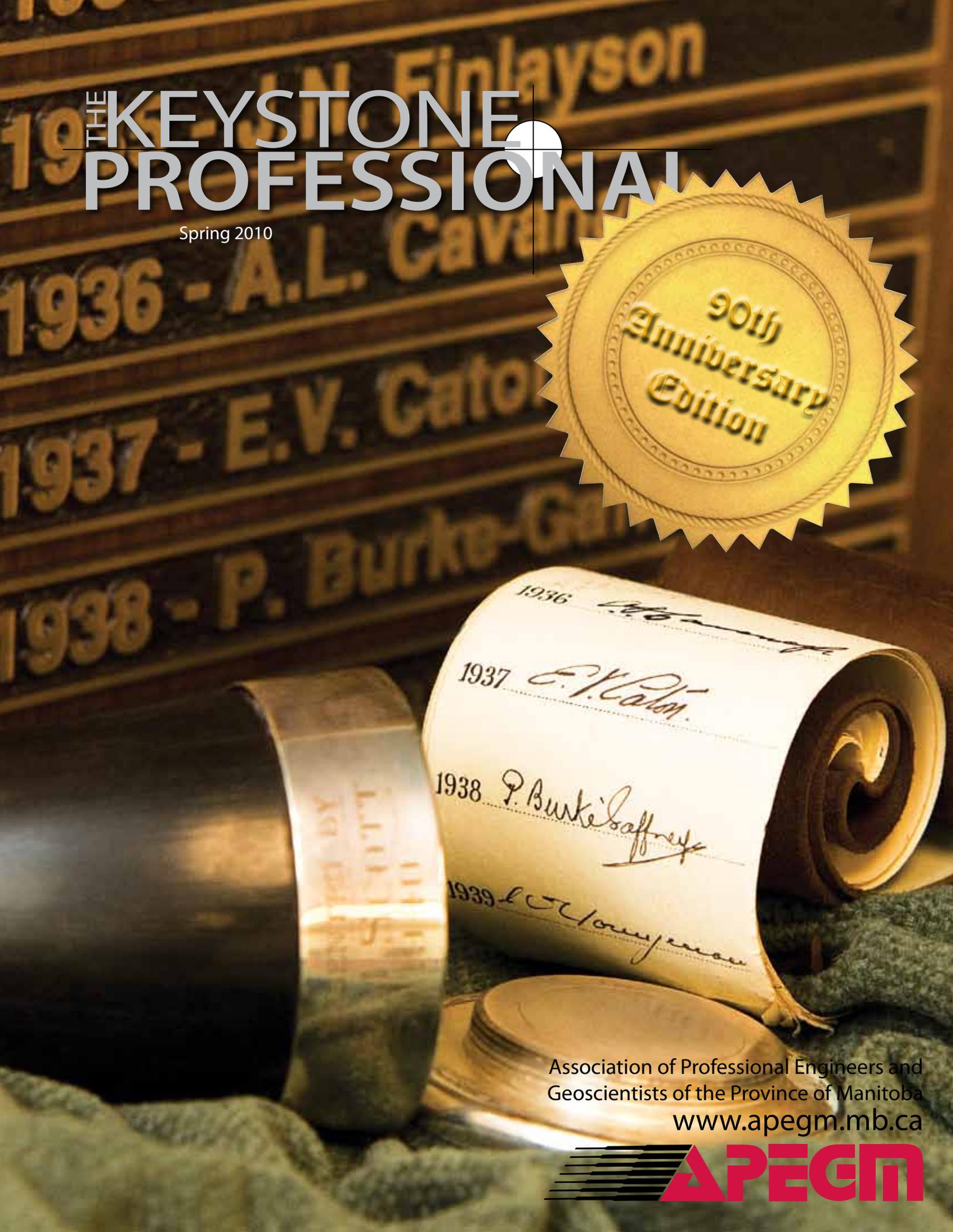


# THE KEYSTONE PROFESSIONAL

Spring 2010



Association of Professional Engineers and  
Geoscientists of the Province of Manitoba  
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# THE KEYSTONE PROFESSIONAL

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- Comments can be forwarded to us through A. Moore: [amoore@apegm.mb.ca](mailto:amoore@apegm.mb.ca). Members are also encouraged to submit articles and photos on topics that would be of interest to the membership.
- Although the information contained in this publication is believed to be correct, no representation or warranty, expressed or implied, is made as to its accuracy and completeness. Opinions expressed are not necessarily those held by APEGM or the APEGM Council.

Front cover photo by Leif Anderson.  
 Leif Anderson is an amateur photographer in Winnipeg, MB, who is slowly being pulled into the world of professional photography. He has been strongly involved in the hobby for ten years and is captivated by the depth of the craft.

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FEATURES



John Woods, P.Eng.  
President's  
Message

## ROUND 2

It was nice to hear back from both of the engineers who contacted me following the last Keystone article. One by e-mail, the other in a very nice typewriter formatted letter. Neither member answered my questions about their AGM attendance, or declared an interest in professional development tracking. However, I know one of them resides in Alberta – and this seems like a reasonable answer, to the first question at least. Are there others? The second gentleman wondered why APEGM did not recognize its role as a trusted adviser to both the public and those who govern on behalf of the public. This is an excellent question, and I will come back to this topic later on.

Being an engineer, I am of course not fazed by the (nearly) null-response. First, everyone I know in the profession remains busy – and this is good. Second, I am persistent by nature and, like every exam I've ever written, I'll probably run out of time before I get all the answers. Maybe this doesn't sound very scholastic. Oh well, it reminds me that the Dean of Engineering recently told me that the level of divorce among engineers is ¼ of that of the general public. Does this mean we are more resilient, more persistent – or perhaps that we have an eye to sustainability going in (I'm going to go with the latter, dear).

Taking a step back, I should certainly acknowledge the hundreds of committee members and council members who have, over the years, volunteered their time and effort. Many were, and are long-standing members of these groups – and I thank you all sincerely. I am also very appreciative of those of you who contribute your time to the Consulting Engineers of Manitoba and other engineering and geoscientific societies. These are important interfaces between our membership and the society

we live in (and all of the above are valid professional development efforts).

Besides the reasons given above, there are other factors to be considered, and I am not trying to generalize the membership as disinterested in the profession. I'm only saying that that is the appearance. As is often the case in our profession – we have to dig a little deeper – before we step up and make sweeping statements.

Let's look first at the mode of communications. Perhaps my writing style is too rudimentary, rambling, or too scattered to keep one's interest. Guilty as charged. I look forward to seeing how it should be done. Perhaps electronic methods of communication are better these days

for the multi-taskers among us. By the time this article is in print – we will have opened a discussion board on the APEGM website – to carry an ongoing dialogue (then we can really ramble). So this may be the answer. And again I invite your e-mail messages or comments. I also invite you to volunteer for the CPD on-line beta testing – which you will reach by logging in on the APEGM website (top left). As described in the previous article, this will allow you to keep track of your various professional development hours using menu driven categories and a space for number of hours. Simple.

Now, for those of you who saw my rope trick at the AGM, I will attempt to tie some

*continued on page 8*

# NOTICE

## Nominations for Election to the APEGM Council

The Nominating Committee of APEGM requests recommendations from members and members-in-training, for nominees who they consider to be qualified to participate in the governance of the Association and who are willing to so serve the engineering and geoscience professions in Manitoba. There will be 4 professional engineer positions and 1 professional geoscientist position to be filled as of October 2010.

The Committee will consider recommendations received by the secretary up to the close of business on Friday, September 17, 2010. In the event insufficient recommendations are received, the Committee may exercise its prerogative to put forward a slate of candidates for election that is equal to the number of positions to be filled. Persons submitting a recommendation are required to obtain the consent of the professional member being recommended and to provide a curriculum vitae or biographical sketch.

Members can also be nominated directly and be on the ballot for the 2010 election by the completion of the prescribed nomination form. The form can be obtained from the Association office or from the website at [www.apegm.mb.ca/NominationsForCouncil.html](http://www.apegm.mb.ca/NominationsForCouncil.html). The consent of the nominee must be obtained.

*Grant Koropatnick, P.Eng.  
Secretary of Council*

# Engineering Philosophy 101

## Consideration of the *Best* Option

M.G. (Ron) Britton, P.Eng.

**B**illy Koen's definition of the Engineering Method, "... the strategy for causing the best change in a poorly understood or uncertain situation within available resources", has always appealed to me. In my view it captures the essence of the process of moving from problem to solution.

Like most processes, however, it has some *sticky* elements. For me, the *stickiest* element in this definition is the word "best".

There are a lot of ways to look at *best*. The Oxford University Press dictionary defines it as an adjective meaning "of the most excellent or desirable type or quality; or most suitable, appropriate, or sensible". As an adverb it is defined as meaning "to the highest degree; or to the highest standard; or most suitably, appropriately, or sensibly". Within a design context, depending on the circumstances, *best* is often considered to be least-cost, greatest return on investment, least environmentally damaging, most immediately available, or any number of other *measurable* characteristics. With all these options, it seems *best* still boils down to a matter of opinion.

If we think of opinion (again from Oxford University Press) as "a view or judgement not necessarily based on fact or knowledge; or, a formal statement of advice by an expert or professional" clarity isn't improved a great deal. However, one can infer that an opinion advanced by a professional requires that professional to accept responsibility, even in the absence of "... fact or knowledge".

In Manitoba the public, through the Engineering and Geosciences Professions Act, has given us special status. All other provinces and Territories have similar Acts with similar rights and responsibilities. One of the cornerstones

of our professional status is the existence, and enforcement, of a Code of Ethics. These Codes of Ethics contain "the moral principles governing or influencing conduct". So, when a professional makes a decision regarding the *best* solution, it is assumed that the decision will be ethically sound. If that professional is a member of APEGM he/she will "... regard the physical, economic, and environmental well-being of the public as the prime responsibility . . ." (from Canon 2, APEGM Code of Ethics).

But as we undertake to do the ethical thing, we still have a problem. In his lectures on Questions of Value, a Teaching Company Audio CD, Professor Patrick Grim identified the Foundations of Ethics. Unfortunately there are two conflicting theories to deal with, the Theory of Good and the Theory of Right.

The Theory of Good is based on the principle of doing the most good for the most people. This is probably the basis of most ethically *best* decisions in engineering projects. We justify infrastructure projects that cause difficulties for individuals because they benefit the public at large. Decisions based on least cost, greatest return on investment, least environmentally damaging, most immediately available criteria are all founded on the Theory of Good. They are conditional and judgmental decisions for which we, as professionals, take responsibility.

The Theory of Right is based on the judgement of right versus wrong. In its purest form, the consequences of the decision are not considered. That is all well and good for philosophers, but as Engineers, we need to accept responsibility for our actions. Based on

this reality, the Theory of Right seems unworkable for us.

Like most *pure* theories, neither of these two options is adequate. It would seem that in our search for the *best* solution, engineers will always follow the Theory of Good. But there are times . . .

About ten days after the January 12, 2010 earthquake in Haiti, efforts turned from Rescue to Recovery. Ethically the Rescue mission was based on the Theory of Right. There is no question that every effort must be made to find those who have survived the disaster and bring them to safety. However, ten days into the operation the probability of finding survivors was very low. There were many bodies under the rubble and they were beginning to decay, causing serious health risks. It was necessary to use heavy equipment to clear the rubble and recover the bodies for proper burial. The move to Recovery was based on the Theory of Good.

But twelve days after the earthquake, a man was recovered from a collapsed building.

There is not *bullet proof* means of reaching the *best* solution. It comes down, as one might expect, to an assessment of the options and consideration of the situation. In each case, it is a decision made by a professional for which she/he must accept responsibility.

Fortunately few of our design decisions are exposed in the context of a disaster like that in Haiti. But as we search for the *best* solution, in spite of our intuitive dependence on the Theory of Good, we must remain mindful of the Theory of Right. The *best* solution requires that both conditions be met whenever possible. ■

“the Theory of Good and the Theory of Right”



Grant Koropatnick, P.Eng.  
Executive  
Director's Message

# OLD GUY WISDOM - YOUNG GUY TRUTH

It was my pleasure to speak at the annual Student Networking Dinner held January 28, 2010. It was a fun night of mixing with students and professional members. The main purpose of the evening was to engage everyone in practicing their networking skills through the very popular game "Speed Networking". In addition to this part, I took the opportunity of telling everyone about my engineering roots.

Many of you know the story. My Dad was an engineer and my two uncles were engineers. My third uncle was a geoscientist. I know what you're thinking: "he's making this up". I'm not kidding! See the old photos. Dad and his brothers Bill and Peter were Civil Engineers from the University of Manitoba (classes of 1950, 1949 and 1941 respectively). My Uncle Nick was a 1940 Geology grad from Brandon University and in today's terminology would be dubbed a "geoscientist." So when people ask me how did I become an engineer, I tell them: "it's in the family DNA".

As always, when I speak in public, I like to spin a bit of controversy into my text. This night was no exception. During one part, I described the differences between "old guy wisdom" and "young guy truth." Here is a verbatim transcript of my speech. Too bad you weren't at the dinner; it was probably better in "live, animated, 3-D colour with surround sound".

When I graduated at age 22, I can remember sitting at my parents kitchen table a week after convocation thinking that I knew everything there was to know about everything. I had a good education from the University of Manitoba; I had been married one year already. I was full of confidence, education, spunk, and bravado, but I really

only knew a little about a few things. I was a young guy full of truth and energy. My Dad was an old guy who didn't know half what I knew . . . or so I thought at the time.

Oliver Wendell Holmes, American physician, professor, and author said: "*the young man knows the rules, but the old man knows the exceptions . . . yes, the young man knows the rules, but the old man knows the exceptions.*"

In this room, there is a wealth of knowledge, experience, confidence, and energy. Some of you have more experience than others. Some of you have a lot more energy and enthusiasm than others. No matter who you are, I want you to share what you have. If you're an old guy with lots of wisdom and experience, I am asking you to be willing to share a bit. If you're a young guy with lots of energy and ideas, I am asking you to muster the courage to share a bit. In this exchange, we'll all get a little bit of something we need . . . and let me tell you, I could use some youthful energy. Let me give you two examples. I will start with an example of Old Guy Wisdom.

## OLD GUY WISDOM

I have 2 adult children and periodically I Google them to see what the Internet gives back. They call that "creepin' on the net".

It's great fun, but I'm sometimes surprised about what I read. So I tell them: "Hey, don't put so much out there on the Internet." They say: "Dad, you're paranoid", but I'm not really. I'm just careful. When I was their age, the only place you could find me was in a telephone book and you didn't find me . . . you found my Dad. There is an old saying: It is better to remain silent and thought a fool than to open your mouth and remove all doubt . . . or in today's verbiage: it is better to not login and update your status than to blast off a stupid tweet and tell everyone you're an idiot. So don't put it all out there. Privacy, decorum, and confidentiality are never out of style or old fashioned. Ya, I know, it's a bit of "Old Guy Wisdom" but it might just save you from embarrassment. Now for an example of Young Guy Truth.

## YOUNG GUY TRUTH

In preparation for the Student Networking Dinner, I interviewed a young professional member who has been practicing about 7 years and he said the following about the early years of his career: "I had learned a lot in a short time; I got a great education from the University of Manitoba and the thirst for knowledge propelled me forward. I wanted to impress my superiors, but worried about

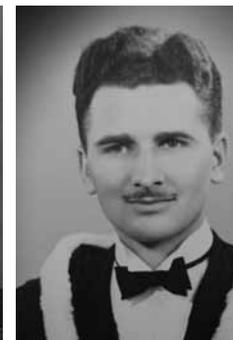
*continued on page 25*



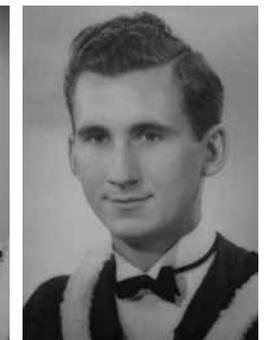
N. Koropatnick, 1940



P. Koropatnick, 1941



W. Koropatnick, 1949



A. Koropatnick, 1950

## Licensing Of Engineers From Abroad

J. Woods, P.Eng.

There have been many articles in the news which address immigration, sharing the difficulties that some new comers have with becoming settled in Manitoba. Learning new customs, culture and in some cases, language are all significant challenges. Immigration can be expensive, time-consuming and often incredibly stressful particularly for those who may also be struggling to take care of young children and to deal with aging parents or other relatives.

As Canadians, we like to think of ourselves as a welcoming nation – a nation that wants to see others succeed and to become proud Canadians themselves.

One of the issues frequently cited in news articles over the years has been the implication that regulatory bodies consciously inhibit the process by which internationally educated people join the profession, or impose unnecessary ‘red-tape’. Regulatory bodies, such as APEGM, are sometimes identified as stodgy or protectionist. It makes good press, but it is not true. To understand the situation a little better, it is important to see the whole picture.

First and foremost, regulatory bodies exist to protect the public. For us, protecting the public requires due diligence to make sure that applicants have engineering degrees at least on par with undergraduate Canadian engineering degrees. This is not an easy task, and can only be accomplished by people who understand both engineering and their education from a Canadian context. In order to evaluate degrees obtained from outside of Canada, APEGM relies on its own research, the universities, as well as the experience of Engineers Canada (an organization whose members are the provincial engineering regulatory bodies). Engineers Canada does an enormous amount of research into the

educational processes of engineering in various countries, and can provide guidance on individual files as requested. However, both engineering and geosciences professions are regulated under Provincial Acts, therefore decisions with respect to an individual’s professional status lies with the provincial regulatory bodies, such as APEGM, not Engineer’s Canada.

The reality is that levels of engineering, and engineering education, are incredibly diverse around the globe. In some growing countries there are universities where the engineering education is of extremely high calibre. The competition to enter these universities is often intense, due to a large population; therefore these universities have their pick of the top applicants. However, it is clear that not all universities can be equal, and due to the sheer numbers of people and programs, it is not possible to keep track of all programs – much less every person – and therefore the possibility of fraud increases.

Every country also has their ‘anomalies’, both above and below average, in both educational facilities and individuals; which makes it extremely difficult to compare a person’s specific education to a Canadian university education. Furthermore, even with global electronic communications, attaining official and verifiable documentation remains a challenge. Some countries do not want to loose professionals like engineers, and therefore do not make much effort to facilitate such a move. While this is somewhat understandable, and clearly not the fault of the individual, it does not negate the requirement.

When evaluating foreign degrees, APEGM must hold public safety first. Again, that is our primary objective. Most Canadians would agree that where life safety is at stake, it is not prudent to simply take someone’s word for it, no matter how valid the claim, or how convincing an individual can be. But, rest assured, we also recognize fairness towards our fellow engineers as one of our core tenets, regardless of their country of origin.

Anyone who has studied the matter even briefly understands that education varies tremendously from country to country, and even within a country. Therefore, all foreign educated applicants go through the same evaluation process. The applicant from a prestigious university has his or her degree assessed in the same way as the graduate of a lesser known university. He or she pays the same fee and is asked to submit the same documentation. It would not be fair if we did otherwise.

APEGM has listened carefully to many helpful suggestions and has made efforts over the past five years to improve our evaluations of foreign-trained engineering graduates. Some of the major initiatives include:

- Remodelling of our academic assessment policy which allows among other things, a ‘looking to exempt (from exams)’ policy for those applicants who have graduated with a post-graduate engineering degree from a Canadian university (provided their undergraduate degree is in engineering). [May 2008]
- Elimination of the yearly assessment fee. [May 2008]
- Interviews for the purpose of waiving exams, for applicants who have a degree and 10 or more years of current engineering experience. Many applicants have been successful in having examinations waived. [Started 2006]
- The Internationally Educated Engineers Qualification (IEEQ) program has been a successful for many applicants: in having exams waived, providing increasing awareness about Canadian engineering and business practices and importantly, securing suitable engineering jobs. [Started 2005]
- The option of taking approved courses at the university in lieu of writing confirmatory examinations. [October 2007]
- Upgrading of website to allow for a ‘picture’ view of the process. There

*continued on page 23*



M.G. (Ron) Britton, P.Eng.  
Thoughts On  
Design

## . . . AND LEARNING FROM FAILURE

The January 2010 recall of Toyota vehicles became headline news. Given that automotive recalls happen almost weekly, one has to wonder why this particular recall got so much attention.

Toyota became the largest automotive manufacturing company in the world by stressing the quality and reliability of their products. From the start their company image has been based on quality engineering, from design through manufacturing to performance. Within our profession, it has been suggested that Toyota is an illustration of what engineers can accomplish if engineering is the corporate priority.

Given the comparative awkwardness of the Toyota recall, one cannot help but suspect that the company had no plans in place to deal with a major component failure. Their competitors can, and do, deal with recalls very effectively. In fact, while Toyota was apologizing, both Ford and Honda quietly announced recalls that were literally lost in the footnotes of the *bigger* story.

Without the benefit of being part of the inner workings of a corporation, it is difficult to know what their real problems and priorities are. But regardless of the corporate priorities, all engineers know that all systems, human or mechanical, will eventually fail. In the Iron Ring ceremony we are reminded of "the perversity of inanimate objects". Toyota engineers have just been reminded of this fact.

Engineering is founded on, and Toyota has prospered on, the concept of innovation through quality design. Henry Petroski observed that "Engineering is the rearrangement of what is", and that, to me sounds a lot like innovation. The problem is that most people, including many engineers, think that innovation is based

on scientific discovery and design is simply the *sizing* of parts based on established scientific *facts*. Nothing could be further from the truth.

Scientific discovery has always followed design. The Wright brothers designed and built an airplane. That led to the study of aerodynamics. James Watt developed a steam engine. That led to serious investigation into thermodynamics. Until space travel became a reality, there was no need for studies into the effects of weightlessness on the human body. Undoubtedly scientific discovery has led to more sophisticated design, but the studies themselves are to better understand how and why some innovation works, not to create innovation.

As systems become more complex, scientific inquiry provides clues that allow the complexities to be analyzed more completely. But the system is still just a collection of *parts*.

An automobile *system* is composed of countless *parts*. Each of these *parts* is supposed to do something and then *communicate* that something to other *parts*. Each *part* is individually designed to satisfy assumptions that are based on what we know from past experience and from recent scientific confirmation.

It is analyzed and tested to determine how it, on its own, will perform. As the *system* develops interactions between and among *parts* are assessed, again based on the assumption that we fully understand what each *part* must do and how it must interact with other *parts*.

Basically what happened to Toyota was that one of the *parts* failed when subjected to what was probably a unique set of circumstances. In this case failure means

that it did something they didn't expect. For some heretofore unknown reason the communication from one *part* to another was faulty.

And to add to the situation, only some of the hundreds of thousands of *parts* failed. Clearly the circumstances that caused that failure were not anticipated and not a part of the quality control testing program. Somewhere in the design performance specifications something was not anticipated.

Over the years, Toyota seems to have based its design specifications on past success. Design based on success will, eventually, lead to failure because refinements and *improvements* tend to move closer to the limit. Failure defines a design limit very clearly. Failure, again quoting Petroski, is an "unintended experiment".

As an academic involved in delivering a graduate class that relates to the design process, I must admit to finding a positive side in the Toyota *troubles*. It has provided a valuable, current "case study" relating to failure.

We were wrapping up discussions on design failures and how they affect both our understanding of system performance and the design process when the recall made headlines. The flood of informed, and other, opinion on cause and effect along with the billion-dollar cost estimates took discussions away from history and textbooks and made an engineering failure very real.

As engineers we tend to become comfortable behind the security of safety factors, standards and specifications. Fortunately major failures are not daily occurrences. But failures, major and minor,

# Empowering Women, Building Communities: More than Just a Tagline - It's a Lifestyle

In May 2010 over 400 women, men, students, academics, entrepreneurs, and professionals from both public and private sector will gather in Winnipeg to take part in the 13th Biannual Conference of the Coalition of Women in Engineering, Science, Trades and Technology (CCWESTT), an event that is proudly sponsored by APEGM.

The CCWESTT conference will feature fantastic opportunities for attendees to engage in professional development workshops, networking activities, panel discussions, presentations, as well as many sightseeing activities in the Winnipeg area. The highlight of the conference will be the exciting line up of speakers who will touch on a variety of relevant topics from feminine energy in business to environmental benefits of straw bale cottages. Two of the keynote speakers

featured at CCWESTT 2010 are Betty-Ann Heggie and Heather Bishop.

**Betty-Ann Heggie**, one of CCWESTT's featured presenters, is a speaker, author, and former corporate



executive at PotashCorp, the world's largest fertilizer enterprise. Betty-Ann grew up working in a family business and attended the University of Saskatchewan School of Education. After stints as a teacher and beer rep, she ultimately landed at the Saskatoon-based PotashCorp, where she climbed the corporate ladder to become the Senior Vice President of Corporate Relations. During her 26-year tenure at Potash, she was named Canada's Best Investor Relations Officer at the IR Magazine Awards, and received the Queen's Golden Jubilee Medal. She



has also been named to the Hall of Fame of Canada's Top 100 Most Powerful Women.

Similar to Betty-Ann's upbringing, **Heather Bishop** began her foray into the trades through her

family. Her father is a master carpenter and embraced his daughter's love of the trade. Although she is best known as a musician, touring the world and producing 14 CDs over her 30 years in the business, her love of the trades stayed with her. Heather lived her belief that when she speaks and sings about the truth in her own life, it strikes a

chord in other people's lives as well. For her social activism as well as her work in the arts, Heather has been awarded the Order of Canada, the Order of Manitoba, and the YM/YWCA Woman of Distinction Award.

Find out more about these speakers at the recently released program at the conference website - <http://www.cwestt2010.ca> - and continue to receive conference updates by signing up for the CCWESTT electronic conference newsletter - "Great Big News!".

Early bird registration will be open until March 24th, 2010, for only \$400 per person (\$250 per student). With an exciting lineup of speakers and events, it's not an event to be missed. Please check the CCWESTT conference website regularly for more updates: <http://www.cwestt2010.ca>. ■



*continued from page 3, President's Message*

of these loose threads together without getting myself too bound up. I have – for a very long time – promoted the idea that APEGM should indeed have a voice in the community. Something beyond “hey this is a great profession – come and join us ...” and “we are the engineers...” (p.s. if there is a Geoscientists' song – I regret that I have not heard it – please let me know).

Most of the objections to this concept come from the perspective that there is no method of finding a quick consensus among the members. The second largest group of objectors feels that APEGM is a regulating body – and therefore has no business generating opinions or giving advice. The last major group of

objectors cannot help but think that the membership dues are already too high, and adding something which I might or might not be interested in would probably add to this outrageous amount – and what exactly does APEGM do for me anyway ...

To all of these groups – I believe there are answers – but you have to go first. I will, however, leave you to consider what it means to you to be a member of the profession (or any profession), and consider Table 1 – showing where we fit in monetarily. I look forward again, and always, to your input. And remember, I would still like to hear at least a couple of reasons why you do – or don't make it out to the AGM. ■

## Current Practicing Fees for Professions in Manitoba

|                                       |           |
|---------------------------------------|-----------|
| Law Society of Manitoba               | \$1450.00 |
| College of Physicians & Surgeons      | \$1350.00 |
| Institute of Chartered Accountants    | \$1207.00 |
| Certified General Accountants         | \$ 850.00 |
| Manitoba Association of Architects    | \$ 760.00 |
| Manitoba Pharmaceutical Association   | \$ 749.10 |
| College of Physiotherapists           | \$ 425.00 |
| College of Occupational Therapists    | \$ 350.00 |
| College of Registered Nurses          | \$ 337.00 |
| College of Licensed Practical Nurses  | \$ 315.00 |
| Engineers & Geoscientists of Manitoba | \$ 300.00 |



Chantal Guay, P.Eng., M.Env.  
Engineers Canada  
CEO Message

## DEALING WITH DISASTER

I offer my condolences to those affected by the catastrophic earthquake that occurred in Haiti on January 12. Thus far the disaster has claimed over 170,000 lives, and will leave a devastating effect both on the country and around the globe.

I hope that the country will be able to recover from the tragedy as quickly as possible. Sadly, reconstruction will cost billions of dollars and take years to accomplish. But it's not just about dollars and cents. It's about the people in need, those who lost their lives - including Canadians - and the friends and family mourning for those departed. While Engineers Canada has made a donation to the Canadian Red Cross to support the relief efforts, it's the work being done on the ground in Haiti that will be felt directly by those suffering from the catastrophe.

This is where engineers come in. The engineering profession can provide tangible support and expertise in response to natural disasters, and we have the required skills to establish engineering projects that facilitate national reconstruction. But is Canada's engineering profession doing enough? Are we, and will we be, ready when another disaster strikes? How can we help as a profession?

I believe that, as engineers, we are in a position to provide concrete positive change when disaster strikes. We are recognized for our expertise in public infrastructure, and as a profession we have the strength and unity to respond to catastrophic situations. As the Engineers Without Borders campaign says: Engineers Serve the World.

As such, members of Canada's engineering profession are currently contacting various

relief organizations across the country to see how they can provide support to the relief efforts. For instance, while RedR Canada is limited in what it can do as an organization, it has been working with larger organizations to identify engineering volunteers for deployment to Haiti to provide relief and recovery operations.

The profession is also studying issues surrounding natural disaster risks and adaptation. While the earthquake in Haiti was not a result of climate change, there is evidence - with an increasing occurrence of extreme/intense weather patterns - that shows the world will be faced with more climate change-related disasters in the future. Engineers Canada has been looking into this issue through its involvement in, and chairmanship of, the World Federation of Engineering Organizations' Committee on Engineering and the Environment. The Committee enables the World Federation and the global engineering profession to address the UN Millennium Development Goals, and its mission statement includes gathering information and providing recommendations on the adaptation of physical

infrastructure to climate change and natural disaster risks.

I am proud of the efforts being made by the engineering profession to help those suffering in Haiti. I see the need for us to look further into how we can mobilize in response to future natural disasters, and my thoughts are with everyone affected by the events in Haiti. ■

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GENIVAR thanks all candidates. However, only those selected for further consideration will be contacted. GENIVAR is committed to equity in employment.



# Professional Development & Networking Events

## The PIEVC Protocol - an Engineering Approach to Coping with Climate Change

G. Lodha, P.Geo.

A one-day workshop on the subject of Climate Change Vulnerability Assessment was held in Winnipeg on November 17, 2009 by the joint efforts of APEGM and Engineers Canada.

Grant Koropatnick, while welcoming the delegates, emphasized on the results of 2007-2008 joint surveys by Canadian Standards Association (CSA), Engineers Canada, and constituent members (including APEGM). The conclusions of this survey were:

- Most infrastructure engineers believe climate change will affect their practice in the future.
- Very few engineers are currently considering climate change in their practice today. This has likely not changed very much since the time of the survey.
- Many say they lack the necessary knowledge.
- There is some established body of knowledge that could be used by engineers to address climate change issues.
- However, several systemic barriers will need to be addressed to accelerate the consideration of climate change in engineering practices – perhaps most notably, influential decision-makers will need to get on board.

David Lapp of Engineers Canada provided history of PIEVC (Public Infrastructure Engineering Vulnerability Committee) protocol development since August 2005. Engineers Canada, in partnership with Natural Resources Canada, has been developing and testing the PIEVC Engineering Protocol. The protocol describes a step-by-step process of risk assessment and engineering analysis for evaluating the impact of potential climate change vulnerability on infrastructures. PIEVC is supported by infrastructure Expert Working Groups consisting of engineers, climate scientists and other technical experts with design and operations experience in the particular infrastructure

category. PIEVC has currently developed and tested four different categories of structures, namely: Buildings, Roads and associated structures, Storm water and wastewater systems and Water resource management systems.

The workshop sessions included the following discussions:

1. Climate Change Projections and Impacts in Manitoba (Danny Blair - Winnipeg). This presentation discussed the historical records of temperature variations since 1880 and atmospheric Carbon Dioxide concentrations since 1960. These observations showed that the global linear warming trend of the last 100 years was 0.74 degrees C per century.

The Carbon Dioxide concentration in the last fifty years has increased from 310 to 380 ppmv. The different modeling approaches predict a rise in average global temperature ranging from 1 to 3.5 degrees C by end of this century.

The related Carbon Dioxide concentration can increase to 560 ppmv for 3 degree C rise in temperature. These changes will also have impact on precipitation levels and associated ecosystems in the Prairie Provinces.

2. Climate Change and Infrastructure Risk Assessment- Introduction to the PIEVC Engineering Protocol (Joel Nodelman-Edmonton). This presentation defined Risk (R) as the product of the probability (P) of an event with severity (S) – should it occur. In applying principles of risk, Nodelman indicated that a small increase in weather and climate extremes, beyond tolerance limits, has the potential to bring large damage to existing infrastructure.

Engineering vulnerability is defined as the gap between forecast designed capacities and identified potential load capacity. Understanding this gap

is called Engineering Vulnerability. The safety margin between forecast capacity and forecast load can identify potential future failure/non-failure conditions. This margin is called engineering resiliency. Most people have an intuitive understanding of risk, but need guidance to sort out and assess the relative significance of likelihood and severity caused by potential climate change impact.

The PIEVC protocol leads practitioners through a formal documented process to identify vulnerability and resiliency and applies standard risk assessment processes to this new concern. Details of these matrix approach tools are available from Engineers Canada in the PIEVC protocol.

3. In the afternoon session, case history examples of four steps of the PIEVC protocol were discussed in four presentations. The examples discussed were:
  - a. Tunney's Pasture Campus study (example of application to Buildings in Ottawa) presented by Vince Catalli
  - b. Vancouver Area Sewer System study (example of storm water and waste water) presented by Andrew Boyland & Brent Burton
  - c. Portage La Prairie water collection and treatment infrastructure study (example of water resource management system) presented by Roger Remple and Jeff O'Driscoll.
  - d. Quesnell Bridge, Edmonton case study (example of Roads and associated structures) presented by Efrosini Drimoussis and Canisus Chan.

Each case study presentation was followed by worksheets for group exercises involving hands on experience in using the PIEVC protocol. Details of the PIEVC case studies are available

on the web site: [www.PIEVC.ca](http://www.PIEVC.ca). Additional details on use of PIEVC protocol are available from David Lapp at Engineers Canada (e-mail: [david.lapp@engineerscanada.ca](mailto:david.lapp@engineerscanada.ca)).

APEGM had compiled a binder with most up-to-date background information on climate change studies in Canada, and copies of the presentation overheads provided by each speaker. This was

an excellent resource for all workshop attendees. Hopefully this will be available to other interested engineers and geoscientists in the near future. ■

## Winnipeg's New Water Treatment Plant *H.M. Turanli, P.Eng.*

On Tuesday, January 12, 2010, the Professional Development Committee of APEGM sponsored a presentation on the Winnipeg's New Water Treatment Plant given by Hanns Till Freihammer, P.Eng. who is a Senior Process Engineer with AECOM.

Hanns started by informing an audience of over 70 engineers how the project was started by the City with a mandate to build a water treatment plant for the City of Winnipeg. After over 10 years of studying, designing, planning and construction, the new Winnipeg water treatment plant was put into service in December 2009.

Hanns described first what was in place prior to the new water treatment plant (WTP) in order to clean and disinfect the water received via the aqueduct from Shoal Lake, which borders the Canadian provinces of Manitoba and Ontario. The raw water supply is chlorinated at the Shoal Lake intake for pathogen, slime, and zebra mussel control. Water flows by gravity through a 137 km long aqueduct to the Deacon Reservoir (DR) east of Winnipeg. Prior to the autumn of 2009, water for distribution was re-chlorinated at the outlet of the Deacon reservoir, UV treated, and sent to three covered distribution reservoirs before delivery to consumers. The current annual average water demand in Winnipeg is approximately 256 ML/d.

The presentation provided an overview about the background of the city's raw water quality and the treatment requirements, information about location and lay out of the new facility and an introduction to the various treatment processes of the plant.

Mr. Freihammer reported that the City of Winnipeg recently completed construction of the new, multi-barrier, water treatment plant. The WTP is

designed to treat 400 ML/d, with an adjacent site available for potential expansion. Ancillary buildings were constructed to support the treatment facility, including Standby Generators and Main Switchgear, Sodium Hypochlorite Generation, Bulk Chemical Storage, and Clearwell Structures.

The WTP has complete standby capabilities and runs two parallel treatment trains. Raw water from DR enters the WTP by means of a pumping station which feeds the treatment trains, supplying eight, 3-stage flocculation tanks and corresponding dissolved air flotation (DAF) tanks. Sulfuric acid is injected into the raw water to adjust the pH for enhanced coagulation. This is followed by the primary coagulant, ferric chloride, which is flash mixed into both trains prior to flocculation and the DAF process. The water flows through two contact tanks where on-site generated ozone is injected for taste and odor control. Sodium bisulphate removes residual ozone before water enters eight filters filled with granular, activated carbon. Water is polished as it flows through the biologically active filter media into a chlorine contact chamber (CCC) where on-site generated sodium hypochlorite is injected as a disinfectant. Sodium hydroxide is injected downstream the CCC to adjust the pH of the water after treatment in the WTP. Finished water moves through the clearwell to the Deacon Booster Pumping Station (DBPS) where it undergoes UV treatment. Fluoridization, and orthophosphate treatment for plumbosolvency control occurs downstream of the DBPS. The drinking water is supplied to the City via the existing distribution system.

The WTP is a zero discharge facility that treats all residuals removed from the water using four settling tanks and two gravity thickeners. Supernatant water

is pumped back to DR while thickened sludge is pumped to freeze-thaw ponds.

A number of challenges were met during design, construction and commissioning of the WTP. A green field site allowed for the design of a complete facility to expand upon the minimal treatment previously used. Due to the new hydraulic configuration, the existing DBPS will operate at all times.

A construction management team coordinated multiple construction contracts and integrated various City supplied process equipment. Training new and existing operations staff to run a new plant was an important process which required careful coordination with existing operations.

Mr. Freihammer included detailed schematic diagrams, layouts, and photographs during and after the construction of the facility in his presentation as well as excellent video clips during the commissioning and full operation.

Commissioning milestones, including disinfection, 3 and 5-Day performance tests, and 28-Day system demonstration, were critical to the transition of the WTP from construction to operation for drinking water supply to the City of Winnipeg. The WTP is operated by the Water Services Division of the City of Winnipeg Water and Waste Department and has been supplying water to the City since December 9, 2009.

The treated water of this state-of-the-art plant complies with highest drinking water standards, reduce the risk of waterborne disease outbreaks, reduce the level of disinfection by-products and improve taste and odor levels of the treated water.

Author greatly acknowledges the information received from Mr. Hanns Till Freihammer for writing this article. ■



## New Opportunities

Last year, a new chapter of a growing engineering organization was founded: the Winnipeg Professional Chapter of Engineers Without Borders Canada. EWB Winnipeg is helping build a community that promotes human development and creates positive, sustainable change for alleviating extreme poverty. This is an organization for engineers and others who want to make a difference and confront the greatest challenges facing our world.

These challenges are at the heart of the UN's Millennium Development Goals, eight ambitious goals that helped to define the fight against extreme poverty. The goals are set high: to halve the portion of people in the world living on less than a dollar a day and halve the number of people suffering from hunger; to reduce child mortality by two-thirds; to reverse the spread of diseases such as HIV/AIDS and malaria.

EWB Canada was formed ten years ago, the same year that the Millennium Development Goals were announced. It began as a name written on a napkin during a conversation between its two founders, and since then it has developed into one of Canada's most respected development organizations. With over 50,000 members, 35 chapters across Canada, more than 2,500 volunteers in Canada and hundreds of past and present overseas volunteers, it is also one of the fastest-growing. The first local presence came through the University of Manitoba Chapter.

During its history, EWB has always been willing to ask tough questions and reinvent itself. We have learned that fighting poverty is neither simple nor straight-forward. It did not take long to realize that promoting new engineering technologies alone is not the answer. However, the pragmatic engineering approach has proven to be beneficial. This means looking at what has worked in the past, and what hasn't. Install a well, but who will fix it when it breaks down? Knowledge is often more valuable than technology.

Poverty is not a matter of weakness; rather it is a lack of opportunity. For those living in extreme poverty, a new opportunity may take the form of education about business concepts in agriculture, a new cash crop, new latrines along with training to maintain them, or up-to-date information on the water sources in the region. These are all examples from EWB projects in the four African countries where we work: Ghana, Zambia, Burkina Faso, and Malawi. In all cases, the focus is building capacity.

Soon we hope to send a volunteer overseas from the Winnipeg engineering community. However, fighting poverty is not only about working overseas. The fifth country where we work is Canada. Here the focus is in three big areas: connecting Canadians to Africa and enabling them to contribute; advocating for improved Canadian policies; and helping engineers to serve the global society. The opportunities within EWB Winnipeg cover all of these areas.

Helping engineers to serve a global society begins with opportunities to learn about international development. In 2010 we will begin a series of Lunch & Learn sessions, where volunteers will come to offices and lead a lunch hour workshop on a topic like "the Root Cause of Poverty". If you are interested in having one of these sessions in your office, please contact the Workplace Outreach team at [winnipeg@ewb.ca](mailto:winnipeg@ewb.ca).

This year we will expand our advocacy work and promote corporate social responsibility through ideas like Fair Trade. Several engineering firms in the province have already switched to Fair Trade coffee thanks in part to the efforts of EWB members, and we hope to bring the rest on board this year.

We are building a community, and that means many opportunities for networking. The next one will be our Curling Bonspiel fundraiser on March 27. Be sure to consult our website or Facebook page for further details.

EWB hopes to provide its members with the opportunity to not only make a difference in the world, but also to grow personally and professionally themselves. Through participating and volunteering, members gain valuable professional skills: leadership, public speaking, interpersonal skills, and cross-cultural IQ among many others. In recognition of this, our educational events are eligible for professional development credit in the APEGM MIT program.

In addition to the above, there will be events such as movie nights, book club meetings, guest speakers, and drinks nights in the months to come. As always, details about upcoming events or volunteer opportunities are on our website or Facebook page. Hope to meet some of you soon!

If you are interested in joining or learning more about the Engineers Without Borders and the Winnipeg Professional Chapter, then please send an email to [winnipeg@ewb.ca](mailto:winnipeg@ewb.ca) or visit our website: <http://www.winnipeg.ewb.ca>. ■

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| Building Condition Assessment  | Winnipeg  | 29-31 |       |       |
| Foundations of Construction Law                                      | Winnipeg  |       | 12-13 |       |
| Canadian Highway Bridge Design Code                                  | Winnipeg  |       |       | 17-21 |
| <b>Electrical</b>  |           |       |       |       |
| Canadian Electrical Code - 2009 (New Code will be Covered)           | Saskatoon |       | 19-20 |       |
| Modern Power System Protective Relaying                              | Regina    |       | 19-21 |       |
| Modern Power System Protective Relaying                              | Winnipeg  |       |       | 3-5   |
| Fundamentals of Modern Substation Equipment, Protection and Controls | Regina    |       |       | 17-19 |
| <b>Environmental</b>   |           |       |       |       |
| Environmental Site Assessment and Remediation                        | Regina    | 8-9   |       |       |
| <b>Mechanical</b>  |           |       |       |       |
| Mechanical Engineering for Non-Mechanical Engineers                  | Winnipeg  |       |       | 10-14 |

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## Council Reports

Thursday, December 10, 2009

A. Erhardt, EIT

At 12:45 p.m., President John Woods called to order his first APEGM Council meeting as president. Following the adoption of the meeting's agenda and a review of the September meeting's minutes, Council accepted the consent agenda, which included the list of applications that had been approved by the Registration Committee for September through November.

Unfortunately Susan Rogers was unable to attend the meeting to lead Council in an education session relating to Policy Governance. Executive Director Grant Koropatnick was instructed to re-schedule the training session for a future meeting.

The topic of electronic voting was brought forward by Professional Standards Officer Mike Gregoire. He indicated that currently, proposed by-law changes are mailed out to the APEGM membership in advance of the Annual General Meeting. At the AGM, members in attendance can approve or reject these changes, following which another mailer is sent out to the membership for a final vote. Given the limited attendance at the AGM, Mr. Gregoire suggested that a better solution would be online voting. To reinforce his argument, Council was informed that APEGBC had introduced online voting for potential by-law changes, and that participation in the online vote was very high, especially when compared to the previous method. This, coupled with the cost savings for APEGM makes the proposal very attractive in his opinion. Mr. Koropatnick indicated that following a by-law change in 2006, the Association was now able to legally communicate with members via email. Following some debate, Council agreed to discuss the item further at a future meeting.

A couple of information items followed. Mr. Koropatnick provided Council with a list of proposed meeting dates for 2010, leading up to the 2010 Annual General Meeting. The dates were accepted by Council.

It was then brought to Council's attention that former Councillor Tim Corkery had been appointed to sit on an appeal committee which was to hear an appeal of a decision that was brought down by the Investigation Committee. Legal counsel had recommended that as Mr. Corkery was no longer on Council, that he should be replaced on the appeal committee. Past President Don Himbeault agreed to join the appeal committee in Mr. Corkery's place.

Entering the governance phase of the meeting, it was time to elect a Vice President and an Executive Committee Member for the upcoming year. Nominations were made according to the procedures, and following the process, Councillor Bill Girling was declared Vice President by acclamation, as the other nominees declined their nominations. Following the nominations and voting for the Executive Committee Member, Council elected Councillor Ed Ryczkowski for the position following a secret ballot.

Continuing with position appointments, Councillor Don Spangelo was appointed as the Council liaison to the EGAIAR Joint Board. As well, eight APEGM members were appointed to serve on the Discipline Committee. As an item for information, Council was informed that Dave Ennis's term of office as Manitoba Director for Engineers Canada was coming to an end in June of 2010. Mr. Koropatnick informed Council that traditionally, a Past President is appointed to serve as the director. He also indicated that two Past Presidents had said that they would be willing to serve as the Manitoba Director. Council decided that each candidate would be given the opportunity to provide a brief presentation on why they are willing to serve as the Manitoba Director for Engineers Canada.

Similarly, Council was informed that Tim Corkery's term as the national director for the Canadian Council of Professional Geoscientists is coming to an end in November of 2010.

In the past, the current APEGM President has served as the Council liaison with the APEGM Foundation. However, given the demands upon the APEGM President as observed over the past few years, Mr. Koropatnick suggested that a Council member be chosen to serve this role instead. Councillor Jeannette Montufar was chosen to fill this role in 2010.

Following up on a presentation that was made at a previous Council meeting, Council debated a draft of a memorandum of understanding between APEGM and the Society of Philippine Educated Professional Engineers of Manitoba. Following some debate as to the use of "professional engineers" in their title, Council still agreed in principle with the idea of an MOU, however, some changes would need to be made to the draft before moving forward.

After reviewing and updating the list of outstanding action items, the next meeting's agenda was previewed, and Council performed their meeting evaluation before adjourning the meeting shortly before 4:30 p.m. ■

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## Thursday, January 21, 2010

A. Kempas, P.Eng.

This meeting was like the old saying “they gave a party but no one came.” The meeting was short of a quorum, which meant that Council could not pass any motions, so President Woods suggested a review of the Engineers Canada Synergy Task Force Proposal. Therefore, Engineers Canada Manitoba Director Dave Ennis guided Council through the latest developments in the task force proposal.

The proposal was an attempt to restructure the governance of Engineers Canada into a modern, responsive system. Mr. Ennis described the 74-year-old organization as the child of twelve parents, a child which should now be allowed some leeway. He went on to review the guiding principles of the task force, and mentioned that the amount of the Engineers Canada membership fee was a concern. Councillors learned that ¼ of Engineers Canada revenue came from fees and the balance from contracts. He was also concerned about the proposed elimination of the past president position as he felt it provided a worthwhile contribution to the organization.

Mr. Ennis’s tenure as Engineers Canada director was over, so Council needed to find a replacement. For the benefit of the future director, Dave provided a brief description of the director’s duties and the time commitment involved. Although Council couldn’t vote on a new director that day, they would allow the two candidates, Dr. Donald Himbeault and Dr. Digvir Jayas, to present their qualifications at the meeting.

Dr. Himbeault cited his good relationships with past directors, his ability with financial reports, flexible time, effective writing skills, support from his employer, and bilingual skills as his qualifications for the position. Dr. Jayas spoke of his numerous technical memberships and standing in the engineering community, and his desire to contribute to profession. While the candidates were out of the room, Council decided that the candidates would submit written platforms and Council would conduct an e-mail vote the following Thursday so that APEGM could fill the position before the next regular Engineers Canada meeting.

With that discussion over, Council ended with a few informational items from Executive Director Grant Koropatnick. He said that membership numbers were looking good . . . APEGM had 5,884 members and was showing consistent quarterly increases.

Next he spoke about the report, A Pan-Canadian Framework for the Assessment and Recognition of Foreign Credentials. Mr. Koropatnick said that APEGM had been doing it right all along when it came to recognizing foreign trained professionals. The Academic Review Committee had proposed new regulations about when candidates would be “exited” from the examination program and Council was approving their recommendations.

With that the meeting ended at 2:29 PM. ■

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# How The Association Got Started!

*Compiled by the Heritage Committee*

*Based on A Short History of the Association of Professional Engineers of the Province of Manitoba, 1920-1945 by C. S. Landon, Secretary-Treasurer & Registrar*

Would you be surprised to learn that there were few rules governing the practice of engineering in the early beginnings of the province of Manitoba?

It is not like Winnipeg was still the wild-wild west; but, the fact is Winnipeg experienced a fantastic boom during the 1890s and the first two decades of the 20th century, as the city's population grew from 25,000 in 1891 to more than 179,000 in 1921.

What comes with such population growth? All kinds of changes and development! This fast paced growth was fueled by many private and public undertakings that would set the economic foundation for the province for many years to come. The river transportation system was making way for the railway transportation system. In both phases of development, Winnipeg was a hub, and was looking more and more like the Chicago of the north. Many firsts and mega projects were constructed during this time including the Pinawa Generating Station, Union Bank Tower (sky scrapper), the James Avenue Pumping station, the St. Andrews Lock and Dam, the Pointe du Bois Generating Station, the "Transcona (Canadian National) Railway Shops, the Shoal Lake Aqueduct and the provincial legislative building to name but a few. (Stay tuned to your Heritage Committee website for more information about these projects and many more in the months and years to come.)

This period provided many opportunities for wholly unqualified individuals to practice engineering required for these projects. There were some engineering

challenges, like the Transcona P&H Grain elevator settlement problem; and, some scandals, like irregularities with the contracts associated with the construction of the provincial legislative building along the way. Although no major disasters occurred, the engineering community was concerned about faulty design and waste on some of these major projects.

## Who was protecting the public?

We have to go way back to 1896 when the Manitoba Civil Engineer's Act was passed by the Manitoba Legislature. The first form of engineering governance in Canada, it restricted the practice of engineering in Manitoba to certain persons who were members of the Canadian Society of Civil Engineers (the predecessor to the Engineering Institute of Canada). That act was replaced in 1913 by another Manitoba Civil Engineer's Act. It turned out that both of those Acts lacked the "administrative machinery" to enforce the practice restriction, and as a result the 1913 Act was repealed in 1920 when the Engineering Profession Act was adopted.

So, following The Great War, 1914-1918, as

the developments in Western Canada continued on a greatly accelerated pace, there was no law in place in Canada that governed the practice of engineering. There were several societies or associations across the country, like the Engineering Institute of Canada (EIC) and the Canadian Society of Civil Engineers, but their mandates were to facilitate continuing education and professional development and promote standards of education and training in the engineering community. The EIC branches across the country began to look into what steps needed to be undertaken to define engineering, and to set legal standards of qualifications for the safe practice of engineering, so that legal status could be provided to those who were registered to practice.

The problem was that the Dominion Government of Canada (as it was known at the time) did not possess authority to pass legislation of this nature until after there were enabling Acts on the statute books of each of the Provinces. So, Manitoba members of the EIC, working in concert with their colleagues across Canada, submitted a framework of the required enabling Act at a session of the 1920 Legislative of the Province of Manitoba. The group of engineers presented a petition praying for the incorporation of "The Association of Professional Engineers."

The Government of the day decided to sponsor a Public Bill, framed in such a way that it conformed very closely to the



Whitemud River Bridge - 1916 - designed by M.A. Lyons  
Source: Archives of Manitoba

draft submitted with the petition. As a result, "An Act respecting the Engineering Profession" was passed, and assented on March 27, 1920. "The Association of Professional Engineers of the Province of Manitoba" became a body, politic and corporate, with perpetual succession and common seal (Chapter 38, Statutes of Manitoba, 1920).

The Act conferred on the Association the power to make By-laws for management and administration, defined the practice of Professional Engineering and set out clearly who might practise as a Professional Engineer. It provided that each Registered Professional Engineer shall have an impression seal, and also named a Provisional Council of the Association to set up the organization.

The Provisional Council, as enacted, were to provide the register called for by the Act, to enter therein the names of those entitled to registration and to call, within six months of the coming into force of the Act, the first General Meeting of the Association for those purposes or any other organization purposes of the Association. This Provisional Council was to have the powers conferred by the Act on Council of the Association. These powers were to cease on the election of the regular Council of the Association.

On April 9, 1920, the Provisional Council convened and W. M. Scott and G. L. Guy were elected Chairman and Secretary, respectively. On Monday, August 23, 1920, the Provisional Secretary was empowered to obtain and open a register for the registration of members. The form of the application and certificate of registration as used by "The Association of Professional Engineers of New Brunswick," with alterations to suit the requirements of the Manitoba Act, were adopted as official stationery of the Association. The Provisional Council met again September 25, 1920, and approved the applications of 168 Manitoba Engineers. The first General Meeting of the Association was held September 27, 1920, in the Engineering Building of the University of Manitoba located at the corner of Portage Avenue and Sherbrook Street, in the City of Winnipeg, with the Provisional Chairman, W. M. Scott, presiding. Seventy-

one Registered Professional Engineers and five non-registered Engineers were present. The By-laws as prepared by the Provisional Council were reviewed and adopted, or amended and adopted, clause by clause.

The presiding officer then called for nominations of members for the first Council of the Association, to consist of seven members, the four receiving the highest number of votes to act until the Annual General Meeting in 1922, and the other three elected until the Annual General Meeting of 1921. In that year and subsequent alternate years, three members and in 1922 and subsequent alternate years, four members have been elected to Council for a term of two years. In all, seventeen were nominated and upon report of the scrutineers, M. A. Lyons, P. Burke-Gaffney, G. L. Guy and J. G. LeGrand were elected to serve until 1922, and A. W. Smith, D. A. Ross and W. P. Brereton until 1921.

As had become the established custom, the members elected to Council retired from the meeting to elect, from their number, the officers of the Association. Upon their return, they reported that the first regular officers were M. A. Lyons, President; J. G. LeGrand, Vice-President; G. L. Guy, Secretary and Registrar; who with P. Burke-Gaffney, A. W. Smith, D. A. Ross and W. P. Brereton comprised the first Council of the Association. With the setting up of this Council, the Association began the business of administering the new act. (Note that the custom of the members of the Council retiring from the meeting to elect the officers ended in 1991. Since then the president-elect, i.e. the person who takes over in a year, is still elected by and from the Council. However, it is done in an open meeting of the Council.)

Look for future articles in the Keystone describing the first steps of the association.

See M. A. Lyons biography on the Manitoba Historical Society website [http://www.mhs.mb.ca/docs/people/lyons\\_ma.shtml](http://www.mhs.mb.ca/docs/people/lyons_ma.shtml)

# Association Firsts

Saturday, March 27, 1920  
*Date of Creation*



M.A. Lyons, PEng, First Association President and designer of the Whitemud River Bridge

168  
*Number of Manitoba Engineers registered on Day 1*



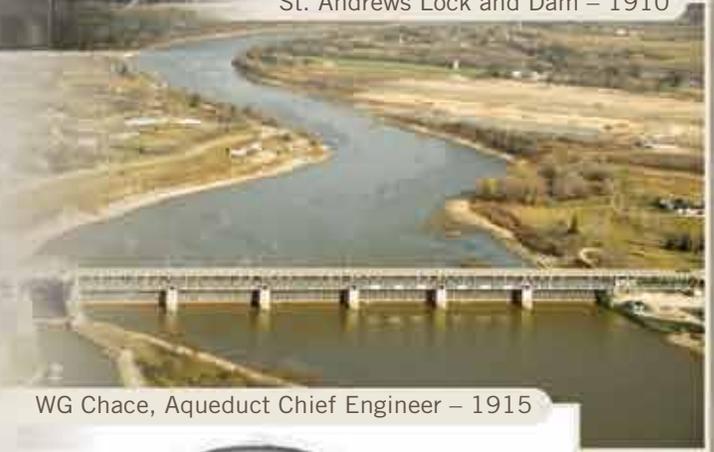
First meeting location, 1918 Engineering Building at the University of Manitoba located at the NW corner of Portage Ave and Sherbrook St. Building was also known as the Deaf and Dumb Institute.

Considered setting up an Engineering library for the membership.

*First Association Committee*



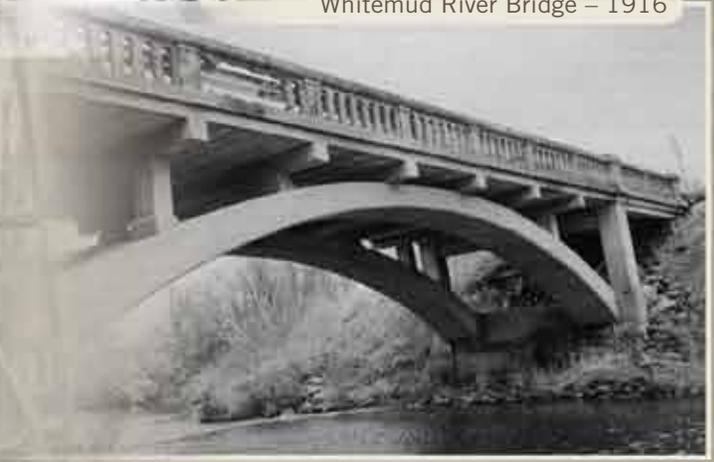
St. Andrews Lock and Dam – 1910



WG Chace, Aqueduct Chief Engineer – 1915



Whitemud River Bridge – 1916



# Engineering & Geoscience Manitoba Milestones

1881

Canadian Pacific Railway (CPR) development

1857

Dawson Trail from Lake of the Woods to Winnipeg

1891

Electrification of Winnipeg Transit System

1895

Tyndall Stone Quarry development

1900

Minnedosa River Plant 1st hydroelectric generating station in Manitoba

1903

Winnipeg Union Bank Tower 1st skyscraper in Western Canada

1907

Winnipeg James Avenue Pumping Station & High-Pressure Fire Fighting System

1907

Winnipeg Telephone System

1911

Pointe du Bois 1st hydroelectric generating station on the Winnipeg River built by the City

1913

Transcona Canadian National Railway Shops open

1913

Manitoba Rolling Mills in Selkirk (Steeltown)

1913

Transcona Parrish & Heinbecker (P&H) grain elevator foundation failure and restoration

1913

Electric Street Cars to St. Vital

1915

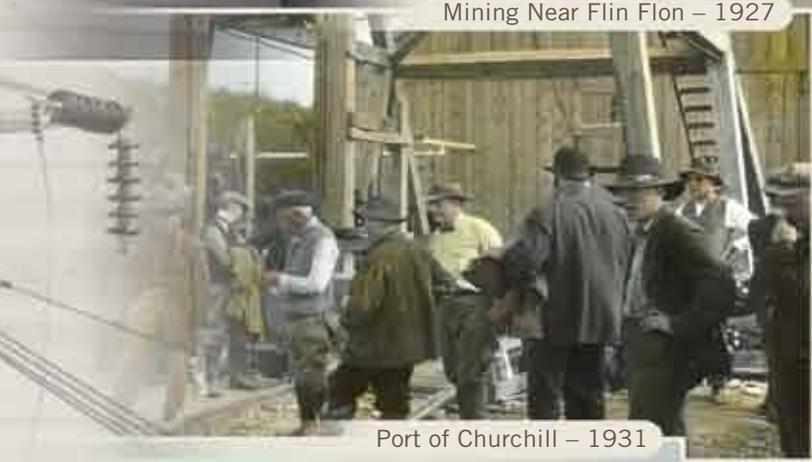
Shoal Lake to Winnipeg Aqueduct

1918

Flin Flon 1st productive copper mine by Mandy Mining Co. Schist Lake



Mining Near Flin Flon – 1927



Port of Churchill – 1931



Seven Sisters Hydro Station Construction – 1930



1921

Manitoba rural electrification starts

1923

Hydroelectric expansion on the Winnipeg River starts with Great Falls

1924

Winnipeg Amy Street Steam Plant

1925

Pine Falls Pulp & Paper

1927

San Antonio Gold Mine at Bissett

1927

Flin Flon Copper-Zinc mining starts

1929-1931

Hudson Bay Railway Line completed and Port of Churchill opens

1933

Bus Manufacturing starts

1938

Flin Flon above-ground Water and Sewerage System

1939

Manitoba engineers join effort for World War II

1940

British Commonwealth Air Training Plan started

1941

Nickel discovery at Lynn Lake

1949

Killberry Industries begins production of agricultural machinery

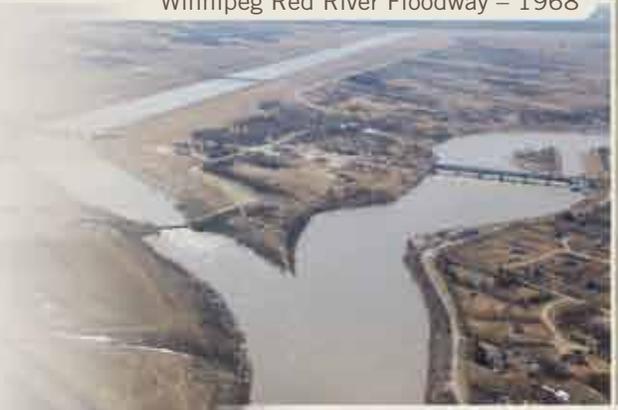
1950

Red River Valley Flood

1950

Record number of engineering graduates from the U of M

Winnipeg Red River Floodway – 1968



Long Spruce Hydro Station – 1979



Mercury Arc Valves, Dorsey & Radisson Station – 1972



Symington Rail Yards – 1955



1954

Tantalum-Lithium-Cesium Mine at Bernic Lake

1956

Nickel discovery by Inco Ltd., Kelsey Hydroelectric & City of Thompson developments

1960

Manitoba Flood Protection System

1960

Bio Medical Engineering starts Local development of lower extremity prosthetics

1961

Black Brant Rocket

1962

Grosvenor House early pre-cast concrete building construction in Manitoba

1963

Atomic Energy of Canada Ltd. (AECL) nuclear research started in Pinawa

1965

Expansion of agricultural manufacturing into four-wheel-drive tractors, swathers and windrowers

1966

Hydroelectric expansion on Lower Nelson River Generating stations at Kettle, Long Spruce & Limestone

1968

Winnipeg Red River Floodway completed

1971

High Voltage Direct Current (HVDC) Bipole 1 'transmission line' first energized

1976

Churchill River Diversion & Lake Winnipeg Regulation

1980

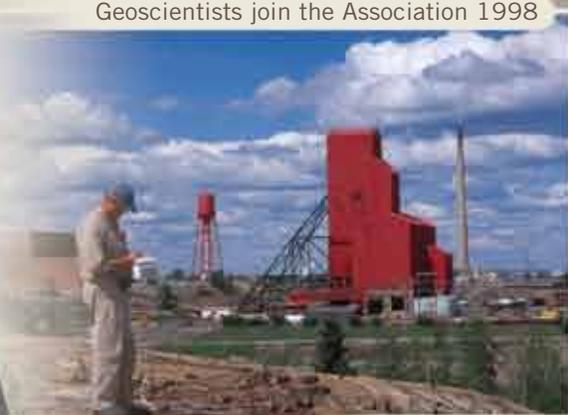
500 kV Winnipeg to Minneapolis transmission line completed

1953

Virden discovery of Roselea Oil Field

1957

Brandon Coal Generating Station



Esplanade Riel – 2002



James A Richardson Airport Terminal – 2010



New Flyer Xcelsior – 2008



**1981**  
Canadarm deployed

**1981**  
Minnedosa Ethanol Plant

**1989**  
Air Strip for British Antarctic Survey

**1990**  
Assiniboine River Walk opens

**1990's**  
Development of inland grain terminals using slip-form construction

**1995**  
End of the 'Crow Rate' revolutionises grain handling

**1995**  
Churchill Transmission Line

**1997**  
1997 Flood Improved forecasting & operation modeling

**1998**  
Taylor 'Smart' Bridge, Headingly Advanced structural health monitoring systems introduced

**2000**  
Power System Management Technology commercialized

**2002**  
Golden Boy restoration

**2003**  
Small science satellite launch - SCISAT

**2003**  
Hybrid Bus Deployment

**2005**  
Winnipeg Red River Floodway expansion initiated

**2008**  
Manitoba Hydro Downtown Office Tower 1st green high rise

# *In the beginning . . .*

*E.A. Speers, P.Eng., President 1987*

**W**estern Canada, in the period following the Great War, saw development greatly increased. Regulations controlling planning and building were lax due to the lack of qualified technicians and engineers and, because of faulty design and construction, the potential for disasters was evident. Thus it was determined that legal standards of qualification should be defined for the safe practice of engineering, along with the provision of those qualified to be registered to practice.

By action of the provincial branches of the Engineering Institute in western Canada, a resolution was sent to the Council of the Institute in Montreal, asking that federal legislation be sought to give engineers uniform legal and professional standing throughout Canada. To facilitate that action it was necessary for each province to pass similar legislation in advance. A model act was prepared and submitted by the engineers to the legislative assemblies of each province of the Dominion.

In 1920 a group of engineers presented to the Manitoba Legislature a petition "praying for the incorporation of The Association of Professional Engineers." As a result, the Manitoba government of the day passed "An Act respecting the Engineering Profession", which was assented to on March 27, 1920. Thus The Association of Professional Engineers of the Province of Manitoba became "a body politic and corporation, with perpetual succession and common seal" (Chapter 38, Statutes of Manitoba, 1920).

The first general meeting of the association was held September 27, 1920, in the Engineering Building of the University of Manitoba located at the corner of Portage Avenue and Sherbrook Street in the city of Winnipeg with the provisional chairman, W.M. Scott, presiding. Seventy-one registered professional engineers and five non-registered engineers were present. The by-laws as prepared by the provisional council were reviewed and adopted or amended and adopted clause by

clause. The discussion was lengthy and at times quite lively, but finally a set of by-laws was evolved which, with relatively few amendments, has effectively controlled the operation of the association through the rest of its life.

The chief duty imposed on the association by the Legislature of the province of Manitoba was to administer "The Engineering Profession Act," and, in carrying out this duty, Council is concerned with ascertaining that all whom it registers are competent to fulfill the functions of a professional engineer to the end that the public may be protected against incompetence in the design, supervision, and inspection of engineering projects.

The above was adapted from "A Short History of the Association of Professional Engineers of the Province of Manitoba, 1920-1945" by C.S. Landon, Secretary-Treasurer and Registrar.

From my standpoint, as a professional engineer newly arrived in Manitoba and interested in involvement with the association, joining a committee was an invaluable experience.

Each committee serves as a great start on a learning curve with a particular aspect of governance of the association. I was fortunate to join the Publication Committee and soon learned that it, and in fact all the committees, came under the organization of Robert's Rules of Order, enabling the committee chair to control the proceedings of any meeting in a decorous manner. It is not dictatorial. It allows any member by point of order to have his say. One learns to work with others for the greater good.

In addition, one was encouraged to prepare and present articles for publication. Mrs. Loreen Dunklee, the executive secretary, was mentor of the Publication Committee. One could not have asked for a better monitor of English—vocabulary, punctuation, and grammar—and, as we were

made aware of how much of the language we had to learn, despite our assumed academic achievements, our learning curve in this as well as in governance, proceeded.

In preparation for one annual meeting, Loreen Dunklee encouraged the Publication Committee to challenge another committee to put on a skit. The challenge was issued! Shakespeare's birthday was an event of the year and our selection was Shakespeare's "Seven Ages of Man." There were three weeks of amusing rehearsals and then costumes derived from various unlikely sources, and we were ready. At first, the infant, "mewling and puking in his nurse's arms" became a large engineer, diapered, in a baby carriage pushed by a suitably clad male engineer nurse; then the whining schoolboy, and so on, totally amusing and great to perform.

Loreen Dunklee's term as executive secretary was from 1956 to 1995. After she retired to Victoria she donated a large bronze plaque, displayed in the APEGM office, providing each President's name and date in office. The plaque was presented in a brief ceremony in the APEGM office, at which time Loreen was contacted in Victoria by phone, with thanks and a brief conversation with her by each one of the participants who were able to attend. ■

*When I was first elected to Council in 1952, there was no paid staff and no permanent address except for the Registrar, Charlie Landon. It was during the ensuing six years that the Council rented space on the second floor at the corner of Notre Dame and Princess and engaged the services of Mrs Dunklee as the first staff member. When I was again elected to Council in the eighties, there were several employees and excellent office space. Since then the Association has come of age and now has very desirable office space, befitting the Association.*

*L. Bateman, P.Eng., President 1958*

**Every year, the APEGM Council elects a new President from amongst its membership:**

|                          |                         |
|--------------------------|-------------------------|
| 2010 - J.C. Woods        | 1964 - B. Chappell      |
| 2009 - D.J. Himbeault    | 1963 - T.E. Weber       |
| 2008 - M.T. Corkery      | 1962 - R.E. Chant       |
| 2007 - R.L. Taylor       | 1961 - C.S. Landon      |
| 2006 - D.S. Jayas        | 1960 - W.L. Wardrop     |
| 2005 - A.D. Silk         | 1959 - W.L. Wardrop     |
| 2004 - A.H. Permut       | 1958 - L.A. Bateman     |
| 2003 - L.R. Ferchoff     | 1957 - N.S. Bubbis      |
| 2002 - M.A. Barakat      | 1956 - J. Hoogstraten   |
| 2001 - A.J. Pollard      | 1955 - J. Hoogstraten   |
| 2000 - J.R. Hosang       | 1954 - G.B. Williams    |
| 1999 - M.G. Britton      | 1953 - J.L. Charles     |
| 1998 - P. Washchyshyn    | 1952 - C.L. Fisher      |
| 1997 - J.M. Symonds      | 1951 - W.D. Hurst       |
| 1996 - C.L. Stewart      | 1950 - W.D. Hurst       |
| 1995 - D.G. Osman        | 1949 - T.E. Storey      |
| 1994 - D.G. Chapman      | 1948 - B.A. Johnston    |
| 1993 - C.E. Anderson     | 1947 - B.A. Johnston    |
| 1992 - N.P. Feschuk      | 1946 - J.W. Battershill |
| 1991 - Wm. M.A. McDonald | 1945 - G.E. Cole        |
| 1990 - K.A. Buhr         | 1944 - H.S. Rimmington  |
| 1989 - G.E. Laliberte    | 1943 - H.S. Rimmington  |
| 1988 - W.D. Christie     | 1942 - C.V. Antenbring  |
| 1987 - E.A. Speers       | 1941 - G.E. Cole        |
| 1986 - E.W.J. Clarke     | 1940 - F.S. Adamson     |
| 1985 - R.A. Kane         | 1939 - W. Youngman      |
| 1984 - R.R. Foster       | 1938 - P. Burke-Gaffney |
| 1983 - D.E. Cross        | 1937 - E.V. Caton       |
| 1982 - K.M. Jardine      | 1936 - A.L. Cavanagh    |
| 1981 - R.C. Isaak        | 1935 - J.N. Finlayson   |
| 1980 - W. Saltzberg      | 1934 - H.M. White       |
| 1979 - R.A. Johnson      | 1933 - J.W. Sanger      |
| 1978 - A.W. Gilliland    | 1932 - J.W. Sanger      |
| 1977 - E.F. Glass        | 1931 - R.W. McKinnon    |
| 1976 - C.R. Bouskill     | 1930 - C.H. Attwood     |
| 1975 - D.R. Grimes       | 1929 - C.H. Attwood     |
| 1974 - G.A. DePauw       | 1928 - W.G. Chace       |
| 1973 - C.R. McBain       | 1927 - Wm. Aldridge     |
| 1972 - S. Barkwell       | 1926 - D.L. McLean      |
| 1971 - R. Hood           | 1925 - C.H. Fox         |
| 1970 - J.D. Adam         | 1924 - A.J. Taunton     |
| 1969 - L.W. Blackman     | 1923 - A.A. Young       |
| 1968 - F.M. Fowler       | 1922 - D.A. Ross        |
| 1967 - R.C. Sommerville  | 1921 - M.A. Lyons       |
| 1966 - R.T. Harland      | 1920 - M.A. Lyons       |
| 1965 - S.J. Borgford     |                         |

*continued from page 6, Licensing of Engineers*

are flowcharts showing the process in graphic form. This also allows potential immigrants to understand the process before they set out to Manitoba [September 2009]

APEGM remains dedicated to continual improvement, including streamlining all processes and making the documentation more accessible to all who seek it. We provide as much help as we can to help internationally educated people navigate the process – but every process takes some time to complete – and each applicant deserves a fair chance. Some files will take longer than others – but that is an indication that each situation is dealt with fairly and correctly – and should not be construed as an attempt to delay people from joining our profession.

In summary, we are a regulatory body, and our primary function is maintaining public safety. As with any human endeavour, we understand that we cannot please everyone; though we remain open to constructive input from all. As a self-regulating profession, we will continue to improve and to do what is right for the public of Manitoba, and ask only that our due process be respected.

*J. Woods, P.Eng.  
President*

# Happy Birthday APEGM!

*You're invited to a Birthday Party for APEGM  
as we celebrate our 90<sup>th</sup> Anniversary.*

*March 25, 2010  
Come and Go Party  
2:30 - 7:00 p.m.*



**Tour the New  
APEGM Office**

**Served  
Refreshments**

**Live Music**

**Great Prizes**

**Activities &  
Entertainment**

**Birthday Cake**

*Event open to the general public*

**APEGM Office  
870 Pembina Hwy, Wpg., MB**



*Past Presidents and Registrars will be able to load you up with meaningful thoughts about the purpose of APEGM and its evolution but I would like to share some trivia as light reading plus a significant thought:*

*I have so many memories, it's hard to select some to share with you, but I remember when I first started, the Association occupied leaky offices in the old Chamber of Commerce building on Lombard, and when it rained we had to put buckets around to catch the rain water. Now the Association has its own newly designed modern facility that better reflects the image of its members. From humble beginnings grew a well respected organization.*

*Also, in those early days the AGM Committee held wine tasting sessions for the committee and staff in order to choose the best wine for the Annual Meeting. (Are you taking notes Angela?) I remember on one such occasion, having a few samples on my desk when an immigrant engineer came into the office to enquire about the registration process. He did become registered - quite quickly I believe.*

*Mostly, and more significantly, I will always remember, with great pride, the enthusiasm of immigrant engineers & geoscientists who I helped through the assessment process and who proved themselves to be worthy members of APEGM. Their determination and perseverance were an inspiration to all.*

*Congratulations APEGM on your 90th Anniversary.*

J. McKinley,  
APEGM Employee 1976 - 2008

## *Thoughts on the Ninetieth*

### **Birth of APEGM**

I find it interesting that the Engineering Institute of Canada established a committee in 1919 to prepare model regulatory legislation and by 1920 five provinces had an engineering act. They knew how to get things done in those days. Today it would be a one-year process to get a few words changed.

### **Act Revisions**

It is interesting that while there was a Civil Engineers Act in 1896, that was repealed in 1913 and there was no regulatory legislation for engineering in Manitoba until the 1920 act came into effect.

### **Office Buildings**

When the decision was being made to locate at 850 Pembina Highway in 1987, I remember thinking that with the proximity the consulting engineering offices and Manitoba Hydro we would be very close to the centroid of engineers in Manitoba.

When I attended the first meeting of the Council in the building at 870 Pembina it was the sixth premises in which I had attended an APEM/APEGM meeting.

### **Office Technology**

I recall that when I first started working for the Association I suggested that I was going to computerize and get rid of the boxes of cards that were essentially the database and computerize. It took me six years.

I can recall the lengthy discussion in 1988 on the issue of whether to purchase a fax machine. My recollection is that the realization that the recipient had buy the paper tipped the balance.

### **Inclusion of Geoscientists**

The development that tipped the scale on the Act change that included geoscientists was the Bre-X scandal.

### **Best Happenings**

Acquisition of the naming rights for the APEGM Design Studio, "Room 229" in the Engineering and Information Technology Complex at the University of Manitoba.

Inclusion of "The purposes of the association are to . . . advocate where the public interest is at risk" in The Engineering and Geoscientific Professions Act in 2004. ■

- A one room APEM office in the Avenue Building on Portage Ave., shared by a secretary, a part time registrar and used for committee meetings that were held in the evening; to an office in the former Great West Life Building on Lombard Ave., shared with the Manitoba Association of Architects; to an office in the Royal Trust Tower on St Mary; to an office at 850A Pembina Hwy; to the current expansive offices at 870 Pembina Hwy.
- The Code of Ethics initially adopted 1 November 1921, revised 6 April 1935, and 23 September 1959, subsequently rewritten and adopted 28 February 1968, revised 13 April 1992 and 9 May 2000.
- The establishment of an Admissions Review Board in 1967 as a result of a recommendation to Council by the Board of Examiners, which evolved into the Experience Review Committee in 1994.
- The beginnings and operation of the Practice and Ethics Committee in 1970, which evolved into the Investigation Committee in 1992.
- The development of Salary Guidelines in 1975, to assist employers to establish equitable salaries when hiring Professional Engineers, and to assist engineering graduates to know what level of salaries to expect when seeking employment. This was a revolutionary undertaking for APEM at the time and caused much soul searching by the Council and Legal Counsel.
- The establishment of a APEM / MANSCELT Liaison Committee in 1977.
- A review of the Professions in Manitoba in the mid 1970's by the Manitoba Government, led by Saul Cherniak, MLA - which gave APEM a encouraging endorsement.
- Revisions of the Act to incorporate the regulation of Geoscience with Engineering under one umbrella, The Engineering and Geoscientific Professions Act. ■

C. R. Bouskill, P.Eng.  
APEGM President 1976

D. Ennis, P.Eng.  
Executive Director & Registrar

*continued from page 5, Executive Director's Message*

possible embarrassment. I felt the energy generated by the potential pride of a real-life project”.

One day at the office, all of his young guy truth and energy interfaced with some old guy wisdom. The young guy said to himself: “. . . but I know my design will work effectively with only one bolt in this connection”. His supervisor (the Old Guy) said: “We always use two bolts. That’s the way we’ve always done it”.

The potential of a collision between the two was obvious, but here’s the best part: instead of leaving it there, the supervising engineer (the Old Guy) said to the young engineer “. . . you go find out why we always use two bolts”. So the young engineer went to the site and started asking different workers: the steel

fabricator, the site foreman, the inspector, and construction workers. He came back satisfied that the 2-bolt methodology was not founded in laziness, inefficient design, or years of apathy. Rather, it was the mix of code experience, load calculations, and construction steps. A little bit of old guy wisdom was passed along without extinguishing the youthful, enthusiasm, and energy of the young guy.

Here’s one for the old guys – make an effort to hang out with some young guys. It will keep you young and open to new ideas. Invite the young professionals (men & women) out for a beer (or Starbucks latte). Find out what they’re up to in their spare time. Take time to show genuine interest in their professional and personal growth. Our professions will be stronger because of your effort. I recently bought a custom-built bike from Natural Cycle in the Exchange. I met an

EIT member at the shop the day I ordered my bike. It has been a fun connecting point with many young professionals who are bike enthusiasts.

**WISE MEN AND WOMEN**

As we celebrate the 90th anniversary of our Association, I want to remind everyone that our professions stand on the historic wisdom and honorable conduct of men and women who might be considered “old guys”, but we move forward on the energy, truth, and vision of the “young guys”, and it doesn’t really matter whether you consider yourself an old guy or young guy.

Your feedback is invited and always welcomed. If you have any thoughts on anything you read in the KP, please email me at gkoropatnick@apegm.mb.ca or message me through Facebook. ■

APEGM is asking members to promote the **Call for Nominations** for the following APEGM awards to be presented at future Annual APEGM Awards Dinners:

- Certificate of Achievement
- Early Achievement Award
- Member-in-Training Award
- Honorary Life Membership
- Leadership Award
- Merit Award
- Outstanding Service Award

If you are aware of **Manitoba engineers or geoscientists** who are deserving of an award, please submit your completed Nomination form, available through the APEGM office or website.

Your help in this regard is pivotal to the ongoing success of the awards program, and to ensure that Manitoba’s most worthy

professional engineers and geoscientists are recognized for their contributions to our professions and society.



[www.apegm.mb.ca](http://www.apegm.mb.ca)



## The Importance of Water to the Development of Manitoba

### Introduction

As a means of celebrating the role of engineering and geoscience over the 90 year history of the APEGM, the Heritage Committee is writing a series of articles that link water to the economic and social development of the province. Elsewhere in this copy of the Keystone Professional is a short article on the foundations of the Association. This first article describes the relationship between commerce and water in the province before the Association was formed. Later articles will focus on other aspects of the importance of water to the development of Manitoba after the Association's launch.

The development of Manitoba has been directly linked to commerce from the origins. Prior to becoming a province it was part of the Hudson's Bay Company lands. The selection of the location for Upper Fort Garry, which developed into the city of Winnipeg, was because of its location at the confluence of the Red and the Assiniboine rivers. Travel over land in those days was tedious and

slow and the waterways became the preferred form of transportation. The city fathers were merchants and as such very concerned about how goods were shipped to the fledgling city. Additionally, Lake Winnipeg was developing a thriving commercial fishery supplying fish not only to Manitobans, but to the US Border States as well. Clearly commerce was a driving force in the young city of Winnipeg in the second half of the 19th century.

### The Red River and Commerce

The Red River was the major transportation route for both people and goods before the arrival of the railways in 1877. Trade in particular was subject to the availability of efficient and competitively priced transportation services. The final leg of the route to Winnipeg was up the Red River.

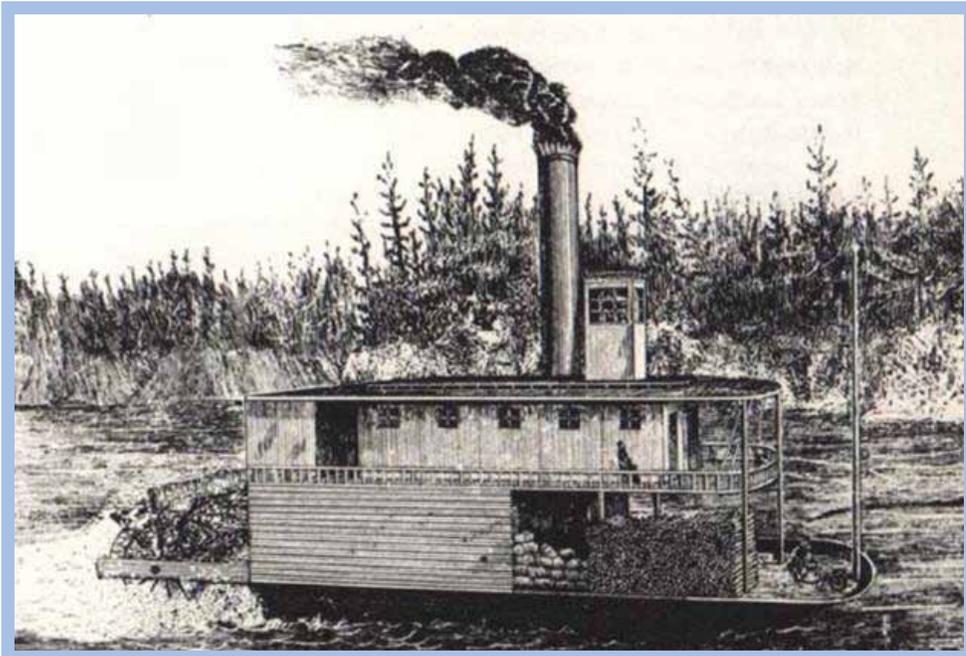
The first steam boat on the Red River was the SS Anson Northrup. It was a sternwheeler named after its Captain, who was anxious to secure the prize money offered in 1859 by the St. Paul Chamber of Commerce to the

first person bringing a steamboat to the Upper Fort Garry settlement. The steamships' arrival in Winnipeg was a big event and started the quest for reducing freight costs which the city's merchants were keen to do.

The cost of freight drove competition between the many steamboats that plied both the Red and the Assiniboine. There are stories of races between the steamboats from Winnipeg to the US border and on to St. Paul Minnesota that show competition to lower freight costs was fierce in the early days of the Province.

Ironically it was by steamship that the first railway train was to arrive. Transported by barge down the Red River, the Countess of Dufferin arrived in Saint Boniface on October 8, 1877. The locomotive, along with six flatcars and a caboose, was loaded onto barges at Fisher's Landing, Minnesota and propelled by the SS Selkirk, they were shipped down the Red River to St. Boniface.

The railways were to replace the rivers as the preferred route for goods transportation, but the steamboats



S.S. Anson Northrup  
Source: Archives of Manitoba

were a regular sight on all Manitoba rivers till well past the start of the 20th century. There are records of over 100 steamships that served the transportation needs of the prairies all the way to the Rockies.

## Lake Winnipeg and Commercial Fishing

Until 1880 only a small-scale local market-oriented fishing industry was found on Lake Winnipeg. Fishing was conducted mainly by First Nations and from 1875 on by Icelanders. The

Icelanders were immediately drawn to fishing the lake, learning the skills of ice fishing from First Nations who had been fishing year-round for centuries.

From 1880 onwards these were displaced by export oriented companies. The first successful commercial fishery began in 1882 when Reid and Clarke came from Georgian Bay to operate one sailboat on Lake Winnipeg and brought their catches to Winnipeg. By 1887, a total of 65 sailboats and seven tugs and barges were operating on Lake

Winnipeg. That year 2.5 million pounds of fish were harvested, worth \$114,000. The rapid development of the commercial fishing industry was a result of production for the American market. Reid and Clarke, one of the major firms, was exporting 83 percent of its yields to the United States.

In October 1888 the Manitoba Daily Press reported trade on Lake Winnipeg for export will be close to \$300,000. Some 1000 railway cars of freight had been shipped from Selkirk including 40,000 railway ties, fish, and lumber.

New settlements, steamship harbours, and fish stations tended to locate on islands. Often the fishermen would set up a camp and fish the local area Selkirk Island, Matheson Island, George Island, Moose Island and Spider Island became resource hamlets. Reserves provided sites for sawmills and fish stations such as Grand Rapids and St. Peters Island adjoining Selkirk which was at the head of navigation of Lake Winnipeg.

Railways did not displace boats on Lake Winnipeg and steam-boating operated well into the 1930's. Clearly,



An undated photo of a fishing camp at burnt Island, likely Lake Winnipeg.  
Source: Archives of Manitoba

post-1885 steam-boating was not based on long-distance freight but was a part of extracting resources. The HBC allowed small capitalists like McArthur and Robinson to take over steam-boating. Methodically, William Robinson bought up independent fish interests on both lakeshores and established a steamboat freight system to relay fresh fish to new freezing plants in Selkirk.

During the 1920's and 1930's sailboats were replaced by gas powered boats giving fishermen increased mobility. By the 1950's diesel engines were prevalent. The larger boats on the lake were colourful whitefish boats measuring 12 m or more in length.

Today, the Lake Winnipeg commercial freshwater fishery is the largest in Canada west of the Great Lakes. Most of the fish are marketed through the Freshwater Fish Marketing Corporation to consumers in western Canada, the United

States and Europe. The average value of the catch is over \$19 million per annum.

## The Impact of St Andrews Lock and Dam

It was the opportunity for commerce that drove the creation of the St Andrews Lock and Dam (SALD). In the late 1880's, the City of Winnipeg

lobbed to improve navigation to the north on the Red River. This effort brought about construction of the St. Andrews Lock and Dam. This was a significant engineering achievement and the only lock on the Prairies although it was finished 10 years before the Association was founded. SALD was officially opened by Prime Minister Sir Wilfred Laurier in 1910.

The impact of the lock was profound. It enabled river traffic to be loaded in Winnipeg rather than Selkirk and effectively enabled the city to grow into a supply hub for Northern Manitoba, a role that had theretofore been Selkirk's.

Designed and constructed over the period from 1900 to 1910 under the supervision of A.R. Dufresne, E.A. Forward and H.E. Vantelet, this facility controlled the level of the Red River and permitted boat traffic to pass to and from Lake Winnipeg. The design of the SALD structure took a great deal of thought and ingenuity. A permanent dam structure could not be constructed because it had the potential to cause an ice jam during the spring floods, which would cause serious flooding upstream in Winnipeg.



Postcard of the Winnitoba near the St. Andrews Lock and Dam, circa 1910.  
Archives of Manitoba, L.G. Wilson Collection

In the end, a style of dam was chosen which could be placed in the water during the navigation season and removed during the winter months. The “Camere” system is the only known use of this type of dam design outside Europe. Invented by French engineer M. Camere, this type of dam was popular in Western Europe in the late nineteenth century. The lock uses automatic self-balancing valves, which were the largest of this type in the world at the time. A bascule lift was added later to accommodate tall ships.

The project proved to be a significant challenge. It was initially undertaken by a Mr. T. Kelly who was responsible for the excavation. This was unsophisticated by today’s standards. Unskilled labourers earned 15 cents per hour, this rose to 25 cents for skilled workers. Progress was slow and by 1905 the site was referred to locally as “Kelly’s Hole”. The consulting engineer, Mr. H.E. Vantelet, designed the Camere curtains and operating machinery.

In modern times, after over 80 years of service Wardrop Engineering Inc. was retained to provide engineering services for the Public Works and Government Services Canada (PWGSC) who began the task of rehabilitating the structure. Part of the task involved the selection and application of a coating system as the final stage of a \$25 million reconstruction project for the structure. Areas to be coated were the six 38.6-m river spans and the dam frames above the water line along with the single 38.6-m overland span, which is adjacent to the east approach. These seven spans cover a length of 283 m and the structural steel surface area that was metalized is in excess of 35,300 m<sup>2</sup> (380,000 ft<sup>2</sup>).

To give a sense of the scale of the lock and the amount of river travel the photo below shows the Winnitoba (1) at the SALD in 1910. The **Winnitoba** was built in Winnipeg, along with her sister ship the Bonnitoba, by the Hyland Navigation Company. Launched in 1909 it was one of the largest and grandest ships in Manitoba waters. The 57-metre long ship was different

than most on the river as it was propelled by two side “paddle wheels”, opposed to a single large wheel astern. She could carry 1,500 to 2,000 passengers for day excursions, with 225 sleeping berths for longer trips, and still had space for 35 carloads of freight.

This was a period when many ships powered by steam traveled the inland waters of Manitoba. The **Winnitoba** was intended for the summer “excursion” or passenger service down the Red River from Winnipeg to Hyland Park. These outings were often planned by local companies for the amusement of their employees and their families.

The normal course of events was for the **Winnitoba** to travel down the river to a designated park and there the passengers would disembark and picnic until the evening. On the return voyage home, as an orchestra played, a dance would be held on the boat’s deck. A barge was sometimes lashed alongside, if there was not enough dancing room for all passengers. The **Winnitoba** was not in service for long, on a September morning 1912, the **Winnitoba** burnt at its moorings, in mysterious circumstances, and the hulk sank to the bottom of the harbour. Destroyed at the same time were two barges plus the Hyland wharf and pavilion.

Turning back to commerce, the SALD enabled Winnipeg to start supplying the North without the added expense of transshipping at Selkirk. Over the next sixty years steamboats were the regular transportation on Lake Winnipeg for Northern Manitoba. Perhaps best known is the S.S. Keenora which was built in 1897 and now has a concrete throne at the Selkirk Marine Museum.

Those who travelled aboard the Keenora in the past, fondly remember her days as a proud lake steamer. In the 1920s, a very popular dance hall was built on the property presently just north of the perimeter. The S.S. Keenora would transport

passengers up and down the Red River, bringing them for an evening of dancing and socializing. In later times the regular route started from Winnipeg, with a turnaround point located at the northern end of Lake Winnipeg, at Warren Landing on the Big Mossy Point. From Warren Landing the passengers and cargo were transferred to a smaller steamboat, which covered the last 30 kilometres (20 miles) to Norway House.

The role of the rivers and lakes of Manitoba clearly had a significant impact on commerce in the province in the period before we had an Association. There was also a lot of activity that would now be conducted by engineers and geoscientists. Future articles will look at areas such as water supply, water treatment, flood control, and hydro electric development. ■

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Reference:  
Information from articles by Brian Hubner

*Manitoba is an “engineered province”. With a temperatures range of over 80C, just about every type of atmospheric disturbance from blizzards to tornadoes, one of the lowest population densities in the world, a major floodplain, and one of the largest hydro-electric potentials in Canada, the very existence of Manitobans and the success of our future economy depends on a strong engineering community. And a strong engineering community is made possible in Manitoba by APEGM. In a very real sense, APEGM is responsible for both the history and future of our province.*

D. Ruth, PEng., Ph.D.,  
Professor & Dean, Faculty of Engineering,  
University of Manitoba

## LOOKING FOR A WAY TO SPEED UP YOUR CITY OF WINNIPEG BUILDING PERMIT? G. Schaub, P.Eng.

The City of Winnipeg is introducing a pilot project this year in an effort to improve the coordination and turn-around time for Development and Building permits. The following information is taken from the City's website:

- Building Permits for Industry Professionals
- Certified Permit Coordinator Program

The Certified Permit Coordinator Program was developed to facilitate issuance of Building Foundation Permits for Certified Permit Coordinators. The Program will be implemented through a trial phase in 2010.

The scope of Building Permit Applications that will be considered for this program shall be limited to Single Storey Buildings (no basement) within the following specific Manitoba Building Code groups:

- Group D – offices
- Group E – retail stores
- Group F2 – medium hazard industrial
- Group F3 – low hazard industrial

The program has been designed to provide certification to applicants through five ½ day training sessions followed by a final examination.

Following are the Certified Permit Coordinator Program Training Modules. These modules have been

developed with a goal of providing a working knowledge of various City approval processes, building permit requirements and other considerations involved in the land development and building permit application processes.

- Training Module 1 – City Governance & By-laws
- Training Module 2 – Site Selection & Development Approval Process
- Training Module 3 – Public Approvals
- Training Module 4 – Permit Application & Fast Track Foundation Process
- Training Module 5 – Program Framework & Certification

This writer recently attended the course as part of the pilot project, along with attendees from all facets of the design and construction industry. Clearly, all parties agree that there is room for improvement in the current permitting process, particularly in the areas of overall timeframe and coordination of requirements. Furthermore, the potential benefits to building owners, contractors, design professionals and Winnipeg's reputation as a place that is "open for business" are very important, if not essential.

The pilot project is scheduled to start in 2010 and all sides are hoping for positive results. Assuming that the program is successful, the intent is

that it would be expanded in the future to include other building groups and building sizes. If you are interested in obtaining more information on the program or would like to take the course to become a Certified Permit Coordinator, access the City's website at [http://winnipeg.ca/ppd/contractor\\_coordinator.stm](http://winnipeg.ca/ppd/contractor_coordinator.stm) ■

### *In Memoriam*

*The Association has received, with deep regret, notification of the death of the following members:*

*Douglas E.M. Allen  
Craig D. Forsyth  
Lance A. Kennedy  
John A.S. Westdal*

continued from page 7, Thoughts on Design

do occur on a regular basis. Failure is a part of innovation, which in turn is driven by design. And design is what engineers do. Design of parts, concepts, processes and systems, both physical and operational, is the reason our profession exists. From time to time a *Toyota recall* will occur to shake our confidence. We all need to strive to make certain the next *recall* isn't based on something we have done. ■

*On membership, first it was my requirement but now it is my belief.*

*In my view the work of geoscientists in our society has always been paramount to the interests of the public at large. It took some provincial associations longer than others to realize the implications of geoscientific endeavours. I suppose the BreX incident was the flare that drew the attention of the greater masses.*

R. M. Lemoine, P.Geo.  
APEGM Member 1999 - President

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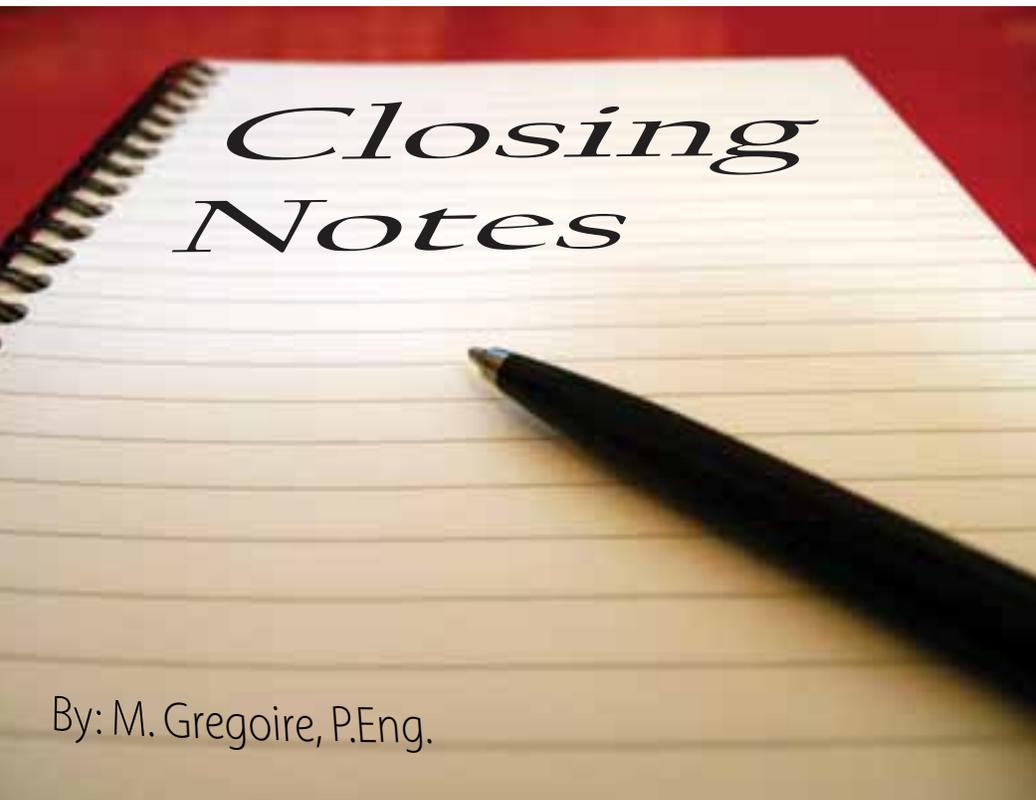
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By: M. Gregoire, P.Eng.

## Rule Change

If there's only one year that has stuck in your head after reading this special edition of the Keystone Professional, it is undoubtedly 1920, the year that the first Engineering Act was implemented. It will not be a far stretch then, for you to remember the year that APEGM adopted its first Code of Ethics, as it was the very next year.

That's right, in 1921, while still in its infancy, APEGM brought into effect a list of duties to which all of its members would be bound.

The first element of that version of our Code of Ethics that sticks out is the extensive use of the masculine words 'he' and 'his'. This shouldn't come as a surprise, since Women had only finally obtained the right to vote in 1916, five years prior. If this language were presented today, however, it would dutifully be rejected for its unethical use of language.

Of course, since Geoscientists were not added to APEGM's Act until 1998,

they are also not referenced in the 1921 Code. There are other, more fundamental, differences than simple replacement of pronouns and the addition of Geoscientists, though, when comparing the original Code with our current one.

The language was much more specific in 1921. Each canon appears to attempt to describe a particular scenario. One wonders if these scenarios occurred regularly at the beginning of the 20<sup>th</sup> Century and shaped the climate that pushed for the ascension of our first Act. The current Code, adopted by Council in 2000, has much more generalized language that allows for interpretation but also manages to establish a working frame for many more scenarios.

What are the fundamental differences, though, in terms of what was/wasn't allowed in 1921 and 2010? The different layouts make comparison more than a straightforward task. The original code divided its 15 canons into

three categories; To the State, To His Client, and To His Fellow Engineer. Some of the original canons have a specific counterpart in the 35 canons we currently have and two of the 1921 canons are covered by one of our current ones. This hints at the reality of the ever increasing number of prescribed duties of a Professional Engineer and Professional Geoscientist.

There is one canon from 1921 that is an interesting one. Canon 10 states that engineers "... shall not accept employment by a Client while a claim for compensation ... of a fellow Engineer previously employed by the same Client ... remains unsatisfied ...". There is no equivalent for this Canon in the current Code of Ethics, and upon examination one can see why this might be the case.

If you as a professional are approached by a client to complete a project initiated by a fellow professional and this Canon is in force, you must decline. But if the originally involved professional was at fault in the original contractual relationship, the client, and possibly the public as a whole, will be adversely affected because no engineer can complete the work. Moreover, the reasons for the termination of the original contract are very likely of a contractual nature and APEGM's professionals should not be forced to become involved in legal matters to which they are not a party.

All of these differences in wording, language, and elimination/creation of canons illustrate that Ethics is a moving target. What was considered ethical at one point in time may not be ethical at another given point in time. The same holds true when comparing ethics from one culture to another, as well. As Heraclitus said, "Nothing endures but change." ■

Detach page for posting

# The Brown Sheet

## APEGM Night at the Theatre

In association with APEGM's 90th Anniversary, APEGM will be hosting two award-winning plays presented by NewStage Productions of Winnipeg that were performed at an International One-Act-Play Festival in the UK, May 2009.

### You Will Write, Won't You?

A senior teen living in a remote Saskatchewan farming community tries to overcome her family's and her boyfriend's resistance to her plan to enroll in the Writers' Institute in Banff rather than stay at home and work on the farm for the summer.

### Sudoku Fever

A mildly off-the-wall comedy in which a family in Minnedosa try to prevent their daughter from enrolling in Mechanical Engineering at the University of Manitoba. The Sudoku room has a hidden meaning for this family.

Tickets available in advance through the APEGM office and at the door. Contact Angela Moore at 474-2736 or amoore@apegm.mb.ca for more information.

Date: March 22, 2010

Time: 7:00 - 9:00 p.m.

Cost:

\$10.00 In advance

\$15.00 At the door

Location: The Park Theatre,  
698 Osborne St., Winnipeg,  
MB

## APEGM's 90th Anniversary 'Birthday Party'

You are invited to take part in a come-and-go open house 'Birthday Party' for the Association of Professional Engineers and Geoscientists of Manitoba as they celebrate their 90th Anniversary.

Come enjoy live music, activities, tour of the new office building, great prizes, and don't forget the Birthday Cake!

Refreshments will be served.

Enter your business card for some great prizes!

Date: March 25, 2010

Time: 2:30 p.m. - 7:00 p.m.

Cost: Complementary

Location: The APEGM  
Office, 870 Pembina Hwy.,  
Winnipeg, MB

## Access in the Age of Excess

In an age of instant access to "information," it is easy to assume that one is informed, learned and knowledgeable. However, because of the glut of information sources and apps for everything, how can one know if the information is credible and current? How can one be sure that they know HOW and WHERE to search for the best information?

Leah Jamieson, Dean of the Purdue Engineering school, 2007 has said that "the half-life of engineering knowledge is between 2 to 7 years." How can you keep up and also contribute to the growing body of engineering information?

Many newer journals are "open access", which the Public Library of Science (PLOS) says that authors and copyright holders grant users "free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly," and that a complete version of the work is available electronically in perpetuity.

For more information, see the APEGM website.

Date: March 30, 2010

Time: 7:00 - 8:30 a.m.

Cost:

\$5.00 In advance

Location: The APEGM  
Office, 870 Pembina Hwy.,  
Winnipeg, MB

## 9th Annual Better Buildings Conference

Find out about:

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3. Email your completed registration form. Print, scan, and email back to [info@betterbuildings.org](mailto:info@betterbuildings.org)

See [www.betterbuildings.org](http://www.betterbuildings.org) for more information.

Date: April 13 -14, 2010

Time: 7:30 a.m. - 5:00 p.m.

Cost:

\$250.00 member rate

\$300.00 non-member

Location: The Winnipeg Convention Centre, 375 York Ave., Winnipeg, MB

## CCWESTT 2010 Conference

The Canadian Coalition of Women in Engineering, Science, Trades, and Technology (CCWESTT) acts as a united voice for women across Canada in SETT (Science, Engineering, Trades and Technology) careers. Established in 1987, CCWESTT has grown to include approximately 25 member organizations and represent more than 20,000 individuals. The goals of the organization can be summarized to include: sharing success stories, disseminating information, and providing consultation on pertinent policy issues. A conference provides the perfect opportunity to address all of CCWESTT's goals.

Approximately 400 attendees including women, men, students, academics, entrepreneurs, and professionals from the public and private industries will enjoy keynote speakers, professional development workshops, networking opportunities, panel discussions, presentations and fun activities. Topics for the two day conference will range from examining the growth and development of SETT professions, to opportunities to develop the variety of skills professionals require to advance their careers.

For more information, see the conference's website at [www.cctest2010.ca](http://www.cctest2010.ca)

Date: May 13 - 15, 2010

Time: 8:30 a.m. - 5:30 p.m.

Location: The Fairmont Hotel, 2 Lombard Place., Winnipeg, MB

## Making Links Engineering Classic Golf Tournament

Proudly Sponsored by Great West Life.

The first 220 registered golfers with accompanying payment will play. Entries and payments are to be submitted to the APEGM office by 4:30 p.m. on Friday, May 21, 2010. Register Early - has sold out the last 3 years!

Contact the Angela Moore at 474-2736 ext. 233 for more information, sponsorship opportunities, and registration.

Date: June 17, 2010

Time:

11:00 a.m. BBQ Lunch

6:00 p.m. Dinner (approx.)

Cost:

\$195.00 Individual

\$750.00 team of 4

Location: The Links at Quarry Oaks, Steinbach, MB

### New Members Registered November 2009, December 2009, & January 2010

|                   |                 |                    |                 |
|-------------------|-----------------|--------------------|-----------------|
| N.H. Aroutzidis   | A.W. Downing    | D. Maximets        | D.R. Rinas      |
| J.S. Ash          | D.C. Dyck       | M.L. McMillan      | G. Rouby        |
| H.A. Asuncion     | S. Farzam       | M.D. Miller        | W.A. Rutherford |
| P. Belzile        | S.T. Fengler    | K.B. Morgan        | K.J. Seguin     |
| P.J. Bredenkamp   | S. Fortin       | R.D. Morrison      | M. Slijepcevic  |
| T.J. Bremner      | C.J. Fraser     | J.W. Mulvihill     | M.J. Smith      |
| B.A. Briggs       | M.A. Froese     | J.C. Nadeau        | S. Somo         |
| M.J. Brown        | L. Fu           | A.G. Nernberg      | R.C. Stevenson  |
| M. Brzezowski     | K.S. Gerrish    | A. Neumann         | R.A. Stranges   |
| B.R. Buettner     | W.L. Gerszewski | D.R. Nicholson     | B.H. Taylor     |
| D.P. Bunner       | P.G. Golden     | B.R. O'Connor      | V.N. Tran       |
| C.J. Buzunis      | S.G. Guangul    | S.S. Okonkwo       | G.L. Tranquilla |
| M.M. Cantor       | J.A. Guerrero   | B. Omann           | S. Tremblay     |
| M.A. Carboni      | J.M. Gunn       | S.V. Ott           | C.J. Valente    |
| J. Chang          | J.M. Hewton     | M. Padron Elosequi | T. Verhey       |
| V. Chatoorgoon    | W.A. Heywood    | G.S. Page          | I.R. Vesterback |
| J.L. Christiansen | M.A. Hoque      | K. Patching        | X. Wang         |
| R.J. Clissold     | Y.L. Huynh      | C. Patenaude       | D.T. Wiebe      |
| M.H. Contreras    | R.J.A. Ihme     | D.P. Patman        | D.D. Williams   |
| G.K. Cook         | C.I. Irioudo    | J.D. Patterson     | K.E. Wiseman    |
| R.T. Cunningham   | D.J. Kondics    | S.S. Paul          | A.M. Young      |
| S. Desrocher      | Y. Li           | A. Peshkepia       | G.R. Yule       |
| M.F. Dobran       | Y.Z. Li         | B.A. Radstrom      | Q. Zhou         |
| M. Dolzadelli     | R. Madugula     | R.V.A. Rea         |                 |
| J.J. Donkersloot  | J.S. Magus      | S.M. Rebelo        |                 |
| P.A. Douel        | K.R. Marsden    | B.G. Richardson    |                 |

### Licenses Enrolled November 2009, December 2009, & January 2010

K.W. Leonard

### Members-In-Training Enrolled November 2009, December 2009, & January 2010

|                      |                        |                        |                |
|----------------------|------------------------|------------------------|----------------|
| M.E. Ahmed           | I.J. Jansen Van Vuuren | M. Mohaddes Khorassani | R.F. Stanescu  |
| A.R. Alfonso-Herrera | C.L. Kamp              | M. Nabipaylashgari     | D.A.R. Taylor  |
| N. Aluloski          | J. Kong                | M.J.R. Nesbitt         | J.H. Toll      |
| I. Covaliov          | K. Mahmood             | D.J.M. Potter          | M.N. Uddin     |
| B.R.T. Dube          | R. Meng                | J. Salanguit           | C.M.I. Venturi |
| S.A.M. Fahmy         | C.A. Milligan          | J.A. Saldivar Vega     | L.L.R. Winter  |
| T.L. Findlay         | I. Minenkov            | V.I. Sarkijarvi        | M.J. Zarnowski |
| T.G. Fitzpatrick     | L.A. Misura            | C.B. Singh             | W. Ziomek      |

### Certificates of Authorization November 2009, December 2009, & January 2010

|                                   |  |                                       |
|-----------------------------------|--|---------------------------------------|
| AATech Scientific Inc.            | Environ EC (Canada) Inc.                   | Stevenson Engineering Limited         |
| AJG Exploration Ltd.              | GBM Consulting Inc.                        | Tracer Industries Canada Limited      |
| ALLNORTH CONSULTANTS LIMITED      | Hewlett - Packard (Canada) Co.             | Trek Geotechnical Inc.                |
| Almita Manufacturing Ltd.         | J.D. Mollard and Associates (2010) Limited | Tridyne Projects Corporation          |
| Asher Engineering Ltd.            | Joel Rheume inc.                           | Trylon TSF Inc.                       |
| Brian Isherwood & Associates Ltd. | Letico Inc.                                | Vanderwesten Rutherford Mantecon Inc. |
| Clean Energy Developments Corp.   | Makami Engineering Group Ltd.              | WD Partners, Inc.                     |
| Counterpoint Engineering II Inc.  | Nisku Engineering Ltd.                     | WESA Inc.                             |
| Counterpoint Engineering Inc.     | PE Pharma Inc.                             |                                       |
| Engineers Northwest, Inc., P.S.,  | Pinchin Environmental Ltd.                 |                                       |

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