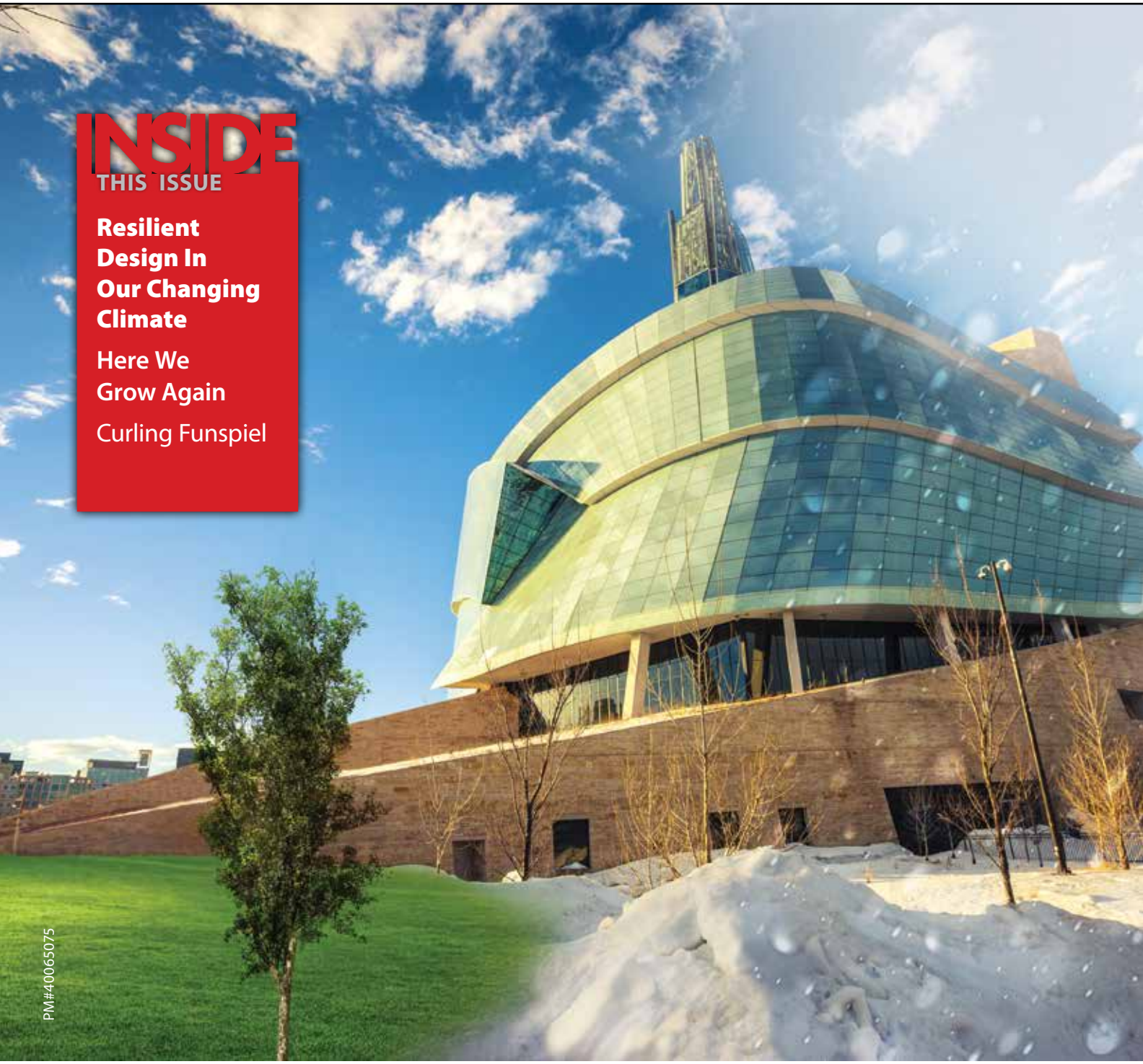
The official publication of Engineers Geoscientists Manitoba

THE KEYSTONE PROFESSIONAL

SPRING 2018



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The Keystone Professional Committee would like to hear from you. Please email your comments to: *GKeatch@EngGeoMB.ca*. Members are also encouraged to submit articles and photos on topics that would be of interest to the membership.

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ENGINEERS GEOSCIENTISTS MANITOBA

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FEATURES

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Jonathan Epp, P. Eng., FEC, President 2017-2018

Marriage & **Ethics**

One of the side effects of being married just over ten years and having four children, is that stuff begins to accumulate around the house. Lots of items, plus lots of hands moving them around, sometimes leads to items being tucked into far away corners or places one wouldn't expect. While not a great organizational system, it does lead to the occasional moment of unexpected joy when you discover some long forgotten and misplaced item.

And it was in one such moment that I recently discovered a marriage advice book that I had not read or looked at since I was first engaged. As I flipped through and read portions of it, I couldn't help but smile/cringe remembering how many misconceptions I would have had on first reading it. It was a great advice book, I was well intentioned and eager to learn, and yet I had no idea what I was getting myself into. It was, fundamentally, a gap between concept and practice.

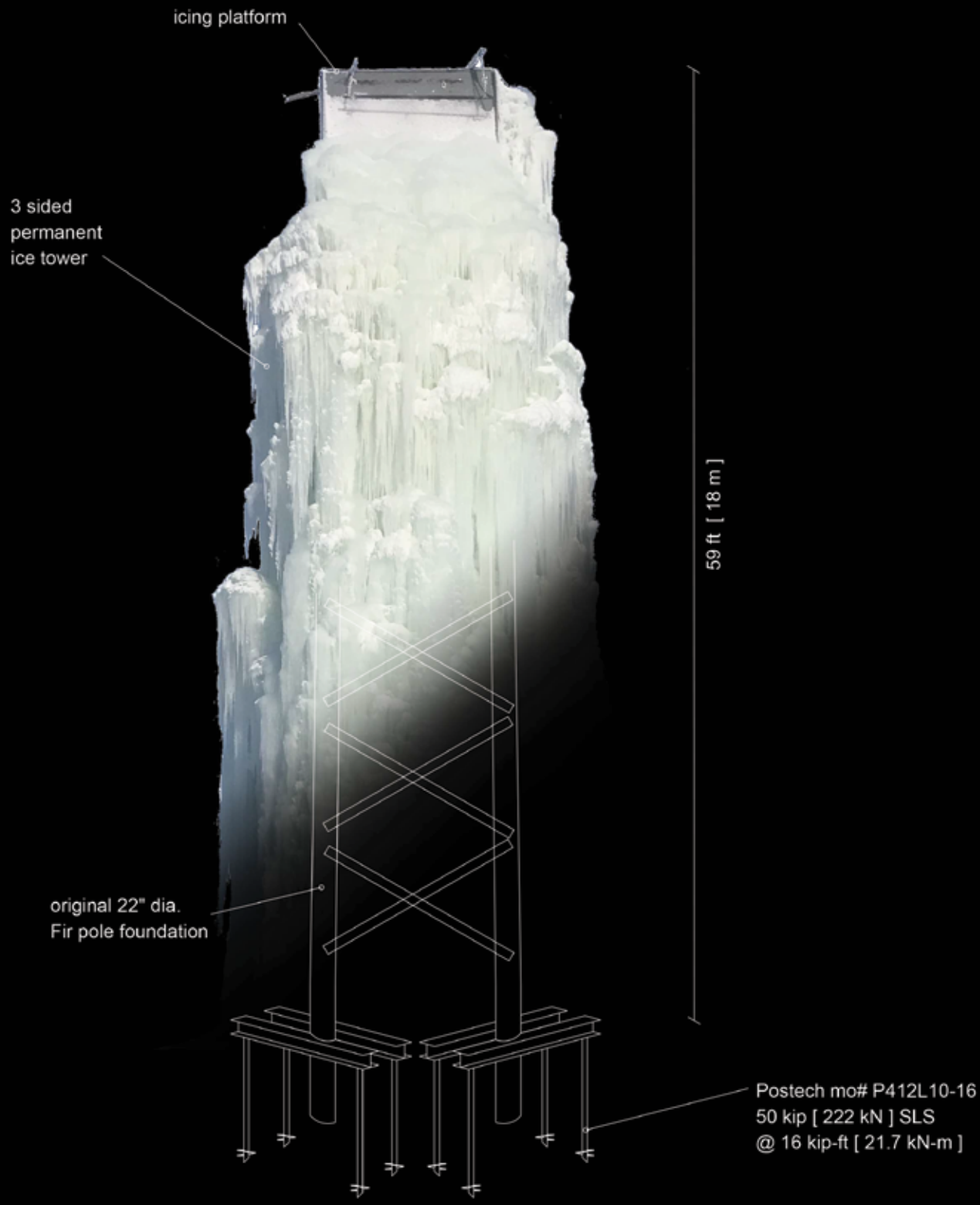
Lately, our Code of Ethics has been on my mind. When I look back to when I first wrote the ethics exam that would allow me to practice, I can't help but see some parallels to when I first read that marriage advice book. We take the ethics exam before we have a true understanding of what it means to practice. We are well intentioned and we likely see the correct answers as startlingly obvious, because we have yet to experience the complexities of those situations first hand.

Ethics are further muddled by their qualitative nature. A sharp contrast from the quantitative side of our profession that we so often champion and revel in. As a result, detailed definitions and standardized tests can only go so far in shaping and ensuring our ethical standards.

We, as an Association, are embarking on a refresh of the By-laws. We are systematically going through them, pulling out the underlying intent of each section, verifying that intent, and then making sure it is clearly reflected. This year we are focusing on a set of By-laws which include our Code of Ethics and our obligation to uphold it. We are welcoming members to engage in this process, because our participation is both the key advantage and distinguishing factor of a self-regulated profession.

> When I look back to when I first wrote the ethics exam that would allow me to practice, I can't help but see some parallels to when I first read that marriage advice book.

As we embark on this process we will need to debate, question, and most importantly listen to one another, with the greater purpose of providing a stronger and clearer Code of Ethics and associated By-laws. However, no matter how well written they will be, because of their qualitative nature and the diversity of our practice, there will always be some room left between concept and practice, and it is in this space that we define ourselves as professionals. Not only do we each have an individual responsibility to follow the Code of Ethics, we also have a collective responsibility to further define it in the ways and places we work.



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Unconscious **Bias**

I heard a new term the other day that I had never heard before: unconscious bias. Have you heard of it? One author defines it this way: "unconscious bias happens by our brains making incredibly quick judgments and assessments of people and situations without us realising. Our biases are influenced by our background, cultural environment, and personal experiences."[1]

What does it really mean? Is it possible our professional judgement can be skewed by memories, thoughts, and attitudes that might be irrelevant to the decision before us? Engineers and geoscientists are making decisions daily: technical, human resource, financial, personal, and more. Is it possible that some are allowing unfair, biased attitudes to influence their decisions and ultimately affect the people around them in a negative way? Consider the following types of bias:

Gender Bias

Were you born or raised in a patriarchal society or family? This is a family system, society, or government controlled by men, and in which men's contributions are viewed as more credible and valuable than women's contributions. The role of men and women in your home, community, and workplace may be viewed differently because of gender bias.

Age Bias

Sometimes referred to as 'ageism', this is the negative discriminatory practices against old people, people in their middle years, or teenagers and children. How do you treat older people compared to younger or those similar to your own age? Conversely, how often have you joked about 'Millennials' who are stereotyped in negative ways, and then those stereotypes are carried forward into actions?

Ethnic Bias

Belonging to (or being outside of) a social group that has a common national or cultural tradition may result in ethnic bias. Various clothing styles, foods, languages, and skin colours are common attributes of a multicultural society. Are you embracing other cultures or are you unconsciously judging or rejecting them?

Similarity Bias

We more readily accept those who are like us than those who are different. It's easy to like someone who looks like us, thinks like us, acts like us, and critically, someone who appears to aspire to be like us. However, research shows that diverse work teams are more effective. Do you unconsciously withhold your effort, skill, or energy from someone on your team that is different than you? Conversely, do you favour a co-worker because they are similar to you in age, gender, or background? Don't be tripped up by this bias.

Perhaps then, some of the inequities in our profession can be explained by unconscious bias: who was hired; the promotion that was given to someone else; opportunities given to a favourite employee; a homogeneous work culture; pay inequality. Many situations come to mind that might be resolved if unconscious bias is mitigated or extinguished.

These are some of the thoughts and attitudes which can prevent us from effectively serving society with our engineering and geosciences expertise. The benefit of our professional practice will be ignored and perhaps criticized if we don't reflect society in its position on these topics.

Engineering Changes Lives

A new initiative launched during Women's Equality Week (January 15-19, 2018). Hon. Rochelle Squires, Minister for the Status of Women, announced a bold new initiative led by Engineers Geoscientists Manitoba. In the next two years, the Association and its partners will undertake a project to see the percentage of women in the profession increase. The overall goal is to have 30% of newly registered engineers be women by the year 2030. In the meantime, recruiting more girls, retaining more female graduates, and making it more favourable for women to stay in the profession while having children are some of the action items that will be highlighted.

Your feedback is invited and welcomed. If you have any thoughts on anything you read in *The Keystone Professional*, please email me at *GKoropatnick@EngGeoMB.ca*. Have a great day!

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[1] Source: www.ecu.ac.uk/guidance-resources/employment-and-careers/staff-recruitment/unconscious-Bias/

Building Right

By D. Strang, P.Eng.

As I sit in the Winnipeg Soccer Federation North indoor soccer complex on Leila Avenue, waiting for my daughter's game to start, I have more on my mind than the likely outcome of the game. I am contemplating the outcome of a recent Canadian court case[1] involving engineers and copyright on a soccer complex in Québec.

I have just been alerted to this case by an article in the December issue of *Canadian Consulting Engineer*. The players in the case included, on defense, a school board, a consulting engineering firm, an architectural firm, and a construction firm. The plaintiff was a design/build construction firm, alleging that the defendant 'team' had infringed its copyright on a building.

The plaintiff had designed and built several buildings, each of which required a large and open indoor space including, in particular, a soccer complex in Granby, Québec, called Complexe Sportif Artoplex. The plaintiff had also registered copyrights on its design and on the building itself. Subsequent to the registration, the school board had retained, for its team, a consulting engineer, architect, and builder to design and build a soccer complex in Victoriaville, Québec. All eventually became co-defendants at trial.

Copyright on a building? What an odd thing! How can that be? Copyright is a form of intellectual property and, per the Canadian Intellectual Property Office, "provides protection for literary, artistic, dramatic and musical creations." Well, it turns out that a building (architectural work) is considered a form of artistic work for the purposes of assessing copyright infringement. *The Copyright Act* of Canada grants to the author (designer) the sole right to produce or reproduce their (architectural) work, or any substantial part thereof. In this case, the plaintiff insisted that it had a sole right to copy its structural design: the arrangement of the steel trusses, columns, beams, and lighting components that, together, form the roof and walls.

The defendants, on the other hand, claimed that they had simply combined a set of well-known functional, utilitarian elements, and further arranged and integrated those elements within the utilitarian constraints of cost and function. Copyright law does not protect functional aspects of a work and does not, in fact, grant a monopoly on a design, even on the aesthetic aspect of a design. The law does, on the other hand, classify copying a design as copyright infringement. To prove infringement and, ultimately, claim financial damages, the plaintiff had to show that it owned the copyright on an original work and prove that the defendant copied that work.

My read of the judgement by the Federal Court of Canada gave me the sense that it featured more back and forth than the soccer game now playing out in front of my eyes. The defence continued its attack by arguing that the plaintiff's design was not original, and pointing to similar structures in Calgary and Germany. However, as the defence could not provide evidence that the plaintiff actually copied those structures, the court was left with no choice but to assume that the plaintiff's works were indeed original and were created independently of those existing structures. No score for the defendants!

On the other hand, there was evidence of copying by the defendants, including a site visit to Complexe Sportif Artoplex, where photographs were taken and sketches were made. Prior to construction of the new complex, the plaintiff had warned the defendants of its registered copyrights and the plaintiff had even made an informal offer to license its designs.

The defense countered that its design was different than the one developed and built by the plaintiff. Its trusses were flat-topped, while the plaintiff's were arched. Dimensions were different. There are only so many configurations of elements possible and no one builder should corner

> Just like the referee on the soccer field in front of me, the judge in the case had to make a call. One must look first to the rules and, where there are shades of grey, at least try to be consistent with prior calls.

the market simply because it chose to arrange the elements in a specific way.

In these types of cases, not only is there a competition between the litigants, there is a competition, in copyright law (and intellectual property law in general) in terms of public policy interests. On the one hand, there is a public interest in providing a fair reward to creators of original works, be they books, movies, designs, or even architectural works. On the other hand, there is a public interest in the dissemination and broad use of new ideas. Architects, engineers, and anyone who seeks to create a design can't help but be influenced by observing and analysing the work of others. The law seeks to strike a balance, and a line needs to be drawn between mere influence and outright copying of the work of others.

Just like the referee on the soccer field in front of me, the judge in the case had to make a call. One must look first to the rules and, where there are shades of grey, at least try to be consistent with prior calls.

If the defendants' play (to argue that no one builder should have a monopoly) seemed familiar, the players may have recalled a similar argument brought to a Canadian court four years earlier involving the use of house plans without the permission, from the custom homebuilder that had drawn the plans up. In that case[2], the defense also maintained that each of the rooms in a house has a functional utility and there are only so many ways to arrange them into a floor plan. Ashley Dumouchel, legal counsel for the custom homebuilder, branded that defense as the 'Every House Needs a Toilet' argument. It was not a successful one, in that case.

The Copyright Act is clear. Architectural works can be protected, provided they are original works. But, what makes something original? Does it have to be an architectural masterpiece and/or an engineering feat, or can it be the output of a rational design process? Unfortunately, *The Copyright Act* does not define the term 'original.' Boo! However, in a 2004 case, the Supreme Court of Canada set the originality standard as requiring exercise of the author's skill and judgement and, while 'creativity' is not a requirement, the skill and judgement must be sufficient so as not to be merely a mechanical exercise. Yay!

Ultimately, there is no minimum level of creativity or intellectual effort required for a work to be deemed original. As technical professionals, engineers and geoscientists should cheer for the fact that the law recognizes that the fruits of their application of skill and judgement should be protected. But we should also be wary of the rights of others whose pioneering work has influenced our designs. The game can be made even tougher when the client says, "I want mine to look like that one." While pleasing the client is, of course, good for business, running afoul of copyright law can be bad for the pocketbook. In this case, the court ruled that the plaintiff's work was both original and infringed, awarding damages of $722,996. Ouch! Clearly, a stinging defeat for the defendants.

And the outcome of my daughter's soccer game? Well, let's just say we can cheer for the fact that there is no money on the line…

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1 *Lainco Inc. v Commission Scolaire Des Bois-Francs et al*, 2017 CF 825.

2 *Oakcraft Homes Inc v Ecklund*, 2013 CanLII 41981 (ON SCSM)

D. Strang is a senior intellectual property advisor with the Public Health Agency of Canada.

GEOLOGY AND SOCIETY – GEOHAZARDS

VOLCANOES

By R. Reichelt, P. Geo., FGC

Introduction

Among geohazards (i.e. ways that the earth can kill its inhabitants), volcanoes are certainly the most spectacular. With massive explosions, rivers of lava, and clouds of ash, they can be quite a sight. They have also been the last sight for many people.

The ancients imagined that powerful gods were at work when volcanoes were erupting. The word volcano comes from the Italian island of Vulcano, which in turn came from the Roman god Vulcan, the god of fire, metalsmithing, and volcanoes. In Roman mythology, Vulcan is at work when volcanos erupt. To the Romans, Vulcan represented both the beneficial and destructive aspects of fire.[1]

In this article, we will take a look at volcanoes: where they are found, what types of volcanoes exist, and what hazards they pose. We will also look at a few infamous examples of volcanic eruptions.

Where are they Found?

Many volcanoes are found at so-called 'hot spots', places on the Earth where plumes of hot rock well up from deeper in the Earth. Figure 1 shows the location of many of the most prominent volcanic hot spots.

As tectonic plates move, the hot spots remain in place, leading over time to a chain of volcanoes such as the Hawaiian Islands.[3]

Volcanoes can also form where tectonic plates converge. As shown in Figure 2, the plate that dives into the mantle melts and the molten magma rises to create island arc volcanoes.

Types of Volcanoes

There are generally four kinds of volcanoes:

1. Cinder cones
2. Composite volcanoes
3. Shield volcanoes
4. Lava domes[5]

Cinder cones are made up of volcanic ash and larger particles. Composite volcanoes are similar except that they are made of interlayered cinders and cooled liquid lava. Shield volcanoes erupt liquid lava and lava domes are made up of very viscous lava that does not flow easily. Cinder cones, composite volcanoes, and lava domes are often found at convergent plate boundaries. Shield volcanoes are generally found at hot spots that are currently located under oceanic crust.

The Hazards of Volcanoes

Volcanoes can erupt with incredible force, ejecting thousands of tonnes of material into the atmosphere.[6] If you are unlucky enough to be on a cinder or composite volcano when it erupts violently, you are likely to die. On the other hand, you can get quite close to liquid lava flowing from shield volcanoes, although the heat may be a killer.

All the material shot into the atmosphere from a violent eruption creates a hazard: eventually the material will fall down as volcanic ash, possibly on top of you. Volcanic ash can suffocate and bury living things. Volcanic ash can fall slowly, gently burying everything – forever. Sometimes the ash falls as a super-heated cloud that incinerates things before burying them. Volcanic ash often contains sulphur oxides that, when inhaled, can form sulphuric acid. In Canada, the main hazard from volcanoes is from ash originating in volcanoes on the west coast.[7]

Famous Volcanic Eruptions in History

Thera, Greece, 1628 B.C

The volcano on the island of Thera, now called Santorini, blew up with a huge explosion around 1628 B.C. Approximately 40,000 people were killed by the eruption and the subsequent 40-foot tsunamis. The blast was heard 3,000 miles away.[8]

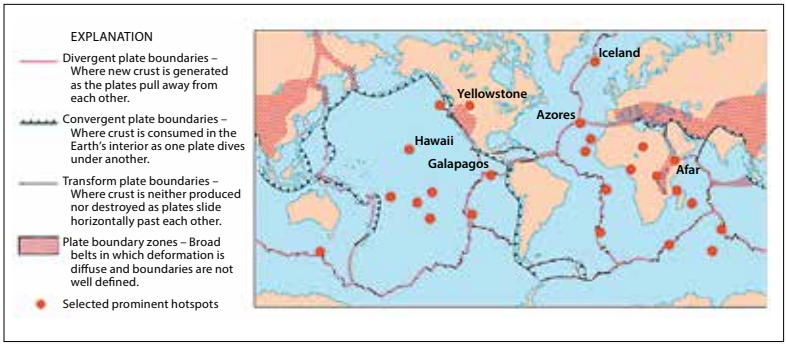

Figure 1 – Location of Volcanic Hotspots[2]

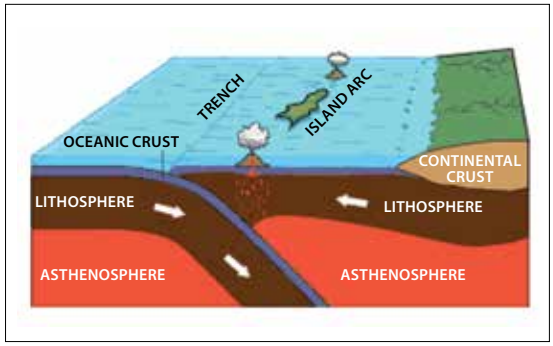

Figure 2 – Volcanoes at Convergent Plate Boundaries[4]

The destruction of the island severely weakened the Minoan civilization and, according to authors such as Dr. Charles Pellegrino, may be the source of Plato's myth about Atlantis.[9]

Mt. Vesuvius, 79 A.D.

The eruption of Mt. Vesuvius in 79 A.D. was famously recorded by Pliny the Younger (Gaius Plinius Caecilius Secundus) in his correspondence with the historian Tacitus (Publius Cornelius Tacitus). In Letters LXV and LXVI, Pliny the Younger describes the eruption of Vesuvius and the death of his uncle, Pliny the Elder (Gaius Plinius Secundus).[10] The Romans in those days believed that leading citizens should risk their lives for the common good; Pliny the Elder died trying to rescue people and was among the approximately 1,500 people that perished as a result of the eruption.[11]

The eruption of Mt. Vesuvius in 79 A.D. buried the cities of Pompeii and Herculaneum and archaeological studies of these buried cities have given us a unique glimpse into life during Roman times.

Tambora, 1815

Tambora is found in Indonesia and on April 10, 1815, it erupted with what has been described as the greatest explosion in recorded history. The eruption spewed an estimated 36 cubic miles of volcanic ash into the atmosphere. Approximately 88,000 people were killed in the explosion.[12]

The following year was called the 'Year Without Summer' and was marked by crop failures, famine, and general gloominess. Mary Shelley wrote her famous novel, *Frankenstein*, that summer.[13]

Krakatoa, August 1883

Krakatoa lies in the Sunda Strait between Java and Sumatra. In May 1883, it began to erupt. On August 27, it exploded with a force equivalent to that of 200 megatons of TNT. The explosion and subsequent tsunami killed approximately 36,000 people.[13]

Adapting to the Hazard

The best way to deal with a volcanic eruption is to **GET OUT OF THE WAY**. Evacuation of affected areas is the best way to reduce death and suffering. Close monitoring of volcanoes to predict eruptions is also needed. If you live near a volcano, your life may depend on having a geologist monitor it and issue a warning before it erupts.

CGS Conference on Geohazards

For those who have an interest in geohazards, the Canadian Geotechnical Society is holding a conference on geohazards in Canmore, Alberta, June 3-6, 2018. More information on the conference can be found at *www.geohazards7.ca*.

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GIRL GUIDES
Engineering Badge Day

By H. Smart, P.Eng.

The Committee for Increasing Participation of Women in Engineering (CIPWIE) hosted Manitoba's inaugural Engineering Badge Day for Girl Guides on November 12, 2017. The half-day event was enthusiastically attended by over 90 girls of the Girl Guide age group (age 9-11) and approximately 20 Guide leaders. Engineers Geoscientists Manitoba helped spread the word to its members, and the committee had an overwhelming response from volunteers, who eagerly transformed the Atrium at the University of Manitoba's Engineering & Information Technology Complex into a series of fun-filled activity stations for our participants.

In the spirit of CIPWIE's mandate to raise awareness of women in engineering, a partnership with the Girl Guides of Canada (GGC) was a logical starting point. Ontario Women In Engineering (ONWIE) have been holding Engineering Badge Day events for a few years and have successfully grown their program into full-day events hosted by multiple universities for hundreds of girls of different age groups ranging from Brownies (7-9) to Rangers (15-17). GGC has shifted focus of their badge program over the years to include several STEM-themed badges such as Aeronautics, Engineering, Scientist, and even a nine-component 'Key to STEM' emblem for Brownies. Recently, Engineers Canada (EC) worked with GGC to develop a large 'There's a Place for You in Engineering' crest, shown here together with the Guides Engineering badge. CIPWIE committee members worked with the Manitoba office of Girl Guides Canada and Engineers Canada to obtain badge and crest requirements, so that young girls could be provided with an opportunity to earn both the EC crest and the GGC engineering badge.

When girls arrived for registration, they were assigned an engineering discipline to be an 'engineer for a day'. Each girl was given a designation of civil, mechanical, electrical, computer, environmental or chemical engineer. As the Guide leaders helped coordinate getting girls to activity stations, each discipline was then assigned to begin the day at one of six activity tables. Faithful and energetic volunteers made short presentations, gave instructions for activities, and answered many questions while the girls participated in these activities. The work station topics were:

- **Build a Penny Bridge** – the girls built bridges from juice boxes and a cue card in order to hold as many pennies as possible. Volunteers showed the girls that folding the cue card created greater strength in the bridge and discussed the importance of triangles in structural design.
- **Design a Room to Scale** – the girls used tape measures and graph paper to draw out a 'room' that was laid out with masking tape in the atrium. Volunteers taught the concept of scale and helped girls understand its importance.
- **Learn about a 5G Network** – our expert volunteer used her own research poster to share the basics of Wi-Fi with the girls and answer their questions about communication technology.
- **Make a Stethoscope** – the girls got active at this two-part station where they not only jogged on the spot to measure their own heart rate, but also used craft supplies to make a working stethoscope. Volunteers taught the girls how to calculate their heart rate, touched on the science of sound, and very patiently helped with the functional craft!

- **Intro to Simple Machines** – after a quick introduction to each of the six simple machines (screw, inclined plane, pulley, wheel/axle, wedge and lever), the girls participated in experiments involving leverage. The longer the lever, the more marbles they could lift.
- **Explore a Vehicle** – the girls learned words like speedometer and gauge, and some basics of an engine. Part of the activity became a quick side trip across the Atrium to see the competition car built by student group UMSAE, where our volunteers could point out different components and answer questions.

As the introductory year for Manitoba's Badge Day event, participation was restricted to the Guides age group, and seen as a pilot project. The response of Girl Guide units from across Winnipeg and surrounding towns was very positive, and registration had to be closed early to prevent exceeding the maximum capacity of the venue. The CIPWIE committee consider this to have been a successful community event expanding young girls' understanding of what engineers actually do, and allowing the girls to experience the joy of discovery under the guidance of practicing engineers, who also happened to be female. We look forward to learning from this year's event and growing Engineering Badge Day to an even more successful occasion in years to come.

CIPWIE would like to take this opportunity to share our gratitude for the member volunteers who dedicated their Sunday morning to advancing engineering awareness in an impressionable age group of potential future engineers. Thank you also to our volunteer photographer, who captured some great moments during the event.

Learning from Experience in Manitoba

ENGINEERING LABOUR STRATEGY CAN CREATE A WIN-WIN

By C. Geddert, P.Eng., and L. Peto

According to the Province's *Manitobas Economic Highlights for 2017*, Manitoba's unemployment rate in 2017 was 5.4%, a full percentage point below the national average of 6.4%. Manitoba is a tight labour market and the projections for the next five years indicate that it will get even tighter (*Manitoba Labour Market Occupational Forecasts 2014 to 2020*). While these conditions create a prime environment for graduate employment, the labour shortages are making it difficult for employers to find and attract new employees. Post-secondary institutions are a logical place for employers to look to establish a recruiting pipeline and fulfill their human resource needs. To support this, engineering employers are looking for opportunities to enhance their campus presence, improve their recruiting results, and access qualified engineering candidates. They are looking for ways to find potential employees with skills and experiences they value. This can be a key factor in the success of a company, but it requires time and resources to be effective.

With small and medium size businesses creating the majority of jobs across the country, these resources may be scarce. Compounded by the fact that these smaller firms are often overlooked because they lack brand awareness among students, recruiting talent can be a real challenge. The opportunity to build and strengthen relationships with these small, local companies is beneficial for both students and employers. Students become more connected to employers that are more likely to be hiring and employers are increasing their brand awareness with potential employees and the community at large. There are strategic ways to leverage the opportunities to hire students, including participating in co-operative education programs at post-secondary institutions. These programs can provide administrative support for labour planning and provide skill development and valuable experiences for potential employees. The Faculty of Engineering Co-operative Education and Industrial Internship Program (Co-op/IIP) at the University of Manitoba is partnering with local companies and students to find creative ways to connect.

Co-op/IIP and the University of Manitoba Engineering Society (UMES) have created a regular space on the calendar for all students in the faculty to learn about work opportunities and learn first-hand about the skills and experiences that are valued by employers. It was named Monday Night H.I.R.E.D. (Helping Industry Reach Engineering students Directly). The acronym was a student creation, made to increase student awareness that the presentations were intended to support the recruiting efforts of employers. Up to 26 employers or employer groups have the opportunity to present to approximately 100 students each year. The only cost to employers is the price of some pizza and soda (under $700).

For a more direct approach, some employers choose to fill their regular summer student hiring with students from the Co-op/IIP. Hiring a significant number of students provides an ongoing cohort of students with knowledge of the company, the expectations for employees, and the skill that would be valued in the next level of the organization. Co-op/IIP employers receive hiring incentives from both the provincial and federal governments to offset the cost of hiring, with the provincial tax credit program only available to employers that hire students from a recognized co-op program. Hiring a number of students creates a pool of qualified candidates to apply for those next-level positions within an organization and often leads to full time employment after graduation.

It can be challenging for employers in rural areas or remote locations to attract applicants for positions. Some companies have chosen to take advantage of the available hiring incentives to hire more than one student to a position. This approach offers students an opportunity to collaborate on accommodations or carpool on a commute. The cost to add an additional student can be substantially offset by the hiring incentives available and the positive experiences of comradery will often mean a better overall experience for employers and students. This can begin to build positive brand awareness and word-of-mouth referrals in the student population.

Most workers in the 21st century will have 15 different jobs and change careers at least three times (Workopolis Research, 2014). This is much different than previous generations where workers were sometimes employed their whole working lives with the same company. Changes in the workforce are transforming recruitment strategies and changing how companies think about their workers. Employers are needing to understand and respond to these changes in order to keep talent and maintain knowledge capital in today's competitive environment. The Co-op/IIP is partnering with employers, students, and funding agencies. From these partnerships, employers can receive opportunities to promote themselves to students (win) and funding from hiring incentives to hire students (win), while gaining both brand awareness and students that have the skills and experiences needed to move Manitoba engineering employers forward (win).

We invite you to contact the Co-op office at *coopiip@umanitoba.ca* or call Carolyn Geddert 204-474-8948 or Lynda Peto at 204-474-6586 to learn more about how our Co-op/IIP students can assist your organization's human resource needs. Your questions and input are always welcomed.

GET AN ENGINEERING INTERNSHIP OR CO-OP STUDENT WORKING FOR YOU

More than 230 Manitoba employers hire U of M engineering co-op students because:

- students are skilled and motivated
- they're able to work flexible contracts from 4 to 16 months
- hiring incentives are available

May and September placements available

HIRE A STUDENT

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UNIVERSITY OF MANITOBA

CURLING FUNSPIEL

By G. Keatch

The year 2018 has marked the revival of an old tradition: a January curling event. Previously started in 1966 and running until 1994 (with a one year resurrection in 1998), the one-day tournament was a popular feature on the Association calendar. According to magazine archives, winners were awarded "fine prizes" and, after Council approved funds for a trophy in 1972, their names were inscribed on the President's Cup.

The current Sports Committee decided to revive the event in the form of a Curling Funspiel, to complement the ever-popular Making Links Engineering Classic Golf Tournament, which takes place annually in June.

On January 24, 16 teams gathered at St. Vital Curling Club, vying for their

Sports Committee: C. Mazurek, P.Eng., J. Boguski, EIT, R. Petursson, P.Eng., FEC, J. Ashdown, P.Eng., and T. Christiansen, P.Eng.

Winning Team: T. Kjerulf, P.Eng., K. Morand, P.Eng., N. Fleury, P.Eng., and J. MacDuff

names to be the first inscribed on the brand new trophy. Using a cumulative high-value scoring system, all teams had the chance to score big, from the seasoned league players to the non-curlers who were trying the game for the very first time. The afternoon was filled with eight two-end games, as well as a Draw to the Button competition. After the final game upset the standings, the team from Manitoba Hydro and Manitoba Infrastructure emerged victorious, winning by a single point! Congratulations to Team Keep Calm and Rock On!

The Sports Committee would like to thank all participants for joining this year's Funspiel and helping to raise over $3,300 to support geoscience students at the University of Brandon.

THANK YOU TO OUR SPONSORS

- Great-West Life
- Lafarge
- KGS Group
- Graham Construction & Engineering
- Proforma Touchstone
- Stantec
- Bird Construction

Here We Grow Again!

By G. Keatch

In 2017, Engineers Geoscientists Manitoba took the opportunity for growth by expanding its office into newly vacant space on the second floor, which had been previously occupied by Granite Financial. The Association had been considering options for future office growth and Granite's move to Donald Street provided a timely opportunity to expand without having to relocate.

The Association moved from its previous office at 850A Pembina Highway, to the current location of 870 Pembina Highway in 2009. At that time, there were 5,608 members and 12 staff. As of January 30, 2018, membership had increased to 8,201 and there are currently 19 staff supporting the growing membership and increased program initiatives. Prior to the expansion to the second floor of the building, several staff were located in shared workspaces with no privacy and minimal storage, and a couple of staff members were working out of boardrooms, due to having no permanent work area.

The office expansion allows all staff access to individual office space, while also including room for future growth, and the Investigations Department benefits from additional private storage space. Growing committees, task groups, and chapters are further accommodated with the addition of four boardrooms on the second floor, named after significant engineers in the Association's history.

The renovations to the second floor updated the décor and functionality of the space while encouraging future floorplan flexibility through the inclusion of an innovative DIRTT movable wall system, as well as several open-plan areas. A new internal staircase links the two floors and features a modern wall art installation, in keeping with the modern décor of the lower level.

As the Association continues to grow to better support members and the public, more working space is a necessity. This expansion ensures Association staff and members, both present and future, will have room to continue their work with necessary privacy and space.

An official ribbon cutting ceremony and open house took place at the end of February, and will be featured in the next issue of *The Keystone Professional*.

SECOND FLOOR BOARDROOMS

Landon
6-person boardroom, named after C.S. Landon, P.Eng., longest serving Association Registrar, from 1934 to 1960 and President in 1961.

Lyons
4-person private meeting room, named after Manson Lyons, P.Eng., the Association's first President.

Wardrop
14-person boardroom with flexible layout, named after Les Wardrop, P.Eng., FEC, Manitoba engineering pioneer.

Weiszmann
6-person boardroom, named after Judith Weiszmann, P.Eng., FEC, the first female applicant to the Association.

RESILIENT DESIGN IN OUR Changing Climate

By M. Chatfield, P.Eng., and J. Lanoway, P.Eng.

Throughout history, communities have always had to adapt to changes in their climate and environment. But today, the rate of global climate change is unusually high compared to the past. In the last century alone, the temperature has climbed roughly ten times faster than the average rate of ice-age-recovery warming. That's why it's important to plan ahead, protect assets, adapt to emerging stresses and risks, and reduce vulnerabilities.

Resilience is the capacity of a system or community to be able to absorb and adapt to change. It is about putting systems in place to help people, institutions, and businesses plan ahead with the future in mind.

Although resilient design must focus on flood prevention, wildfire resistance, winter storms endurance, and survivability after natural disasters, building designers are also beginning to appreciate a more everyday level of resilience. Engineers and architects must ensure the building can be run cost effectively and kept at an affordable level of comfort for its occupants. Optimizing building operations, even with increasing swings in peak temperatures, is imperative to minimize impacts on the building systems, including premature end of life. Whether buildings rely on natural or mechanical ventilation, maintaining acceptable levels of efficiency, comfort, and durability will likely become more difficult and expensive as the planet heats up.

As good stewards of the environment and good professionals, we have a responsibility to future generations to design buildings that have a lasting legacy.

Future Climate Scenarios

As a first step in assessing the impact of climate change on building design, we need to make some assumptions about the future. No one knows for sure how greenhouse gas emissions (GHG) will rise over the next century, however Representative Concentration Pathways (RCPs), as shown in Figure 1, are four greenhouse gas concentration trajectories that are typically used. These scenarios were produced as part of the Intergovernmental Panel on Climate Change's Fifth Assessment Report:

- RCP 2.6 - assumes that global annual GHG emissions peak between 2010-2020;
- RCP 4.5 - assumes that emissions peak around 2040;
- RCP 6 - assumes that emissions peak around 2080; and
- RCP 8.5 - assumes that emissions continue to rise throughout the 21st century.

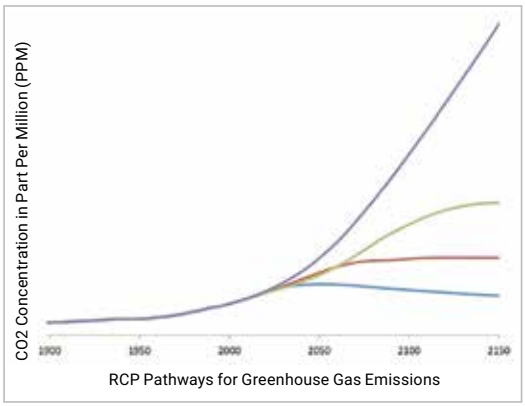
Although it is not known which scenario is most likely, for this analysis, we have chosen to concentrate on RCP 8.5 which is the worst-case scenario.

Climate Change in Manitoba

According to the Prairie Climate Centre, if carbon emissions continue to rise as they have, by 2051-2080 a community like Winnipeg may see an average of 46 days above 30˚C in a single year. That's more than four times the current average of 11 days!

A more useful metric to quantify the impacts of climate change on building design is to use degree days, which are defined as the energy demand for heating or cooling in buildings. According to ASHRAE 90.1-2010, Winnipeg currently sees 6032 heating degree days (HDD) and only 991 cooling degree days (CDD), and therefore has a very heating dominated climate.

Figure 1:



RCP Pathways for Greenhouse Gas Emissions

Figure 2:

Current and Predicted Degree Days for Winnipeg

	Present Day	2041-2060	2081-2099
Heating Season	HDD: 6032 Winnipeg MB Design Temp: -33C	HDD: 5454 Duluth MN Design Temp: -30C	HDD: 4434 Minneapolis MN Design Temp: -27C
Cooling Season	CDD: 991 Winnipeg MB Design Temp: +29C	CDD: 1521 North Platte NE Design Temp: +33C	CDD: 2293 Amarillo TX Design Temp: +34C

Figure 3:
Current and Forecasted Annual Energy Consumption

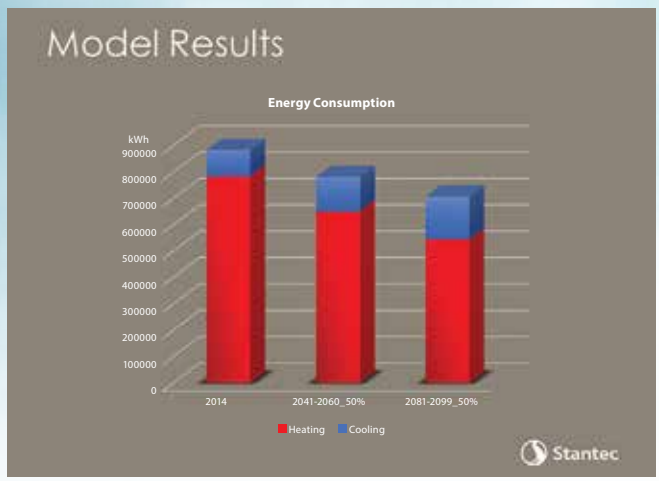
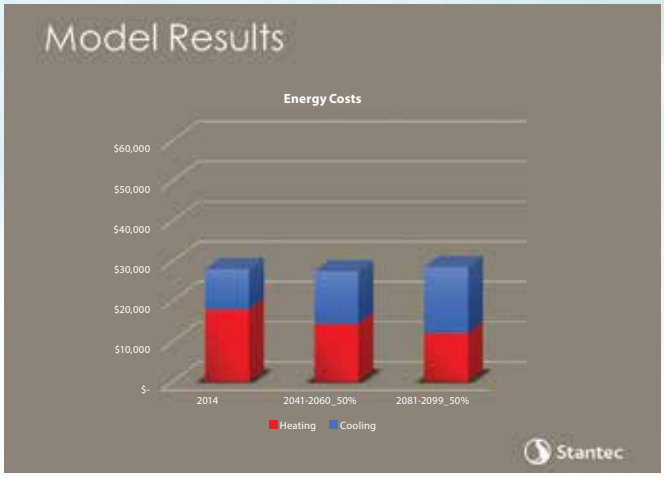


Figure 4:
Current and Forecasted Annual Energy Cost without Inflation



The Prairie Climate Centre predicts that if emissions continue to rise as they have in the past, by 2041-2060 we will have a winter climate more like Duluth, Minnesota, and a summer climate like Nebraska. In this scenario, HDD will drop by about 10% but CDD will increase by almost 50%!

Predictions for 2081-2099 suggest our winters will mimic Minneapolis, Minnesota and our summers will be like those of northern Texas (Figure 2). This would see winters that require 25% less heating than today, but summers that require more than twice as much cooling!

These results raise the question: are buildings today being designed resilient enough to stand up to future climate, especially the potentially drastic increase in cooling degree days?

Analysis Process

By using future weather files, energy modelling can be used as a tool to examine potential building performance and inform early design choices.

IES, Arup, and Argos Analytics have partnered to make WeatherShift™ future weather data. WeatherShift™ generates weather files representing future predicted climate data based on a range of emission scenarios. For this study, RCP 8.5 (50% percentile) was used with two different time periods: 2041-2060 and 2081-2099.

The baseline building chosen was a typical school that has been modelled using eQUEST simulation software.

Results

Results of the analysis, shown in Figure 3, align with the above forecasted heating and cooling degree days, showing heating energy will drop by about 25% and cooling energy will approximately double by the end of the century. While these relative changes are significant, annual energy consumption results show we will still be living in a heating dominated climate.

The results shown in Figure 3 suggest that the general approach to building design does not need to change drastically. However, we must take this discussion a little further and examine the energy sources for heating and cooling, and their relative costs. In Manitoba, heating is typically provided by natural gas, whereas cooling is provided by hydro-electricity. While Manitoba is known for its relatively cheap electricity, it is still approximately 2.5 - 3 times more expensive than natural gas.

Revising the model results to reflect the relative costs of heating and cooling shows a different picture of how future climate will impact building operations. Whereas current costs are still heating dominated, the model results in Figure 4 suggest that by the end of the century we could be living in a cooling cost dominated climate.

While the above results suggest a fairly constant level of energy costs through the next century, they do not factor in expected increases which will certainly make buildings more expensive to operate in the future. For example, Manitoba Hydro has announced its intentions to request drastic increases in electricity rates over the next five to seven years, increases that could see current cooling costs rise by as much as 65%. Similarly, the provincial and federal governments are negotiating the future price of carbon which will also have a large impact on the cost of heating with natural gas.

Implications of Climate Change on Building Design in Manitoba

Based on the above model results and potential future increases in both heating and cooling costs, future resilient designs will require a shift to include more efficient systems and a more balanced approach between heating and cooling efficiencies. Most buildings being built today will be around in 2050, and some will even survive to 2100. The question is whether their designs will be resilient enough to withstand future temperatures while maintaining occupant comfort and cost effective operations. If not, building owners may be forced to upgrade, and in the worst cases, some may not be able to afford to make the buildings last to the end of their original planned lifespans.

Proposing a Path Forward

To address future climate demands on building designs, this study has proposed a three-step approach to reducing building energy demand and shifting focus to address both heating and cooling design challenges.

Step 1: Passive Systems

Passive systems can be defined as building envelope systems that assist in heating and cooling without requiring active systems or energy production.

In Manitoba, we already do a great job of applying passive systems for the heating season such as high insulation levels, high performance windows, and relatively good air tightness. However, we

are not great at applying passive cooling systems such as shading, natural ventilation, and building orientation. With our changing climate, we will need to start doing more to address these passive cooling systems, which will in turn reduce the demand on active building systems.

Step 2: Active Systems

Active systems are the mechanical and electrical systems in a building that provide heating and cooling to maintain thermal comfort.

The most efficient active systems are those that can get the most heating or cooling out of an energy source. We already do a great job of utilizing some high-efficiency systems such as condensing boilers and energy recovery ventilators. However, there are many more opportunities to find savings.

Maintaining room temperature at 21˚C does not require high quality, high temperature energy sources. Instead a building design can turn to lower temperature systems that are more efficient and can use a broader range of energy sources such as the ground, sun, or waste heat from other operations. One such example is a radiant floor system coupled to a ground source heat pump system. In the summer, the radiant floor absorbs excess heat from the building and the heat pump rejects this heat into the ground. In the winter, the heat pump can then pull this stored heat and use it to warm the building using the radiant floor system. This type of system uses low quality, low temperature energy but can be sufficient to heat and cool a building if it is designed properly and supported by good passive systems.

Step 3: Operating Set-Points

Most assume comfort is driven by the thermostat, but it is actually controlled by six factors:

- Clothing Insulation
- Humidity
- Metabolic Rate
- Radiant Temperature
- Air Temperature
- Air Speed

By making changes to one or more of these factors, low cost energy savings can be accomplished without affecting comfort. A decade ago, the Japanese government began a policy it calls Cool Biz, which asks offices to keep their thermostats at 28 °C or above during summer, and allows employees to shun cultural norms by coming to the office in lighter, less formal attire. By adopting Cool Biz, companies traded formality for energy savings and environmental benefits. According to the most recent official estimate[1], the program prevented 1.69 million tons of carbon dioxide emissions in 2010, and reduced emissions by 7.92 million tons in the previous five years.

Conclusions

Future climate data suggests that Manitoba buildings will consume less energy in the future but potentially cost more to operate. Cooling costs will also rise in the future and possibly surpass heating as the dominant operating cost. Buildings being built today will be impacted by this future climate, and so we must begin discussing today how we can shift design approaches to be more resilient to our future climate

References

[1] https://ondankataisaku.env.go.jp/funtoshare/action/coolbiz/result_2010.html (Japanese webpage)

Engineering Changes Lives

By T. Wright

A celebration to launch the "Engineering Changes Lives" initiative, which aims to achieve the goal that 30% of newly licensed engineers in Manitoba are women by the year 2030, was held on January 17 by Engineers Geoscientists Manitoba at the RBC Convention Centre in Winnipeg, attracting over 120 attendees. This goal, which was created by Engineers Canada along with the thirteen engineering regulators across Canada, results from the urgent need for diversity within the engineering profession. Through this bold new initiative, Engineers Geoscientists Manitoba has secured a partnership with the Manitoba Government to help increase attraction and retention of women in STEM, with particular emphasis on engineering.

Honourable Rochelle Squires, Minister responsible for Status of Women, was the guest speaker representing the Manitoba Government's endorsement of this initiative: "As Minister, I am aware of how important working and collaborating with equality-seeking organizations in community is, in order to advance opportunities for women in our province. I look forward to the work ahead with Engineers Geoscientists Manitoba as we participate on their task team." Other government representatives in attendance included Robert Falcon-Ouellette, MP for Winnipeg Centre, Kelly Bindle, M.L.A. for Thompson, Janice Morley-Lecomte, M.L.A for Seine River, and Beth Ulrich, Executive Director of Manitoba Status of Women.

It was great to see that a near-equal representation of female and male engineers and industry professionals attended the celebration, as male support within the profession is fundamental. Ruth Eden, P.Eng., President-Elect of Engineers Geoscientists Manitoba, Acting Assistant Deputy Minister of Water Management and Structures Division for Manitoba Infrastructure, and a member of the 30 by 30 Task Group summed it up well: "For engineering to be the best profession that it can be, the membership needs to be representative of all society. Our profession needs the best-suited candidates to take the necessary training to become professional engineers and continue to solve the problems of tomorrow."

Hon. Rochelle Squires

Dr. Jeannette Montufar, P.Eng., FEC, Chair of the Manitoba Women's Advisory Council and a member of the 30 by 30 Task Group, expressed her commitment

(L-R) Jonathan Epp, P.Eng., FEC, President of Engineers Geoscientists Manitoba, Lindsay Melvin, P.Eng., FEC, Past President of Engineers Geoscientists Manitoba, Ruth Eden, P.Eng., President-Elect of Engineers Geoscientists Manitoba, Hon. Rochelle Squires, Minister responsible for Status of Women, Dr. Jeanette Montufar, P.Eng., FEC, Chair of the Manitoba Women's Advisory Council, and Kathryn Atamanchuk, P.Eng., Chair of CIPWIE (Committee for Increasing the Participation of Women in Engineering).

to the initiative: "Over the next two years, I look forward to working with the task team to implement the strategic, multi-year approach to reach out to young girls across the province." This initiative aims to increase both the number of women entering engineering and the retention rate of women working in the field. In order to achieve the 30 by 30 goal, by 2018 and 2019, females in high school should be taking the required electives of physics, math, and chemistry necessary to enter undergraduate engineering. These girls are currently in grade 8, so the focus will be on girls in middle school and their influencers.

An effort has been underway for years to increase the number of women in engineering and this initiative will build on the progress that has already been made by dedicated volunteers. Chair of the Association's Committee for Increasing the Participation of Women in Engineering (CIPWIE) and a member of the 30 by 30 Task Group, Kathryn Atamanchuk, P.Eng., said, "CIPWIE's grassroots efforts over the past 20 plus years have built a foundation of community building and support, but the Engineering Changes Lives initiative is going to take this to the next level, the level that is required to help us meet the 30 by 30 goal and beyond".

To be successful in reaching the goal, something different needs to be done. Lindsay Melvin, P.Eng., FEC, the Association's sixth female President and a member of the 30 by 30 Task Group, explained what the initial strategies will include: "Activities over the immediate years will include a marketing program to share the important message about why engineering changes lives, building partnerships, research, and the development and implementation of strategic plan to be executed over a number of years." The Association's Director of Government Relations, C. Scott Sarna, along with colleagues, has developed a three-phase strategy under the direction of the 30 by 30 Task Group and with the support of the Government Relations Advisory Committee.

Phase One consists of the development of a market analysis for grades 6 to 9, in order to create a marketing plan. This will be accomplished by a women-driven marketing company that was retained

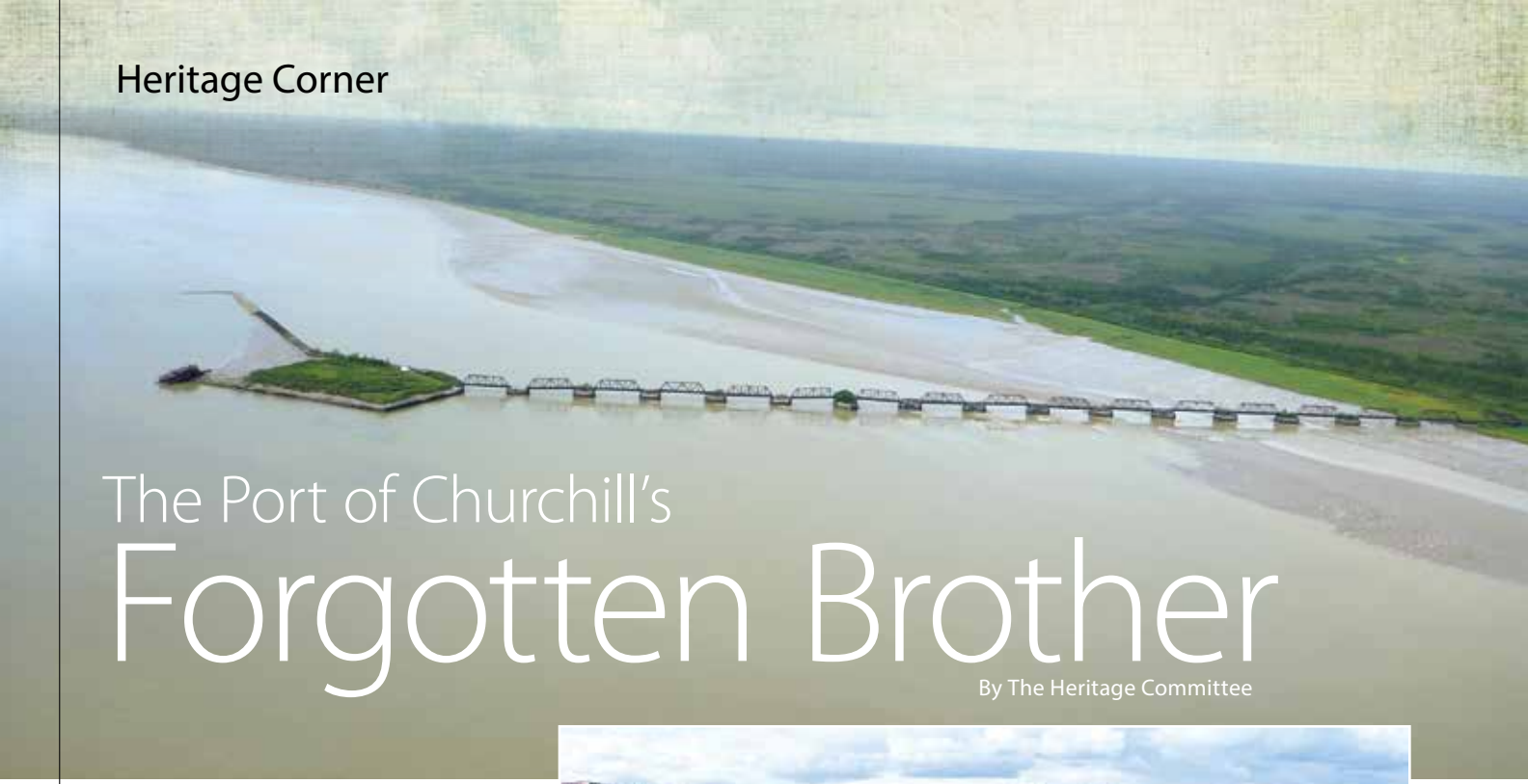
in January 2018. The marketing plan will guide a communications and advertising campaign focused on a fresh and innovative way of spreading the message about the importance of engineering in society, the vital role that women play in it, and the positive impact that occurs when women and men work together to serve the public.

Phase Two involves several key initiatives including the development of a Provincial Steering Committee. There has been a significant amount of work by various stakeholders over the years, including academic researchers and committees formed with mandates of meeting the 30 by 30 goal. By combining a large representation of stakeholders on this committee, there is a unique opportunity to pool all of this information together to seek out the influencers and increase the power and momentum behind this initiative, making it a reality.

Another key initiative in Phase Two is conducting an environmental scan, a process to bring forth all the pertinent information to assess the strengths, weaknesses, opportunities, and threats in achieving the goal. Other provinces have already succeeded in meeting or exceeding the goal of 30 by 30 and the task group will be looking towards these successes to determine the deficiencies in the process within Manitoba. The information collected through the environmental scan will also help to create a successful advertising campaign that will be launched in April 2018.

Finally, a strategic plan will be developed using the information collected throughout the environmental scan and the advertising campaign. This focused, well-researched strategic plan will have measurable goals within an extended multi-year timeframe and will be complete with follow-through.

The timeline to create the fundamental shift in perception, and practice, of engineering is short. There are no easy answers or quick fixes, nor a single solution. However, through the commitment of the Association, backed through industry and government support, funding, and the leadership of dedicated volunteers, staff, and stakeholders, the goal of achieving 30 by 30 and beyond will be fulfilled.



The Port of Churchill's Forgotten Brother

By The Heritage Committee

The Port of Churchill and its connecting rail line have been in the news a lot recently, mainly due to the financial troubles of the port and its severely damaged rail line. However, many are not aware that the port and rail line were not originally supposed to be in Churchill. Instead, the port was supposed to be located on the Nelson River, not the Churchill River, and the rail line was to take a better "muskeg free" route towards the coast. Called Port Nelson, it was to be the original "seaport of the prairies".

Port Nelson was a seaport along the coast of Hudson Bay which was started over a century ago, but never completed. Situated at the mouth of the Nelson River, it was constructed as part of a scheme by the Federal Government to help increase competition in the movement of grain out of the prairies. It was intended to create an alternative route to the traditional ports in Vancouver, Thunder Bay, and Montreal by going through Hudson Bay. The project involved building approximately 800km of dedicated rail line (the Hudson Bay Railway) along with extensive port facilities along the coastline. Construction of the port on the Nelson River began in 1913 but was halted in 1917 due to the economic effects of World War I. The works completed to that point included a significant portion of a 2km long man-made island, a 17 span, 730m long truss bridge to access the island, a large custom-built dredge for construction, a small town site with all the amenities, and the most-advanced radio communication system of the day in Canada.

In order to see this Canadian misadventure first hand, a group of Heritage Committee members made the long journey north to visit what's left of the Port Nelson facilities this past summer.

Top Photo: Aerial view of remnants of Port Nelson.
Inset: Engineers visiting Port Nelson. Glen Cook, P.Eng., FEC, Dave Ennis, P.Eng., FEC, Ryan Bernier, P.Eng., and Reed Winstone, P.Eng.

The project was not revived until 1927, at which time an expert engineering consultant was brought in to re-evaluate the technical feasibility of the port's location. The conclusions of the consultant's report were that the site was a poor location for a port due to its shallow waters and openness to the north wind, and that the Churchill River was a far superior location, offering a naturally protected deep harbour. The decision was then made to abandon the partially built Port Nelson facilities in favour of the better Churchill River location. Despite salvaging as much usable material as possible, a significant amount of infrastructure was left behind and abandoned. To this day, over 100 years later, portions of the man-made island, the bridge, and the dredge are all still present at the site. This failed engineering project may possibly represent the most significant engineering boondoggle in Manitoban, or even Canadian, history.

For more about this failed engineering project see the Heritage Committee's wiki site at *http://heritage.apegm.mb.ca*

Welcome New Members

A.T. Abrera
R. Ahmed
S.N. Ahmed
S. Alam
P.R. Alcantara
F. Almassri
E.K. Apostle
R. Ashwarya
G.R. Atmuri
N. Balakrishnan
T.W. Becker
M. Bejte
E. Berard
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A.G. Bhandarkar
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B.D. Boutilier
D.B. Boyd
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M.P. Burtnick
R.G. Bussard
J.B. Carswell
B.J. Castle
Y.J. Cha
A. Chan
B.R. Coreau
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M. Daryabak
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A.E. Dietrich
P.G. DiFilippo
R.M.R. Dyrkacz
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K.L. Groff
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S.M. Harms
C.E. Henderson-Toth
J.Y. Hong
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D.A. Lee
E. Li
Z.Q. Li
L.S. Liu
E.J. Luna Moros
J.J.K. Mak
A. Maksymenko
J.H. Mann
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V.F.A. Anzala
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K.A.D. Bsisu
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Gordon Thomas Christie
James Stewart Hicks
Arthur Nick Kempan
Gerald Arthur Smith

University of Manitoba Engineering Graduate Receives Order of the White Rose Scholarship

Written by C. Campbell with excerpts supplied by Polytechnique Montreal

On December 1, 2017, Polytechnique Montréal presented the third annual Order of the White Rose scholarship to Ella Thomson, an electrical engineering graduate of the University of Manitoba. This $30,000 scholarship, created three years ago, is awarded annually to a female Canadian engineering student who wishes to continue her engineering studies at the master's or doctoral level in Canada or elsewhere in the world.

Brilliance, creativity, generosity, and determination: these are all qualities that describe Ella Thomson, who is headed for a career as a university researcher in electrical engineering and intends to have a positive impact on society: "As I progress in my career, I hope to be able to give back to my community by serving as a mentor for young girls interested in engineering. Increasing the participation of women in engineering is extremely important, and mentorship for girls is crucial to achieving this goal."

She has attracted attention for her research into the role of mitochondrial dysfunction in degenerative diseases, which was sparked by her volunteer work with patients with developmental disabilities, namely Alzheimer's, which was conducted at St. Boniface Hospital Research Centre, and for which she received funding from the Natural Sciences and Engineering Research Council of Canada.

Ella is also the recipient of a prestigious Schulich Leader Scholarship, and she had an outstanding academic record while studying toward her bachelor's degree in electrical engineering at the University of Manitoba. Ian Jeffrey, Assistant Professor in Electrical and Computer Engineering from the University of Manitoba, had Ella as a student in 2015: "Ella's scholarly success, technical excellence, commitments, initiatives, volunteer hours, and humanitarian efforts are cause for inspiration. She continues to demonstrate the importance and capabilities of women in the field engineering through action. Fortunately for everyone at our institution, and those helped elsewhere, Ella is devoted to her education, work, and future profession. Her initiatives will positively impact the image of Canada's engineering profession in a substantial way."

In the summer of 2016, Ella completed a research exchange at Hochschule Ravensburg-Weingarten in Germany and, in September of 2017, began the PhD program in electrical engineering at Stanford University in California: "I was extremely excited to be accepted to the competitive PhD program at Stanford, and to begin my studies here

this past fall. The first year of the program is focused on taking courses and exploring research opportunities in the department. While at Stanford, I hope to find a research area that is of interest to me, and that also has positive applications for society."

After graduation, Ella will be pursuing a career in academia.

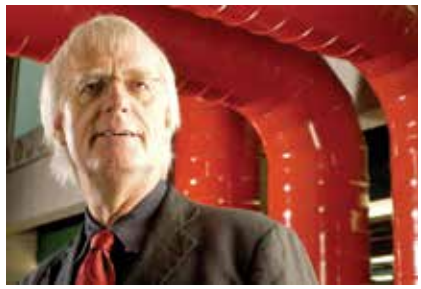
The Order of the White Rose was established to honour the victims of the tragedy of December 6, 1989, at Polytechnique, as part of the activities surrounding the 25th annual commemoration of the event. The scholarship not only recognizes the importance that Polytechnique attaches to women's contributions to engineering, but also, and especially, rewards and encourages a young woman who stands out in that field. As such it represents a model for women attracted to careers in science and technology.

ORDER OF THE WHITE ROSE
POLYTECHNIQUE MONTRÉAL

THE FUTURE BLOOMS IN OUR HANDS

Local Geologist Receives Highest Recognition

Dr. Frank C. Hawthorne, C.C., Distinguished Professor of Geological Sciences at the University of Manitoba, has been honoured with a promotion to the highest designation of the Order of Canada through appointment to Companion. Having first received the Officer of the Order of Canada (O.C.) in 2005, he has sustained contributions to geological sciences as an internationally renowned authority in the research of mineralogy and crystallography. The order is one of the country's highest honours, serving to recognize outstanding achievement, dedication to the community, and service to the nation.



Canadian Blood Services Seeks Engineering Firms For Project Donate

Canadian Blood Services is asking engineering firms to roll up their sleeves to save a life by participating in Project Donate this March. Approximately 5,000 appointments in Manitoba need to be filled this month to meet the needs of local patients. You can donate at the central Canadian Blood Services clinic on William Ave, or at one of the mobile clinics taking place in Steinbach, Selkirk, Brandon, Morden, Winkler, and many more Manitoban locations.

All participants should identify themselves as taking part in Project Donate when signing in on arrival at a clinic, as Project Donate donors will be entered in a prize draw to win a $100 Keg gift card!

Encourage your workmates to donate with you and Canadian Blood Services will provide LifeBus transportation to and from the clinic on William Ave! To book a group appointment, or a LifeBus shuttle to the Winnipeg Blood Centre, call 204 789-1056 or email *groupbookermb@blood.ca*

To book an individual donation appointment, download the GiveBlood app or visit *www.blood.ca*

Manitoba Mining and Minerals Convention

By L. Stewart, P.Geo.

The Manitoba Mining and Minerals Convention took place November 15-16 at the RBC Convention Centre Winnipeg, presented by the Government of Manitoba Department of Growth, Enterprise, and Trade. The theme of 'Explore Manitoba' was assessed through the two-day event, having incorporated opportunities for networking, professional development, and industry engagement. The annual event showcased Manitoba's ground-breaking geoscience activities and exploration highlights.

Session talks highlighting activities from the past year were presented by executives from Manitoba Government, Indigenous communities, mineral industry representatives, and mining communities on a variety of topics relevant to the mineral resource development opportunities in Canada. Many updates to ongoing government research, grassroots exploration, and advanced stage projects were presented, including individual sessions relating to the main mineral resource regions of Manitoba: the Superior Province, the Superior Boundary Zone, and the Trans-Hudson Orogen.

In addition to the conventional base and precious metal projects primarily relating to nickel, copper, zinc, gold, and silver, a special session for emerging commodity opportunities included topics relating to gypsum, high-purity silica sand, carbonatites, and kimberlites. Furthermore, a dedicated session addressed the potential of lithium in Manitoba.

A crucial component to mineral resources exploration is the commitment to sustainability. A special session on Indigenous Business and Manitoba Mining Forum included panel discussions with community groups, training providers, and industry relations to promote engagement within the mineral resources sector.

Capitalizing on being named by the *Fraser Institute's 2016 Annual Survey of Mining and Exploration* as one of the top-ranked global jurisdictions for investment based on Investment Attractiveness Index (2nd place behind Saskatchewan), Manitoba's mineral resources sector is on the rise. Manitoba's mineral resources sector's production value is an estimated $2.1B. With 2016 capital expenditures totalling $427M, it represents around 5% of the province's GDP output, and employs approximately 5,200 people annually. Coincident with recent recovery of commodity prices, underexplored regions in Manitoba present exciting potential for the discovery of world class deposits.

Geoscientists Canada Names New CEO

Geoscientists Canada has announced that Andrea Waldie, P.Geo., FGC, will take over as Chief Executive Officer of Geoscientists Canada on the retirement of the current CEO, Oliver Bonham, P.Geo, FGC, on March 1, 2018.

For the past five years Ms. Waldie has consulted to the geoscience profession, through her company Waldie Geo-Governance, on matters of governance and geoscience professionalism, as well as acting as business manager to the APGO Education Foundation, and consulting to Geoscientists Canada on a variety of projects. Prior to her consulting work, Ms. Waldie was the Executive Director and Registrar of the Association of Professional Geoscientists of Ontario (APGO) for six years. She began her career as an exploration geoscientist, working for several major and junior mining and exploration companies.

Arthur Kempan

August 10, 1944 – January 16, 2018

The Keystone Professional Committee was saddened to learn of the passing of one of its own, Arthur Kempan, P.Eng., FEC, on January 16.

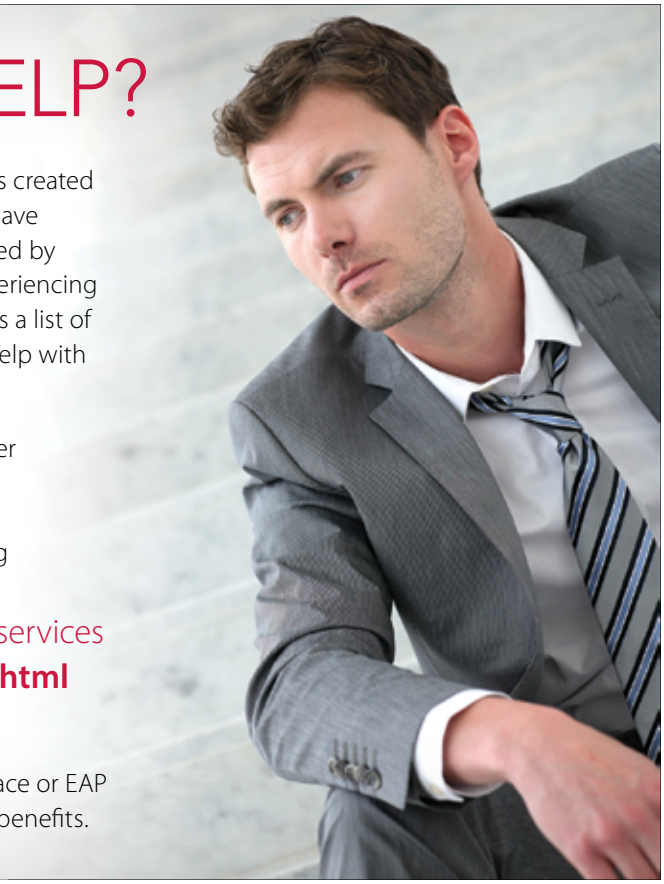
Arthur joined the Association in 1978, and served on six committees during his time as a member, as well as holding a Councillor position in 1994 and 1995.

Arthur was the longest serving committee member of *The Keystone Professional*, volunteering his time to the publication for over 21 years. He was a caring contributor with a talent for seeing the bigger picture. He will be missed.

DO YOU NEED HELP?

Are you experiencing job loss or some other event that has created stress in your life? Many professional members in Alberta have experienced job loss due to the economic downturn caused by low oil prices. Although the Manitoba economy is not experiencing the same conditions, Engineers Geoscientists Manitoba has a list of support services that you may find helpful. Do you need help with any of these?

- Job loss
- Career change
- Change in health
- Personal conflict
- Death of a family member
- Financial pressure
- Mediating a dispute
- Personal decision making



For a comprehensive list of member support services visit **www.EngGeoMB.ca/SupportServices.html**

In addition to the Engineers Geoscientists Manitoba list, contact the Human Resources department at your workplace or EAP (employee assistance program) representative if you have benefits.

ProDev Update

This January marked the fifth anniversary of the beginning of the first ProDev reporting period. The ProDev Program, as well as the Continuing Competency Committee that oversees it, has evolved and grown with the membership as we continue to strive to be the best profession possible.

It's worth putting into perspective how much Engineers Geoscientists Manitoba as a whole has changed in those five years. The number of professional members has grown from 4,975 to 5,765, an increase of more than 15%. Another reality of change is that approximately 1,000 of our current members were students or interns when ProDev came to life.

Within that period, we've also seen changes to *The Engineering and Geoscientific Professions Act,* including new provisions relating to continuing professional development reporting covered under the ProDev Program. These changes, which came into effect at the end of 2015, have simplified the administration of the program. Now, the Continuing Competency Committee can better focus its efforts in assisting practitioners who are seeking interpretation and changes to their reporting requirements.

(A list of the Continuing Competency Committee's interpretations can be found at *www.EngGeoMB.ca/ProDevInterpretations.html*)

One of the most commonly referenced interpretations made by the Continuing Competency Committee relates to practitioners who are 'semi-retired'. The informal term 'semi-retired' is used to reference practitioners who wish to maintain full practising rights, but whose work hours throughout the year is very limited. The committee has done an excellent job of recognizing the many years of practice undertaken by 'semi-retired' practitioners, while ensuring that they maintain current with recent developments in their fields.

Practitioners who are 'semi-retired' or otherwise have reason to seek a reduction in their professional development targets use the Application for Abatement. This application is the starting point for dialogue between the practitioner and the Continuing Competency Committee regarding appropriate targets. To date, the committee has considered more than 200 of these applications.

DID YOU KNOW? In 2017, approximately 70 members were suspended for non-compliance with the ProDev Program.

In addition to interpretations and applications for abatement, the committee continues to explore options for improvement of the ProDev Program. A recent and significant product from the Continuing Competency Committee in this regard was the creation of a Returning to Active Practice Guideline. This document aims to provide guidance to members on the important elements considered in the case where an engineer or geoscientist has been away from practice for several years and wishes to regain practising status.

An example of a member who will find this guideline useful is one where the member has been on parental leave for several years. Members who have retired but then subsequently decide to return to work is another example where this guideline will be useful. The guideline provides this guidance by recognizing key elements for consideration, including years of practice, time spent away from practice, area of practice, recent professional development, and considerations relating to character.

The Continuing Competency Committee welcomes all input from practitioners who have suggestions for improving the ProDev Program.

As always, I appreciate comments and discussion about standards issues. If you'd like to talk about the above topic or any other area of concern, please do not hesitate to contact me at: MGregoire@EngGeoMB.ca.

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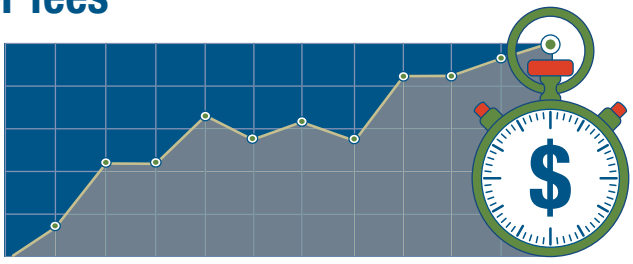

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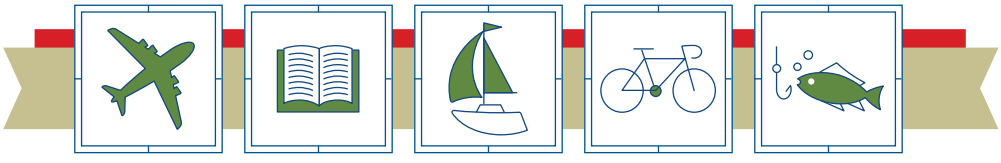

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