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THE KEYSTONE PROFESSIONAL

SUMMER 2019



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THE KEYSTONE PROFESSIONAL

The official publication of Engineers Geoscientists Manitoba



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Save the Date!

It's really hard to believe, but we are less than a year away from our 100th Anniversary! The Centennial Task Group has been very busy planning ways to recognize and celebrate this important milestone. They are focused on highlighting how engineers and geoscientists have made life better for all Manitobans over the past 100 years.

To coincide with our anniversary date on March 27, a Recognition Gala will be held at the RBC Convention Centre in the City View Room on Saturday, April 4, 2020. The Gala will feature highlights from our past, truly enjoyable entertainment, a great networking opportunity, and a special centennial showcase. It will be an evening that you definitely won't want to miss! I strongly recommend that you mark this date in your calendar now!

Throughout 2020, the Association will also highlight important achievements at many different events and locations throughout Manitoba. While I don't want to ruin any surprises, you'll want to include the Association's Centennial Book on your holiday wish list. The Centennial Book Team, led by a group of volunteers from the Association's Heritage Committee, has been combing through our archives to produce a historical collection of stories and events since 1920. The good news – you too can be involved. If you have photos (the older the better), they want to hear from you.

In May 2020, we will also be co-hosting the 17th Biennial Canadian Coalition for Women in Engineering, Science, Trades, and Technology



2020 promises to be a year to celebrate, and we hope you will join us in the festivities!



(CCWESTT) Conference here in Winnipeg. This conference will bring delegates from across Canada to participate in presentations, panel discussions, and workshops.

To make sure there's something for everyone, several teams from the Centennial Task Group are working on a number of other initiatives:

Legacy Team is focusing on activities and engagements through Association Chapters, outreach to school-age students, and support for students in secondary education within the area of STEM through bursaries and scholarships.

Professional Development Team is working on a professional development speaker and tour series around Manitoba for practitioners throughout the year.

Outreach and Events Team is overseeing community outreach activities and opportunities to 'Give Back' to our community. These include activities such as:

leading a Habitat for Humanity Build, volunteering during *I Love to Read* month, helping the Christmas Cheer Board, or participating in Project Donate Blood Drive. Promotional activities, such as sporting and cultural events, to raise awareness of our professions and to thank members are also planned throughout the year.

Keep watch on our website and through the weekly E-News for more information to come.

In addition to our 100th Anniversary next year, our province is celebrating Manitoba150, the 150th Anniversary of the passing of The Manitoba Act by the Parliament of Canada, making Manitoba the fifth province to join Confederation.

2020 promises to be a year to celebrate, and we hope you will join us in the festivities!

If you have any questions or would like to discuss ideas or concerns with me, I can be contacted at President@EngGeoMB.ca. ☎

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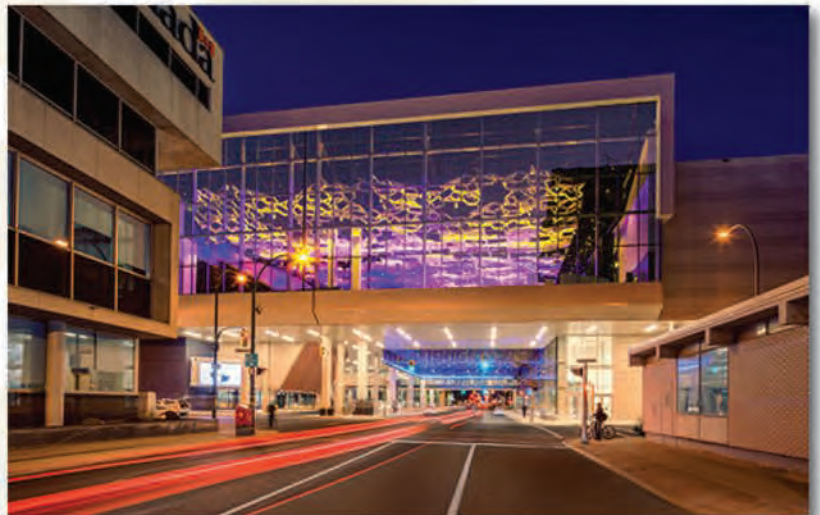
**ENGINEERS
GEOLOGISTS
MANITOBAN**

1920
— to —
2020

Centennial Recognition Gala

SAVE THE DATE - April 4, 2020

*Saturday, April 4, 2020
City View Room,
RBC Convention Centre*





Sales Engineer

I'm giving a shout-out to the practitioners in Engineers Geoscientists Manitoba who work in positions such as sales engineers, technical sales specialists, and technical sales managers. You represent your companies to clients in the marketplace; selling a product, service, or developing a business relationship. When you do a keyword search for "sales" in the practitioner public directory, 53 names appear. This indicates only the members who have used the word "sales" in their member profile; however, I'm sure there are many more employed in these roles. To all, I applaud your practice!

Too many times I've heard other practitioners say, "Sales Engineer? That's not engineering!" On the contrary, I believe that only a top engineer can be a good sales engineer, because the dual skill of understanding the technology and explaining it, so others get it, is rare. Many engineers can go on about finite element modelling, optimization, lean manufacturing, blah, blah, blah, but no one in the room wants to hear it. Some engineers don't get it when the eyes of the other person glaze over in confused disinterest. Rather, the sales engineer is adept at detecting signals from the customer that show trust or distrust, doubt or clarity, confidence or insecurity about a topic, product, or explanation of service. They are skilled at both the technical practice of engineering and the human side of applying it at the personal level of a one-to-one customer relationship.

More than Technical

The sales engineer must know more than just the technical aspects of engineering. Whether or not you work in the role of a sales engineer, do you have the following skills?

- Communication** Can you explain complex technology and systems at a level understood by non-engineers?
- Awareness** Are you good at knowing yourself and your customer, the audience, the context; seeing the non-verbal signs given off by the other person and responding appropriately?
- Negotiation** Do you have the ability to achieve a "win-win" outcome in routine business interactions?
- Ethical practice** Are you resisting the temptation to score a big sale at your customer's expense? Don't rip people off; always steer toward a "win-win" fair deal.



The dual skill of understanding the technology and explaining it, so others get it, is rare.



Value Proposition

Have you seen the Engineers Geoscientists Manitoba value proposition on the website? Approximately 10% of members have viewed this information. You should go and check it out to see the many benefits that come with a P.Eng. or P.Geo. licence. To read more about value proposition visit www.enggeomb.ca/pdf/Registration/ValueProposition.pdf.

Compensation Survey

The Engineers Geoscientists Manitoba compensation survey was conducted by Probe Research and surveyed 110 engineering and geoscience employers on key metrics such as base salary, overtime, profit sharing, vacation, and other benefits. The survey was administered to HR managers and supervisors instead of receiving responses directly from Engineers Geoscientists Manitoba members. In the past, data submitted by members proved to be unreliable; for example, no practitioner declared an executive level salary. There was only one salary reported in the previous survey (2016) above \$150K and it is likely that many senior practitioners earn more than that after 25 or more years of employment. What value is bad or skewed data? No value. Speaking to HR managers it was learned that less than half of them use salary survey data for assessing the value of their engineering or geoscience positions. Reportedly, only 5% to 20% use salary surveys of any kind when reviewing compensation. It seems that many employers rely on other information when setting pay levels for their practitioners.

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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Geology and Society – Sand

By R. Reichelt, P. Geo., FGC

Introduction – What is It?

For some of you, sand might seem to be a boring subject. Yet, to some of us it is interesting. One geologist wrote a whole book on it.¹ For engineers, sand is also important. It underlies much of our built world, and we depend upon it.

In their Unified Soil Classification,² ASTM International defines sand as, “material passing a 4.75mm sieve (No. 4) and retained on a 0.075mm (No. 200) sieve”.

Sand is mostly made up of quartz and of other common minerals such as feldspar, calcite, and magnetite. In the

right places, you might even find gold dust in the sand. Generally, the make-up of sand is often a reflection of the local geology.³ For example, somewhere in my personal collection of rocks and minerals is a vial containing garnets that I found on the beach of Careen Lake in northern Saskatchewan where the wave action had separated the garnets.

Where Does It Come From?

Sand comes from the weathering of rocks. Weathering can be mechanical, as when glaciers grind down the bedrock as they move across it; chemical, such as

the effects of rainwater on exposed rock; or biological, when lichens and plants pry mineral grains out the bedrock as they grow their roots.

How each mineral weathers depends on its chemical composition and physical properties. Stable minerals, such as quartz, are the most resistant to chemical weathering. Chemical weathering more easily decomposes other minerals, such as feldspars, amphiboles, pyroxenes, and olivine. The decomposition of feldspars, for example, creates clay minerals. In an exposed rock, the less resistant minerals will be weathered away, and the grains of the more resistant minerals will fall out.⁴

A useful way of envisioning the relative durability of minerals comes from Bowen’s Reaction Series.⁵ In the Reaction Series, Bowen described how minerals crystallised out of molten magma. However, the series also describes how resistant minerals are to weathering, as shown in Figure 1.

And so, over time the minerals that are less resistant to weathering are decomposed into other minerals, such as clay minerals, leaving behind the more resistant minerals such as quartz. Carried by water and wind, the mineral particles are eventually deposited into a sand bed. If the sand bed is buried deep enough, it can become a sandstone. If the sandstone is exposed again to weathering, the process begins again.

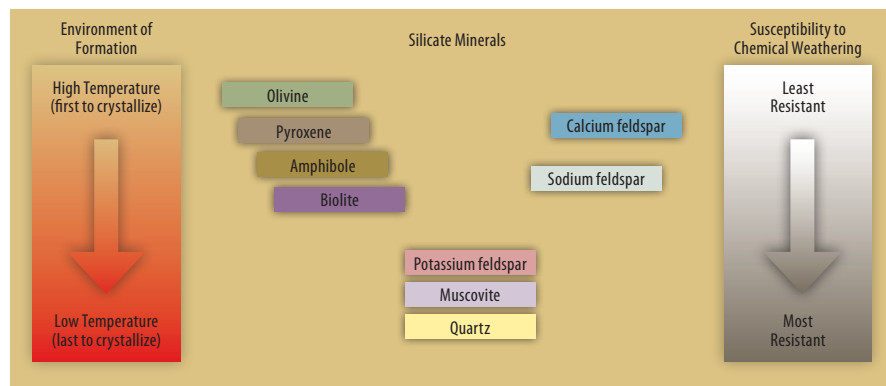


Figure 1⁶

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The Uses of Sand

There are many uses for sand in our daily lives. One of the biggest uses of sand is in construction. Sand is used in the foundations of roads, in lining trenches for buried water and sewer lines, and as a component in making concrete. Mixed with lime, sand is used for mortar in bricklaying.

There are many industrial uses for sand, especially sand with a high quartz content called silica sands. Silica sand is a component in glass and in enamels. Metal foundries use sand to make moulds. Silicon extracted from silica sand is the material basis of much of our electronic world. Sand is used to make abrasives like sandpaper. In the petroleum

and natural gas industry, silica sand is used in the practice of fracturing low permeability formations to extract oil and gas.

Sand in Manitoba

Sand quarries for road construction are widespread in Manitoba, though not always conveniently located. Information on quarries for road construction is available from Manitoba Infrastructure; check out their website at www.gov.mb.ca/mit/mateng/aggregate.html.

Manitoba has an excellent source of silica sand in the Winnipeg Formation.⁷ Over one hundred years ago, a glass factory in Beausejour used sand from the Winnipeg Formation in the production of bottles and jars, operating from 1906 to 1914.⁸ Canadian Premium Sand Inc.⁹ is currently seeking approval to develop a silica sand deposit near Seymourville, MB.

As is seemingly normal nowadays, there are people objecting to the development in Seymourville.¹⁰ One of the objections seems to be that the sand will be used in the petroleum industry.¹¹ Information on the proposed Environment Act Licence for the project may be found at www.gov.mb.ca/sd/eal/registries/5991wanipigow/index.html.

Just to make things interesting, another company, HD Minerals, has announced that they will be pursuing development of silica sand deposits in the Winnipeg Formation on their property in Manitoba.¹²

Something to think about the next time you build sand castles on the beach this summer.

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Chris Hewitt, P.Eng., C.Eng. (U.K.), MIET, LEED AP

Member Profile

Chris Hewitt is an electrical engineer and LEED Accredited Professional with an interest in the design and construction of sustainable buildings and forensic electrical engineering. He is the president of SMS Engineering Ltd., a well-established Winnipeg-based mechanical and electrical consulting firm. Before taking on this role, he lived and practiced internationally, including in Thailand, Singapore, and the UK. In 2009, he was awarded the 40 Under 40 award for engineering professionals in North America,¹ and in 2012 he was a finalist for the *Future Leaders of Manitoba* award.²

What was the catalyst for you to enter the engineering profession?

Ha, well, my dad (electrical engineer), uncle (electrical engineer) and brother (fire engineer) are all engineers. So, it is in the blood. I have always been interested in how things work, and in fixing things. Like many engineers, I suspect Lego had a big influence on me!

What does a typical workday look like for you?

Emails and meetings!! My career has somewhat led me down a path away from mainstream design engineering, to the management aspects of running a business of over 80 people, such as sales, human resources, marketing, and accounting. I am an engineer at heart, and I try to take every opportunity to stay current by being involved in projects as much as I can. I actively review projects as part of our quality assurance process,

and I do still get involved in design, and in working with the more junior staff to help set projects off on the right foot, and keep them moving in the right direction.

I am especially interested in forensic engineering, and so I am frequently called upon at short notice by insurance companies to review failures, fires, and floods. Sometimes my job is to figure out what happened, and involves inspecting the tiniest details and writing reports, and sometimes I am involved in restoring whatever it was that failed. I especially enjoy this aspect of my job as I get my hands dirty and I get to test and dismantle things to figure out why they failed. I frequently get to meet with lawyers to assist the insurance companies in figuring out who might be liable for a particular issue, and I really enjoy the legal process of formulating a technical opinion based on the facts. Occasionally, I even get to testify in court as an expert witness.

What advice do you have for people considering entering the geoscience and engineering professions?

Get out on site and learn how things and people work. I remember my boss calling me when I was about 25 years old, to ask how I would like 10 years of experience in two years, and he sent me to a construction project site in Thailand in the middle of the jungle. I only had limited support from the home office, and had to figure out things on my own, in an environment where not only was the language different, but the culture was too. Everything we do as engineers is experience, and you need to suck as much experience out of every task as possible, however mundane it might feel at the time.

**What's the most rewarding part of your career?**

Engineering is complex, and we make decisions every day that result in millions and millions of inter-related outcomes on projects. Millions of these things work out perfectly. But, sometimes, things don't go to plan. I get my kicks out of solving these problems. I think that is why I enjoy forensic engineering the most – I get to figure out what went wrong.

What are the three most memorable projects you've worked on?

It has to be the Winnipeg Airport New Terminal Building, Central Utility Building, and Parkade. I worked on these projects from 2004 to 2012, and I am still actively working for the Winnipeg Airports Authority today. These were giant projects (in excess of \$300M) with many other design firms and contractors. I take every project seriously, and I act like the client's money is my money. But, I felt real ownership of these airport projects, as I put such a significant part of my career into them. As an immigrant to Canada, the airport is an important part of my life, as I stay connected to my friends and family back home in the UK.

**Do you have a “dream project?”
If so, what is it?**

I have been fortunate enough to work on mega-projects like a \$1B car factory in Thailand, an underground railway system in Singapore, and a new terminal building in Winnipeg. My dream (although on the one hand, I hope it never happens) would be to investigate an air accident. I have been involved with many forensic investigations of sometimes-large fire scenes relating to complex buildings. But there is nothing more complex than an airliner.

What do you get out of engineering that you couldn’t get out of any other line of work?

Every day is completely different. I often drive to work not knowing what the day is going to bring. In consulting engineering every day brings multiple high stakes deadlines, and they require us to constantly adjust our schedules and plans to meet these deadlines. We also get to work on diverse projects in many sectors from healthcare to transportation.

Are there Engineers Geoscientists Manitoba initiatives that you are involved in or support?

I am a member of the Engineers Geoscientists Manitoba Discipline Committee. This is a great opportunity for me to work with other engineers and

geoscientists, and to give something back. As a member of that committee, I feel that together we are one part of the process that ensures we maintain our profession at the highest levels.

You’ve been with SMS Engineering for over 15 years. What makes it such a great place to work?

People and projects. And, we could not do the projects without the people. I have had the privilege to work all over the world, and I can tell you I have the pleasure of working with some of the best people anywhere, both at SMS Engineering and in other firms and clients that we interact with. As a result of the people at SMS Engineering, we are able to win interesting and challenging projects, which directly appeals to me as an engineer.

What do you hope the engineering and geoscience professions look like 20 years from now here in Manitoba?

Engineering has changed so much in the 24 years since I graduated. The rate of change of technologies that we need to understand, specify, and work with has exploded. I suspect the rate of change is close to that in the industrial revolution. Artificial Intelligence is making its way into building design and operation and we must remain ahead of the curve.

We are rapidly adapting to new technologies in our workplace, and

I think in the coming years, these technologies will start to compete with us human engineers for our jobs. I have no doubt automation and artificial intelligence will take over many of the tasks of engineers, like repetitive calculations and production of some engineered drawings.

I think the upside of competing with technology for jobs is that it will hopefully free up some of our time to focus on incorporating these technologies into our projects.

When you’re not working, you can be found...?

I can usually be found at the karate dojo 3-4 times a week. I am a brown belt at Shotokan karate, and I am training hard to test for my black belt in the summer.



¹ <https://www.csemag.com/articles/2009-40-under-40-winners>

² <http://futureleadersofmanitoba.ca/nominations> ⊕

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Colours

By A.K. Rakhra, Ph.D., P.Eng.

If we imagine a world around us without any colours, what would it look like? Maybe monotonous, dull, and sad. Colours contain unique vibes hidden within. Regardless of whether we are consciously able to decode the message embedded within a particular colour, its presence influences us. We may also feel some affinity for a particular shade, or may like to avoid a few other colour tones. Every colour has a unique vibration and energy associated with it. The visible spectrum of light radiation, abbreviated as VIBGYOR (rainbow colours), represents the sequence of colours as violet, indigo, blue, green, yellow, orange, and red – represented from colder to warmer, based on the

frequency and wavelength of the electromagnetic radiation associated with the colour. As engineering and scientific community members, we remain neither confident nor certain about the effect of specific colour choices on psychological, behavioural, and business outcomes; there are possibilities to explore and utilize colour knowledge in improving the lives around us.

Use of vibrant and bright colours on murals in villages, cities, and slums around the world have provided these communities with a much needed ‘facelift’ aimed at improving mental health, self-esteem, and emotional well-being, and reducing crime.

Interest in studying the effects of colours on psychological function is not new; scholars for many decades have been exploring the colour domain. Early scholar Goethe¹ associated colours such as red and yellow with ‘excitement’ and ‘warmth’. Elliot² summarized that colours could influence attention, alertness, intellectual performance, motivation, and even food and beverage consumption.

In nature, we see a wide variety of colours. Flowers and ripened fruits usually show bright and vibrant colours. Some birds and sea animals have bright and vibrant colours too, whereas others have dull and dark textures. Some species can even change their colour depending upon mood and the situation. Colours are an intrinsic part of nature, and it appears that colours play a critical role in the continuance and evolution of species. In the plant world, the bright colours of flowers, fruits, and crops indicate change and maturity, and help in pollination. In the animal kingdom, some species change colours for protecting themselves, attracting the opposite sex, camouflaging, signalling, and communicating.³

Based on cultural and regional backgrounds, colours also carry a unique meaning and may have deep psychological influence. The typical colour of mosques in the Islamic world is green.⁴ The colour of temples, shrines, and the robes of priests and monks in Hinduism and Buddhism are in maroon and saffron shades. In Christianity, blue, purple, gold, red, black, and white are common shades worn by the priests.⁵ In Yogic philosophy, seven chakras of



Rainbow Village of Indonesia – a slum; before the facelift (left), and after facelift by using bright and vibrant colours (right) (Helen Coffey, 2017–Source: Independent.co.uk)



Mumbai slum after the facelift (Amrit Dhillon, 2018–Source: TheGuardian.com)



Mexican neighbourhood facelift (Giovanna Salazar, 2015–Source: www.pri.org)

As engineering and scientific community members, we remain neither confident nor certain about the effect of specific colour choices on psychological, behavioural, and business outcomes; there are possibilities to explore and utilize colour knowledge in improving the lives around us.

the human body are associated with the seven major energy centers, and are responsive to different colours. The Root chakra is associated with the colour red, Sacral chakra with orange, Solar-plexus chakra with yellow, Heart chakra with green, Throat chakra with blue, Brow chakra with indigo, and Crown chakra with violet.⁶

Graphic designers, media personnel, interior designers, and technology developers use colours generally based on social, behavioural, and visual properties. Longer-wavelength colours, such as red and orange, are associated with warmth and arousal, whereas shorter-wavelength colours are associated with coolness and relaxation.² Usage of the colour blue for technology, green for finance and energy, and red for the food sector is common. Based on a detailed literature review, Elliot summarized some findings regarding the influence of the colours including that, “wearing red has been shown to enhance performance and perceived performance in sport competitions and tasks”; “blue stores/logos have been shown to increase quality and trustworthiness appraisals”; “viewing red on, or near, a female has been shown to increase attraction in heterosexual males”; and “participants ate fewer chocolate chips from a red plate (relative to a blue or white plate)”.

Based on the literature cited, it seems that colours influence us, and different colours may be associated with different situations, moods, energy, and feelings. Informed usage of colours may influence behaviour and mental well-being.

¹ Goethe, W. (1810). *Theory of Colors*. London: Frank Cass.

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Stanley Pauley Engineering Building – Coming to Life!

By J. Beddoes, P.Eng., Dean, Faculty of Engineering

Join Us at Homecoming – September 20, 2019

This decade, undergraduate enrolment in Faculty of Engineering programs at the University of Manitoba has increased by 62% to more than 1,800 students. These students are well engaged in their engineering studies as exemplified by two trends.

The first trend shows an increasing number and participation of students on design competition teams. Last year, at least 500 students participated with impressive outcomes, some of which include: the UMSAE Aero team winning, for the second year in a row, the global championship held in Fort Worth, Texas out-performing teams from eight countries; the UMSATS team winning the most recent Canadian Satellite Design Challenge; and the WEDesign team successfully competing in the International Small Wind Turbine Contest in the Netherlands. The second trend indicates our students are serious about developing their career skills with continuous growth in the number of Cooperative Education/Industrial Internship Program placements, which exceeded 500 in 2018. This is occurring concurrently with an increasing research intensity in the Faculty of Engineering. Masters and Ph.D. students are the backbone of the R&D enterprise, with this enrolment increasing by 44% this decade to about 500 students. This enrolment and engagement at all levels has placed unprecedented pressure on the facilities available to the Faculty and has justified the construction of the Stanley Pauley Engineering Building, now being commissioned in 2019.

Foundational funding for the Stanley Pauley Engineering Building was the result of a \$5 million commitment from the Pauley Family Foundation. Mr. Pauley is a 1949 electrical engineering graduate who has achieved significant business success in the United States and hasn't forgotten his start in Manitoba. The Pauley Family Foundation has donated more than \$9.7 million to the University of Manitoba, with nearly the entire amount committed to the Faculty of Engineering. In addition to Mr. Pauley's foundational support, the \$28 million budget for the construction of the Stanley Pauley Engineering Building is funded by the Government of Canada Strategic Infrastructure Fund and the Province of Manitoba, along with more than 700 donors who individually contributed between \$10 and \$900,000, achieving more than 95% of the fundraising goal.

The resulting Stanley Pauley Engineering Building provides the facilities to support the enrolment growth and increasing research intensity with major facilities in the new building devoted to:

- Communications/Radio Frequency and Microwave Laboratory
- Electronics Laboratory
- Power Electronics and Energy Conversion Laboratory
- Power Simulation Laboratory
- Power Systems Dynamics and Control Laboratory
- Biomedical Electrical Engineering Laboratories
- Biomaterials Laboratory
- Donald K. Johnston Undergraduate Student Study Lounge
- Price Innovation and Prototyping Centre
- Robert Allen Kennedy Cooperative Education/Industrial Internship Program Offices
- Internationally Educated Engineers Qualification Program Offices
- The Friends of Engineering Centre for Engineering Professional Practice and Engineering Education Offices
- Concord Projects Sustainable Building Engineering Laboratory
- Structural Performance Laboratory
- Geomatics Laboratory
- Architecture/Engineering Virtual Reality Facility

In January 2019, undergraduate electrical engineering laboratories represented the first use of the Stanley Pauley Engineering Building with the remaining elements of the building coming to life throughout 2019. With the new facilities becoming available, several laboratory and office areas in the existing Engineering and Information Technology Complex (EITC) and other engineering buildings are being renovated in 2019 to better support and engineering students and research endeavours.

You are invited to see for yourself the Stanley Pauley Engineering Building and improvements to all engineering facilities when we celebrate its opening during the University of Manitoba Homecoming 2019 festivities on September 20, 2019; please be sure to mark your calendar. Additionally, there is still an opportunity to help us achieve the last 5% of our fundraising target with all donations of more than \$1,000 recognized on a donor wall in the Stanley Pauley Engineering Building. To donate visit <https://give.umanitoba.ca>.

Hope to see you at Homecoming in September. ☺

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SEPTEMBER 20, 2019

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Funding for the Stanley Pauley Engineering Building was provided by the Government of Canada Strategic Infrastructure Fund and the Province of Manitoba, along with more than 700 donors, including a \$5 million commitment from the Pauley Family Foundation.

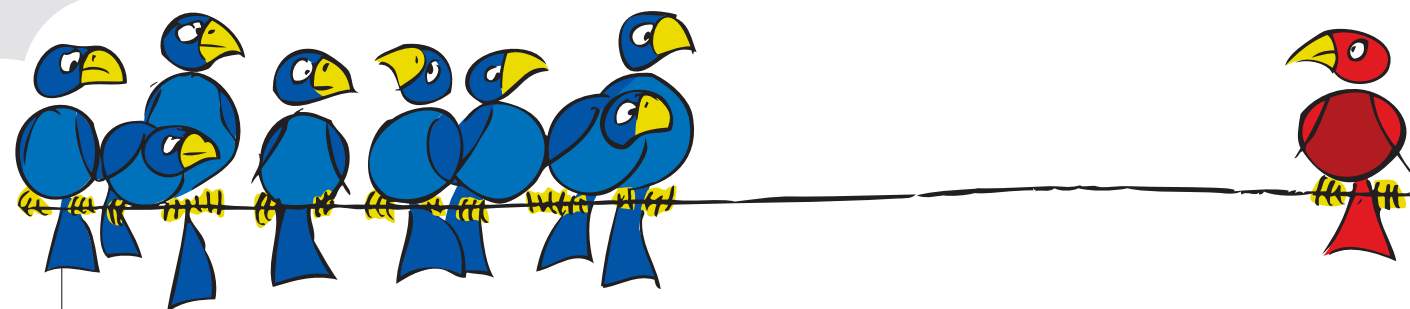


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Unconscious Bias



By J. Henkelman, P.Eng.

I have always been very passionate about inclusion and diversity. In order to inspire new ways of thinking, we must be intentional and proactive about leading change. To that end, I have been involved with my company's Inclusion and Diversity Committee for the past several years. We are a group of diverse, passionate, and committed employees who are driving inclusion and diversity to allow all employees to excel. Our focus on inclusion is about creating an engaging environment where everyone feels supported, listened to, and empowered to do their personal best.

Unfortunately, unconscious bias can inadvertently create barriers, even with the best intentions. So, what is unconscious bias? It is something that is unintended, implicit, and done all the time. This means we don't even know that our minds are holding onto the bias. In contrast, an explicit bias is an attitude or prejudice that one endorses at a conscious level. A great analogy is an iceberg; we make implicit associations based on what we can see, but there is so much more going on below the surface that we do not take into consideration.

The Implicit Association Test was introduced in the 1990s by scientists to study unconscious bias. The test is available online and has been taken by over 2.5 million people. The various tests expose the differences – or alignment – between the test taker's conscious and unconscious attitudes toward people of different races, sexual orientation, or physical characteristics. This is a great tool to bring visibility to some of the unconscious biases that you may hold, and not be aware of.

Mitigating unconscious bias is an important step in creating a workplace where everyone feels engaged, energized, and able to contribute to their maximum. Last year, our company committed to training 100% of our people leaders across Canada on the topic. The training was so successful that we have offered a follow-up session to our employees this year to further build on the topic.

There are more than a thousand studies that have been published over the last 10 years that report that people make decisions based on various human identifiable factors (such as age, appearance, weight, skin tone, and accent). Foundations for first impressions come from our own experiences and sense

of the world – what is familiar to us. Our reactions to someone we don't know may be positive, negative, or neutral depending on what is visible and audible about them. Most of us harbour deep-seated resistance to the 'different', whether that difference is defined by such evident factors as race, gender, ethnicity, age, or physical characteristics; or more subtle ones such as background, personality type, or experiences. Studies show us that perceptions of people are tied to expectations of competence, intelligence, and even trust, with an advantage given to some and a disadvantage given to others.

Our brains are bombarded with information every second. However, our conscious mind can only handle a small amount of that information. Therefore, as a form of efficiency, our brains use association to organize specific examples into broad categories.¹ The same mental abilities that allow us to perceive and categorize appropriately, that are necessary for us to learn and understand, are also the abilities that lead us astray and create bias. If our decision-making is being driven by things that we're not aware of, it might go in directions that we didn't necessarily intend. For example, if my bias is influencing my hiring, development, and promotion decisions, then my bias (whether conscious or unconscious) is impacting not only me, but the larger organization as well.

Even the most well-meaning person unwittingly allows unconscious thoughts and feelings to influence seemingly objective decisions. Put simply, our mindset is not as inclusive as we think it is. It is a tale of two brains. You know far less about yourself than you think you do.

So, what can we do about this? Learn about the unconscious biases that you might hold and try to keep that information top of mind. Pause and be aware of your initial judgements and interpretations. Remember, if we emphasize inclusion and diversity, it will allow our organizations to attract and retain diverse talent, drive innovation, and ultimately improve business performance. Be a champion for change ... and be comfortable with being uncomfortable!

¹ "Neurophysiology of Sensory Systems" Manfred Zimmermann, 1986

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Engineering Our CLIMATE

By W. Scofield

The urgency of climate change has become increasingly apparent in recent years with the onset of more intense (and frequent) wildfires, hurricanes, droughts, and glacial melting. Despite this urgency, and the scientific certainty surrounding its anthropogenic cause, comparatively little has been done to reduce emissions to the levels deemed acceptable by climate scientists. Additionally, the 2°C warming cap imposed on signatories of the Paris Accord has been rendered unrealistic, with a new Intergovernmental Panel on Climate Change (IPCC) report detailing the rather severe effects which could be imposed by warming of only 1.5°C.²

It has been said that climate change is the “perfect storm” when applied to our quasi-concealed evolutionary psychology; such that the consequences seem so distant, and our impacts on them so small, that we grant this existential problem only piecemeal partitions of our conscious awareness. Evidence of this is manifested in our continued use of coal, a continued reliance on petrol for transportation, the ever-prospering petrochemical industry, and our unabated love for cheap beef. Need I also mention food waste, deforestation, and population growth? Engineering and governance solutions abound for these problems. Yet, they maintain high degrees of significance as a result of petty convenience, nostalgia, and the failure of human psychology in implementing solution(s) to “distant” problems.

With a behavioural paradigm shift of proper size unforeseeable in the coming decades, alternative or supplementary solutions to the growing climate crisis may need to be deployed. The diversity of such strategies for the purpose of reducing planetary warming have been collectively dubbed “climate engineering”, or the “intentional, large-scale intervention in Earth’s climate system to counter climate change”.¹

Winner of the 2019 Student Writers Scholarship



This scholarship, sponsored by Craig Kelman & Associates, encourages student members of Engineers Geoscientists Manitoba to engage with the Association’s quarterly magazine by submitting an article they have written. As well as having their article featured in *The Keystone Professional*, one student each year will receive \$500 towards their engineering and geoscience studies.

In the interest of brevity, only one technique – stratospheric aerosol injection (SAI) – in the larger climate-engineering categorization of solar radiation management (SRM) will be described below.

SAI has been recognized by many climate scientists as the most feasible and effective means of managing incoming solar radiation, due primarily to its natural analog (volcanoes) and its low monetary burden. Volcanic eruptions with a volcanic explosivity index (VEI) of four or higher generate a vertical explosive force sufficient to inject considerable quantities of aerosol – primarily SO₂ – into the stratosphere.⁵ As a relevant example, the 1991 eruption of Mount Pinatubo in the Philippines (VEI = 5) lowered the average global temperature ~0.5°C by injecting five million tons of sulfates into the lower atmosphere.⁴ Such a quantity of sulfur aerosols injected annually at an altitude of 20-30 km has the potential to completely offset projected planetary warming over the next century, at a cost of USD 2b-8b/yr. In comparison, the estimated annual cost to global governments from greenhouse gas (GHG) emissions reduction and climate change effects mitigation is USD 200b-2t.³ Despite these undeniably favourable conditions, there exist side effects of this technique, which could prove severe at the scale required to offset planetary warming of 2°C or greater. Simulations and studies attempting to analyze the macroscopic implications of abundant SO₂ in the atmosphere have found that this gas interacts with stratospheric

chlorine – namely, chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) – increasing the potency of these substances to decompose UV-shielding ozone. Despite this, atmospheric chlorine concentrations are decreasing, and no significant Arctic ozone losses have been detected following recent “sulfur-rich volcanic eruptions”.⁵

With the plethora of climate engineering strategies at our disposal (including SAI), one would think that a select few of these strategies would be at the centre of public discourse surrounding the mitigation of climate change. While discussion of, and support for, climate engineering seems to be growing, it still represents somewhat of a “moral hazard”⁶ in the eye of many experts, insofar as solar geoengineering technology is expected to reduce the public focus on emissions reduction. Additionally, many environmental and religious philosophies are opposed to deliberate intervention in Earth’s climate; yet simultaneously treat the persistent presence of civilizational waste products in the stratosphere as if it were in a different philosophical realm, due to professed *unintentionality*. But are anthropogenic emissions truly unintentional, given the fact that scientists have been aware of the greenhouse effect for nearly a century? Is careful climate engineering more unethical than allowing the human and ecosystem consequences of unabated climate change?

It has become increasingly evident in recent years that a rapid, drastic, international reduction in GHG emissions will not arrive in time to prevent devastating changes to our home planet. Used following proper research and modeling, climate engineering techniques have the potential to supplement adaptation and accelerated emissions reductions in the industrial, transportation, and agricultural sectors. Indeed, “every serious researcher or policy expert who studies climate engineering ... believes that cutting GHG emissions is at least as important as developing geoengineering technologies, if not more urgent”.⁴

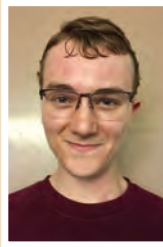
It is often said in engineering that changing technology to accommodate human behaviour is easier than changing human behaviour to accommodate technology.

As engineers, we must improve the conditions for what has evidently become the incremental transition away from fossil fuels and harmful agricultural practices by developing climate-engineering technologies under the guidance of scientists and the public. As a student and a young person just starting my career, the challenge of climate change is daunting. Yet, the solutions remain rather straightforward – as we stand on the shoulders of generations and their unrealized hopes, the problem finds itself presented with a newfound creativity and vigour. My hope therein lies with the engineer, today and tomorrow.

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WILL SCOFIELD, 2019 Student Writers Scholarship Recipient



Will Scofield is a second-year student enrolled in the Department of Biosystems Engineering, pursuing a specialization in environmental engineering. Born and raised in Minneapolis, Minnesota, Will's decision to study in Canada was motivated primarily by impressions gained in trips prior to university, and out of a desire to avoid the student debt crisis that is burdening an entire generation of American youth. Winnipeg is his second home, and it may very well become his first.

“ It has become increasingly evident in recent years that a rapid, drastic, international reduction in GHG emissions will not arrive in time to prevent devastating changes to our home planet.”

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30 by 30 – What Can You Do?

By L. MK Melvin, M.Sc., MBA, P.Eng., FEC

So, you've read the articles, heard the presentations, and understand the business case for gender parity in engineering. You're ready to be part of the change to achieve 30 by 30.¹ The common follow-up question is: what's next?

The following are a few key steps that we, as members of the professions, regardless of our positions or titles, can take.

Learn

Being open to learning is a first key step. The 30 by 30 is a journey, and it's great that you've decided to be a part of it. We didn't get to the milestone of defining the 30 by 30 goal overnight. No organization, group, or individual has all the answers for how to achieve 30 by 30. We all have ideas. Some ideas or strategies may, or may not, have success when implemented. Understanding the root cause of this situation, and the solutions, is very complex. Regardless, we are all learning and growing, and we are all on this journey together.

Mentor

Mentors come in various forms. Some mentoring relationships are formalized, through a program or initiative, while others are informal. Mentors play a huge role in supporting grade school students, engineering and geoscience students, and professionals. We all need various mentors at numerous times in our careers. Some mentors give us technical guidance, while others provide career guidance.

If you don't think you can be a mentor, think again. Taking a few extra minutes out of your day to explain how a technical analysis relates to a social impact, or how to manage tricky situations in the workplace, can make all the difference to a present or future colleague.



Perhaps use 'folks' instead of 'guys'. Do not use salutations such as 'gentlemen'. Even if all of the original recipients of communication identify as 'gentlemen', the person eventually receiving such information or instructions may not.



Sponsor

Sponsors are distinct from mentors. Sponsors speak up for others. Consider speaking up for people who may not be as good at promoting themselves. Sponsors are particularly important when they speak up for those not in the room.

Listen

Take time to hone your listening skills. In listening to all voices, we learn. The inequitable barriers in our systems and our institutions can be difficult to discern without effective listening. It's a beautiful gift. You never know what you may learn.

Stand up

No matter your position in an organization, you can set an example. Even if your organization may not be taking the lead on creating the most welcoming workplace, consider what you can do to make your circle a safe and welcoming environment. You'll be surprised how your circle will widen.

Check your language

To achieve 30 by 30, and a welcoming workplace, our language can have a

significant impact. Pay attention and try to make one small change. Eventually, these changes become routine.

Perhaps use 'folks' instead of 'guys'. Do not use salutations such as 'gentlemen'. Even if all of the original recipients of communication identify as 'gentlemen', the person eventually receiving such information or instructions may not.

Consider asking colleagues *how* their weekend was, rather than *what* they did. Not everyone is comfortable with sharing all of their personal life in the workplace. Using more inviting language allows recipients to decide how much of their personal life they'd like to share at work.

Share

Share your knowledge, expertise, and learnings. Don't hold on to corporate or organizational knowledge because you had to learn it the hard way and you think others should too. They shouldn't. Maybe consider sharing your safety boots, books, or tools too. We are all in this together.

Talk

Some may refer to this as authentic communication. We bring our whole

“Addressing miscommunications and seeking true understanding can be beneficial for all parties.”

selves to work, and yet the workplace can sometimes be a difficult place to have truly open and honest (while appropriate) conversations. Acknowledging our whole selves, including feelings, can be productive provided it is done with respect. Addressing miscommunications and seeking true understanding can be beneficial for all parties.

Reflect and self-evaluate

Be honest with yourself about how you're doing. It's a busy world we live in. But, taking time to reflect and internalize insights you've gained from any of the actions suggested can help maintain the change and keep you motivated. Small changes add up. Journal your journey, if it helps.

Take and apply training

While the steps listed so far may be applied informally, there are a variety of topics for which formal training exists and that can assist in transforming an organization. Check out what your organization – or others – offers on unconscious bias, diversity, or multicultural communication (to name a few topics).

Welcome to the journey. You are part of an exciting time. Someday, our professions will be known for representing the diversity of the society we serve. If you are open to change, you never know what you may learn, or the benefits you'll receive.

Reference

¹ Ends. 5.2 <http://www.apegm.mb.ca/pdf/Council/StrategicPlan2017-2022.pdf> ☒



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underground operations. The Russian engineers have also been doing extensive studies into the backfill systems at Russian. Backfill is a material remaining from our milling operations that refills the holes we made underground. Studies of backfill are necessary to prevent the fill material from shifting as blasting and ore removal proceed in the area.

The Russian open pit operation is phasing down and should be shut down completely by late Summer, then all our Russian products of 10,000 tons per day will be coming from underground.

Coming to the North will be the Canadian Institute of Mining and Metallurgy District Four Meeting which will be held in Flin Flin, September 1980. At this meeting several local engineers will be presenting papers.

For the warm southerners - the ice has gone off our lakes a month early this year and our thoughts will soon turn to swimming (the kids were swimming here on May 2nd), and to fishing, when the season opens, rather than engineering activities. So you may not hear from us again until the Fall. So long from the North.

Contractor Does It His Way

Several years ago we were involved in a sewer installation job where a problem developed that the contractor chose to solve in a unique fashion.

Some months after the sewer had been installed, a T.V. survey showed that two rubber gaskets were hanging in a certain section of the sewer. We advised the contractor to correct the problem.

The section of sewer had been laid down the middle of a street that had subsequently been paved with concrete. To complicate matters, it was impossible to reach the gaskets with a knife on a rod extended from a manhole. So the job evidently called for breaking up the pavement, correcting the problem, backfilling, and replacing the pavement.

A series of phone calls to the contractor, instructing him to remove the pavement and get rid of the gaskets, got us nowhere. Finally, after we had hounded the contractor for several months, he announced that there were no hanging gaskets in the sewer. Sure enough, another T.V. inspection proved him right. It was not until recently that the contractor confessed he thought the way we wanted it done was too expensive, so he removed the gaskets by blasting them off with a shotgun!

From "The Role of the Consulting Engineer in Municipal Engineering",
by George Pratt, P. Eng.



Walter Saltzberg and Gail Isaak doing their Groucho Marx and Barbra Streisand Act at the Ball.

Welcome New Members (January - April)

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Specified Scope of Practice Licence (December 2018 - April 2019)

L. Demko, Eng.L.	P. Lapointe, Eng.L.	G.K. Mikolayenko, Eng.L.
S.S. Deo, Eng.L.	H. Mapa, Eng.L.	M. Rioux, Eng.L.
K.C. Devisser, Eng.L.	B. Mathews, Eng.L.	J.C. Tolentino, Eng.L.
H. Dixon, Eng.L.	A.J. McCardle, Eng.L.	M.A. Turko, Eng.L.

Certificates of Authorization (February - April)

1973489 Alberta Ltd. o/a HausTec	CVL Engineers Inc.	nVent Thermal Canada Ltd.
8915156 Canada Inc.	CWA Engineers Inc.	Pario Engineering &
Aegis Engineering Inc.	Duma Engineering (2018) Inc.	Environmental Sciences LP
Armtec Inc.	Eclipse Engineering P.C.	PCLL Engineering Limited
Autopro Automation Consultants Ltd.	Engineers Northwest, Inc., P.S.	Robb Kullman Engineering LLP
BBA Engineering Ltd.	EnSpec Engineering Ltd.	Sitar & White Architecture and
Beaulier Inc.	Finar Steel Buildings Inc.	Engineering Ltd.
Behlen Industries LP o/a	GDR Structural Engineers Inc.	Spark Power High Voltage
U-Build Steel Buildings	Glidepath Systems Ltd.	Services Inc.
BMG Engineering Limited	Gravity Engineering Inc.	Steadfast Engineering Ltd.
Building and Environmental	HDA Engineering Ltd.	Strategic Community Consulting Inc.
Engineering Ltd.	ITS Automation & Controls Inc.	Teletek Structures Inc.
Burns & McDonnell	Lakeside Process Controls Ltd.	thyssenkrupp Industrial
Engineering Company, Inc.	Malone Projects Canada Inc.	Solutions (USA), Inc.
C.A. Reed & Associates (Sask.) Ltd.	Marathon Underground	TWD Technologies Ltd.
C.E.S. Engineering Ltd.	Constructors Corporation	TYZ Engineering Ltd.
Castle Engineering LLP	Modern Dimensions Design Inc.	Vector Structural Engineering, LLC
CTL Group	Novus Fire Protection Consulting Inc.	Ziyutec Inc.

Interns (January - April)

E.A. Adejumo
A.U. Afuberoh
H. Alboushi
E. Alishahi
H.Z. Alnajjar
M.U. Anwar
A.L. Araujo
Andrade
O.J. Ashaye
E. Asihene
I. Babenkova

A. Bagheri Vandaei
N.A. Beley
J.E. Bellan
S.V. Borodinski
K.M. Butt
V.M.R. Calanio
D.A. Cardenas Lozano
F.W. Cardenas Lozano
J. Cestina
M. Chatzini
J.A. Comeau

M.G. d'Auteuil
C. David
L.A. De Luna
S. Derakhshanfar
D.M. Dreolini
M. Elmaamoun
E. Enaworu
M.A. Eressa
K. Fattal
M.L. Fehr
M.N.J. Fillion

T.M. Fontaine
M.P. Froese
Y. Gelfat
S. Gerami
M.A. Ghaib
B.R. Harris
A. Indrabudi
M.A. Iwhewhe
S. Jangle
P.S. Kalsi
J.R. Koerner

M.A. Kulasza
K.A. Logan
Y. Luo
A.A. Maciuszonek
M.N.E. Maharajh
A.E. Martin
M. Mathew
L.D. McAllister
J.B. McLeod
B.W.H. Melville
A.M. Monaghan
I. Montani
A. Muhammad
G.S. Multani
N.T.T. Neil
G.M.D. Neufeld
K.R. Nickel
O.T. Omonmhenle
G.R. Oughton
O.O. Oyekunle
D.H. Patel
T. Peranantham
D.J. Poetker
M.D.A. Reimer
R.D.L. Reyes
E.A. Rich
K.L.N. Robinson
S.A. Sadowy
K.B. Schmidt
R.C. Shaha
K.N. Shambo
T.S. Shaw
J. Shim
A. Singh
S.K. Slagerman
T.G. Smith
O.T. Soneye
T.M. Stainton
K. Stamatis
S. Suri
Z. Taban
C.R. Terpstra
M.J. Traa
S.E.M. Unrau
K.M. Wang
G.S. Wararh
D. Yamoutzavareh



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Licenseses

(Jan - April)

M.J. Cash
G.R. Elfers
A.G. Fellows
A.D. Gipson
D.S. Kramer
D.A. Olheiser
B.D. Oliver
S.A. Schaller
J.M. Van Hove

In Memoriam

(Jan - April)

Beverly
Lloyd Fisher
Robert Harry
James Ritchie



Spaghetti Bridge Competition Smashes Bridges and Fights Hunger

Local students use spaghetti to build bridges and bridge the hunger gap

New this year, Engineers Geoscientists Manitoba brought its annual Spaghetti Bridge Competition into two Winnipeg schools, in addition to two days at Kildonan Place shopping centre. By bringing the competition into schools, volunteer engineers had the opportunity to speak to hundreds of students about how professional engineers provide many trusted and valuable skills and services that make people's lives better. Over a four-day period, more than 800 students competed, building 476 trusses, each of which was tested to its breaking point during the event. Prizes were awarded for the strongest structures from each grade, and a grade 12 student from John Taylor Collegiate earned this year's top spot when her truss bore

180 kg of weight before breaking!

"It's great to see so many students and teachers joining us to build strong entries in support of Winnipeg Harvest. By applying their ingenuity to make the most from simple building materials of spaghetti and glue, these future engineers constructed trusses which held up a combined load of **14,577.43kg!** Engineers Geoscientists Manitoba multiplied this number by two and we happily gave a donation of **\$29,154.86**. This will help Winnipeg Harvest in feeding approximately 150 families for a whole year," said Grant Koropatnick, P.Eng., FEC, Engineers Geoscientists Manitoba's CEO & Registrar.

"Students and teachers thank you so much for participating in this amazing event by putting your imagination to

work and helping to feed your fellow hungry Manitobans," said Keren Taylor-Hughes, Chief Executive Officer of Winnipeg Harvest. "By donating \$2 for every kg of weight sustained by over 470 pasta bridges, you've raised over \$29,000 to fight hunger and feed hope for families in Manitoba. Thank you to Engineers Geoscientists Manitoba for your continued support."

The Spaghetti Bridge Competition was part of a series of events planned to celebrate Provincial Engineering and Geoscience Week (PEGW). The celebration is part of National Engineering Month, which takes place across Canada throughout March each year. PEGW also promotes careers in engineering and the geosciences to young people of all ages.



Janelle Duerksen, Manitoba Harvest, Tristen Gitzel, P.Eng., FEC, Chair of PEGW Task Group, Ruth Eden, P.Eng., President of Engineers Geoscientists Manitoba, Grant Koropatnick, P.Eng., FEC, CEO & Registrar of Engineers Geoscientists Manitoba, and Association volunteers.

Notice to Members

Special Meeting

The Council of Engineers Geoscientists Manitoba invites all members to a Special Meeting to discuss by-law proposals at 7:00 p.m., on Thursday, September 19, 2019, at the Holiday Inn South, 1330 Pembina Hwy, Winnipeg, MB.

Annual General Meeting

The 2019 Annual General Meeting of Engineers Geoscientists Manitoba will be held at 3:30 p.m., on Thursday, October 17, 2019 at the RBC Convention Center, 375 York Avenue, Winnipeg, MB.

Member Petitions

Members wishing to submit a petition for the proposal of a by-law amendment, repeal, or enactment may do so by August 19, 2019. For full requirements on how to submit proposals and what must be included, please see By-law 17.5.

Nominations for Election to Council

The Council of Engineers Geoscientists Manitoba requests recommendations from members and interns for nominees who they consider to

be qualified to participate in the governance of the Association and who are willing to serve the engineering and geoscience professions in Manitoba. There will be three professional engineer positions, one professional geoscientist position, and one intern position to be filled as of October 2019. Nominations will be received by the Secretary up to the close of business on Thursday, September 5, 2019. Nomination forms may be downloaded from the website or obtained from the Association office.

Resolutions

By-law 5.2.4 prescribes that resolutions put forward at an Annual General Meeting must be in writing, signed by the mover and seconder, and received by the Secretary no less than 48 hours prior to the commencement of the meeting. Either the mover or the seconder must be present in person or by distance conferencing at the meeting for the resolution to be considered.

Grant Koropatnick, P.Eng., FEC
Secretary

2019 ACEC-MB Awards Gala

The 20th Annual Association of Consulting Engineering Companies – Manitoba Awards of Excellence were held on April 9, 2019. Approximately 240 people enjoyed an evening of food, entertainment, and celebration of the exceptional projects submitted by 13 ACEC-MB member firms.

The top prize for the evening, the Keystone Award, went to Teshmont Consultant LLP and Stantec Consulting for the Bipole III HVDC Project.

Awards of Excellence were presented for projects submitted by AECOM Canada Ltd., Hatch Ltd., KGS Group, MCW/AGE Power Consultants, Teshmont Consultants LLP and Stantec Consulting, Tetra Tech Canada Inc., and WSP Canada. AECOM, Canada Ltd. JR Cousin Consultants, KGS Group and Morrison Hershfield, SMS Engineering, and Stantec Consulting received Awards of Merit.

Bruce Wilton, P.Eng. was presented a Lifetime Achievement Award, and Tyson Ehnes, P.Eng. was presented with the Rising Star Award. An Engineering Action Award was presented to Richard Tebinka, P.Eng.

ACEC-MB's mission is to promote the business interests of the consulting engineers of Manitoba, and to promote the application of engineering for the benefit of society. Further information can be found on www.acec-mb.ca.



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New Members Luncheon



New members in attendance at the New Members Luncheon on February 12, 2019, where they received their official licence certificates.

12th Annual Bike to Work Day

Ditch the car and grab life by the handlebars for Winnipeg's 2019 Bike to Work Day, on June 17! Make sure to join us at the Engineers Geoscientists Manitoba pit stop, co-hosted by Dillon Consulting, on your way in to work. We'll be outside the office at 870 Pembina Highway (northbound Pembina at Harrow), from 6:30 a.m. to 9:00 a.m. with water, snacks, and more!

Whether you are trying it for the first time, or it's your thousandth time biking to work, we want to make your commute more enjoyable. So, trade your four wheels for two and join the 2019 Bike to Work Day!

Visit www.bikeweekwinnipeg.com for more information on all the events happening during this year's Bike Week Winnipeg.



Notice

Under the Engineering and Geoscientific Professions Act and the Association's Discipline By-law

This is notice that on March 31, 2019, Mr. J. L. Rocke, P.Eng. consented to the registration of a conviction and issuance of a reprimand on a charge of professional misconduct and unskilled practice in accordance with section 35(1)(f) of *The Engineering and Geoscientific Professions Act*. The conviction arises out of Mr. Rocke's engagement to inspect and make recommendations on the remediation of a home in Winnipeg. In the course of his engagement, he failed to provide a written report to his clients outlining his assessment of the home's foundation issues, his assumptions, his understanding of his clients' expectations, and his recommendations for remediation. In addition, a structural drawing made by him in the course of this engagement did not properly identify all of the existing structural elements.

Grant Koropatnick, P.Eng., FEC, CEO & Registrar

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Specified Scope of Practice Licence

Over the past several months, Engineers Geoscientists Manitoba has been registering its first group of Specified Scope of Practice Licensees (SSPL). Although the Association has had information sessions regarding this category of licensure going back as far as 2015, it is clear that many people still have questions. Hopefully, with the information provided below, anyone with anxiety about the relatively new path to licensure will have that anxiety alleviated.

Engineers Geoscientists Manitoba was not the first province to implement a limited licence like the Specified Scope of Practice Licensee category. In fact, we are one of the last provinces to do so. Ontario, B.C., Alberta, and Saskatchewan have had a similar category for several years. In conversations with those regulators, the introduction of these licensees has not resulted in any significant issues.

What designation?
Specified scope of practice licensees use the designation Eng.L or Geo.L

In Alberta, the take-up of the limited licence category has resulted in approximately 700 engineering licensees. Given the fact that they have 53,000 professional engineers, the ratio is approximately 76:1. In Saskatchewan, the ratio is similar at 89:1. At the time of writing, the total number of SSPLs registered in Manitoba was ten. As Engineers Geoscientists Manitoba has more than 6,400 professional members, we can expect the number of Specified Scope of Practice Licensees to grow about eightfold.

One of the key requirements for obtaining a Specified Scope of Practice Licensee is demonstrating competency within a scope of practice. This scope can vary significantly, and it is interesting to see the variety within that scope. For example, one person may have a scope such as:

“Scope Limitation: Design, inspect, and report on fire protection systems in residential, commercial, institutional, and industrial buildings.

Exclusions: Fire alarm systems.”

Where can I get information about a licensee’s scope?
The online directory provides every licensee’s scope of practice. Simply go to: www.enggeomb.ca click the check box for engineering licensee, and then click the ‘Search’ button.

Another example of another licensee’s specified scope is:
“Discipline: Mechanical
Field of Practice: Building Systems.
Scope Limitations: Design, study,

and investigation of the following:

1. Plumbing (domestic hot and cold water, sanitary drainage, storm drainage, and natural gas/propane piping) systems.
2. Planning/coordination of fire protection systems involving the layout of sprinklers and sprinkler systems.
3. Heating, ventilation, and air-conditioning systems.
4. Functional specifications of controls for HVAC and plumbing systems.
5. Sizing of medical gas pipeline systems

for Class C health facilities as defined in CSA Z317.2-10.

Exclusions:

1. National Building Code Subsection 3.2.6. “Additional Requirements for High Buildings.”
2. Site services outside the property line such as water main, gas main, and storm/sewer drainage that is related to civil works.
3. Detailed fire sprinkler design and fire alarm systems.
4. Manufacturing, industrial, aviation, and mining industry.”

Do specified scope of practice licensees get a stamp?
Yes, and it looks like this:



Technical competency is not the only element assessed when reviewing a Specified Scope of Practice Licensee’s application. Just as the applicants

for full membership are evaluated based on multiple factors, so are the applicants for limited licence. As an example, all applicants

Technical competency is not the only element assessed when reviewing a Specified Scope of Practice Licensee’s application. Just as the applicants for full membership are evaluated based on multiple factors, so are the applicants for limited licence.



Two key elements of demonstration of good character are a willingness to abide by the code of ethics, and a demonstrated understanding of their competency.



must demonstrate that they are of 'good character.'

Before practising professional engineering or professional geoscience, whether as a full member or licensee – the individual must first demonstrate that their character meets the characteristics expected of a professional. Two key elements of demonstration of good character are a willingness to abide by the code of ethics, and a demonstrated understanding of their competency.

Before joining Engineers Geoscientists Manitoba, I practised in the consulting engineering industry. At the firm where I last practised, there was one partner who stood out – his formal education was as a C.E.T. Under the old legislation, he would not have been able to gain a right to practice without returning to school to get a full engineering degree. Yet, many of the younger engineers turned to him regularly for advice. In thinking about his situation, it makes me happy to know that Engineers Geoscientists Manitoba now provides a path to licensure for people who are competent and are committed to ethical practice.


Do you know anyone who has been licensed within a specified scope? Is there someone you worked with in the past who did not have an engineering degree, but was worthy of gaining a limited licence?

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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