He has been President of Richmond Kings Community Club for three years and serves on their building committees in the Fort Garry area.

Bill has two sons and a daughter. The youngest son is presently enrolled in Engineering at the University of Manitoba. He enjoys spending any spare time at his cottage at Victoria Beach.

Mr. McDonald has been a member of three provincial associations: Manitoba, Saskatchewan and B.C. He has been active on various committees in each association. In B.C., he served on the pensions committees in each association. He has been a member in Manitoba since his return to the province in 1975 and has been on the Practice and Ethics Committee for two years. He is in his third year on the Admissions Review Board.

Bill feels he has gotten a lot out of the Association and is prepared to give some time back. He is willing to apply his management skills to help solve any problems or decisions Council has to make. In his opinion, it would be difficult to comment on any outstanding issues presently facing the Association having attended only one Council meeting.

In general, Mr. McDonald feels the Association has to be more responsive to the needs of the public and of the members.

While on Council, Mr. McDonald has resigned from the Practice and Ethics Committee according to the Association's By-Laws. He will see how the work load is before deciding if he will run for re-election to Council at the next general meeting. □

1989 APEM Curling Bonspiel

by C. Kohuska, P.Eng.,
Chairman, Sports Committee

Tuesday, January 10, 1989; 6:30 a.m.; -35°C. One hundred cold, tired Engineers went out to start their cars and begin their day. 7:00 a.m. they began arriving at the Granite Curling Club. What was the occasion? The 1989 APEM Bonspiel. A nice hot cup of coffee, a doughnut or two and ready themselves for the day's events. 7:40 a.m. the teams lined up and in "traditional style" were piped on to the ice to begin the first draw.

The first draw was good, very good. The Kavanaugh Clan faced defending champs the Suzuki rink. In a close game, the win went to



Winners Again! Left to right, Jim Suzuki, Harvey Kaita, Murray Vanderpont, and Brock Sanderson.

the Suzuki rink. Off to 'B' side for the Kavanaugh's and the other top second rink of Bill Mackenzie, Bill Saunders, Larry Williams and Dick Russell.

The morning was gruelling. Suzuki realized they weren't going to walk away with any wins this year; and after initial disaster for the Mackenzie rink — they were back into the swing of things.

A hot lunch, a cool beer, and a much de-



U of M Rink, left to right, Grant Sims, Ray Hoemson, Ross Bullee, Garland Laliberte and Mascot.

served rest; then the serious stuff began. The Ennis rink — in keeping with their tradition — failed to win a game. In 3 years, the team has yet to see a victory!

Final matches were close this year. For the curlers on the ice they were knuckle-biting, for the curlers off the ice they were exciting. For the 3rd consecutive year the Suzuki rink of Brock Sanderson, Murray Vanderpont,

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Council Reports

NOVEMBER 7, 1988 by W.G. McKay, P.Eng.

At which Council expresses concern about the relevancy of the Canadian Engineering Manpower Inventory and seeks answers from CCPE on the operations of Canadian Manpower Board.

With new President Garland Laliberte presiding and previous councillors, W. McGilvery, K. Buhr, K. Kjartanson, M. Goble, J. McDougall, S.W. Saunders and the newly elected Councillor K. Kidd present, the meeting commenced at 3:30 p.m. Also attending was Registrar W.B. Mackenzie, Act Administration Officer D.A. Ennis and Secretary J. McKinley.

Following approval of the agenda and the minutes of the Council meeting of October 12th, a review of the Financial Statements was made. A discussion arose on the accounting procedure using of brackets around balance figures for income and expenses.

Licences, Engineering Transfers, Registrations and Reinstatements: All applications were approved except one where further information is requested from an applicant for licence in respect to the work experience.

Appointments: Board of Examiners — 12 members appointed. Nomination Committee — In addition to the two past presidents and three members elected at the annual general meeting, two members were appointed from Council — K. Kjartanson and W. McGilvery. The Council is aware of some inconsistencies in the terms of reference and this will be reviewed at an early date.

Liaison Councillors to Committees: In the previous term, some committees had liaison councillors whose role is to communicate to and from committees to Council. In this position they do not have a vote on matters arising at the committee meetings. The following liaison councillors were appointed: K. Kidd — Board of Examiners and University Liaison Committee; W. McGilvery — Consulting Engineers Committee and Salary Review Committee; K. Kjartanson — Professional Development Committee; G. Saunders — Legislation Committee; G. McDougall — Publication Committee; M. Goble — Research and Development Committee; W. Newton — Safety in Engineering Practice Committee.

The role of the liaison councillors on the committee was discussed at length and, in particular, should he be vested with a vote or not. Under the present terms of reference the liaison officer is not restricted from suggesting a motion which might later be considered by Council Committee.

Canadian Engineering Manpower Inventory: This inventory of engineering manpower statistics, etc. is maintained by the Canadian Engineering Manpower Board, a Board of CCPE. Mr. E. Clarke, APEM's Director to CCPE, reviewed the history of this Board and

in particular its financial cost to the CCPE membership. Very much in question is the validity of the inventory inasmuch as APEM has, on some occasions, not supplied the requested data. Enquiries re the inventory and Board operations have also not been answered by CCPE. There are publications and it was requested that copies be made available to the Council members.

Inasmuch as it is too late to place an item on the agenda of the November 8th meeting of CCPE, Council resolved that Mr. Clark would question the report of the CEMB on the matter of the relevancy and finances and that APEM would also seek a direct answer to these concerns and if necessary place an item on the agenda of the next meeting.

Canadian Engineering Qualifications Board: CCPE appoints a joint representative for Manitoba and Saskatchewan. Professor G. Wacker of the University of Saskatchewan is succeeding Professor Cahoon of the University of Manitoba. The appointee is there as an individual representative and not as a representative of either professional association. Council approved the appointment.

Joint APEM Council/Faculty of Engineering Meeting: This year a dinner meeting will be hosted by the Faculty. All Councillors are invited to attend on November 23rd. This occasion provides an opportunity for interchange between Council and Faculty on matters of mutual concern.

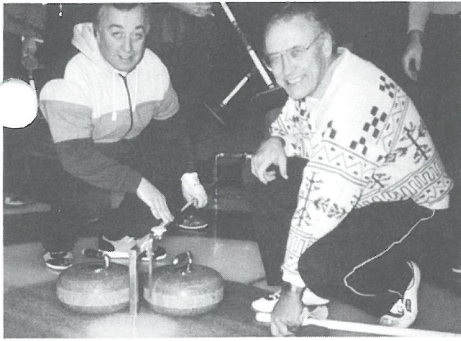
University Grants Commission: Chairman Laliberte spoke to the matter indicating that the University Liaison Committee had requested that direction be given to the University Grants Commission to allocate more funding to the Engineering Faculty. He advised that the Commission does not deal with allocations, this being a function of the Board of Governors. The President will so advise the University Liaison Committee.

Banking Resolutions: A routine item and quickly passed by Council.

Engineers' Wives Association Bursaries: The Engineers' Wives Association is seeking an APEM occasion to award their student bursaries. It had previously indicated that the APEM/Faculty Dinner might be a suitable occasion. But as this is not a meeting with a student attendance, it was suggested that the annual dinner of the Professional Engineers and students held in February 1989 would be a much more suitable occasion. The Engineers' Wives Association will be advised to contact Mr. Murdock of CSCE for more information on this function.

Report of the Ad Hoc Committee on Westman Chapter: The Ad Hoc Committee had reviewed the request of the Brandon group to formally recognize a Chapter structure and provide financial assistance. As there is no formal group at the Thompson, Pinawa, or Flin Flon locations, it was noted that there would have to be equality

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"I guess we will just have to buy each other a drink!"

Harvey Kaita and Jim Suzuki — another year was over and another Victory under their belts.

Maybe we should rename the President's Cup the Suzuki Trophy? Congratulations to the A Side winners and to all the teams they played this year — it was a hard fought win for them.

The B Side final was exciting, down to an extra end — and then to a measurement; with the winning rock only millimetres ahead! After disappointing losses for top seeded Mackenzie and Kavanaugh rinks, the two met head to head in the finals. An exciting game that could have gone either way, but in the end the experienced skip Bill Mackenzie beat out Bruce Kavanaugh, the youngest of the clan, by only millimetres.

The events were over, presentations to be made and then nice, hot relaxing baths for us all. To all the participants — thanks for coming out. To the Sports Committee — a fun-filled day; and a special thanks to the sponsors, Lafarge Canada, Delcan Western Ltd. Boge & Boge (1980) Ltd., Nelson River Construction Inc., Scouten Mitchell Sigurdson, R.W. Carson Agencies Ltd., Con-Force Structures Ltd., State Contractors Inc., Building Products, Supercrete, Westinghouse Ltd., North American Life, L.P. Williams, Inland Cement and Labatts. □

A Short Test About Ethics

Concerned about the ethical considerations of a decision you're about to make? Norman Vincent Peale and Kenneth Blanchard, authors of *The Power of Ethical Management*, suggest asking yourself these questions:

"Is it legal?" If not, don't go ahead with it.

"Is it balanced?" Do all parties affected by the decision get a fair shake? If one side comes off badly, reconsider.

"How will it make me feel about myself?" Also: How would I feel if the decision was made public? If you'd have trouble living with it, rethink the decision. □

of treatment to all such groups. The recommendation was that no formal recognition be made. Discussion indicated that assistance in kind, clerical, mailing, lending of tapes, speakers, etc. can be given. A motion that financial assistance be given was defeated. Further consideration to this matter was deferred to the December Council meeting. At this time, since there were insufficient councillors left to provide a quorum, the meeting terminated at 7:05 p.m. The writer noted a well-run meeting by Chairman Laliberte who kept a close hand on the agenda matters and proceeded briskly through the evening's proceedings. A very pleasant break for Chinese Food was enjoyed, by all. □

DECEMBER 12, 1988 by R.A. Kane, P.Eng.

At which Council appoints, anoints, accounts and adjourns.

The last Council meeting of 1988 began, as most Council meetings do, with the approval of the agenda, the minutes of the previous meeting, discussion and acceptance of the financial statements, and approval of various types of applications for Licences, Engineering Graduates, Transfers, Registrations and Re-instatements. All these items were conducted without the watchful eye of the M.P.E. reporter because he, like so many reporters of the past, was sociably late.

I confess that my tardiness was prompted by a certain understanding that, while the foregoing functions of Council are to all intents and purposes the essence of a Council meeting, it is largely a non-event in terms of reporting. Generally speaking more interesting matters follow.

I arrived in time to hear Bud Christie present a motion to have the fees for persons transferring their membership into APEM prorated. Such a member transferring in would pay ¼ of his annual fee for the quarter in which he transfers plus the remaining pro-rated fees for the remainder of the year.

Election and Appointments: Council held a democratic election for a member of the Executive Member of Council.

Next, Council pondered the rather serious problems that had arisen due to the fact that two Councillors have, for various reasons, been unable to attend Council meetings. Mr. Larry Williams has submitted a letter of resignation and Prof. Ostap Hawaleshka has advised that he would be prepared to resign because he is out of the council for most of the time. Council appointed Dick Menon of Brandon and Bill McDonald of Winnipeg to Council to replace these councillors.

Westman Chapter: Council then spent a great deal of time discussing a "West-Man Chapter". The discussion went over a lot of ground with people expressing concerns about the possibility of factionalizing versus maximizing total provincial participation in Association

affairs by out-of-town members. The issue of money came up and the West-Man idea to get a percentage of the take (so to speak) of the members of that area also was discussed. In the final analysis Council decided to authorize a maximum amount of \$200.00 to the West-Man group for start-up activities. Council will encourage the group to continue their activities. However, their basic request to be an autonomous arm of APEM was denied.

Fortunately for me, since Christmas was less than two weeks away, Council decided to lay over until next meeting discussion of a "Log of Experience" Report made by Bud Christie.

Council ratified a number of standing and Ad Hoc committees for 1989.

CCPE Credit Card Program: Despite a problem in maintaining a quorum, Council was able to address a number of further items on the agenda. The most complicated discussion revolved around a request from CCPE to have the APEM participate in a national affinity credit card program. CCPE wishes to contact all engineers across the country with information relating to the program and have asked APEM to co-operate in this matter. The affinity credit card program, if implemented, would provide revenue to CCPE in an amount of \$3.00 per application and ¼ of 1% of all purchases made by members using the cards. CCPE has informed APEM that if we provide them with our mailing list they will share the income generated on a 50/50 basis. However, Council decided that APEM would not officially participate in the program, would not accept any monies generated, but would allow CCPE and the Bank of Montreal — the sponsors of the program — to contact our membership via a regular APEM mailing.

Committee Appointments: Council considered two reports from the Practice & Ethics Committee relating to investigations which they had conducted and accepted their recommendations that the matters be considered closed.

Council re-appointed the 1988 Awards Committee in total for 1989, mostly because they had done such a good job.

Historic Site: The future of the James Avenue Pumping Station was discussed. A group headed by Mr. Bill Caroll wished to have this building made into some sort of an Engineering Historical Site. They would like APEM to participate in the process. However, Council decided only to have the President write a letter to Mr. Caroll encouraging the group in their activities and asking that APEM be kept informed of developments. No formal affiliation or participation will be made at this time.

Finally, Council appointed Dave Rogowsky and Bob Gottfred to the ad hoc committee which will investigate fatal and major accidents on engineering-related projects.

The meeting concluded at 8:00 p.m. with expressions of good wishes for the upcoming season. □

Potential of Expert Systems for Engineers

by D. Jayas, P.Eng.

Working engineers today can not afford to ignore the current developments in the area of artificial intelligence (AI), a term used to represent all activities mimicking human intelligence using computers. This does not mean that computers will replace human experts once the systems are fully developed rather they will enhance problem solving capabilities. Expert systems, which have been hyped to some extent, is one of the subgroups of the AI. Other areas include robotics, computer vision, natural language processing and voice recognition. Each of these areas deals with certain aspects of human actions. Keeping in mind that the human brain has an incredibly large processing capacity, much greater than several Cray supercomputers, and is beyond our understanding in its ability to connect, recall, make judgement and act, representation of all human actions using computers will continue to be a dream which may never come true. But certain aspects of the AI can be fruitfully utilised to increase the productivity of people.

The expert systems area tries to mimic human expertise. Human expertise may be defined as the accumulation of information and the ability to use it based upon experience and study. In other words, the expert systems provide a way to record and use the expertise.

Expert systems are special *computer software* applications that are capable of carrying

out some reasoning and analysis functions in *narrowly defined* subject areas at a proficiency level approaching that of a *human expert*. The italicized words in this definition point to the limitations of the expert systems.

Expert systems are capable of handling factual and declarative (heuristic) information while the conventional computer programs can only handle factual information. For applications dealing with a lot of number crunching and equation solving, expert systems should not be used. On the other hand for the problems dealing with rule of thumbs, gut feelings, experience in decision making, expert systems can provide significant advantages over the conventional programs. To date, expert systems developed for narrow specialty areas have proven more successful than those for general areas. This may be due to the complexities in representing the human reasoning process for very generalized problems. Another requirement, which must be met before an expert system can be constructed, is the availability of at least one human expert, who can solve the problem in a reasonable time frame. The need for a human expert for the development of expert systems endorses the point that ES can not replace human experts but can only help in improving the ways people do the job.

The question "why we need expert systems, if the human expert can do the job?" has to be answered at this point. Part of the answer to this question is given in the definition of the ES since they provide proficiency

level of an expert to solve problems. Human experts are often not available when where needed. At 3:00 a.m. in the morning or when the technical person who really knows the system is on holidays, how nice it would be to have a mimicked expert to help solve the problems. To train new personnel usually human experts are used. These human experts can perform some other creative activities if made free of training duties. An expert system can do the job as well or even better because of the consistency provided by a computer based expert. Also the computer based systems are not affected by emotions, can work any time of the day and can repeat any number of times without being irritated. Impact of the retirement and transfer of key personnel can also be minimized by developing the computer based expert systems.

The development of expert systems is made easy by the availability of the specialized computer programs known as "shells". The development shells are just like any other application program. As a word processor can be used to process many documents, an ES shell can be used to develop many expert systems. Many ES shells are available for use on micro, mini or main frame computers. PC PLUS is one such shell which is widely used at the University of Manitoba. For those who might wish to learn more about PC PLUS, an introductory course is planned for April 15, 1989. Contact Mrs. Marilyn Wawro, the Continuing Education Division, University of Manitoba (474-9922) for details. □

CCPE National Scholarships

Once again the Council is pleased to announce its sponsorship of the 1989 scholarships within its National Awards Program.

CCPE, in conjunction with NORTH AMERICAN LIFE ASSURANCE COMPANY, is pleased to continue to offer three scholarships of \$7,500 each in 1989.

In 1989, the Canadian Council of Professional Engineers, in conjunction with THE OPTIMUM Financial Services Limited, parent company of Monnex Insurance Brokers Limited and J. Meloche Inc., Insurance Brokers and ENCON insurance Managers Inc. added two new scholarships to its program.

THE OPTIMUM Scholarship program will offer one scholarship annually in the amount of \$5,000 to provide financial assistance to engineers returning to university for further study or research in a field other than engineering. However, the field of study chosen should favour the acquisition of knowledge pertinent to enhancing the performance of the candidate in the engineering profession.

The second enhancement to the CCPE National Awards Program will be the offering of an annual endowment by ENCON Insurance Managers Inc. in the amount of \$5,000. This endowment will be awarded to a professional engineer wishing to pursue

studies or research in the area of engineering failure investigation. Engineering failure analysis has recently emerged as a separate and recognized discipline in the United States, with a growing number of engineers specializing in this field.

These CCPE sponsored programs are administered by the Selection Committee of the National Awards Program of the Canadian Council of Professional Engineers and assist in encouraging excellence in Canada through the promotion of advanced studies research.

Canadian Geotechnical Society Meeting

At the CGS luncheon meeting on January 26, 1989, Scott Duncan, Ph.D. Student, Department of Civil Engineering, University of Manitoba presented an interesting talk on potash mining research currently being performed at the University of Manitoba.

Following the presentation, the membership elected its 1989 executive consisting of Don Kingerski (Chairman), Gary Giesbrecht (Program Director), Jeff Tallin (Secretary), Ralph Wittebolle (Treasurer), Ken Skaftfeld (Membership) and Jim Oswell (University liaison). Past Chairman is Ken Boyd. In addition, K.V. Lew succeeds Tom Wingrove as Regional Director.

In his 1988 Chairman's report, Ken Boyd summarized that year's activities which in-

To be eligible for the programs, candidates must:

- have been engaged in engineering practice for more than two years since graduation;
- be registered as full members of the provincial/territorial professional association/order in their province/territory of employment;
- have been accepted for post-graduate study by a recognized university.

To receive further information and an application form, please apply to: National Scholarship Program, Canadian Council of Professional Engineers, 401-116 Albert Street, Ottawa, Ontario, K1P 5G3. □

cluded six (6) technical presentations, a short course on Geosynthetics, an "Engineering of our Riverbanks" Boat Tour and the spring wind-up dinner.

He also congratulated several CGS members who were honoured in 1988. Frank Penner was awarded the Fellow of the EIC. Messrs. Jim Graham and Tom Wingrove received service awards from the national CGS while Messrs. Andy Baracos and Dick Menon were presented with Awards from APEM.

In October 1989, the Winnipeg section of CGS will sponsor the 42nd National Geotechnical Conference in Winnipeg. For information on this or any other activities of CGS please contact Don Kingerski (986-5159). □

Professional Development

Trueteel Affair — Case Study in Engineering Ethics

by P.R. Gordon, P.Eng.

Another successful Professional Development breakfast was held on Thursday, January 12, 1989 with approximately 90 engineers attending a viewing and discussion on the film the Trueteel Affair. The film was produced in 1983 by the Association of Professional Engineers of the Province of Ontario and is based on an actual case demonstrating an engineering dilemma.

The film was introduced by Dave Ennis, P.Eng. APEM Act Administration Officer, with an admission that the meeting notice was somewhat unethical by Engineering standards with the reference to the Burnaby Shopping Centre failure, but that this was justified by the attendance. Mr. Ennis reviewed Section 24 of the Engineering Act which covers the disciplinary process for negligence, misconduct and criminal activity. APEM does not have a clear definition of negligence but the APEO definition is "failure to maintain standards that a reasonable and prudent engineer would maintain". The APEO definition of misconduct is "conduct that would reasonably be regarded by the engineering profession as

disgraceful, dishonorable or unprofessional". Dave didn't dwell on the involvement of engineers in criminal activity. He summarized the intent of ethical behaviour with the following sentence. "The Engineer must apply his specialized knowledge and skill at all times with honesty, integrity and honor." Dave commented that ethics and professionalism are inextricably connected and individual actions really do count.

I will not review the film in detail as it might spoil it for those have not seen it yet. The film is thought provoking and emphasizes how difficult it is to live up to the code of ethics as humans can rationalize out of almost any situation. The film also demonstrates that because of the Code and the obligation to protect the public, the consequences of unethical conduct can be particularly harsh on the engineer. One comment overheard was that the film was "pretty close to home". I would recommend it to all engineers, potential engineers and other professionals. A VHS video version of the film which is about 20 minutes in length, is available for loan free of charge from the Association office.

Following the film Dave responded to several questions. Dave indicated that the proper procedure for an Engineer facing a similar dilemma would be to call the APEM Act Administration Officer or General Manager, describe the situation and identify oneself. The Association would advise the Engineer on a proper course of action or go to the authorities on his behalf. The Association would try to maintain the confidentiality of the source. Dave asked that the anonymous caller from a couple of months ago call him again.

The Association has established an ad hoc committee to develop a policy for dealing with accidents, failures or incidents involving an engineer. Another ad hoc committee has been established to produced recommendations regarding the engineering content and enforcement of inspections and supervision of construction of buildings.

As a final thought Dave stated that an ethics problem is seldom a matter of one decision only but often happens in a piecemeal fashion as the result of many pressures.

My congratulations to Dave Ennis and the Professional Development Committee. □

1987 Professional Development Activities

by B. MacBride, P.Eng.

One of the work areas of the Professional Development Committee is to monitor the professional development of members. This is part of the voluntary professional development program for engineers. For purposes of its work, the Committee defined Professional Development quite broadly as

"maintaining and enhancing the level of competence of engineers through continuing education in professional engineering, including training in; technical subjects, engineering professionalism, management, communication, and inter-disciplinary skills. Continuing education is viewed in the broad sense, including formal courses, seminars, conferences, technical reading, technical writing, and contributions to related associations."

The mechanism chosen to monitor Professional Development is the Professional Development Reporting Forms which members are asked to fill in annually on a voluntary basis. To date, forms have been received for the calendar years 1986 and 1987. The 1986 results were reported in the February 1988 Manitoba Professional Engineer. The purpose of this article is to present the results for 1987.

The statistical summary of results for the 1987 calendar year is shown in Table 1. Observations are presented below. The figures in brackets are the 1986 results.

1. For 1987, 155 (121) forms were received.

Approximately 6% (4.7%) of members filled out the forms. With the low number of returns, and the fact that respondents are self selected rather than random, it is impossible to generalize the results.

2. The average number of hours reported was 185 (153). Although not analyzed this year, the experience last year was that the results are highly skewed and follow a log distribution. To illustrate this, the 1986 average was 153 but the median was only 78.

3. For 1987, the prominence of the engineering area of study was even higher at 75.0% (64.2%).

The Committee would like to see more engineers reporting on their professional development activities. This will help the Association to demonstrate that the Professionals are carrying out their responsibility spelled out in the Code of Ethics to keep abreast of new techniques and developments in engineering, and to contribute to the work of engineering societies and engineering press.

TABLE 1
1987 Professional Development Reporting Forms

OVERALL		SPONSOR OF ACTIVITY	HOURS	%
Number of Forms Received	155	(1) A.P.E.M.	219	0.8
Total Number of Hours Reported	28,676	(2) University/College	11,491	40.1
Average Number of Hours Per Member	185	(3) In-House	3,809	13.3
		(4) Government	5,797	20.2
		(5) Industrial Association	1,200	4.2
		(6) Technical Society	2,909	10.1
		(6) Management Association	859	3.0
		(8) Financial Institute	157	0.5
		(9) Other	2,235	7.8
			28,676	100
		AREA OF STUDY	HOURS	%
		(1) Engineering	21,519	75.0
		(2) Management Studies	2,210	7.7
		(3) Law	302	1.1
		(4) Communication	1,972	6.9
		(5) Finance/Economics	1,215	4.2
		(6) Personnel	305	1.1
		(7) Humanities	160	0.6
		(8) Others	993	3.5
			28,676	100
GEOGRAPHICAL LOCATION				
Winnipeg	99			
Manitoba (Non-Winnipeg)	40			
Other Canadian	15			
Foreign	1			

Please take the time to fill out the form for 1988 included with this publication mailing.

News from other Associations

by D.A. Ennis, P.Eng.

In **Quebec, OIQ** plans to publish a series of guidelines to inform members of rights and duties towards society in the professional environment. Separate guidelines will be prepared for the consulting, industrial and public/para-public sectors. There will also be a fourth one of a more general nature.

The Order also reports, that in accordance with a recent modification to the Quebec Professional Code, disciplinary hearings in which professionals are involved will now be open to the public and that upon request a record of the hearings will be made available.

The **New Brunswick Association** recently held its two day annual meeting at which there was a forum on The Engineering Professional in the 21st Century and another session of informal dialogue with the Association President billed as "Tell the Prez".

The **New Brunswick** President has also announced the appointment of Huntley Wishart, P.Eng. as Executive Director of the Association replacing Sheila W. McLeod following her recent resignation.

At its annual meeting to be held in March in Regina the **Saskatchewan Association** will have a technical session on Expert Systems

for Engineers. Members of that Association have expressed concern that a recent Academic Review Task Force at the University of Regina has put forward a suggestion that engineering programs in Saskatchewan be offered only at the University of Saskatchewan in Saskatoon.

The theme for the **Alberta** annual meeting to be held in Jasper in June is "Man in Nature". One of the more recent accomplishments to do with nature of Alberta engineers has been the completion of the Rogers Pass Tunnel project on the CPR. The project which came in under budget and on time has eliminated the need for six three thousand horsepower locomotives on each west bound freight train and increased the capacity of the system by up to 40 trains per day.

On the other side of Rogers Pass the **B.C. Association** began its disciplinary hearing regarding the Burnaby Shopping Centre failure. The hearing has been adjourned until May 1989. At the same time the Association is in the midst of legal action with a member of the British Columbia Technologists Association for an alleged breach of Engineer's Act. The APEBC Council has

made a decision to review its registration requirements with respect to the free trade agreement.

The **Ontario Association** has announced the appointment of Peter G.S. Large, P.Eng. as Executive Director of the Association effective May 1st, 1989. Mr. Large has been the APEO general secretary since September of 1986.

After four years of negotiation APEO has obtained exemptions from the compulsory professional liability insurance requirements for holders of certificates of authorization which "... lets the professional be flexible and make decisions based on the market place".

Two APEO members were elected to Parliament in the recent Federal Election. They are no doubt untypical of the portrait of an engineer obtained from a recent APEO membership survey. The survey which is conducted every ten years indicates that the employment status of the average APEO member is that she/he is an employee in a company with over 1000 employees working in the industrial sector, has more than 11 years of seniority and pays her/his own professional fees. □

Coming Events

Meetings

Canadian Society for Civil Engineering — Topic: How to Manage Durable Concrete. Speaker: Mr. P. Smith, President CSCE. Date: March 9, 1989, Noon. Location: Squash Club.

* * *

Topic: Hazardous Waste Management. Speaker: S. Hrudey and others. Date: March 22, 1989, 8:30 a.m. - 4:00 p.m. Location: Fort Garry Hotel.

* * *

West-Man Engineers — Dinner Meeting — Topic: Service for Future. Date: March 9, 1989. Speaker: R. Bird, P.Eng., President of MTS. Contact: D. Menon, 726-6092.

* * *

International Conference on Environmentally Sustainable Economic Development — Date: May 17-18, 1989. Location: Winnipeg. Contact: F. Cosway, Manitoba Industry & Trade, 948-8747.

* * *

Thriving in Management Seminar — Location: Lake Louise. Contact: B. Hart, U of S, (306) 966-5578.

For further information on the above and other functions, also contact by computer access the APEM Electronic Bulletin Board. Contact: J. Hildebrant, Professional Development Committee — Wardrop, 956-0980.

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Call for Papers — Canadian Institute of

Mining and Metallurgy Conference. Location: Calgary, October 1989. Contact: R. Nicolls, (403) 237-3389 (Calgary).

* * *

Conference — Creep Behaviour of Frozen Soil & Ice. Location: Winnipeg, October 1989. Contact: L. Domaschuk, Civil Engineering, U of M. □

Taguchi Method of Quality Engineering

by Madhav Sinha, P.Eng.

The Manitoba Section of the American Society for Quality Control (ASQC) is holding a full day executive awareness seminar on Taguchi Methods of Quality Engineering given by "the" expert, Shin Taguchi. The Taguchi Method for Quality Engineering, that allow engineers to design uniform, robust products and processes at lowest cost, has revolutionized the way quality is supposed to be built into the products and processes to attain the World Class Manufacturing status.

Don't miss this rare opportunity afforded and in Winnipeg for the first time. To be held at University of Manitoba, Engineering Building, Senate Chamber Hall, Wednesday, may 31, 1989. Fee: \$240, (for non-members), \$225 (for ASQC members). Send your cheque or money order to: ASQC (Manitoba Section), C/O 71 Lafayette Bay, Winnipeg, MB R3T 3J9; or phone Madhav Sinha, at 945-3380 for more information. □

Thesis Days

by D. Jayas, P.Eng.,
Faculty of Engineering

The annual undergraduate thesis presentations are scheduled during the months of March and April 1989 for all departments and programs in the Faculty of Engineering. All APEM members are cordially invited to attend the presentations and/or read theses. For further information please contact the departmental coordinators.

The dates for the 1989 University of Manitoba Thesis Days, and the names of the departmental coordinators, are: Agricultural Engineering, Thursday, March 23, Dr. N.R. Bulley (474-9868); Civil Engineering, Thursday, March 16 Dr. R.B. Pinkney (474-9816); Computer/Electrical Engineering, Friday, March 17, Dr. Al Jakobschuk (474-9603); Industrial/Mechanical Engineer, Friday, March 10, Dr. D. Card (474-6408); and Geological Engineering, Monday, April 3, Dr. B. Stimpson (474-8270). □

Notice

APEM now has a FAX.

The number is 942-3718.

Committee members are asked to advise the office by FAX of their FAX numbers.

Please co-operate.