THE MANITOBA
Professional Engineer
OF THE PROVINCE OF MANITOBA
January/February 1986

Drawing Review Found Critical in Hyatt Collapse

The 1981 collapse of a walkway at a Hyatt Regency hotel in Kansas City occurred because the structural engineers shirked their responsiblity to review shop drawings of the critical steel-to-steel connectors that failed, a Missouri judge has ruled. The decision was released in November, 14 months after the conclusion of a 26-day hearing into allegations of gross negligence and misconduct stemming from the walkway failure which took 114 lives. The ruling is expected to have major implications for design engineers in many disciplines.

The two engineers involved, Jack D. Gillum and Daniel M. Duncan, responded with a written statement to the judge's findings. They noted that the "decision appears to be telling design and construction professionals . . . that the structural engineer is responsible for each and every item of design, fabrication and construction even though the structural engineer does not design all items nor is he on the job site with authority to control the quality of construction."

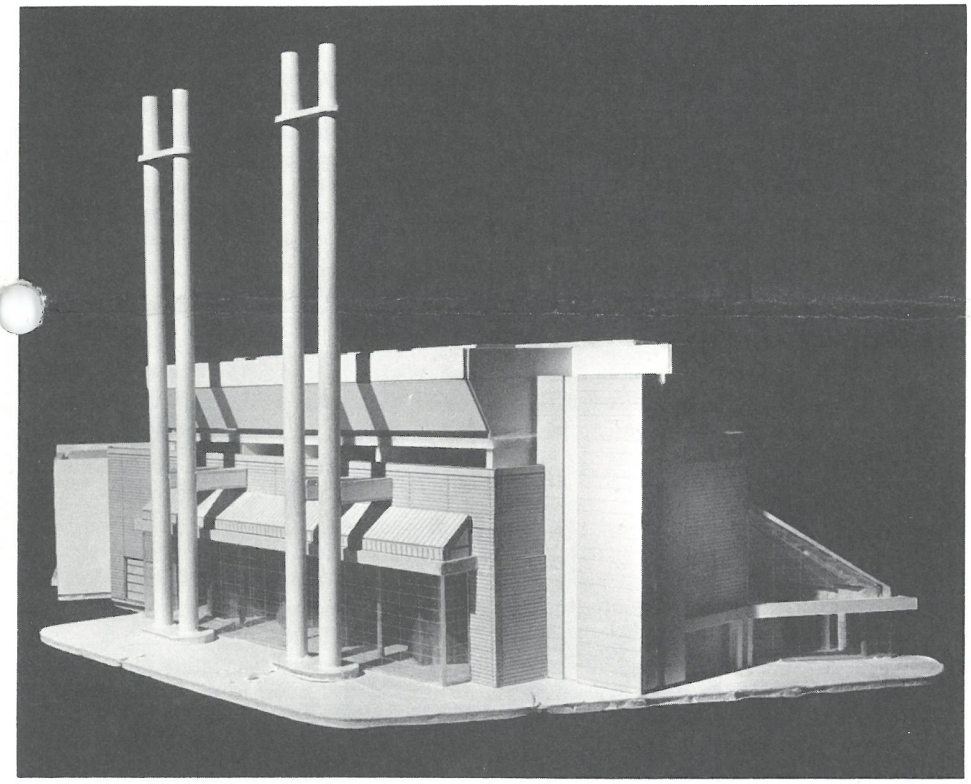
The 1981 walkway tragedy was preceded by the 1979 collapse of part of the atrium roof when the hotel was still being built. As a result of that incident, the engineers were requested to do a thorough design review of the complete atrium lobby structure including the walkways.

Testimony at the 1984 hearing revealed, however, that the shop drawings for the walkways were only "spotchecked" and that the crucial final connection details were not revised by an engineer. Instead they were checked by a technician who admitted not knowing how to do the calculations required. The judge remarked that Gillum's "later conduct in misrepresenting that he had in fact done such a complete design review when he had not was worse than unacceptable and constituted fraud upon the owner and architect."

The National Bureau of Standards investigation of the walkway collapse found that a connection design change which replaced continuous support rods with pairs of offset rods was the primary cause of the failure. Gillum and Duncan claimed that the engineers working for the fabricator, because they did the final detail work on these connections, should have been held responsible.

The fabricator's engineers, while admitting that they had executed the connection design, insisted that their work was subject to final review and approval by Gillum and Duncan. The judge agreed, stating that any attempt by the structural engineers to shift the responsibility to the fabricator "smacks of cost-benefit analysis run amok and is improperly inserted out of place in a system requiring professional judgement and integrity. It im-

(continued on page 2)



St. Boniface Hospital Energy Centre. *Photo courtesy of Smith Carter Partners*

Hospital Energy Centre to Open Fall 1986

The above photo shows a model of the New Energy Centre for St. Boniface General Hospital, presently under construction. The plant will provide high pressure steam to a total capacity of 126,000 lbs. per hour, chilled water cooling to a total capacity of 3,000 tons and domestic hot water.

A new tunnel distribution system is being provided with steam and chilled water piping to all points of use in the hospital complex.

The plant will have four water-tube delta-type high pressure boilers: two 40,000 lbs. per hour; one 30,000 lbs. per hour and one 16,000 lbs. per hour. Boilers will have combination gas/oil burners. Primary operation will utilize interruptable gas with oil for standby operation. The plant has a water treatment system which includes a duplex layered cation exchange system, decarbonating tower, acid storage tank, automatic ph correction equipment and a 3,000 gallon treated water storage tank.

The plant will have three 1,000 ton capacity centrifugal chillers. The main chilled water circulation loop can circulate up to 10,000 US gpm with its two 300 hp pumps. The plant's six cooling towers are on the roof.

Electrical power is provided to mechanical loads via two 4,160 Volt unit substations con-

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A New Year and a New Look

With this issue, the A.P.E.M. Bulletin ushers in a New Year and a new look.

Most of us on the Bulletin Committee feel that the revised layout represents an improvement over the previous format in a number of areas. But it is you the readers who will decide whether we have succeeded in delivering fresh perspectives in a contemporary package, or whether we have simply indulged in some cosmetic surgery with little improvement to the substance or appeal of our offering.

The primary reasons for the format changes are to make the Bulletin more flexible, attractive and easier to read. The larger page, with 2, 3 or 4 columns being available to match the requirements of particular items, will provide more versatility in layout.

The format is also intended to make it more inviting for readers to glance through the Bulletin to ascertain its contents.

However, these alterations are intended to go beyond the cosmetic and reflect a change in editorial emphasis for the Association's newsletter. The present committee feels that the Bulletin, while maintaining its coverage of Council meetings and Association social events should take a more global outlook on the profession. Reports on developments in other provinces and countries will receive more attention to assist our membership in keeping abreast of events and trends affecting our professional colleagues in other jurisdictions. Additionally, more thought-provoking opinion pieces will be included, many, we hope, written by our own members.

The revised format will allow longer articles such as the recent Bulletin item on professional liability to be presented more attractively. This can be accomplished by including photographs or illustrations, or by highlighting excerpts from the text.

As well, the Bulletin's masthead has been revised to put more stress on the "Professional Engineer" rather than the "Bulletin". Hopefully, this will also clear some of the confusion as to whether the title of our publication is the "Bulletin" (as prominently displayed on the cover of past issues) or "The Manitoba Professional Engineer" (as has been noted on the top of each page in previous issues). □

THE MANITOBA
Professional Engineer

February 1986

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Opinions expressed are not necessarily those held by the A.P.E.M. or the Council of the A.P.E.M.

Notice — Annual Fees

Fee invoices have been mailed to all members. Fees received in the office **after** February 28th incur a late payment administration fee of $35. If fees are not received **before** July 1st, the member ceases to be a professional engineer. Since the reinstatement process is long and costly, members are urged to use common sense and pay their fees on time.

W. B. Mackenzie, P. Eng.
Registrar □

Recently a local citizen, Mr. Joe Mepa, was parked near the Portage and Hargrave intersection when he noticed a group of workmen standing near their truck — apparently waiting for their foreman to show up. Putting on a hard hat (white), Mr. Mepa went up to the group and said "Okay boys, follow me." Without comment the men followed Mr. Mepa to the centre of the intersection. He marked off an area and told the crew to start digging. Barriers were erected. The police cooperated by diverting traffic. Mr. Mepa said he would come back later to check.

That was October 3rd. Local officials are unable to advise when the work will be finished. *(Inner City Times Nov. 12/85)*

Hyatt Walkway Collapse

(continued from page 1)

putes to the licensed professional the same financial and economic motives as are held by the construction team. This attempt (by the engineers) to join the construction team leaves the owner and the public unprotected from a hazardous activity for no greater purpose than their own convenience and financial benefit."

The Missouri Board of Architects, Professional Engineers and Land Surveyors, which brought the original charges was expected to hold a disciplinary hearing at year end to determine whether further action is to be taken against the two structural engineers. □

Hospital Energy Centre

(continued from page 1)

nected to the existing hospital distribution system via a 4,160 Volt loop feeder. Chillers are fed at 4,160 Volts and all other loads are fed at 600 Volts from one of four major Motor Control Centres.

Emergency electrical power is provided to all essential loads from an upgraded emergency power system consisting of three 1,000 kva diesel emergency generators, sychronizing equipment and a programmable control system which controls the distribution of emergency power to essential loads. The system includes the ability to parallel to the Hydro system for "bumpless" load testing and future peak demand reduction.

Special energy saving features include:

- Economizers on the three larger boilers to maximize fuel to steam efficiency.
- Oxygen-trim control systems on each boiler to maintain optimum fuel-air mixture for maximum combustion efficiency.
- An electric boiler which will operate on low-cost off-peak power.
- A variable speed circulation pump for the main chilled water loop. Pump speed will be controlled via a variable frequency drive system with speed adjusted using a programmable logic controller which senses differential pressure between supply and return.
- Heat-recovery bundles on one chiller with preheat domestic hot water using waste heat from the chiller condensers.
- One chiller will have a free-cooling capability.

The plant incorporates computer based control systems including:

- Computerized boiler controls (boiler masters, plant master).
- Direct digital control system for plant and tunnel environment controls, cooling tower fans, pumps and other auxilliary equipment. The system will have a central monitoring terminal and printer.

The design for this project was produced in Winnipeg by Smith Carter Partners Ltd. □

Local Museum Display, International Convention Will Highlight Engineering Centennial Celebrations

R.R. Foster, P. Eng.
Chairman, Manitoba
Engineering Centennial Committee

The Centennial of engineering as an organized profession in Canada will be celebrated in 1987. Although engineers have practised their profession for a long time in this country, actual organization came about only in 1887, with the founding of the Canadian Society of Civil Engineering. In 1919, the society changed its name to the Engineering Institute of Canada. Since then, various associations have emerged to meet the needs of engineers.

The Engineering Centennial Board Inc. is the prime organizing body for all centennial activities and was federally incorporated in August of 1984. The Board includes representatives from the Canadian Council of Professional Engineers, the Association of Consulting Engineers of Canada and the Engineering Institute of Canada.

Centennial highlights will include:

- A major engineering convention to be held in Montreal from May 18 to 22, 1987. World-renowned experts in various fields of engineering are expected to attend; specialists from the top firms will be there to comment on their work and lead workshops; an extremely interesting technical program will be presented.
  It is anticipated that about 5,000 people from across Canada and around the world will attend the convention, the theme of which is "MIND, HEART AND VISION — CANADIAN ENGINEERING: THE NEXT HUNDRED YEARS."
- An exhibition of new technologies will be displayed in conjunction with the national convention. This technical exhibition, which will take place in Montreal from May to September, 1987, will be of national importance and will act as a showcase for the technologies of the future.
- A world class exposition of Leonardo da Vinci's work will be held, including original sketches and paintings never before assembled. This exhibition, a world premiere, will have as its theme, "LEONARDO DA VINCI, THE FIRST ENGINEER" and show Leonardo da Vinci's involvement in the areas of physics, anatomy, mechanics, water currents, canals and architecture, through a collection of documents and drawings.
- An engineering concert will be performed by the Montreal Symphony Orchestra at PLACE DES ARTS under the direction of conductor Charles Dutoit.
- Canada Post will issue a stamp depicting 100 years of engineering evolution in Canada.
- A commemorative medal will be cast by the Canadian Mint.
- A book describing 100 years of Canadian Engineering accomplishments is being written. This work, whose subject matter speaks for itself, is aimed at arousing enthusiasm and pride among both engineers and the general public.
- The Engineering Centennial Board has set up a committee to identify the ten most exceptional achievements in Canadian engineering over the past hundred years. The Board will ensure that these achievements are permanently recognized in an appropriate manner.
- A travelling engineering exhibit is scheduled to cross the country during 1987.

"A world class exposition of Leonardo da Vinci's work will be held, including original sketches and paintings never before assembled."

MANITOBA'S PARTICIPATION

In addition to these activities which are national in scope, activities are being planned at the provincial level. Manitoba's engineering centennial project will be a prominent engineering exhibit at the Manitoba Museum of Man and Nature.

This permanent Museum exhibit will focus on the engineering aspects of the development of Northern Manitoba including hydroelectric development, mining and the Port of Churchill. The major theme which will link these elements will be the construction of the Hudson Bay Railway. This engineering project is of particular significance in 1987, since it was in 1887 that the Winnipeg and Hudson Bay Railway Company was formed.

One of the greatest challenges that faced Canada's early railroad builders was the construction of the Hudson Bay Railway. While considerable attention has been paid to the political machinations that influenced the development of this rail link between Winnipeg and Churchill between the 1870's, when agitation for the line first began, and 1929, when it was completed, it has only been in recent years that historians have begun to contemplate the astonishing feat of engineering and human labour that made the Hudson Bay Railway possible.

The proposed exhibit is intended to examine the development of the Hudson Bay Railway from the perspective of the surveyors, engineers and workmen who constructed it. It will examine their daily work with their tools and instruments, and their daily lives. It will consider the technological feats of spanning rivers and rapids as well as the utilization of donkey-powered slip-scrappers and shovels in grading railbeds. The exhibit will also examine economic developments that came in the wake of railway building including mining and hydroelectricity. Finally, it will consider the development of the Port of Churchill, with its grain handling facilities.

It is anticipated that at least two miniature dioramas will be constructed to aid in the interpretation of this theme, one of an early rail construction and bridge site and the other probably of a hydro-generating station or possibly the Churchill harbour facility. Artifacts demonstrating the work and lifestyle of those involved in the engineering design and construction of such projects will be used wherever possible, along with archival photos and graphic panels. A further option under consideration is the preparation of an audio/visual presentation to interpret the historical material and to bring the story line up to the present day and into the future, consistent with the centennial theme: "Engineering — The Next 100 Years."

"it has only been in recent years that historians have begun to contemplate the astonishing feat of engineering and human labour that made the Hudson Bay Railway possible."

The budget for the Manitoba Engineering Centennial project is $140,000, including a $30,000 grant from the Engineering Centennial Board, a $10,000 grant from the A.P.E.M. and $30,000 from Museum funds. The balance of the funding will be raised by means of Corporate and individual support, with a dollar for dollar matching grant being provided by the Government of Manitoba. About one-half of the required financial support is now in place and other provincial donors will be approached in the near future.

This first-class engineering exhibit will not only interpret some major features of the early economic and social development of the Province, but also will clearly demonstrate the impact and significance of engineering in Manitoba's development, both past and future. □

O.P.E.E.P.M. Settles

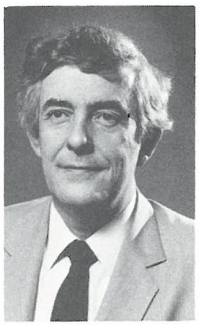
On December 4, 1985 the Organization of Professional Engineers Employed by the Province of Manitoba members conducted a ratification vote. Fifty-two percent of the members voted to accept the agreement. This established a finalized settlement between the Government of Manitoba and O.P.E.E.P.M. after 2¾ years. □

Performance of Engineering Work by

Every time engineering work is done illegally in Manitoba without being challenged and dealt with, the credibility of each registered engineer and of this Association is put at risk, and the interests and safety of the Manitoba public are affected adversely.

President's Message

E.W.J. Clarke, P.Eng.



The Association of Professional Engineers of the Province of Manitoba, as every reader of this Bulletin should know, is the self-governing body which is charged by the provincial government with the responsibility of regulating the practice of professional engineering in Manitoba under the Engineering Profession Act.

Those who practise engineering in this province are required by law to be registered with the Association and to adhere to its Code of Ethics.

The A.P.E.M. plays an important part in the process of enforcement of the Act, in that it disciplines those of its members found to have failed to adhere to a professional standard of practice. The Association is fully responsible in this sense for enforcement of the Engineering Profession Act.

This disciplinary process works well and it works fairly, contrary to the assertion sometimes put forward that the Association and its Practice and Ethics Committee protect members from the consequences of their errors.

Although involvement by engineers is no guarantee of perfection — a point of which those who have participated in the 'Kipling' ritual are acutely aware — it can nevertheless be said emphatically that the works of engineers have served the Manitoba public extremely well. Engineers in Manitoba have carried out their responsibility to protect the safety and well-being of the public in an exemplary manner. Discipline is, of course, not

". . . . enforcement of the Engineering Profession Act is complicated by the immense diversity of the engineering profession."

the only reason, or even the major reason, that this has been so. Were we entirely dependent upon discipline for the quality of engineered works, those works would be mediocre.

More important by far are the members' awareness of and voluntary commitment to the objectives of the Act, the Association's By-laws, and the Professional Engineers' Code of Ethics. I believe that most members of the Association are members not only because membership is obligatory if they wish to practise engineering, but also because they wish to belong, and are proud to be members.

Implicit in the character and methods of every truly professional engineer is a commitment to diligence and excellence. As a result, the need for act enforcement among professional engineers has been relatively infrequent.

There is another important requirement of the Engineering Profession Act which is being less adequately enforced. I refer to the legal requirement that professional engineering work not be done by anyone who is not a registered member of the Association or a licensee. In order that the safety and well-being of the public be adequately protected, it is important not only that those qualified to practise be registered, but also that those not so qualified be prevented from registering or from practising. This requirement must be addressed vigorously by the A.P.E.M. and by the Attorney General's Department of the provincial government.

This aspect of enforcement of the Engineering Profession Act is complicated by the immense diversity of the engineering profession. It is quite easy to list twenty or more distinctly different specialized disciplines within the engineering profession. Thus, it is by no means always clear cut whether the works of others in the engineering-related fields should indeed be considered as engineering work. Definition of what is and is not engineering work has always been complex, and is becoming increasingly difficult as technology advances and as new technologies are developed and applied.

Another complication is that efforts by the Association to prevent practice by those not qualified may be perceived as self-serving — an attempt to put more money into the pockets of engineers by insisting that engineers must be engaged to design projects and supervise their implementation.

This cynical viewpoint must not be allowed to be a constraint on enforcement. Few would argue, for example, that the construction of bridges should be allowed to proceed without careful and competent design and analysis of their capacity, and without competent supervision of their construction by qualified engineers in order to ensure that those bridges will bear the loads which will cross them and that they will withstand other forces and factors tending to cause their deterioration.

However, even when it is clear that engineering work is being done by non-engineers, a further constraint on enforcement stands out. Who, under the Engineering Profession Act, and in practical terms, is responsible for this second aspect of its enforcement?

Clearly, the Association is at least partly responsible. And, I should add, it would be impractical to carry out such enforcement without any involvement by professional engineers.

But should the Association, and indeed **can** it, on its own and with its present resources, be expected to accomplish this aspect of enforcement completely and successfully? The procedures required are very different than those applicable to peer discipline. The necessary resources are much greater.

In the case of certain blatant violations of the Act, the Association has had some limited success in addressing the problem through correspondence with and persuasion of violators.

However, it is disturbing to note that in its most recent such efforts, the Association has had little if any cooperation from the provincial Attorney General's office and from the provincial government itself in attempting to solve the problem.

". . . the Association has had little if any co-operation from the provincial Attorney General's Office and from the provincial government itself."

The Attorney General's Department expects this Association to carry out the necessary investigations and to provide comprehensive and credible evidence of the violation before the laying of a charge can be considered.

At the present time, complete investigations of this sort are beyond our financial means, our staff resources, and our volunteer capacity.

As for the government, it would obviously agree in principle that its own legislation (i.e. the Engineering Profession Act) should be enforced. However, in response to this Association's request, the Department of Municipal Affairs during 1985 declined to insert a simple announcement (summary information about the Act) in a government publication regularly distributed to potential inadvertent violators of the Act. Thus, when approached by this Association for a modest degree of assistance, the government seems to be neither persuaded nor convinced that enforcement is indeed an axiomatic requirement.

The Association's members clearly are, and should be, responsible individually and

Non-Engineers Must be Challenged

collectively for the quality of work that they and their peers perform. It may not be reasonable to expect that they should be obliged as well to fund and to conduct all Act enforcement directed at those outside the profession.

This matter is now under study by an ad hoc committee of the Association. A report on its findings can be expected in the near future, and may lead to proposals for the Association to augment its resources in order to play a more active role in this area.

In the meantime, no conscientious engineer can be comfortable with the thought that a degree of responsibility to which he is required to adhere rigorously for the safety of the public is being disregarded by others, and without consequences to those others.

Thus, individually, each member should alert the Association to instances in which engineering works are done by non-engineers. While the Association is not yet in a position to deal effectively with all alleged violations that are reported, it can and will, through the persistent and persuasive presentation of examples, enlist those who should be its willing partners in resolution of the problem.

More and better information is essential if this Association is to address the serious problem of unqualified practitioners, and if we are to convince those who share the responsibility for Act enforcement to fulfill their part of that role. □

Bernard Lamarre Awarded Canadian Engineers' Gold Medal

"The Canadian Engineers' Gold Medal Award was established in 1972 by the Canadian Council of Professional Engineers. This national award by the profession bestows distinction on outstanding Canadian professional engineers and recognizes their exceptional achievements.

On Wednesday, November 6, 1985, at the Chateau Laurier in Ottawa, the fourteenth Canadian Engineers' Gold Medal Award was presented to Bernard Lamarre, P. Eng., President of Lavalin Inc. of Montreal.

Born in 1931 in Chicoutimi, Bernard Lamarre graduated from l'Ecole Polytechnique de Montreal in 1952 with the degree of B.A.Sc. in civil engineering and in 1955 received his M.Sc. from the University of London. He has participated in a wide variety of projects and has gained a thorough knowledge of engineering and construction.

Much of the success of Lavalin, one of the five largest engineering firms in the world, is due to Mr. Lamarre, who became president of the company in 1964. Mr. Lamarre has created many opportunities for Canadian engineers to play a leading role in innovative and challenging projects in Canada and throughout the world, and his firm has completed projects in 56 countries.

Bernard Lamarre has received many honours in recognition of his contribution to the engineering profession and his services to the nation. This year, he was invested as an Officer of the Order of Canada and as an Officer of the Ordre National du Quebec.

He has helped to further public understanding of the role of Canadian engineers, and is currently chairman of the Engineering Centennial Board.

Mr. Lamarre is a member of the Ordre des Ingenieurs du Quebec, a Fellow of the Engineering Institute of Canada and of the Canadian Society for Civil Engineering, and an Honourary Fellow of the Royal Architectural Society of Canada. He serves on numerous boards and is involved in many professional organizations, including the Association of Consulting Engineers of Canada, the Engineering Institute of Canada, and the American Society of Civil Engineers." □



Bernard Lamarre

In Memoriam

B. V. Pada, P. Eng.
(Copper Cliff, Ontario)
Bryan K. Johnston, P. Eng.
(Winnipeg, Manitoba)
J. W. Davies, P. Eng.
(Calgary, Alberta)

Manitoba Building Envelope Council Holds Inaugural Meeting

On December 10, 1985, the Manitoba Building Envelope Council held an informal, inaugural meeting.

Some 60 individuals attended, giving the organizers of the event a clear signal that there is overwhelming support and need for such an organization. Particularly encouraging was the cross-section of the audience, representing the design professions of architecture and engineering, owners, contractors, sub-contractors, suppliers, inspectors and educators.

The aims of MBEC will be:

—to promote the pursuit of excellence in building envelope design and construction;

—to serve as a "linker" between research, design and construction technology and practice;

—to encourage appropriate research in design and construction practices;

—to develop a feedback network;

—to disseminate information to other organizations;

—to develop new standards based on experience;

—to serve as a forum for frank, non-adversarial discussion relating to general and specific problems of common interest; and

—to develop standards for maintainability.

The aims of the organization will be achieved through a variety of means, including: regular meetings, seminars, a published newsletter, publication of detailed critiques of generic problems, special projects, such as special surveys, occasionally funded by government agencies, and discussion of case studies.

For further information contact Mrs. Madelene Hardy at (204) 956-0980. □

Latest Elections Bring Three New



Ken Buhr

By Bob Brown, P. Eng.

Mr. Ken Buhr, one of our newly elected members to Council, has brought with him an impressive portfolio of committee experience.

Born in Altona and raised in Winnipeg, Ken has spent the majority of his life in Manitoba. He graduated from the University of Manitoba with a Geotechnical Master of Science Degree in 1974.

Ken's engineering career began with the Provincial Water Resources Branch in 1967. When the department was restructured in 1979, he became Chief Engineer of the Manitoba Water Services Board. Ken moved into private industry in 1981 with A. J. Poetker & Associates Ltd. who provide expertise in land development, drainage, soils, water and sewage. His reputation in the rural community has flourished while at A. J. Poetker & Associates Ltd.

Ken's experience in volunteer work is extensive. Some activites include work with the Manitoba Council of the EIC as Secretary-Treasurer, the Prairie Region of the EIC as Secretary, the Canadian Geotechnical Society, and with his church as a youth leader.

His involvement with the Association did not begin with his election to Council, but began in 1982 when he joined the newly formed Professional Development Committee.

Ken has a concern about the public's image of the professional engineer. As the public becomes more knowledgeable and questions the competency of the various professions, whether they be doctors, lawyers or engineers, he feels it is vital that the engineering profession be a forerunner in demonstrating professional conduct. It is important that the public knows that engineers are concerned about public safety, and how their work affects society as a whole.

Through the promotion of the profession, Ken believes the public will become aware of the benefits derived from retaining the services of engineers.

Ken and his wife Lou-Anne have two children, a daughter Kristin 12, and a son Kevin 14. His family is proud of their husband and father and offer their full support.

The Association is pleased to welcome Ken to the A.P.E.M. Council. The oustanding work that he has done in the past will definitely be reflected in his new commitment. □

Ostap Hawaleshka

By D. E. Cross, P. Eng.

Ostap Hawaleshka is a welcome addition to this years A.P.E.M. Council. Ostap was born in Bucharest, Rumania and is now a Canadian citizen. He is married to Tetyana, a Manitoba Home Economics Graduate, who teaches Home Economics and Ukrainian at Sisler High School. Ostap is the proud father of a daughter, Natalka (18) who is in first year Science at the University of Manitoba and a son, Adrian (16), a student at St. Paul's High School.

Ostap is the Associate Head of Mechanical Engineering at the University of Manitoba and is responsible for the introduction and operation of the Industrial Engineering Program. This program has been extremely well received by Manitoba Industry. Ostap has worked very hard with our local industries both large and small to show them what modern Industrial Engineering methods can mean to their business operation. He has successfully placed many students



Ostap Hawaleshka

Council Reports

November 12, 1985

By K. L. J. Webb, P. Eng.

On November 12, 1985, President Ted Clarke and ten Council members gathered for one of the shortest Council meetings in recent memory. (It was even shorter for your faithful but tardy bulletin reporter).

Following approval of the minutes of the October 7th and 18th council meetings 11 licences were granted, three engineering graduates were enrolled, and two transfers and one registration were accepted.

The approval of accounts generated some debate, not for their content, however, but for their format. Like most things numerical they have been computerized, allowing for a plethora of financial data to be tabulated, analyzed, totalized, cross referenced and acronymed in almost every combination known to man and PC. After some discussion it was decided that Council members would be given complete printouts at the next meeting so that a decision could be made as to which data should be suppressed and which would be presented on a regular basis. The accounts, as presented, were approved.

The next items on the agenda were the appointment of A.P.E.M. representatives to the University of Manitoba Engineering Faculty Council and the Liaison Councillors to the Board of Examiners and six of the sub-committees. Ted Speers was nominated to represent the Association on the Faculty Council and a second individual was to be recommended by the University Liaison Committee.

The Liaison Councillors, who sit on various committees and provide regular communication between the committees and council, were then appointed for 1985-86. The need for and role of the salary schedule committee were debated and it was decided to invite the committee chairman to a future council meeting to discuss its terms of reference.

With the first 12 items of the agenda efficiently dealt with in the first hour, Council then moved on to the final piece of new business. A request from the Mechanical Engineering Department of the Faculty of Engineering to sponsor a student award had been reviewed by the Awards Committee. The committee had recommended $10,000 be set aside to generate income to sponsor four awards, one for each department.

Members of Council generally agreed that the awards were a worthwhile endeavour which would enhance the association's image and improve the students' perception and understanding of A.P.E.M. However, much discussion was raised on the value,

Faces to A.P.E.M. Council

during their summer months and for some, these positions have become permanent upon graduation.

Ostap completed his primary education in Munich, Germany and Lyon, France. He began his secondary education in Lyon, and then emigrated to Canada where he completed his high school training at Rosemount High in Montreal. He graduated in Mechanical Engineering from McGill and obtained his Masters Degree from McGill in 1965.

Ostap has always shown a keen interest in the education field. He started as a Research Assistant at McGill, moved to the University of British Columbia to teach, then back to McGill and arrived at the University of Manitoba in 1970. Ostap has placed a great deal of importance on being able to relate the academic life to industry. During his early days at McGill he sold Collins' Encyclopedias. Now he combines his teaching with being Vice-President of an Automotive AfterMarket Products Company and provides consulting services to the Garment Industry, Forest Products Industry, Machinery Industry and Asian Development Bank.

Ostap has numerous publications in the Industrial Engineering field and has been instrumental in obtaining many research grants.

With all these accomplishments would you believe that Ostap also finds time to play piano, guitar and sing? He has made three commercially available records of Ukrainian popular songs.

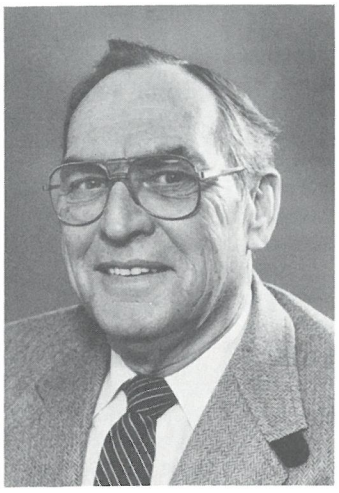
As this brief account shows, Ostap is a busy man who brings a combined wealth of both academic and business experience to the Association Council. □

Bill Newton

By K. J. Hearson, P. Eng.

Born in Duluth, Minnesota, Bill Newton moved at an early age to Stony Mountain, Manitoba, where he obtained his early education.

After spending four years of military service in the European theatre, Bill enrolled in the Faculty of Engineering at the University of Manitoba, as engineering had always appealed to him. Graduating in 1952 with a degree in Civil Engineering, Bill joined the Reclamation Branch of the Province of Manitoba as a survey party crew member. This was to be the first step in a distinguished career with the Province; when Bill retired in March of last year, he held the concurrent positions of Director of Engineering for the Department of Mines and Natural Resources, as well as Manager of the Conservation Districts Authority and Coordinator of Flood-Fighting Activities.



Bill Newton

Bill is presently Chairman of the Rivers and Streams Authority, as well as the related Harbour Commission and the River Control Board. He has just completed a comprehensive report on the jurisdictions involved with the Red and Assiniboine Rivers and adjacent lands. It is obvious that Bill remains very involved in his profession.

Bill has participated in our Association in many capacities in the past. He is a former Councillor and past member of the Bulletin, Nominating, University Liaison, Public Relations and Practice and Ethics Committees. He is presently chairman of the Ad Hoc Committee on the Ethical Use of the Engineering Seal and Liaison Councillor on the Safety In Engineering Practice Committee. In recognition of this commitment, Bill was awarded the A.P.E.M. Outstanding Service Award in 1979.

Bill makes the time to serve on the Executive of the Manitoba Provincial Rifles Association. An avid full bore and small bore competitive shooter, Bill also hunts, and enjoys "bagging his limit" of gamebirds in the fall. He relishes the chance to show Association member Bob Stokes how to get his limit as well.

Bill and his wife Mae have a daughter Lee, and 3 sons; Boyd, Blaine and Brent. Blaine has followed in his father's footsteps; he is an engineer with Reid Crowther and Partners in Edmonton.

With the amount of valued participation Bill has lent our Association in the past, we certainly look forward to his positive input in the future. □

criteria, and delivery of the awards. It was finally decided that a small committee of A.P.E.M. councillors would invite the Dean of Engineering to discuss the matter, after which they would report back to Council with their recommendations.

With business finished by 17:30 and no food in sight ad hoc discussions were held regarding the schedule for Council meetings for the next year. After selecting the second Monday of each month as the date for Council meetings, the meeting was adjourned. □

December 9, 1985

By Don Spangelo, P. Eng.

With President Ted Clarke presiding, the meeting was called to order at 3:40 p.m. With the exception of O. Hawaleshka, all Council members were present. Bill Mackenzie and Joan McKinley were also present.

The meeting agenda, minutes of the previous Council meeting, seven licences, seven engineering graduates, two transfers, and one registration were quickly approved. Council then considered the many financial statements provided to the Association. They decided that the balance sheet, the transaction register and statement of income and expenses should be distributed to Council at each Council meeting. They then approved the monthly statements. In order to facilitate a better banking service, Council approved a change in Association Banks from the Royal Bank of Canada to the Canadian Imperial Bank of Commerce.

The next item to be considered was a recommendation by the Awards Committee. The Association presently sponsors a first and second year scholarship of $200.00 each plus a prize for report writing at the University of Manitoba. The committee has recommended a scholarship fund for students entering fourth year. The awards could be made at our Annual Meeting which would increase exposure. A proposed fund of $10,000 would allow $1,000 per year to be available to five departments; 1) civil, 2) mechanical, 3) electrical, 4) computer and industrial, 5) agricultural and geological. The recommendations were approved but more information relating to the criteria for the award, the method of funding, the mechanism and the body to determine the winners is required. The Ad Hod Committee will look into these and report back.

COUNCIL ELECTS VICE-PRESIDENT

Council then elected, by ballot, E. A. (Ted) Speers as Vice-President and Garland E. Laliberte as Executive Committee Member. Com-

(continued on page 10)

Engineers Must Provide Leadership

By Samuel C. Florman, P.E.

This paper, which addresses philosophical issues that should be of deep concern to responsible, practicing engineers, was given by Mr. Florman before the First Annual Consulting Engineers Exposition and Management Conference at Washington, D.C. on March 15. The following excerpts are used with the author's kind permission.

Over and over again it is said that technology is the key to a better future, while at the same time it is at the root of our most vexing problems — problems that politicians can't even understand much less solve. Some mornings I ask myself — and I pose the question today — can we go on in the same way for another 20 years? If politicians can't cope with our technological problems then it seems obvious that if we hope to get to the 21st century in one piece, technologists must step forward in leadership roles.

Of course, maybe we can continue to muddle our way through. But, as engineers, that isn't the way we have been trained to think. We are gathered together in this place to talk about the future and we would be strange engineers indeed if we did not propose plans. My proposition is, I think, self-evident and common-sensical: in a technological age we simply must have leaders who are technologically savvy. This means that we — the engineers — must have more say about what our society decides to do.

Paradoxically, as the technical accomplishments of engineers become every day more marvelous, the status of our profession has been declining. Oh, I know we make a living and are fairly well respected, but we lack power and we lack influence. For one thing, we are not represented in the halls of government. A mere handful of engineers hold high elected office, and even in the civil service we are underrepresented at the top. We have no voice in the media. We do not have the money, and if you look in *Who's Who in America* you will see that we are underrepresented in such "establishments" as there may be. We do our jobs — and do them very well, by and large — but we do not formulate policy.

"What I would like to do is propose — not a revolution in engineering or even in engineering education — but rather a determined effort on the part of a few engineers to think in terms of leadership roles."

Some people claim that technology policy *is* established willy-nilly by engineers in the course of their daily work, but I think that this gives engineers too much credit — or as is frequently the case — too much blame. Overall the important decisions stem from the public will. However, it is important to have engineers in decision-making roles so that the decisions are timely, not belated; rational, not frenetic; and sensible, not ill-considered. Occasionally engineers are called upon to give advice, but giving advice is not the same thing as participating in a decision. Our nation is run by lawyers and businessmen and wizards of the media.

If we would be honest with ourselves, we must admit that this is partly because *we* do not seem to *care*. We do not seek positions of leadership. Most engineers are content to solve technical problems and leave the driving — the driving of society — to others.

Why are there not more engineers among the leaders of our society? Why are so many engineers aloof and disengaged? Why do they "turn off" when the talk turns to politics or philosophy?

Part of the answer, I suppose, lies in the nature of the creative engineering process. Some engineers are so deeply involved with theories and numbers and spatial concepts that they have little energy left to devote to other matters. One might as well ask why ballerinas do not occupy positions of leadership.

Yes, society should have a place for the totally committed technician and I do not suggest that such people — some of who are brilliantly creative — leave their laboratories or drawing boards in order to attend political rallies. But I don't think that the phenomenon of dedicated technician explains more than a small part of engineering apathy. A more significant cause, I believe, is the lowly position that so many engineers occupy in the industrial world.

A century or so ago, most American engineers could look upon themselves as independent professionals, but today the vast majority are employees of giant corporations. Many of these employee-engineers feel exploited and far removed from the wellsprings of creative professionalism. Many of them, indeed, have lowered their sights and expectations, "selling out" in a sense for the sake of a steady job.

Ironically, the situation gets worse as the number of young people entering engineering increases. A generation ago polls showed that most engineering students chose the field because it offered "interesting work." Today one hears more and more about engineering as a way to make a good living.

In one sense, the conservative mood of the 1980s has been good for engineering. Engineering jobs are plentiful. Engineers are in demand. Students are clamoring to get into the field and resources are being allocated to engineering education. The anti-technology backlash of the 1960s and 1970s is somewhat in abeyance.

But in another sense the new conservative mood has hurt the profession. How does one get ahead in this age of the yuppie? By keeping one's nose to the grindstone. By looking for a job with better fringe benefits. This limited view brings with it a loss of idealism and vitality, a diminishment of pride and vision, and a lowering of the general tone of engineering professionalism.

It is interesting to note that consulting engineers do not work as employees in large corporations and thus constitute potential exceptions to this pattern.

The problem of the lowly status of American engineers begins with American engineering education. In the early 19th century, Sylvanus Thayer, the noted "Father of the Military Academy," designed the engineering curriculum of West Point after the pattern of the French polytechnics.

In his later years, Thayer endowed an engineering school at his alma mater, Dartmouth College. The Thayer School was designed as a two-year curriculum intended to *follow* a four-year college course. Eventually the program was compressed to five years with the senior college year combined with the first year of professional school.

"Why are there not more engineers among the leaders of our society? Why are so many engineers aloof and disengaged? Why do they turn off when the talk turns to politics or philosophy?"

Several universities from time to time have introduced such 5-year programs only to drop them under the pressure of economic competition. Incredible as it may seem, Dartmouth is the only school in the nation that requires engineering students to acquire a B.A. degree enroute to a B.E. in a program that takes five years to complete. Dartmouth's uniqueness stems from the fact that hardly anybody wants to spend five years getting a degree that might possibly be obtained in four.

Several committees, and many notable individuals, have recommended that the 5-year pattern be made the standard, but this recommendation has always been voted down. (This is in striking contrast to other professions such as law and medicine — even dentistry and veterinary medicine — where the requirement is seven years and more.)

In engineering there simply is no consistency for change. The large corporations, although they pay lip service to the concept of liberally educated engineers, are well satisfied to hire the current product and to

as We Move into the 21st Century

use many of them in sub-professional jobs. The students are anxious to make a dollar as quickly as possible. Only five percent of them voluntarily choose a five-year program.

As for the engineering schools, they are reluctant to rock the boat. So what we have is a situation in which the typical engineering student takes a 4-year course with a 12½ percent accreditation requirement in the liberal arts. When we consider that the liberal arts include the social sciences as well as the humanities, this translates into the typical engineering student taking at most two or three courses in the humanities. In other words, while more and more Americans are getting college educations, most engineering graduates are essentially high school graduates with technical knowledge. Thus vis a vis our fellow citizens, we engineers are every year less and less educated.

Engineering educators have frequently made the point that liberal arts students, if they know nothing about science and technology, are not truly learned. A valid point, but it is my observation that liberal arts students have become aware of their shortcomings and are moving to remedy them. We all know about the great rush to achieve technological literacy. Engineering students, however, are more single-minded than ever, and hence less cultured.

"Culture" is a word that nowadays sounds somewhat effete, and granted it is not the best standard by which to measure merit. Nevertheless, in our society, culture and education are significant indicators of status, and by these indicators engineers are found wanting. And even if we set aside artificial concepts of social position, the worst of it is that because they bypass an education in the liberal arts, engineers are largely unable to communicate well.

They lack understanding of people and their passions, they lack knowledge of history, philosophy, esthetics, and politics. Add to these handicaps the other factors I mentioned — the intense concentration with which some engineers approach their technical work, the increasingly subservient position of engineers in large corporations, the lowly place of engineers, and we have what appears to be a pretty grim situation.

"Most engineering graduates are essentially high school graduates with technical knowledge. Thus vis a vis our fellow citizens, we engineers are every year less and less educated."

I have no desire to revamp a system that has produced so many successes and served so many people well both within and without the profession. I have no illusions about my power to change the system even if I wanted to. And I don't want to spout empty platitudes.

What I would like to do is propose — not a revolution in engineering or even in engineering education — but rather a determined effort on the part of a few engineers to think in terms of leadership roles. I envision an engineering elite who will concern themselves with matters beyond the purely technical — with politics, history, economics, and esthetics, with philosophy in its broadest sense.

"In Japan half the people trained as engineers do not, strictly speaking, practice engineering. Even more striking, half the senior civil servants and half the industrial directors have engineering qualifications."

By using the word "elite" I do not mean to denigrate the more than 1½ million of my co-engineers who practice their profession honorably. As a matter of fact, there are many different sorts of elites within the profession and that is the way it should be. There is no reason why we shouldn't be able to combine our heritage with the pursuit of excellence and a search for leadership.

In looking for members of this new elite, I can't think of a better place to start than among the ranks of consulting engineers. As I mentioned earlier, consulting engineers already constitute an elite within the profession. They form a link with the great engineers of the past — the fabled "chief engineers," the independent, truly professional engineers. They are not immersed in huge corporate organizations. They deal with private clients. They deal with a variety of government entities, municipal, state, and federal. They deal with the public.

I envision more and more engineers taking on a variety of leadership roles — in politics, in academe, in the civil service, in public interest groups. I recognize that such a process would require some talented engineers to give up the practice of engineering. Too bad in a way, but that is the tradeoff. In Japan half the people trained as engineers do not, strictly speaking, practice engineering. Even more striking, half the senior civil servants and half the industrial directors have engineering qualifications.

I am not suggesting that half of America's engineers branch out into other fields. Just a few will give us the start we need — just a select few.

I do hope that none of us is ever moved to say that during *our* lifetime we have seen engineering revert back from a profession into a trade. I regret to say that I consider this a danger, a real danger, in this age of diminished idealism, vocational education, and corporate domination of engineering activity.

What I pray we will say — what I believe we will say as the year 2000 approaches — is that during our lifetime we saw engineering grow from a great profession to an ever more powerful force for good in our society, and that we saw engineers sally forth as missionaires of good sense, technical knowhow, and moral strength, providing leadership where it is so desperately needed. □

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About the author

Samuel C. Florman, P.E., is vice president and co-owner of Kreisler Borg Florman Construction Company, Scarsdale, New York. He is the author of three books: *Engineering and the Liberal Arts, The Existential Pleasures of Engineering,* and *Blaming Technology*. He is a contributing editor of *Harper's* and writes a regular column for *Technology Review*. His more than 100 articles concerning the relation of technology to the general culture have appeared in a variety of periodicals and professional journals.

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International HVDC Conference Features Manitoba Contribution

Recently, A.P.E.M. Councillor L. A. Bateman attended two meetings in England.

At the Fourth International Conference on AC and DC Power Transmission, sponsored by the Institution of Electrical Engineers of the United Kingdom, Mr. Bateman presented a paper entitled "A Reflection on Past Decisions AC or DC Transmissions for Nelson River and Churchill Falls". Mr. Bateman's paper was given first place on the program — a program consisting of 129 papers presented by Engineers from all parts of the world.

He also attended an International Committee Meeting of CIGRE* on HVDC links for which he is the member for Canada. The Committee examined the nearly completed Cross Channel 2000 mW DC Link between England and France, and other developments in HVDC Transmission in the world.

Mr. Bateman's attendance at these meetings reflects favourably on the involvement of the Manitoba Engineering Profession at the international level. □

**CIGRE — Conference International Des Grands Resaux Electrique.*

News from Other Associations

In an article in *The B.C. Professional Engineer,* the ramifications of the Mexico City **earthquake** are pondered. Both the Mexican and our National Building Code earthquake provisions have evolved from the same Californian seismic and America Concrete codes. These provisions seem to have produced inadequate results in a major earthquake, therefore it is suggested that conformance to the National Building Code is not sufficient to prevent collapse of buildings in a major earthquake. Code revisions are recommended.

Again in *The B.C. Professional Engineer,* the **MacDonald Royal Commission** on the Economic Union and Development Prospects for Canada is reviewed, and our profession is urged to read it with the attention it commands. We engineers, both collectively and individually should speak out on the Commission's findings, for "our own future and that of the profession is about to be redefined".

In the *Plan,* the journal of l'Ordre des ingenieurs du Quebec, the president's message as well as a lengthy article discuss the findings of the Quesnel Commission of Inquiry into the **tragic collapse of the bridge over the Ste-Marguerie River.** The collapse caused the death of six workers and serious injuries to two more. The Commission's report confirmed that the disaster was caused by a clearly identifiable design error but it placed more blame on the procedure used by the Department of Transport than the person who committed the error or failed to detect it. The Commission found that "action is needed not with the man but with the system, and it is urgent". "A systematic and complete system of verification" must be established, with the designation of a "project leader whose responsibilities would include that of coordinating all activities associated with the construction". There must be a "quality assurance program". The Department of Transport, in its own brief, stressed its firm intention to implement a system that will ensure the quality of studies and minimize errors during a project. The Ordre indicated that it is up to their own Association to ensure that the Commission's recommendations are implemented.

Also in the *Plan,* engineers are reminded that the Code of Ethics prohibits engineers from giving **free services,** whether voluntarily or involuntarily. This is reiterated to Quebec engineers because of the increasing number of contracts or agreements which the engineers' fees for preliminary work be paid on condition that the work proceeds or that grants are received.

In the November issue of *The B.C. Professional Engineer* the response from the Cabinet Committee on Economic Development to the APEBC's annual brief is published. The brief elicited a response from the Ministry of Universities, Science and Communications as well. Several provincial associations submit **annual briefs** to their respective governments, however, this is not the case in Manitoba.

A major article found in *Engineering Dimensions,* the Journal of the Association of Professional Engineers of Ontario, updates the **liability insurance situation** in that province. Bill 123 requires anyone offering engineering service to "the public" must carry professional liability insurance. The January 1, 1985 effective date has been deferred twice, with the effective date now April 1, 1986. The situation is now in a state of crisis. Ten months ago eight underwriters offered new professional liability insurance policies; one exists today, with a greatly reduced capacity. Rates have increased for previous policy holders from 60% to 500%. At least 16% of engineering firms cannot, under any circumstances, purchase insurance because of the nature of their businesses. The A.P.E.O. has written to Ontario's Attorney General expressing the impact on the engineering community. Serious curtailment of the economic life of a significant number of engineering firms will result. These firms employ in excess of 20,000 people.

The President of the Association of Professional Engineers, Geologists and Geophysicists of Alberta, in his comment in "The Pegg", also speaks out about the **national concern regarding liability insurance.** Don Bellows wonders whether a suggestion by some legislators that licences to consult be granted only to those who have insurance is protection of the public when 16% of Ontario firms cannot obtain insurance at any price. He advocates national attention in an attempt to quickly resolve this matter.

It seems that other Associations across Canada experience the same **degree of involvement** that our Association encounters. The Fraser River Branch of APEBC reports that their executive is encountering difficulty in assessing the effectiveness of their programs as only two to four percent of the 2,700 Branch members support functions or express an interest in contributing input. □

New Members

Registered at the December 1985 and January 1986 Council Meetings

K. S. Au, P. Eng.
S. P. Baker, P. Eng.
G. Balodis, P. Eng.
V. S. Buckler, P. Eng.
H. A. Chan, P. Eng.
R. J. Charles, P. Eng.
M. B. Chislett, P. Eng.
H. Dansereau, P. Eng.
J. H. Davis, P. Eng.
V. M. DeWiele, P. Eng.
C. J. Dufault, P. Eng.
D. M. Egan, P. Eng.
L. J. Fraser, P. Eng.
R. J. Gladding, P. Eng.
D. S. Jayas, P. Eng.
J. Kotysan, P. Eng.
C. K. Kwok, P. Eng.
G. L. McDonald, P. Eng.
A. J. McFarland, P. Eng.
R. D. Miles, P. Eng.
R. A. Morgan, P. Eng.
G. F. Ortega, P. Eng.
R. Picard, P. Eng.
R. E. Platford, P. Eng.
J. P. S. Ponton, P. Eng.
S. W. Saciuk, P. Eng.
G. W. Sack, P. Eng.
C. B. Saunders, P. Eng.
J. L. Sawatzky, P. Eng.
D. C. Saxerud, P. Eng.
D. A. Schesnuk, P. Eng.
C. L. Sproule-Matieshin, P. Eng.
P. S. St. Jean, P. Eng.
P. V. Stanus, P. Eng.
R. Tan, P. Eng.
M. D. Vanderpont, P. Eng.
J. A. Zapfe, P. Eng.

Council Meeting Reports

(continued from page 7)

mittee chairmen and key positions were approved for all but the Social Committee and University Liaison Committee. These will be subsequently appointed.

A report submitted by the Committee for Premier's Awards for Design Excellence was then discussed. The Committee felt A.P.E.M. should continue to endorse the program in principle, but would like to see the award privatized. At present, it is subject to too much government red tape. Council approved the Committee's resolution.

The last agenda item was a report by the ASTRA Steering Committee. ASTRA (Association of Science and Technology Related Associations) is a newly formed group which has the proposed objective of increasing interaction between all disciplines of technology. Council agreed that Roger Kane would continue as a member of the Steering Committee and report back to Council periodically.

The meeting was adjourned at 7:00 p.m. □

The Boys of Winter . . .

Recently, while most engineers were still abed, the skirl of bagpipes could be heard soaring and falling on the early morning air, warming the hearts of a rag-tag bunch of curlers who were gathered at a west end Sports Emporium to take part in an Annual January Classic. A comely lass in full highland regalia led the parade of participants onto the ice. The Annual Engineers Bonspiel was underway.

This Bonspiel provides an opportunity for a 100 or so engineers to gather in a friendly environment, renew old acquaintances, get some mild exercise, quaff a beer or two and have a day away from work. Quite a number were actually curlers.

During the day there were many good shots, bad shots, lucky shots and maybe even a few cheap shots. One member of Dave Nicolls rink almost lost his "kilt" in his enthusiasm for sweeping. Possibly the old question of whether or not a Scot wears anything under his kilt was answered. In this case the person in question was wearing long red underwear. A nice feminine touch was added to the Bonspiel by Cindy Kohushka who played lead on Bruce Crawley's rink. (Although she was a beginner, her shooting percentage exceeded that of any other member of that rink).

President Ted Clarke was on hand to present the **"PRESIDENT'S CUP"** to: John Bell, Harold Wilson, Keith Walker and Steve Kormilo. **"A" EVENT** Winners — Bill Mackenzie, Bill Saunders, Clyde Allan and Bill Hayes. **"B" EVENT** Winners — Bob Friesen, Glenn Hermanson, Cy Howard and John Herman. **"D" EVENT** Winners — Bill Borlase, Roy Houston, Andrew Chimko and Norm Ulyatt.

Other presentations were handled by Bill Saunders, Chairman of the Sports Committee. A total of 48 prizes were awarded, due in no small part to the contributions received from the corporate supporters of this event. Their generosity is very much appreciated.



Traditional Bonspiel parade.



A.P.E.M.'s Belles — not to be confused with Heather Belles.

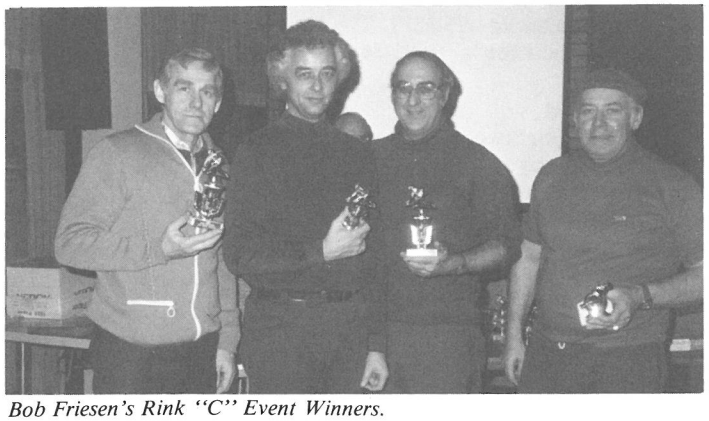
The Sports Committee comprised of Bill Saunders, Brian Mather, Peter Cohoe, Dan Zelich, Dave Sharpe and Jeff Belagus are to be commended for putting together a very enjoyable and well run event. NOTE: "A" Event Winners, Bill Mackenzie, Bill Saunders, Bill Hayes and Clyde Allan were too shy to have their photo taken. □



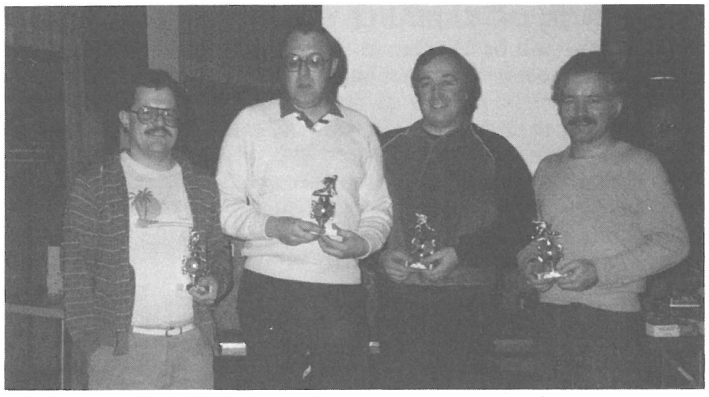
John Bell's Rink President's Cup Trophy Winners.



Dave Evans' Rink "B" Event Winners.



Bob Friesen's Rink "C" Event Winners.



Bill Borlase's Rink "D" Event Winners.

Engineers' Wives Association Marks 45th Anniversary

The Professional Engineers' Wives Association of Manitoba is celebrating its 45th anniversary with a sincere invitation to all professional engineers' wives to join its membership. The Association, established in 1940 meets monthly from September to November and from January to April, plus an annual golf, bridge and luncheon day in June.

Association bridge groups meet on alternate Wednesdays, and the men get involved in a mixed bridge group on the fourth Friday evening of every month. For all you engineers, the bridge being referred to here is the card game; it is neither the structure over a depression nor the instrument used for measuring various electrical units.

The Association is not a purely social group, as three bursaries are given annually to worthy students at the University of Manitoba. This year's bursaries were awarded to the following students:

Dean A. E. MacDonald Memorial Bursary to:
Christopher Laurie Allen
Professional Engineers' Wives Association Scholarship to:
Richard Allan Ilnisky
Dean E. P. Fetherstonhaugh Memorial Bursary to:
James Ross Turner

Support is also given to the Big and Little Sisters organization.

More information can be obtained by contacting Mrs. E. H. Klassen at 889-3589 or Mrs. J. C. Aitken at 475-3219. The balance of the Association's 1985-86 program follows:

March 18, 1986
Luncheon — Southwood Supper Club, 1855 Pembina Highway
Speaker — Brenlee Carrington — Public Affairs Director Q94FM Radio.

April 1, 1986
Dinner with the Big and Little Sisters, Hollow Mug, International Inn — optional attendance by members.

April 22, 1986
Luncheon — St. Charles Country Club — Annual Meeting.

June 3, 1986
Golf, Bridge and Lunch. □

Licences Issued

J. A. Axelson, P. Eng. (Florida)
K. W. Dean, P. Eng. (Sask.)
S. M. Giga, P. Eng. (Ont.)
C. W. Gray, P. Eng. (Alta.)
K. E. Guido, P. Eng. (B.C.)
J. A. Hayes, P. Eng. (Ont.)
E. Hrudko, P. Eng. (Alta.)
T. C. W. Ip, P. Eng. (Ont.)
David L. Killam, P. Eng. (B.C.)
R. G. Ohler, P. Eng. (Ont.)
M. J. Rosseker, P. Eng. (Alta.)
A. A. Vandertol, P. Eng. (Alta.)
R. Walker, P. Eng. (Ont.)

Engineering Graduate Members
Registered in December 1985 and January 1986

G. I. J. Chartier
D. B. Duncan
S. Harnish
H. Ko
R. N. Kummen
W. A. McTaggart
B. S. Nazar
G. R. Norberg
D. G. Pokrant
G. S. Waters
O. Wegner
K. A. Wycislik

Congratulations to Darryl Glenn Pokrant for achieving 100% on the Professional Practice Examination.

Resignations
(Effective December 31, 1985)

Grant E. Allen
J. G. Alston
H. W. Armstrong
J. A. Barlow
L. A. J. Beaulieu
M. Cerny
U. J. Chaput
K. K. Y. Choi
R. M. Colman
R. P. de Lhorbe
J. E. Dowell
G. Handfield
J. R. B. Johnston
L. Mayotte
D. G. Mollard
P. L. Money
J. D. Ogrysko
K. C. Pearce
B. J. Platzer
R. Ross
D. A. Scarth
S. Tomczak
W. M. Veldman
A. R. West
L. Wing-King

Thesis Day
March 21, 1986
University of Manitoba

An invitation is extended to those interested in reading EE graduation theses. For further information, please contact: A. Jakobschuk, P. Eng. (Theses Co-ordinator) 474-9616. □

The Ritual of the Calling of an Engineer

Date:
March 11, 1986
Time:
8:00 P.M.
Place:
University of Manitoba, Tache Hall
Contact Person: C. R. Bouskill, P. Eng.
For applications telephone 934-3374.

Professional Development

SELECTION OF VARIABLE SPEED DRIVES

This seminar will be of value to those interested in purchasing and operating these drives. It is not intended for drive specialists. The use of mathematics is avoided as far as possible and the seminar is primarily aimed at graduates in electrical engineering but is open to anyone who has some acquaintance with this topic.

The basic properties of drives are presented, motor characteristic, speed range, starting properties, stability, input power factor and waveforms.

February 25, 26, & 27, 1986
Rooms 543 - 544 University Centre Building, University of Manitoba 9:30 a.m. to 4:30 p.m each day.
For further information please contact: Professor G. S. Bains at 261-5760.

PLANT, MACHINERY AND EQUIPMENT MAINTENANCE: REPLACEMENT AND RELIABILITY

3 Day Seminar designed for engineers and others responsible for maintenance and replacement decisions in connection with their company's plant, machinery and equipment. Two specialized computer programs will be demonstrated at the seminar. Participants will learn techniques that should result in lower maintenance costs and improved production.

April 23, 24, 25, 1986
The University of Manitoba, Campus
9:00 a.m. to 4:30 p.m.
For further information contact: Mrs. Merilyn Wawro, Program Secretary at 261-5760