

THE IRON WARRIOR

THE NEWSPAPER OF THE UNIVERSITY OF WATERLOO ENGINEERING SOCIETY

VOLUME 37 ISSUE 9 | WEDNESDAY, JULY 6, 2016



facebook.com/TheIronWarrior

twitter.com/TheIronWarrior

iwarrior.uwaterloo.ca

President Hamdullahpur Appointed For Second Term



LEAH KRISTUFEK
CHEMICAL
ENGINEERING 2016

The University of Waterloo has established itself as a center for innovation, entrepreneurial thinking and diversity. It is therefore fitting that Feridun Hamdullahpur has been re-appointed as the President and Vice-chancellor to serve for a second term. Like many of the students who come to Waterloo seeking a dynamic education, Hamdullahpur is constantly working to keep the university on the leading edge, just barely in balance. In particular Hamdullahpur has continued to be an active researcher, teacher and administrator, even living in student housing for a time just after becoming President. As an administrator, he is close

to the issues that also affect the student body. While his academic research focuses on thermo-fluids and energy engineering, he also recognizes the importance of the lasting impact that education has outside the classroom.

Currently, in addition to being president of the University of Waterloo, Hamdullahpur also serves as chair of the U15 group of Canada's research-intensive universities and vice-chair of the Waterloo Global Science Initiative. In 2015 he was appointed chair of the Leadership Council for Digital Infrastructure. Hamdullahpur was also proud to be appointed to the United Nation's HeforShe Impact 10x10x10 campaign.

The fight for gender equality is one that Hamdullahpur understands firsthand, as he obtained his bachelor's and master's degrees in mechanical engineering at the Technical University of Istanbul, and his

PhD in chemical engineering from the Technical University of Nova Scotia. Since UW has a large focus on technical fields like math, science and engineering, establishing a strong positive message about gender equality is important, especially as students embark on co-ops. It was only a year into Hamdullahpur's first term that Pearl Sullivan became UW's first female dean of Engineering.

When I was applying to universities back in 2010-2011, the recruiters for Waterloo talked about how friendly and welcoming the [then] president David Johnston was. That tradition of openness, continues with Hamdullahpur often attending student events and participating in fun student videos. Personally, as I head off to apply what I have learned in the real world, I look forward watching the continued successes of Feridun Hamdullahpur and my alma mater.



President Hamdullahpur at the Engineering 7 Groundbreaking

Brexit: It's Happening... Sometime Soon



CAITLIN MCLAREN
3T CHEMICAL

The votes have been cast, and British citizens have elected to leave the European Union by the narrowest of margins. The overall result was 52% for "Leave" and 48% for "Remain". England and Wales leaned in the "Leave" direction, while Scotland and Northern Ireland preferred to remain. The results of the referendum, which was an election promise of current Conservative Prime Minister David Cameron, will be binding. Accordingly, Britain will invoke Article 50 of the Lisbon Treaty, which provides for member states to leave the European Union. It will be a slow process, and the UK and the EU will have to work out what, exactly, their new relationship will look like.

The actual exit of the UK from the European Union will not take place for some time. David Cameron has resigned following the vote, and will be succeeded as Conservative leader on September 9th; the task will be left to the new Prime Minister. After Cameron's successor begins the process, it will take a minimum of two years and a great deal of negotiation before Britain actually separates, with many pro-EU politicians vowing that they will work to keep Britain and the EU as closely allied as possible under the circumstances, especially in matters of trade.

The Vote

The close results highlighted many political and demographic divisions in the country. Notably, younger voters were mainly swayed by the European Union's wider economic opportunity. 70% of voters aged 24 and younger voted to remain in the EU. The scale was tipped by older voters, leading many

Remain supporters to argue that older voters sold the younger generation's economic future for ideological reasons. Meanwhile, Scottish voters were very upset by the results, especially because of Scotland's own recent independence referendum. Indeed, one of the major arguments against Scottish independence was the United Kingdom's EU membership, which Scotland might lose upon leaving. Britain's leaving the EU now seems like an underhanded betrayal to many members of the Scottish National Party, with some even calling for a repeated Scottish independence referendum. Meanwhile, in England, voters with higher education and economic status tended to support Remain more than those with lower education and economic status, who largely believed that the European Union was economically bad for them. Many working-class people felt, with some justification, that blue-collar jobs were being taken by foreign workers, especially Polish immigrants, who under EU law are able to work in Britain very easily.

The Issues

Undoubtedly, the economy was the main issue behind the Brexit vote. Remain supporters argued that remaining within the wide and unified European market was vital for British economic security, while Leave supporters claimed that EU membership was expensive for Britain and cost the UK money that could go towards healthcare. EU membership costs around 13 billion pounds per year, while Britain only received about 7 billion in return.

After the vote, the British pound dropped to a 30-year low compared to the American dollar, falling by around 4%; it currently stands at around US \$1.33. The Euro also fell by around 1% and at the time of writing is worth about US \$1.11. This drop has many Remain supporters worried that their fears are coming true; Leave supporters maintain that the drop is temporary and that freedom from EU regulations will be better for the British economy in the long term. Nevertheless, the fall of the pound reflects fears of decreased

foreign investment in Britain.

Currently, the single European market means that Britain can both import and export goods within Europe without tariffs. About half of Britain's trade is within the EU at present. Moreover, workers from other countries can access British jobs, and the same goes for British workers in Europe. Thus, Britain's leaving Europe means that the future of these jobs will be uncertain; Leave supporters hope that in the long term it will lead to higher British employment in British jobs. Leaving the EU will mean that Britain will be free of European trade restrictions, which currently impose tariffs on outside trading; in the future, Britain will be able to make its own trade agreements, which supporters hope will offset increased restrictions on the European market.

What will the agreement between the EU and the UK look like? There are several possibilities for future models, some more likely than others. In brief:

A Norwegian-style agreement, in which Britain would remain within the European Economic Area and follow EU regulations, and would continue to pay for these privileges; this is highly unlikely, as it would fail to address the main issues behind the Brexit vote. The position of Britain within the EU would not be substantially changed.

A Turkish-style customs union, in which Britain would continue to follow most (but not necessarily all) EU regulations, and would avoid tariffs within the EU while imposing external tariffs. However, Britain would not have full access to the single market. On the other hand, Britain would be able to exert more control over immigration and would not contribute to the EU budget.

Britain could also take a "most favoured nation" approach, wherein Britain would be entirely free to make its own trade deals and regulations without any impositions by



frankieleon via Flickr

Brexit has many people in both the UK and the EU wondering what the future has in store for them.

Continued on Page 4 as Brexit

Letter from the Editor

The Ethics of Placebos



BRYAN MAILLOUX
EDITOR-IN-CHIEF

Hello dear readers! I hope you all had a fantastic Canada Day weekend!

Like most people who are fortunate to live in this great country, I always have a good time celebrating Canada Day. As a country that didn't gain its independence through fire and blood, it takes a little bit more imagination to find the things we can do to celebrate our "Canadianness". So, for instance, this year on Canada Day morning, I first got up and ate some pancakes smothered in maple syrup while listening to the CBC. Then I went out in my thick red-and-white jacket and boots and got a double-double from Tim's, while being polite to the cashier and everyone else there. After that, I built an igloo and chilled with my polar bear friends for a bit. Finally, I went home, cracked open a couple of Molson Canadians, and watched hockey all night. And that's pretty much par for the course on Canada Day.

Ok, so maybe Canada Days don't happen like that in real life. (Aside from the maple syrup and the double-double – those really did happen this year.) What I truly enjoy about Canada Day is the way this country brings people together. It's not uncommon for people from all backgrounds and walks of life to appear at Canada Day celebrations, and the best part is that no one thinks twice about it. Here in Canada, we don't care who you are or where you're from – you'll always be invited to the party.

Another thing I find amazing is that anyone here in Canada who is from a different country, or who has parents who come from different countries, manages to integrate perfectly into Canadian culture, while at the same time keeping their own cultural traditions very much alive, in a country different from their own. Other countries manage this, to a certain extent, but I don't think there's anywhere in the world where cultural diversity is celebrated as much as Canada. Being "proud to be Canadian" doesn't mean that we are proud that our culture is better than other cultures. It means that when we put all our cultures together, we are proud that we all make up more than the sum of our parts.

But this national pride should come with the responsibility of representing equality and tolerance, and of fighting with what means we can the violence and the hatred that we hear about so often these days. Let's take Brexit, for instance. Looking back at history, the Battle of the Somme, the bloodiest battle of the First World War, began on July 1st exactly one hundred years ago. Would the thousands of soldiers who died on that morning a hundred years ago be proud of the British people today? Would they be happy that the people of the UK,

through silly ignorance mixed with a bit of racism, voted to leave an organization that was created to ensure that the Somme never happened again? I don't think so – and so it's our responsibility, as Canadians, to condemn steps in the wrong direction like Brexit, and to promote diversity and encourage tolerance.

Speaking of Canada Day celebrations, Caitlin, our resident columnist who writes *Five Things You Don't Want To Know*, informs me that if you're someone who is looking for, as the band Queen so vocally put it, "somebody tooooooove loooooooooooooooooooooove," you should have plenty of luck at Canada Day celebrations. (You definitely shouldn't trust me with dating advice. But if it's from Caitlin I'd say it's pretty safe.) In any case, if you believe you'll get lucky at a Canada Day celebration, or any event for that matter, there's a better chance you would actually get lucky than if you didn't believe you would.

This brings me to the subject I want to talk about in this editorial, which is the placebo effect. For those who don't know, the placebo effect is something that occurs when a person is told that a certain drug is a cure for an ailment they have. Though that drug usually has no effect whatsoever on that illness, sometimes a person is cured simply by believing that the drug would cure them. Conversely, there's the nocebo effect, which occurs when a person is harmed by taking a certain drug, simply by believing the drug would harm them, rather than because the drug has any adverse effects.

As one can imagine, both the placebo and nocebo effects can wreak havoc on scientific experimentation, especially in the medical domain. Every time scientists want to test a new drug, they need to make sure that the placebo (or nocebo) effects aren't tampering with their data. One way they can do this is by giving one test group the actual drug that needs to be tested, and by giving another group a pill that does nothing and that might just be full of sugar water or something. None of the patients know whether or not they are being given a placebo (and they shouldn't even know that any of the other patients are receiving placebos), but the scientists keep tabs on who received the real drug and who didn't. Often, some of the test subjects who received the placebo will simply recover on their own – the scientists are then testing whether the drug works *better* than placebos or not.

Though scientists can get around the placebo effect in this manner, there has also been some scientific research on the placebo effect itself. More than one article talks about whether placebos are a valid replacement for drugs or medical procedures that are known to work. And if placebos are found to be a suitable alternative to drugs with scientifically proven active ingredients, then people suffering from placebo-treatable ailments could save a lot of money by buying cheap, generic drugs, like aspirin, to "cure"

their ailments, rather than a specially tailored drug made just for that ailment.

Unfortunately, this problem leads to an ethical dilemma for scientists. One study (*Active Albuterol or Placebo, Sham Acupuncture, or No Intervention in Asthma*) claims that even if test subjects with asthma were informed that the drug given to them was a placebo, it was still around 20% more effective at treating the symptoms of their asthma than no treatment at all. However, the same study objectively measured patients' lung function after placebo treatment (using the FEV1 ratio), and found that those patients did not have a higher lung capacity than those who had taken typical asthma medication.

So what does this mean? The results of the study seem to suggest that while placebos succeed in treating symptoms by helping patients feel better (sometimes by helping them produce more endorphins and dopamine), placebo treatments may not treat the underlying problems patients might have. And herein lies the ethical problem: in a country such as the United States, where healthcare can be ridiculously expensive for people with ongoing medical issues, should doctors prescribe placebos to people who can't afford proper treatment, knowing full well that they will likely not be fully cured by that placebo?

In my personal opinion, I think doctors need to make sure their patients aren't just offered a temporary solution; they should be making sure their patients don't need to come back over and over again for the same ailment. In the American healthcare system as it currently stands, this isn't really possible, because not everyone has the means to afford specialized drugs. This means that it should be doctors' responsibility to change the healthcare system so that the best solutions and treatments are affordable to everyone.

Of course, I'm asking too much. Affordable healthcare? Never gonna happen. But one can always hope.

One last thing I'd like to rant about: people not being able to afford the drugs or treatment they need can lead them to "alternative" medicine. I'm talking about homeopathy, fad diets, and the weird "fix your body using this medieval-looking torture thing" devices you can buy on the shopping channel. I'm not going to say don't try alternative medicine; it's up to you to figure out what you're going to do with your body. But for your own sake, do your research (yes, this means listening to the skeptics as well) before trying anything! Don't just trust the good word of your friends or the people you see on TV or on the Internet; make sure the treatments you will be going through are *safe* above all, and then make sure they're *proven to be effective* and that they aren't just a waste of your money. Don't fund some crook who makes a fortune off gullible people who will choose to believe anything. When dealing with people who lie for profit, heed the words of the band Muse, and destroy their City of Delusion...

THE IRON WARRIOR

The Newspaper of the University
of Waterloo Engineering Society

Editor-in-Chief

Bryan Mailloux

Assistant Editor

Donovan Maudsley

Layout Editors

Donovan Maudsley
Brigita Gubins
Cameron Soltys

Copy Editors

Elizabeth Salsberg
Cameron Soltys
Caitlin McLaren
Brigita Gubins
Tiffany Chang
Isabel Vilchis

Circulation Manager

Donovan Maudsley

Advertising Manager

Brigita Gubins

Web Editor

Bryan Mailloux

Social Media Manager

Sarah Chan

Staff Writers

Raeesa Ashique
Sarah Chan
Tiffany Chang
Brigita Gubins
Gabrielle Klemm
Ashlyn Low
Donovan Maudsley
Caitlin McLaren
Elizabeth Salsberg
Cameron Soltys
Ratan Varghese
Tristan Kuehn

Contributors

Hannah Gautreau
Teresa Lumini
Kieran Broekhoven
Don Tu
Anson Chen
Katie Arnold
Megan Town

ADVISORY BOARD

Off-Stream Editor-in-Chief

Caitlin McLaren

Executive Members

Sarbjay Majumdar
Teresa Lumini

Students-at-Large

Megan Town
Maya Deen

Advertise With Us!

Want to reach a wide, intelligent audience which includes students, faculty and staff at the University?

We are the official newspaper of the University of Waterloo Engineering Society representing the entire undergraduate engineering student body of over 6000 students.

Our newspaper is distributed all across campus and is the perfect medium to advertise your event, employer information session, service, etc.

For more information, please visit iwarrior.uwaterloo.ca/advertising or contact us at iwarrior@uwaterloo.ca, 519-888-4567, Ext. 32693

Issue #5 Deadline: Friday, July 15th at 6:00pm for publication on Wednesday, July 20

Send your submissions to iwarrior@uwaterloo.ca

Spring 2016 Publication Schedule: May 25, June 8, June 22, July 6, July 20

The Iron Warrior is a forum for thought-provoking and informative articles published by the Engineering Society. Views expressed in The Iron Warrior are those of the authors and do not necessarily reflect the opinions of the Engineering Society.

The Iron Warrior encourages submissions from students, faculty and members of the university community. Submissions should reflect the concerns and intellectual standards of the university in general. The author's name and phone number should be included.

All submissions, unless otherwise stated, become the property of The Iron Warrior, which reserves the right to refuse publication of material which it deems unsuitable. The Iron Warrior also reserves the right to edit grammar, spelling and text that do not meet university standards. Authors will be notified of any major changes that may be required.

Mail should be addressed to The Iron Warrior, Engineering Society, E2 2347, University of Waterloo, Waterloo, Ontario, N2L 3G1. Our phone number is (519) 888-4567 x32693. E-mail can be sent to iwarrior@uwaterloo.ca

Terror Mars the End of Muslim Holy Month



**RAEESA
ASHIQUE**
2N ELECTRICAL

IS, the so-called Islamic State, has been increasing their attacks to the point where it is difficult to keep track of who has been most bombed most recently, with four attacks targeting Muslim countries at the end of the fasting month of Ramadan.

These are brutal and despicable acts, but understanding just how despicable they are requires an understanding of the importance of Ramadan. For the last month, Muslims around the world have been refraining from food and drink during the daylight hours, and standing for long prayers at night, all the while going about their normal routine of work or school. It is a blessed month, and Muslims try to take advantage of this time to increase spirituality and become closer to God. The atmosphere is comparable to the holiday season leading up to and including Christmas: happiness, generosity, and love. It

is a time of family, when the community comes closer together.

IS has chosen this time to target Muslims, just as they are wrapping up the holy month and looking forward to Eid-ul-Fitr, the first of two religious celebrations. This is akin to carrying out atrocities in the days leading up to Christmas.

On June 28, there was a suicide gun and bomb attack at Istanbul's Ataturk airport, the third busiest airport in Europe. Three gunmen opened fire, and detonated bombs when shot at by police. 45 people were killed and 240 injured.

On July 1, militants held hostages at the Holey Artisan Bakery café in Dhaka, Bangladesh's capital, until troops entered almost twelve hours later. The siege began in the evening, as diners were gathering to break their fast. Twenty hostages and two policemen were killed, most of them foreigners from Italy and Japan, and 30 others were injured. The gunmen tortured anyone who was unable to recite the Quran, and only provided food overnight for the Bangladeshi captives. More information about the attackers is emerging: they were

educated young men from prominent families, who had been reported missing back in December.

On Sunday, July 3, a truck filled with explosives detonated in Baghdad, Iraq's capital. An estimated 200 people were killed, with the death toll rising as more bodies are dug from the rubble. Many of the victims were women and children, doing Eid shopping after breaking their fast in the popular shopping centre in the Karada district, in preparation for the celebration. A police officer said that dozens burned to death or suffocated. Hundreds more are injured. Residents are angry with the government, blaming them for the lack of security. A woman told their local newspaper, "We can't enjoy the Eid; if it isn't ISIL, it's al-Qaeda, and if it isn't the two, it's the filthy corrupt politics in this country." They will be mourning, rather than celebrating.

Finally, (at least, "finally" on the day of writing) on July 4, there was a suicide bombing in the Muslim holy city of Medina in Saudi Arabia, outside the mosque of the Prophet Muhammad. There are no

words strong to condemn this atrocity, carried out at a holy location and a holy time of year. Four security officers were killed, and five other people were injured. The attack has not yet been claimed, but IS is suspected. There have recently been two other suicide attacks in the Saudi cities of Qatif and Jeddah.

There has also been a lot of criticism as to why these attacks are getting significantly less media coverage than Paris, Brussels, or Orlando did. Why Facebook does not have a profile picture filter to show solidarity. Perhaps the media considers Western lives to be more valuable, more worthy of air time. Or perhaps they do not want to re-evaluate their opinions. It's hard to mark Islam as the problem, as a terrorist religion, when Muslims are now the ones being killed and injured in the hundreds. Even worse, in their holy month.

I shudder to even begin to speculate about IS's twisted motives, and I shudder to think about what may be in store. Here's to hoping that Eid can pass without any violence or anger or senseless tragedies.

Supreme Court Strikes Down Texas Abortion Law



GABRIELLE KLEMT
1B GEOLOGICAL

Last week, the US Supreme Court struck down a new Texan law restricting access to abortions for people in the state. You may have heard something about this because it is the biggest win for abortion rights fighters since *Planned Parenthood vs. Casey* in 1992. Yes, that's right, since 1992 the States have really only been increasing the amount of restrictions on abortions.

The laws which were struck down would

have reduced the amount of abortion clinics leaving them only in metropolitan areas, making it unlikely that those living away from large cities would be able to get an abortion even if they really wanted to. Abortions have always been a touchy subject, especially in the state of Texas where a large religious population sees the act as going against what they stand for theologically. Many parents, especially in more rural areas, are believers of this and it's hard to imagine a young teenager trying to convince her parents to take her into the nearest big city, who knows how far away it might be, to let her undergo a procedure they believe to be against their religion.

The two laws, one which requires abortion clinics to be certified as ambulatory surgical centres and one which required doctors to gain admitting privileges at a local hospital, were deemed unconstitutional in a 5-to-3 vote. It was decided that these laws placed an "undue burden" on women seeking abortions, wouldn't protect women's health. Additionally, all those clinics which could not immediately meet the demands of the laws would have been forced to close, seriously restricting access to abortions.

23 other states are currently trying to implement the first of these two laws, while 10 have already implemented the second and six of those ten are already facing lawsuits.

While the win for women's rights in Texas does not necessarily mean that these laws are officially unconstitutional in all states, it will no doubt help the campaigns against them and perhaps force a victory for the abortion rights side.

The US has long been in a battle to gain equal abortion rights for all women. In fact, since the big win in 1973 establishing abortions as a constitutional right, men and women have been fighting to see improvement in access and quality. It can only be hoped that this win will force real change and, if not a switch in perception, then maybe a more tolerant and accepting view of abortions throughout the States.

FARC and Colombian Government Agree to Ceasefire



**DONOVAN
MAUDSLEY**
3A MECHANICAL

52 years is a long time. In 1964, for instance, the Toronto Maple Leafs had just won their second-to-last Stanley Cup Championship. On a much different note, the country of Colombia had just been plunged into a conflict that lasted until just a few short weeks ago. Peace talks have been happening since the fall of 2012, and have been making consistently slow progress throughout.

The conflict is between the Government of

Colombia and the Revolutionary Force of Colombia (FARC). The FARC sought to emulate the establishment of Cuba's Marxist-style government during the Cuban revolution. Formed as a peasant, rebel army to repel the military, the ideals of the movement became muddled in the waters of organized crime as time went on. Eventually the FARC became a violent guerrilla movement, who have committed terrorist attacks, kidnapped government officials and made serious waves in the illegal drug trade.

In the early 2000s the violence escalated even further, and in 2006 Juan Manuel Santos, Colombia's current President, became the Minister of Defense. From 2006 to 2009 Santos fought vehemently against the FARC,

but last week in Havana, Cuba he shook hands with Rodrigo Londoño Echeverri, the top FARC leader, also known as "Timochenko". Timochenko told the leaders of many influential Latin and South American countries that he wished this to be the last day of the war.

Raúl Castro, the President of Cuba, has acted as the mediator in the peace talks since they began, and is adamant that there is no turning back on the path to peace. The signing ceremony was also attended by representatives from the United States and Norway, as well as Ban Ki-moon, the U.N. Secretary-General.

Critics of the agreement point out that the numerous splinter factions of the FARC as well as the National Liberation Army are not

included in the peace treaty. Timochenko also discussed the future of the FARC, who wish to become a full fledged political party. Critics also point out that the FARC still refuse to lay down their weapons.

The United States have been instrumental in the counterinsurgency effort, and have put billions of dollars into the wallet of the Colombian government.

The 52 year long conflict has left over 220,000 dead and over 5 million people displaced from their homes. While restoring peace will not be an overnight process, I hope that some semblance of peace can be restored soon for the civilians and families of Colombia.

Canada Pension Plan to be Reformed



GABRIELLE KLEMT
1B GEOLOGICAL

The Canada Pension Plan, or CPP, is going to increase mandatory payments in eight provinces this year. As a young person who has almost certainly not even out one jot of thought into retirement, you may be asking how this could possibly affect you. Here's the thing: scary as it is, we should all be thinking about retirement.

Actually, starting at 18, we can all contribute to the CPP. In fact, in order to receive the maximum payment from CPP when you retire, you have to have contributed 83% of your eligible time, which is 18-65 years old.

In other words, you can't receive full benefits unless you contribute for at least 39 years from 18-65. Not only that, but you must also make a minimum payment every year in order to be considered. As of 2016, the yearly Maximum Pensionable Earnings (YMPE) level was \$54,900. That means if you are not making \$54,900 a year, and let's get serious, who in university is, then you will not be able to contribute enough to have "contributed" to CPP.

Now, just because it's almost certainly impossible for most Canadians to receive maximum CPP, doesn't mean you can't get a significant amount of money from them if and when you retire, but it does seem a little unfair that we can't get it no matter how hard we try just because we want a university education. The average expected payment currently is about 25% of your yearly earnings.

What CPP wants to do is increase that to about 33% by 2025. The way they are doing it has some people upset, however. They want to set up an "Upper Earnings Limit" which will be 7% above the YMPE limit in 2024 and 14% above it in 2025. To give some perspective, it is expected that this new upper limit will be \$82,700 in 2025. The people who earn in the range between the YMPE and the upper limit will have to start paying a premium of an extra 4% on top of what they currently contribute, which will rise to 5.95% of your income by 2025.

Many small business owners are currently upset about this move and you can probably find a dozen petitions circulating trying to stop it. Quebec has already refused the change to QPP due to too many complications and expenses. But, it's not just people currently

contributing who are benefiting, it is current retirees who are seeing a significant increase in payments starting even this year. Already the monthly payment has gone up \$330 and is projected to keep increasing at a rate of 1.2% for the next many years.

The rise in CPP is in an effort to help "grow the middle class" as Trudeau likes to put it. I respect that he's not just trying to help out those who are currently working but also increasing payments to those who are already retired. I think retirement scares a lot of people because it means a lot less financial security and really takes away from your freedom and independence at a time when you finally want to start doing things. I also think that this hike is so small compared to what it could be, that I think it is a major overreaction on the parts of those people who just don't like change.

Brexit: Not Quite the EU's Cup of Tea

CONTINUED FROM PAGE 1

Political Fallout

the EU. However, this would greatly restrict Britain's access to the European market. In this scenario, Britain would also have tighter immigration control.

A free-trade agreement with the EU, wherein Britain would make its own free-trade agreements with the EU and others. Britain would thus be able to, depending on the deal, avoid import and export tariffs with the European market; however, without a unified set of regulations, there would still be some trade barriers. This would leave Britain free to pursue trade with non-EU partners while avoiding EU tariffs on outside trading. The extents of the agreements would depend on the political climate; Britain would face a trade-off between economic independence and access to the market. Immigration to Britain is not relevant to the free-trade agreements and would be under British control.

A Swiss-style bilateral accord would allow Britain access to the single European market in specific sectors, which would be negotiated according to the different cases. Britain would have to follow EU regulations in those sectors, but not others. Free-trade agreements would be negotiated separately, with Britain remaining free to pursue deals with non-EU members independently. The EU may not favour this approach, as it may be difficult to come to an arrangement that benefits all parties. Again, immigration would be controlled by Britain.

In the immediate aftermath of the exit vote, it is becoming clear that Britain's austerity measures will have to go on hold. While Chancellor of the Exchequer George Osborne had previously pledged to bring about a budget surplus by 2020, Britain may well be forced into more debt in order to offset the immediate economic fallout of leaving the EU, with the money going towards investments such as infrastructure, as well as avoiding the need for tax increases and spending cuts. This position is strongly backed by Theresa May, one of the prominent candidates for Cameron's successor.

While the economy was the central focus of both campaigning and voting, another issue that overshadowed the campaign was immigration, with the Leave camp having strong anti-immigration sentiments. While much of that was also based on economic reasons, there were undercurrents of xenophobia among right-wing nationalist groups. Indeed, Labour Party MP Jo Cox was murdered by an anti-immigrant nationalist because of her Remain stance and support of immigration. Sadly, in the wake of the Brexit vote there was a spike in anti-immigrant hate crimes, with a 57% increase in violent or verbal attacks against immigrants or even British-born minority citizens. Muslims and Poles bore the brunt of these attacks, which are attributed to xenophobes feeling empowered by what they see as their country's support.

David Cameron, who was prominently against Brexit, announced his resignation immediately following the election results, stating that "I do not think it would be right for me to try to be the captain that steers our country to its next destination". However, he will remain in his position until September 9th, when a new leader will be announced. Cameron will not start the process of invoking Article 50; this task will be left for his successor.

Several candidates have put themselves forward for leadership of the Conservative Party. Notable among them are Theresa May, current Home Secretary, who was against Brexit but is now calling for party unity moving forward. Ms. May was recently said "[The British are] not looking for a prime minister who is just a Brexit Prime Minister, but a Prime Minister who can govern for the whole of the country." Michael Gove is another potential candidate. Mr. Gove is the current Justice Secretary and a prominent Brexit supporter, having previously stated that he would not run for Prime Minister and had been expected to support the campaign of Boris Johnson. Johnson, erstwhile Mayor of London and strong supporter of Leave, is a controversial and outspoken liberal conservative who had initially put himself forward as a possible candidate. After Gove's surprising last-minute change of mind, which many Johnson supporters characterized as betrayal, Johnson stepped out of the running. Other candidates are Andrea Leadsom, the formerly pro-EU but more recently pro-Brexit energy minister, Liam Fox, former secretary of defense and Leave backer, and Secretary of State for Work and Pensions Stephen Crabb, another Remain supporter who nevertheless has widespread blue-collar appeal.

Meanwhile, Cameron's counterpart Jeremy Corbyn, leader of the Labour

Party and the official opposition, refuses to resign despite the non-confidence vote his own party brought against him. Corbyn's position on the EU was complex and evolved over the years of Britain's membership; while he formally supported Remain as Labour leader, many were unconvinced, as he had voted against joining in 1973 and his support seemed half-hearted and ambivalent to many. In Britain, the official opposition assigns members of a "Shadow Cabinet", composed of counterparts to the official Cabinet Ministers; over two-thirds of the Labour Shadow Cabinet has resigned (echoing the many Shadow Cabinet resignations upon his 2015 election as Labour leader). Corbyn has long been an unpopular leader in his own party, and the non-binding no-confidence vote went against him by an overwhelming 172-40. While Corbyn refuses to step down voluntarily, there is talk of ousting him; even his two predecessors, George Brown and Edward Miliband, are pressuring him to leave lest he damage the Labour party. The names of Angela Eagle and Owen Smith, both former Shadow Cabinet ministers, are being bandied about as potential challengers to Corbyn for leadership of the Labour party.

Meanwhile, Nigel Farage, leader of the UK Independence Party, is having his day in the limelight. UKIP is a right-wing populist party whose *raison d'être* is, as its name suggests, British independence and nationalism; it was formed in order to get Britain to leave the European Union. Farage triumphantly announced to the European Parliament: "When I came here 17 years ago and I said that I wanted to lead a campaign to get Britain to leave the European Union, you all laughed at me - well I have to say, you're not laughing now, are you?" He accused EU leaders of being "in denial" about what he perceives as the failure of the EU due to excessive immigration and economic weakness in the Mediterranean

states. Furthermore, he stated that "virtually none of you have never done a proper job in your lives", while simultaneously requesting that all parties be "grown-up and sensible". Naturally, this speech was highly controversial, with many European politicians feeling insulted. European Commission President Jean-Claude Juncker said, "You were fighting for the exit, the British people voted in favour of the exit - why are you here?" and accusing Farage of misrepresenting the economic situation during the referendum campaigning. Guy Verhofstadt, former Prime Minister of Belgium, accused Farage of using Nazi propaganda posters depicting refugees.

On July 4th, Farage decided to step down from the leadership of UKIP, saying that his "political ambition has been realized."

European leaders are largely upset by the decision, which they see as threatening European unity. François Hollande, President of France, and German Chancellor Angela Merkel both expressed regret along with many other heads of state. However, far-right politicians such as France's Marine Le Pen and Geert Wilders of the Netherlands, who are opposed to Europe on principles of nationalist interests, welcomed the decision and see it as precedent to be followed by other countries in the future.

In the upcoming months, European Union leaders will meet in the absence of British representatives to discuss the exit terms. When the EU bloc has decided what their terms for separation will be, they will negotiate with Britain to draft an agreement; Merkel, one of the most prominent and well-respected leaders in Europe, warns well ahead of time that Europe will not tolerate British "cherry-picking" during negotiations. The negotiations must be agreed upon by Britain and at least 20 EU states with 65% of the population, and will be ratified by the European Parliament; the process will take a minimum of two years, and if an agreement cannot be reached in that time, the negotiations will be extended if all countries agree. After this time, EU treaties will cease to apply to the UK, while the UK Parliament will repeal the European Communities Act of 1972.

Considering the fracture of both of the largest political parties in Britain, and increased European internal tensions due to the usual suspects - the economy and immigration - it is unclear between whom the negotiations will even take place in the next two years, let alone the outcome. Everything might change in Europe, or despite everything, there may be relatively little change. The referendum was largely driven by British partisan politics and the personalities involved; in the future, we are looking at a number of new players and a very different playing field. The wider world situation - that is, the global economy and conflicts in the Middle East - are not going anywhere, and if Europe's position drastically changes in the future, the entire world may look very different soon...



Dilliff via Wikimedia Commons



U.S. Embassy London via Flickr

Nigel Farage, left, and Boris Johnson, right, were two of the leaders of the Leave campaign.

WWW.CHAINSAWLOVERS.COM

\$2 BUCK TUESDAYS
EVERY TUESDAY

\$10 PITCHERS
THURSDAYS BEFORE 11 PM

PABST ATTACK
\$4.50/TALL CAN
WEDNESDAY - ALL DAY
FRIDAY & SATURDAY - BEFORE 11 PM

DIRTY BURGER DAYS
\$2 BURGERS AND WINGS \$6.50/LB
TUESDAY, AND WEDNESDAY

BIGGIE-UP
ANY DAY ANY TIME

A BURGER AND A BEER FOR \$4 BUCKS!!

ADD FRIES FOR \$2
ADD WINGS FOR \$2

PRESENT THIS COUPON AT TIME OF ORDERING

LIMIT 1 COUPON PER PERSON. OFFER DOES NOT INCLUDE APPLICABLE TAXES. NOT VALID IF REPRODUCED, SOLD OR TRANSFERRED.

SAWDUST AND BEER AT 28 KING ST N, UPTOWN WATERLOO • (519) 954-8660 • LIKE US ON FACEBOOK • FOLLOW US ON TWITTER

Point Vs. Counterpoint

Should Countries with an Appointed Senate Abolish it in Favour of an Entirely Elected Government?

POINT

COUNTERPOINT



RATAN VARGHESE
1B ELECTRICAL

Unelected “upper houses”, such as the Canadian Senate, are archaic and undemocratic institutions that should be abolished. A Senate whose members are appointed by the Prime Minister or Governor General makes the legislative process more costly and less nimble, strengthens long-established parties at the expense of newer parties and independent politicians, and worst of all is a self-reinforcing impediment to the will of voters.

According to their own figures, the Canadian Senate cost \$81 million to operate during the 2014-2015 financial year. That is \$81 million of taxpayer money that wasn't spent on improving infrastructure, helping the poor, or investing in renewable energy. One would hope that \$81 million was being spent wisely, but unfortunately it is not so.

That money was spent on an institution whose very purpose is to slow the pace of legislation. In Canada, a bill must be approved by both the House of Commons and the Senate before it can become law, doubling the time the legislative branch spends mulling over important issues. This may have not been a problem in the days of horse-drawn buggies, but in today's fast-paced world every second of decision-making counts. Additionally, the long tenure of senators leads to longer-term stagnation in government. The minimum age of a Canadian senator is 30 years, and they can stay in power until they are 75 - assuming they don't die, resign, achieve comically low levels of attendance, become a foreign citizen, become bankrupt, commit a crime, leave their home province, or sell property in their home province until their remaining property has below \$4000 worth. If any of those are in dispute, it is the Senate that decides whether its own seats are vacant.

One position where the Senate stagnation is evident is the Leader of the Opposition. The Opposition in the Canadian Senate is “formed by the non-Government party with which the most senators are affiliated”, which right away means robs independent politicians and newer, smaller parties of a chance to shape policy. The Leader of the Opposition of the elected House of Commons, meanwhile, can be from any party opposing Government. Scanning a list of House opposition leaders from 1957 to 2015, one sees an eclectic mix of party backgrounds: ranging from the Reform Party and the Canadian Alliance to the Bloc Quebecois and the New Democratic Party. Over the same time period, every Senate opposition leader has been a Liberal or a Progressive Conservative. Even the Senate's official website admits that “the Opposition in the Senate and the Official Opposition in the House of Commons can be different parties.” In an era of constant change, the Senate is a static, inflexible think tank, full to the brim with old blood. In another self-reinforcing twist, guess how many Senate seats end up with parties trying to abolish the Senate?

The limited ability of smaller parties to influence Senate proceedings is a subset of perhaps the largest issue with an unelected Senate: it is fundamentally undemocratic. These appointed senators are almost as powerful as the elected representatives chosen by voters, but have nobody to hold them accountable. They can nullify the will of the people by disapproving of bills passed by the House: it is part of their job and often the course of

action most fitting their incentives. These senators are not appointed for their ability to represent the will of the Canadian people, but for their ability to represent the will of the governor or prime minister who appoints them. That is both undemocratic and redundant, considering that after a bill is passed by the House and the Senate it must be approved by the governor general anyway. Having an unelected Senate may help some suppressed minorities gain more influence in governance, but other minorities are actively shut out. In a rule reminiscent of Ancient Greece, these philosopher kings are required to own or have equity in at least \$4000 of property in the province from which they were appointed. Coupled with the minimum age restriction of 30 years, it is almost guaranteed that the Senate will fail to represent students, the homeless, and low-income households without significant restructuring.

The Canadian Senate is an old institution, imitating the still-older British House of Lords. It has a long and storied history, but conditions have changed since the 19th century. Money is harder to come by, with the global economy so fragile. The world is changing faster and legislation should keep pace. New and interesting political parties come and go, but are being systematically silenced and shut out of governance. Most of all, in an era of smart, fickle knowledge workers the last thing we need is a branch of government where the main qualification is the willingness to oppose the public for one's entire lifespan.

Most of Canada's international peers do not have an appointed Senate. While the United Kingdom retains its House of Lords, the upper chambers of Australia, Austria, Belgium, France, Germany, Ireland, Italy, Japan, Mexico, the Netherlands, Spain, Switzerland and the United States of America are all composed of senators elected by the people. Those organizations probably aren't as essential as they claim to be, seeing as Croatia, Denmark, Estonia, Hungary, Iceland, New Zealand and Sweden all abolished their senate-equivalents. Even within Canada, provincial level upper houses have been abolished for hundreds of years in Ontario, Newfoundland, Manitoba, New Brunswick, Prince Edward Island, Nova Scotia and Quebec. A single house parliament can definitely function efficiently, so it's about time Canada and the UK made the jump to simpler, more democratic governance.



RAEESA ASHIQUE
2N ELECTRICAL

Many people believe that the current model under which the Senate operates is not working. Some call for an elected instead of an appointed Senate, some call for reform, and some call for abolishment altogether. Granted, there is some corruption, but reform is a much better solution than abolishment.

The Canadian Parliament is based on the Westminster model, which is the same as the UK's Parliament. The Senate is the Upper House of Parliament, and its purpose is to keep checks on the Lower House. The MPs in the House of Commons, or the Lower House, are elected based on population, while the Senate is appointed and represent regions of the country.

First of all, there would be no Confederation without the Senate. Canada has had a Senate since the British North America Act passed in 1867, because equal representation by region in the Senate was the only way Quebec would accept representation by population in the House of Commons. At the time, no one wanted to see Ontario as the decision maker or breaker. The same rule still applies: the Canadian Senate is the best way to make sure that the smaller provinces' voices are still heard in Parliament, and prevent the more populated provinces from abusing their power of the majority.

The Fathers of Confederation wanted the Senate to have the following characteristics: independence, long-term perspective, continuity, professional and life experience, and regional equality. Are these no longer valid? Or do reformers believe that abolishment will increase the integration of these elements in government? Change for the sake of change must be discouraged: while abolishment may appear to be the easy way out, it's important to come up with the best case scenario for the Canadian system of government.

Sir John A. Macdonald wanted the Senate to “be an independent House” which would serve as “the sober second thought”. This is the point of the Senate: besides being able to introduce their own bills, they are supposed to review, amend, and ap-

prove or reject bills passed by the House of Commons. Basically, their main role is as a check on the House of Commons. This is essentially the same role as the House of Lords in UK. Although the House of Lords cannot prevent a bill from passing, they can force the House of Commons to reconsider their decisions, which is a valuable system to put a check on power and a system which is also working.

Members of the Canadian Senate are appointed by the Governor General based on the Prime Minister's recommendation, and there are many benefits to an appointed Senate over an elected one. It is filled by people with valuable professional experience, who are generally not politicians but rather consultants, managers, teachers, lawyers, health care workers, and the list goes on. They were contributing members of society who were making a difference, and want to continue to make a difference. Appointing these people is the best way to bring them into government without making them run for office.

Not only is an appointed government beneficial, but an elected one may be harmful.

First of all, there is a very likely chance of elected a Senate that mirrors the House of Commons, which would result in a gridlock in the decision-making process and defeats the purpose of the Senate. The purpose of the Senate is to provide a check on the House of Commons, but not to be able to overpower it.

Second of all, members of elected Senate will try to keep the people happy, but sometimes the right decision is not always the popular decision. They will be less likely to attempt to appease the people if their motive is the good of the country, rather than re-election. They have time to spend doing their job right, rather than campaigning. And, they have the education and diverse background to be able to do their job well.

Finally, do we really trust the people's choice? The Governor General will appoint a Senate based on the candidates' background, experience, and record, but the people do not always make the most informed decision. I think the American election situation makes this pretty clear, as does Brexit. Letting just anyone run for office may be democracy, but having just anyone win may be asking for trouble. The people often don't know what or who they're voting for. They are influenced by campaign ads and tricks, which are dependent on strategy and budget, or by the candidates' party affiliation, or other aspects which do not necessarily speak to the candidates' abilities to be the best at the job.

The best decision is to reform the Senate, rather than abolish it in favour of a fully elected government. The system has been working in Canada and the UK for years, and Canada must strive to implement the model in the way that the Fathers of Confederation intended. Also, it is key to ensuring that the needs of the smaller provinces are properly represented, and that the power of the House of Commons is kept in check. Yes, corruption exists in the Senate, but attempting to remove party affiliations and partisanship as well as adding accountability to the appointment process are better alternatives to abolishment, as a properly functional Senate will make a decision to best represent their region, not their party. Finally, do we really want the people to make ALL the decisions? No one wants another Brexit.



Mightydrake via Wikimedia Commons

The Canadian Senate meets in this room, known as the “Red Chamber”, in the Centre Block on Parliament Hill.

Editor's Note:

Point Vs. Counterpoint is a feature meant to stimulate discussion on thought-provoking topics. The views and opinions expressed here do not necessarily reflect those of the authors, *The Iron Warrior*, or the Engineering Society.

Prof Personalities: Andrew Beltaos



ASHLYN LOW
2B NANOTECHNOLOGY

It's probably not a far stretch to say that the majority of us have had, or at least know of friends who have had, Professor Andrew Beltaos as our Calculus or Linear Algebra lecturer. Completing his Bachelors degree in Honours Mathematical Physics and a Masters degree in Mathematical Biology at the University of Alberta, Professor Beltaos then came to the University of Waterloo in 2009 to begin his lecturing position. Since then, he has shared his undeniable love and excitement for teaching with countless students from the Civil, Chemical, Mechanical, Electrical and Computer, Systems Design, Mechatronics, Management, and Environmental and Geological Engineering Programs.

This issue, the *Iron Warrior* had the pleasure of getting to know this amazing professor a little more personally.

Which courses do you teach?

These days I'm teaching a lot of the engineering calculus courses and in the past I've also taught linear algebra for the math, engineering and science faculties. Specifically, I've taught SYDE 111 (Fundamental Engineering Math 1), Math 116 (Calculus 1 for Engineering), Math 118 (Calculus 2 for Engineering) and Math 215 (Linear Algebra for Electrical and Computer Engineers).

Why did you choose to become a math lecturer?

I would say it chose me. When I was doing my Masters, I realized that teaching was really fun and really awesome. So I heard that what you need to be able to lecture at the university level is a Masters, and I had that, so I asked them if I could teach courses and they said yes. It was harder than I thought but it was still really fun and I kept doing it, and getting better at it, and that was nine years ago.

What is your favourite part about being a lecturer?

The best part is honestly being able to pass on knowledge of really cool things. There's certain things when I was a student that I found really exciting to learn about them, and now as I teach them, I hope that I can pass on that excitement and give a lot of people the same insight as to what is so interesting about this material. In my classes that I teach, which is typically first year calculus and linear algebra, there's a handful of days of specific topics which I'm always excited to cover. I'm like, I can't wait to teach about, the definition of the definite integral for example, where we do the limit of the sum of the rectangles. I think it's just such an interesting idea and I always look forward to that. I always feel honoured that I get to be the one, in so many peoples' lives, to let them know about these really cool things. So that's what one of the best things. When students respond to that and they are like, wow that is awesome, it just makes me feel so happy. That's the best part I think.

What is the most challenging part of being a lecturer?

I don't know, I've been really lucky that I haven't had any crazy situations with my teaching. Students are always pretty respectful, so I don't have to worry about discipline or anything like that. That's what I would fear having to deal with, because

that's not what I like to do, it's not what I want to do.

I think the biggest challenge I ever had was during the first year that I taught. I made a rookie mistake of not bringing enough copies of the midterm to the exam. It was a bit of a fiasco, and I got really panicked. There were 100 students, and I picked up the big pile of papers and didn't look carefully at the numbers since someone else printed it and it turned out I only had 50 exams. So I got half way through the room and I ran out of exams! It was kind of crazy, but the resolution was that this was a large course and there were many sections. So a student, it was like a funny dream basically, he came up to me, dressed in gym shorts and stuff and he's like, "I'm a runner, I could run to the other classrooms and see if they have spare copies. And so he ran to the different classrooms that were writing the same midterm and he collected about 50, because he went to about five or ten different rooms, and brought them back. We ended up starting the exam late and it was really terrible, but it was a long time ago and I learned a lesson to always count your exams before you come to the exam. So that was the most embarrassing, challenging thing so far. But it's actually not so bad, like it was bad but I feel like I'm lucky that there haven't been worse things.

What is your teaching philosophy?

I definitely have a way of teaching, and it has evolved a lot over the years. When I first started teaching my philosophy was, "when I learned this topic I found this difficult, so I'm going to make sure students don't find that thing difficult, because I know I found it hard." But over the years, I realized that there's so many types of people out there and they are not all like me, they don't all think like me, not even a little bit. Now I've adapted my explanations to target what students find tricky and not what I used to think was hard. So every time a student asks a question, it adds to my inventory of possible ways of looking at a topic. Now I have like dozens of different perspectives on any one given topic so that when I start teaching it I can portray it from different angles. Presumably after enough years, I'll have a way of explaining it that will make sense to everybody.

When I teach, I really like to teach to the students that are in the room. For example, right now I'm teaching two different sections of Math 118, and the lectures are different because it really depends on what the students need or what they ask. When they stop and ask a question, that's when I'll go and do an example on the spot that explains the question they have, but in the other class they might ask about something different, so I'll go and do a different example. So it's very customizable, my lectures are like a conversation between myself and the students in the class.

What would you have pursued as a career if money didn't matter at all?

If money didn't matter, and I could just fill my time with whatever I wanted, I would still really enjoy teaching. When I was back in my old town and met with my old high school teacher from 17 years ago, we were talking and he was asking me, since I was in a similar career as him, if I liked marking. He said, "I hate it. The teaching, you know, I do that for free. The marking is what I get paid for." So I kind of agree with him; there's certain aspects that go along with teaching that are a lot of work, like marking, or even creating exams which can sometimes be a little stressful since you have to make sure it's good and that all the numbers work out nicely. If I wasn't getting any money, I wouldn't want to be doing those things. But being in a classroom, explaining concepts



Professor Beltaos plays a number of instruments, including some exotic ones like the accordion and the gamelan.

to people, I would still love to do that even if money was not a factor. The other thing I would do in my time is music, because I'm very into music.

Leading to the next question, do you have any hobbies?

I play a number of instruments. Guitar is my main one, it's the one I've been playing since I was 11. I've learned a couple of other ones, I don't play any of them very well, I just have a basic level that I'm competent at and it's what works for me, and it's really fun. So I also piano, accordion, harmonica, drums, and just last year I started playing the gamelan, because the university has a group for Balinese music, and I've been playing for a year and a half and it's so fun. I pretty much all my free time on music. If it's not basic necessities or social things, I'm just focusing on music, either playing or listening or going to concerts or writing music.

What was your most memorable experience as an undergraduate student?

I think I have two very memorable experiences from undergrad. One is memorable just because it was the first time I pulled an all-nighter. It was third year quantum mechanics, and I had gotten into this bad habit of starting an assignment the day before it was due. So me and my friends were working on it, and I ended up staying up all night. It was actually kind of exciting and fun, like it was the first time I did that for working on school. I went home after handing it in at 1pm in the afternoon, and then I went to sleep for I think 19 hours. So that was memorable for that reason.

But the most interesting thing in a really positive sense, was the first day of university, when I went to an astronomy class which I was taking as an elective, and the professor explained how gravity behaves. Before that I didn't really understand it, like I thought, you're in space, you float; you're on the earth, you're stuck to the ground. But it's not even remotely like that. Gravity works the same way whether you are within the earth's atmosphere or in space, and it's just that there is a force pulling directly towards the centre of the earth. If you have a little bit of tangential velocity, you are going to go in that direction of the tangential velocity, as you are still being pulled down, so the vector addition causes you to orbit. If you are standing on a mountain and you throw a rock, it will start to orbit the earth. If you didn't throw it fast enough though, it will hit the surface of the earth before it has an

opportunity to continue its orbit. And that just blew my mind. It was 16 years ago and still to this day it amazes me, like every time I watch a soccer game and there's a big kick I think, wow, this object is in orbit, just for this brief moment, and then it gets interrupted by the foot of another player.

Do you have any advice for your students?

One advice I have is just don't stress about exams. When I was in undergrad, it was probably in third year or so that I started to see exams more as just an opportunity to sit down in a quiet location and work on some math problems for two and a half hours or whatever the course was, rather than, oh no this is a thing that my grade is riding on. If you've been putting in the work, if you are a reasonable student with a good work ethic and reasonable competency, then it's no different from if your friend is like, "Hey you like crossword puzzles? On Friday I'm going to have a crossword puzzle party, you can come over to my house, it's between 2pm and 4:30pm, bring a pen and I'll give you a crossword puzzle and you can work on it, and it will be quiet and nice." So there's no stress there. You just think, sure, I like doing this, why wouldn't I want to go and sit there and do that. Most of the learning you do at school is pretty fun, sometimes you get a little bit overwhelmed with the sheer load of it of course, but overall the learning is fun. Plus, the material you are working on, if you've chosen the right field of study, is something that you enjoy doing and are probably reasonably good at after putting in the work, so when it's time for the exam, it's not a stressful thing. So the exam anxiety is something I don't think students need to have. Of course, there are some who have different levels of anxiety, I'm only talking from my own experience right now, but having that perspective reduced my exam anxiety significantly.

The other thing I would say on a similar note about if you are in the right program, is that you have to look towards what you are enjoying. What I did with my undergrad, and Masters, and career, is that I pick and choose the things I like, and then those are the things I'm motivated to do. That means those are the things that I will do well in, and then it's like a positive cycle because I'm rewarded for doing things really well by being able to do more of it, which is fun. So just explore deeper the things that you enjoy the most, and you will find your path, in an ideal world. I've been lucky that I've had an ideal situation and I hope that everyone can have that kind of luck as well.

Elie Wiesel, A Man Who Remembered The Forgotten



GABRIELLE KLEMT
1B GEOLOGICAL

There was a period in high school when all it seemed we talked about was the Holocaust. What made this term in school so hard to bear was that all of it was true, not one thing covered was fiction; that was truly what someone—the same age as us—had experienced. We'd move from history where we studied WW2, to French where we studied the saddest play ever, *Au Revoir les Enfants* (literally "Goodbye children"), to English where we were reading *Night*, a book about one boy surviving the Concentration camps.

On July 2, the world lost one of its foremost fighters for the cause of peace, Elie Wiesel, who died at the age of 87. His most famous work *Night*, written in 1956, has been translated into over 30 languages and has sold millions of copies all over the world.

Born to a Jewish family in Romania, 1928, Elie grew up in a town where Judaism was just a fact of life. In 1944, the Nazis came

to their town, rounded everyone up, and put them on freight trains, packed in like animals for slaughter without food or water. His family was soon split up, boys from girls.

They were taken to Auschwitz in Poland, where Elie survived by working hard and lying about his age, telling them he was 18 instead of 15 to avoid being killed. Miraculously, he survived the war and the hard labour, the sickness and the camps, although most of his family and friends did not. And yet, when he wrote about his experiences, he did not write about revenge or hate, he wrote about unity and peace, of brotherhood.

In essence, it was his message of unity which won him, in 1986, the Nobel Peace Prize. In his speech after being given the award, Elie spoke of his guilt in surviving, in speaking for the people who no longer had a voice. He brought his message around the world, trying to spread the idea that there is always a better way than death, than war. He fought not only for the memory of all those killed in the Second World War, he fought for the persecuted the world over. His causes included Soviet Jews, Nicaragua's Miskito Indians, Ethiopian-born Israeli youth, Argentina's

"Disappeared," Cambodian refugees, the Kurds, and victims of famine and genocide in Africa, apartheid in South Africa and war in the former Yugoslavia.

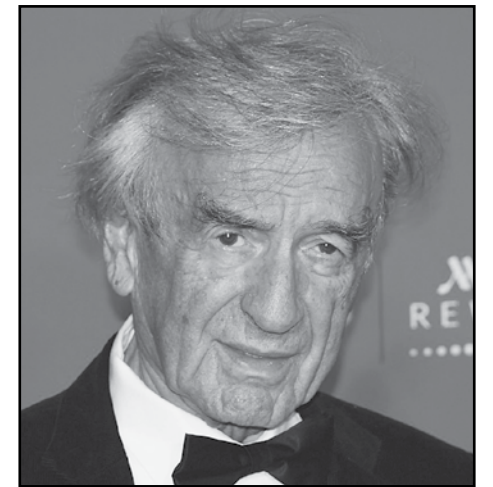
Often Elie would lobby the Presidents of the United States and other politicians to make certain changes or to avoid others, and often they would listen. He was the kind of person who inspired people to make a difference, according to his son.

A prominent author, activist, journalist, and professor at City College in New York and at the University of Boston, there are many people who were touched by Elie and are speaking out about his passing. Former students, Presidents, journalists, there is hardly a group with whom Elie's message didn't resonate.

It is incredible how relevant his message still is today, that unity is better than division. Especially at this strange time with Donald Trump and the Brexit vote. It seems that people have forgotten, or maybe that they don't want to remember, the harm that labelling people as "different" can cause.

People like Elie are survivors for a reason, as he said in 1981, "I must do something with my life. It is too serious to play games with

anymore, because in my place, someone else could have been saved. And so I speak for that person. On the other hand, I know I cannot." He may have believed he could not speak for those without a voice, but his efforts should never be overlooked or forgotten. In today's world that should be more than obvious, let's hope we take note soon.



David Shankbone via Wikimedia Commons

Elie Wiesel at the 2012 Time 100 Gala

War Games of the 21st Century



DONOVAN MAUDSLEY
3A MECHANICAL

Artificial Intelligence was elevated to another level this month, as an ace fighter pilot was defeated in a simulator by an AI pilot. This comes only a few months after AlphaGo, a Google developed computer program, defeated the reigning human champion at Go, the world's most complex game. Artificial intelligence is a terrific and frightening area of scientific area. For better or worse, once a fully functioning AI is created, the world will

never be the same. Whether the breakthrough comes in a military or civilian form, it will have major ramifications the world over.

Research into AI is largely limited by the processing power of modern day computers, but scientists at the University of Cincinnati have found a way to beat the system with their AI ALPHA. Using a type of programming called "Genetic Fuzzy Tree" logic, the program is able to break down large decisions into hundreds of smaller decisions which can each be analysed separately. Other AI programs need to run on room sized supercomputers, but the possibility to run ALPHA on a computer as small as a Raspberry Pi ex-

ists.

The ALPHA was tested against Gene Lee, a retired United States Air Force Colonel and former fighter pilot instructor. This was not the first time that Lee has tested fighter pilot simulations; he has flown against them since the 1980s. During multiple tests, Lee was unable to score a single victory even when he was given a significant handicap.

The University of Cincinnati researchers used a system of natural selection to determine the best possible pilot program. By pitting multiple variations of the software against each other in a tournament style competition, they were able to eliminate the weaker configurations and make

improvements based on which programs were successful.

This program is not designed to entirely replace fighter pilots, but the researchers say that their program could serve as a wingman for human pilots. Their end goal is to create a system with multiple AI aircraft operating with a hive style intelligence. In a real dogfight situation, an AI pilot would also have a considerable physical advantage. The g-forces acting on the aircraft would not affect a program, and the ability to monitor and manage technical readouts from the vessel would be a major asset. The AI pilot might be able to get the optimal performance out of the fighter jet where a human could not.

Small Differences Add Up



BRIGITA GUBINS
YEAR 2 ENVIRONMENTAL

LEAFY THOUGHTS

There are many, many things we do as humans that are detrimental to the health of the environment. Driving to go see your grandmother releases carbon emissions, further insulating our atmosphere and contributing to climate change. Getting a cup of coffee on campus has the combined effects of the agricultural impact of growing coffee beans, the human impact of poor working conditions for many field labourers, the shipping causing more carbon emissions, the electricity used to roast and grind the beans, as well as the entire process for harvesting materials, producing, packaging, shipping, and then filling a disposable paper coffee cup.

Buying your favourite chicken-salad wrap for lunch in the plaza has to take into account all of the agricultural production of the grown ingredients, like the vegetables, as well as the welfare of the animals, and the processing, feeding and waste created by producing meat products. Factory farming is going to be covered in another issue, but the environmental impact of industrial-scale agriculture is enormous. Just my typing this column on a relatively new computer has a significant impact, with the precious metals and other materials mined to produce the components, the shipping of those raw materials, the shipping of the assembled product, and the inevitable obsolescence of this

laptop.

While all of this can be overwhelmingly depressing, we're not quite in a position of no hope yet. Upcycling, the process of taking scrap/waste material and making something new from it, has endless possibilities in tackling the waste problem. Just carrying your own coffee mug – or even a mason jar – cuts down the amount of waste produced by the average North American by a significant amount. Bring Tupperware if you

need to buy lunch on campus – most places are quite happy to deposit your Pad Thai in your own container as opposed to their disposable one. Now that it's summer, clothes dryers only waste your money when you can hang dry stuff on whatever horizontal surface is available.

Just doing some basic googling to figure out what is and isn't recyclable makes a world of difference for the person who has to sort through all the recycling at whatever

centre your local waste collection drops them off.

Making a difference isn't that hard. Walking back home from campus instead of driving or taking the bus is free, and better for everyone. While the GRT is free with student cards, Waterloo is the only place [of which I am aware] to have this luxury. Working in Toronto? You are welcome to commiserate with me over the \$115 metropass every month of co-op.

KITCHENER WATERLOO



Travel Vaccines
& Advice
by Appointment

Health Canada Certified for Yellow Fever

519.570.4208

www.kwtravelclinic.ca

Physicians Certified in Travel Medicine

10 Meetings AttendED

VP Education Update



ANSON CHEN
VP EDUCATION

Hi everyone! As promised last issue, I'm back with real VP Education updates from meetings that have now all happened at once. Please bear with me because there are a lot of updates!

PD

Last month, I sent an open letter to WatPD expressing student concerns, and EngSoc B's approval of a department professor's idea of running a survey. These concerns have been taken seriously and got the ball rolling on what I hope will be very meaningful changes to PD. The Engineering PD committee has agreed to run a survey through EngSoc, potentially by Fall. The nature of the survey will broadly capture what students feel about the PD, and why they feel that way. This information will then shed insight on how PD and Engineering can tackle those issues which, I think we can all agree, are currently highly widespread. That said, I have the general impression now that PD and the engineering professors have students' interests at heart and am fairly optimistic about where this is heading.

WaterlooWorks

CECA has consistently promised that WaterlooWorks will launch in Winter 2017, and this continues to be true. I'm hearing through Feds, however, that it is best to only expect "basic functionality" for the launch term - i.e. WaterlooWorks will be functional enough to replace Jobmine, but some of the promised extra features may take longer to be fully implemented. CECA will be running a demo of WaterlooWorks

in CPH Foyer on Tuesday, July 12, during lunchtime for anyone to stop by.

Rate My Work Term, the co-op rating tool, is one of those features promised for WaterlooWorks. I've been working with CECA along with reps from the other societies to develop the questionnaire that will become Rate My Work Term. It looks decent so far, but let's cross our fingers that it launches in a timely fashion.

Co-op

7 students were on co-op in Fort McMurray during the fires; they are all safe. CECA is assisting them with finding replacement employment, and compensated them \$500 each.

Employment stats for both Spring and Fall are good; as is what typically happens, the overall number of jobs/employed students went up, while the percentage dipped slightly due to increasing enrolment.

A common question I get asked is why Waterloo is able to advertise a 99% employment rate when, for example, the typical employment for Spring is around 96%. I found out the answer is that the 99% corresponds with Fall work terms; coincidentally, Fall is the term with no first years on work term. This is on CECA's radar for them to figure out with UW marketing.

Student Concerns

Thanks to a highly-noticed Facebook post on the EngSoc group that you may or may not have spotted, a handful of important academic concerns were discussed amongst engineering students. I have since brought all of them to the attention of somebody relevant. Some were answered while the following are currently on the radar:

- Rising international tuition

- Rising admission averages and effects on the interest diversity of incoming students

- Access to course overrides and course

approvals on co-op

Schedule-related challenges in fulfilling CSE requirements

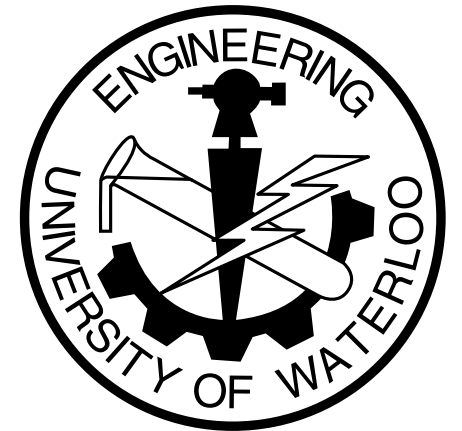
If you have others, definitely let me know at vpeducation.b@engsoc.uwaterloo.ca and I'm happy to bring them to people who can address them!

Exam Bank

Exam Bank raffles are ongoing this term! This means everyone who got midterms back (hey you, yes you!) should be submitting exams at engsoc.uwaterloo.ca/exambank for some pretty solid chances to win \$25 Cineplex gift cards! We will raffle out 3 more gift cards before the end of the term, dates depending on submission

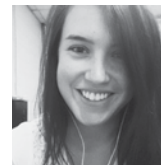
volume.

That's everything for now. Thank you so much and talk to you soon!



Update Time!

President Update



HANNAH GAUTREAU
PRESIDENT

Hello Everyone! I hope your long weekend treated you well! Things have been quite slow over the past couple of weeks with most of my time being spent preparing for our Joint Annual General Meeting and transitioning the new executive. So we will have another short and sweet update this term!

Joint Annual General Meeting

The second Joint Annual General Meeting took place on June 26th, and it was incredibly successful! We elected a new Board of Directors, re-structured ECIF funding, and had some amazing discussion about Council. The Council

Review Committee proposal generated a lot of debate, and there were so many great points brought forward that will hopefully improve council in the future. I am currently working on updating all of the governing documents to reflect the changes that were passed.

Transition

I have been spending a lot of my time transitioning my successor, Rachel Malevich, since she will be the B-Society president starting in August. I am really excited to see what her and her team are going to accomplish in the next two months!

Otherwise, I am spending most of my time wrapping up my term since there is only one more month left. If you have any questions or feedback please send me an email at president.b@engsoc.uwaterloo.ca or stop by the orifice for a chat!

Upcoming Events Calendar

Wednesday July 6	Thursday July 7	Friday July 8	Saturday July 9	Sunday July 10	Monday July 11	Tuesday July 12	Check out up-to-the-day event postings on the EngSoc website at engsoc.uwaterloo.ca/event-calendar/
Council Meeting #4 5:30 PM - 7:30 PM		Nail Art 12:00 PM - 14:00 PM Semi Formal 6:00 PM - 1:00 AM	Movie Night in POETS 7:30 PM - 10:30 PM	Water Day 10:00 AM - 1:00 PM		Eat Grilled Cheese 11:30 AM - 12:30 PM	
Wednesday July 13	Thursday July 14	Friday July 15	Saturday July 16	Sunday July 17	Monday July 18	Tuesday July 19	 
Beach Day with the Tool 11:30 AM - 12:30 PM EngPlay 8:00 PM - 11:00 PM	Conference Night 5:30 PM - 7:00 PM	EngPlay 8:00 PM - 11:00 PM	Beach Day with FEDS 11:30 AM - 4:30 PM Dungeons and Dragons 12:00 PM - 3:00 PM EngPlay 8:00 PM - 11:00 PM	Summer Potluck + Networking 11:00 AM - 2:00 PM	Sing Songs and Eat Ice Cream 7:00 PM - 9:00 PM	Course Critiques 11:30 PM - 1:30 PM Eat Grilled Cheese 11:30 AM - 12:30 PM Genius Bowl 7:00 PM - 9:00 PM	

VP External Update

Sharing is Caring



KIERAN BROEKHOVEN
VP EXTERNAL

Busy times, busy times.

The last couple weeks in my portfolio have mostly been leading up to this past weekend! Like every year, EngSoc was involved in Toronto's Pride Parade and UWaterloo's Canada Day. Sadly, that marks the last of the significant parts of my portfolio. In the summer, once those two and WEC are over, things start to wind down. With my remaining events being Day at the MUSEUM, Water Day, another Blood Run and conference night, I'd like to talk about the major thing that'll be happening in the last months of this term: the charity election.

Heather Smith, a past VP Ex of ASoc, had this wonderful idea in summer 2014: vote on a charity every summer and support it throughout the rest of the year! That year it was OneROOF, while this year it's water.org. Both are fantastic causes and we'd like to find another great one this year. Thankfully, I have 2 wonderful successors to handle

it. The game plan is to set up a Google form allowing nominations for charities, then the exec will choose the best options and have another Google form to hold a vote on which charity we will support. All undergraduate engineers can vote - on stream or off stream. Keep an eye out for the emails! If you have any questions go ahead and shoot them to incomingexecutive@engsoc.uwaterloo.ca, addressed to Chelsea and Sabrina (shoutout to our awesome new VP Student Life).

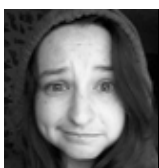
Okay, that's a lot of words, so real quick: what's coming up? Water Day: a water fight and a watermelon eating contest; what's not to love? Blood Runs: a group trip to the blood drive, because as you know, it's in you to give and we can prove that engineers care about our community. Day at THE MUSEUM: just like the last one, go to the museum in Kitchener and do fun science experiments with kids! We would love to get more volunteers this time, so tell your friends. Finally, I'll be holding a conference night in POETS to tell people all about why conferences are awesome and why you should go to them. Check the calendar for the dates.

Thanks for reading!



VP Internal Update

Good News Everyone!



TERESA LUMINI
VP INTERNAL

Hey everyone! We have some very exciting events coming up in the next two weeks.

First, it's time to get your fancy on, with Semi Formal coming up this Friday! The Tool will be making an appearance and there will be snacks, dancing and a cash bar. Then, next week, you get to see the Tool

again in POETS for Beach Day with the Tool. You can take pictures with a variety of beach related props and, obviously, the Tool. Finally, they have been hard at work since the beginning of the term and they are ready to strut their stuff and show off their musical masterpiece! EngPlay performances are next week on July 13th, 15th, and 16th. Ever wonder what Engineering would be like as an MMPORPG and a musical? Well, now you can find out. Come on down to see the shows next week as we follow a scrappy group of first years as they find their way through Engineering Land.

VP Finance Update

Things Tu Be Thankful For



DON TU
VP FINANCE

If you have any fourth-year friends, you may be led to believe that they are all under a contractual obligation to constantly remind everyone around them of how old they feel. However, as my 3A term rapidly comes to a close, I think I get it. By the time you're in fourth year, you've been through a lot - and I mean a lot.

Now, I'm not quite that old... yet. However, my term as an Engineering Society Executive has definitely put me through a lot. There have been a lot of things that I've done and gotten to experience that I wouldn't have been able to otherwise.

Over the 16 months that I've been VP Finance for the Engineering Society, I've had the privilege of looking after over \$100,000 in funds. That money has gone into running events, funding student teams, and improving student services such as the C&D. Considering the fact that I had never done anything as financially involved as this prior to university, it's been a very eye-opening experience for me! The best part of this has been talking with student teams that have been funded during my term. There are so many talented and driven people on student teams, and it's amazing to see what kind of ideas they can turn into reality.

I think that my fondness of speaking

to teams that were successfully funded speaks to something more general that I loved about being an Executive: making a difference for people. At the beginning of this wild journey, what I really wanted to do was to be in a position to make Waterloo Engineering a better place. I had been so impressed with the people I had met during my first three terms that I couldn't wait to find a way to give back and to match their passion with my own. Looking back at troves of emails, the meetings, and all of the work that was put in, I'm really glad that I was able to make a difference to some peoples' time at the University of Waterloo.

And, of course, I can't forget the people that made a difference in my life over the past 16 months! I've worked with some truly amazing people, including directors, commissioners, members of Council, and of course... my fellow Executive. It's been an amazing time with you, Hannah, Anson, Teresa, and Kieran! From the Council meetings, commissioner interviews, and extensive planning sessions, you've always been there to support me through thick and thin. Thank you so much for all of the energy that you've poured into the team. I will never forget it.

Now, after that little episode of reminiscence, it's time to get back to work. This term, we still have ECIF and Sponsorship proposals to deliberate over! Although the Sponsorship deadline has now passed, ECIF proposals will still be accepted until July 15th! Until then, you know that you can still reach me at vpfinance.b@engsoc.uwaterloo.ca. Again, thanks for reading!

Electronic Course Critiques

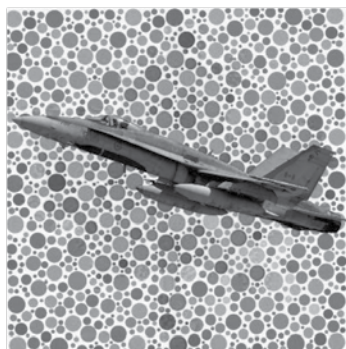
**PROF GORDON STUBLEY,
KATIE ARNOLD, MEGAN TOWN**
ASSOCIATE DEAN, TEACHING;
COURSE CRITIQUES DIRECTORS

Last fall, Waterloo Engineering ran a small-scale trial of a campus-built online course evaluation platform called Evaluate (<https://evaluate.uwaterloo.ca>). Those of you who were a part of courses included in the fall trial helped us—a lot!—by participating at the high levels we're used to in Engineering. So thank you! Your

strong participation in the trial meant that the Faculty was able to take the next step, and electronic delivery became the default last term. Moving forward, students will still be given class time to complete Course Critiques during the evaluation period—July 4 to 15—but they're completed online (on your phones, tablets or laptops - in class) instead of with paper & pencil.

Why the move to electronic delivery? Teaching has significantly changed since the paper questionnaire was introduced over 20 years ago. At that time, single-instructor, multi-section lecture-based courses were the norm. Engineering's programs now include labs, projects, seminars, team-taught and other types of courses, many of which cannot be adequately evaluated with the questions found on the existing paper questionnaire. And the paper questionnaire is not readily customizable to suit these different courses. Moving to electronic delivery is the first step toward a new comprehensive evaluation system that will provide instructors of these varied course components with meaningful student feedback. We anticipate the introduction of a new set of core questions that are applicable to all course experiences plus additional question sets that are specific to different teaching modes. This will provide instructors of all types with meaningful student feedback.

This term, you'll find that most of your courses will be evaluated electronically; there are a few special cases (about 4% of all classes) where paper questionnaires are still necessary. We hope that you embrace electronic course evaluations so that we can continue to move forward toward more effective evaluations for all types of classes.



Modified Image from the Canadian Armed Forces Image Gallery.
www.combatcamera.forces.gc.ca

Do you know, or suspect, that you have difficulty distinguishing between colours, then this study may be of interest to you

We are determining whether new colour vision tests for testing pilots and aircrew are as good as the current tests.

There will be two sessions separated by approximately 2 weeks. In each session, your vision will be assessed with a variety of different colour vision tests which determine how well you see shades of colour. Each session takes about 2 hours to complete.

After participating in the sessions, you will receive \$45

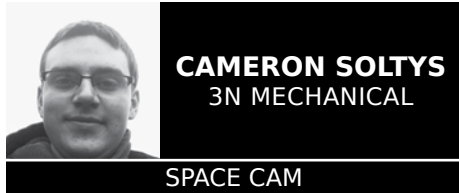
If you are between 17 and 60 yrs and you would like more information or are interested in participating, please contact us at

Colourvision.study@uwaterloo.ca
School of Optometry and Vision Science
University of Waterloo
519-885-1211 ext 36768



Colourvision.study@uwaterloo.ca

Radio Astronomy



CAMERON SOLTYS
3N MECHANICAL

SPACE CAM

Modern telescopes are marvels of engineering. Space telescopes like Hubble give us magnificent views that are simply unobtainable from Earth. Larger ground-based optical telescopes are so sensitive that they are built on mountaintops in remote locations to reduce sources of extraneous light and get above the densest part of the chaotic, vision-disrupting atmosphere. But optical telescopes are currently limited to around 10 m in diameter. The biggest, most impressive telescopes ever created are the radio telescopes. These monstrous machines are impressive sites to behold.

Starting small, in a sense, there are telescope arrays such as the Allen Telescope Array (ATA). This array was built for the SETI (Search for Extraterrestrial Intelli-

gence) Institute to scan the sky for signals from alien intelligences. The ATA is made up of a group of 42 6.1-metre telescopes spread out over 300m. 6.1 metres is not very large as telescopes go, especially for radio telescopes. However, the 42 telescopes can work in concert to make much better results than any single dish can obtain. Essentially, the signals from each telescope can be combined to make a much bigger telescope, albeit one with a lot of holes in the dish.

The biggest advantage of the arrays such as the ATA is economic; it is much cheaper to assemble many small telescopes than one massive one. Furthermore, these projects can be expanded; ATA has plans to grow to 350 telescopes, though these plans are constantly constrained by lack of funding. Unfortunately, a telescope array has less sensitivity than a single dish would, so it can't pick out as many features. However, the array has a similar angular resolution to a filled dish and so can pick out features of the same size. This array also has another ad-

vantage, especially when you are trying to scan the entire sky for radio signals; by changing how the signals from each telescope are combined, researchers can make several virtual telescopes at once, each looking in a slightly different direction.

The radio telescope arrays sound impressive when you think about the size of the virtual dish they produce, especially in the case of the continent-spanning Very Long Base Array. But that impressive image loses out to the sight of a massive full-dish array. The largest and most famous of these massive radio telescopes is Arecibo, located in Puerto Rico. Arecibo has a diameter of 305 metres, making it the same size as the ATA, but with much higher sensitivity. Such a large dish is understandably un-movable. Instead, the 800 tonne radio receive that collects radio waves from the dish is suspended overhead by cables, moving back and forth to collect transmissions from different parts of the sky.

China is working on a new radio tel-

lescope, the FAST (Five-hundred-metre Aperture TeleScope). As the name suggests, this project will dwarf Arecibo with its 500 metre made of 4450 triangular panels. This is a mammoth undertaking, and will allow for radio astronomy like never before. The Chinese government has even gone as far as to evacuate civilians in a 5 km radius around the site to, according to a Communist party official, "create a sound electromagnetic environment." Among its goals is studying the beginning of the universe, and searching for extra-terrestrial intelligence from beyond our galaxy. FAST is currently scheduled for completion in September of this year; amazing new discoveries are sure to follow shortly.

Radio astronomy allows for many unique measurements and observations. As China's investment in FAST shows, the discoveries are far from being complete. While optical telescopes continue to improve, it is almost certain that machines like FAST and Arecibo will not be surpassed for years to come.

Taking Dinosaurs to New Heights



DONOVAN MAUDSLEY
3A MECHANICAL

OLD NEWS

In this issue of Old News, I'm going to talk about some of the most iconic orders of dinosaurs, the Pterosauria. The Pterosauria, such as the Pterodactylus and Pterandon, were the family of flying dinosaurs that roamed the entire planet from the late Triassic until the end of the Cretaceous. One common misconception about the Pterosauria is that modern day birds are directly descended from them, but birds are actually descended from smaller terrestrial dinosaurs. Just imagine if modern day birds were indeed descended from the larger members of the Pterosauria family, like the Quetzalcoatlus species which had a wing span of around eleven or twelve meters. The bald eagle, one of today's largest flying birds, has a maximum wingspan of around 2.3 meters.

The term dinosaur technically does not apply to any of the flying species. The term dinosaur scientifically only applies to reptiles which were descended from the com-

mon ancestor groups Saurischia, which all carnivorous dinosaurs are descended from, and Ornithischia, which herbivores are descended from. The Pterosauria, along with many types of marine reptiles from the era of the dinosaurs, are excluded from these groups.

The Pterosauria had a wide range of sizes, with wingspans ranging from eleven inches to over eight feet, but for the most part they shared similar features during specific eras. The wings of the Pterosauria consisted of a membrane of leathery skin and muscle stretched over their bones and connecting their ankles to their hands. Early species had long tails which were likely not useful for flight and which were greatly reduced as they evolved. Some species even had fuzzy coat or pycnofibers, which closely resembled mammalian fur. The family of Pterosauria were the first known vertebrates to develop flight. Earlier species possessed the ability to glide from point to point like the flying squirrel, but not powered flight.

All of the Pterosauria were carnivorous, like modern day birds of prey. Most had long beaks and while some had teeth, most were toothless. Their forelimbs were also usable for feeding, as they hold prey



DinoPark Košice via Wikimedia Commons

This model of a Pteranodon, at DinoPark Košice in Slovakia, represents what we usually think about when we imagine flying "dinosaurs". Adult males had an average wingspan of 5.6 metres, and are only slightly more terrifying than geese.

steadily once caught or even tear it apart. Typically the terrestrial fliers ate small prey, eggs, and scavenged carcasses. Some species lived on the or near the water, and ate fish, squid and various shellfish. Studies suggest that they could sit on the water the way that modern day ducks do, except that their beaks would have sat close to or

under the water. This is thought to have led to the drowning deaths of many juvenile Pterosauria, as they did not possess the muscular endurance to keep lifting off from the water.

I've loved the idea of flying dinosaurs since I saw Jurassic Park 3. Yes, I know it's a horrible movie, but it has its shining moments. The Pteranodon was the greatest example of a flying dinosaur, and lived during the Upper Cretaceous period between 75 and 85 million years ago. It shared the common appearance of the flying dinosaurs, with a needle shaped beak and large crest on the back of its head to counterbalance the weight of the beak during flight. The Pteranodon was also toothless, leading to its name, which means wing and toothless. Its hands were at the "elbow" of its wings, with an extended fourth finger. This finger held one side of the Pteranodon's wing, with the other being attached to its ankle.

At the other end of the spectrum was the Rhamphorhynchus, which was one of, if not the, strangest flier ever. Its beak was very distinctive; it had an upwardly-curved tip and needle like teeth which interlocked when closed, giving it a very menacing appearance. These needles were designed specifically to pierce fish. Its body was covered with a furry coat of pycnofibers, and it had a long tail with a frill on the end. Its wingspan was around six feet, but unlike other members of its family it had a very short neck. This suggests that the Rhamphorhynchus flew close to the water over which it hunted for fish.

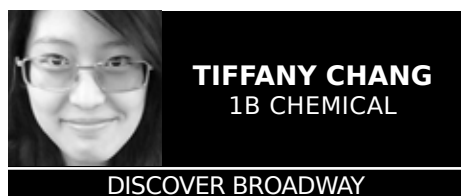
WIN CASH EVERY WEDNESDAY

LE SHIN SWAH
TABLE TENNIS LEAGUE

Join our Le Shin Swah Table Tennis and Foosball League.
Register at www.leshinswah.com

Discover Broadway

bare: A Pop Opera



TIFFANY CHANG
1B CHEMICAL

DISCOVER BROADWAY

Twiddling my thumbs to figure out what to share with everyone this issue, I look up from my screen to see what's going on in the world. Prime Minister Justin Trudeau was going to march in Toronto's Pride Parade on Sunday. Hmm, that strikes a bell, somewhere in my collection of musicals...

I open up my collection, and voilà—there it is!

bare is a rock opera that tells the rather Shakespearean tale of a pair of young, gay lovers. Peter is the sweet nerd, whereas Jason is the deeply-closeted jock. Their relationship blossomed during a holiday break, but they must

keep their relationship hidden from their Roman Catholic boarding school. Peter really wants to come out about their relationship, but Jason vehemently opposes the idea. The pair audition for their school's production of "Romeo and Juliet", and gradually, hints of their relationship come to revelation.

Everything is complicated when Jason is cast as Romeo opposite to Ivy, a transfer student who brings along interesting rumours from her old school. A classic love triangle forms: Ivy wants Jason, which confuses him; Ivy is unattainable to love-stricken Matt; and Jason's sister Nadia develops a crush on Matt even though she knows they will never happen.

Admittedly, it probably wouldn't appeal to many people outside of our university age group—at most—but it is definitely worth mentioning for raising awareness for important issues on top of LGBTQ

equality, such as adolescent homophobia, stigmatization, and bullying.

My favourite recording of it has to be the 2007 album recording, with best performer going to Matt Doyle as Peter; he characterizes his pain and inner turmoil perfectly—his lyric voice is also music to my ears.

I first became entranced with this musical because it reflects the power that music and music theatre have on us to get us thinking about controversial topics, such as LGBTQ issues, with an open mind. Personally, I never really know how to approach the topic. On one hand, I was born and raised in a conservative family, but at the same time, I recognize that times are changing, and besides, I know that I wouldn't feel safe to be my true self if people were going to treat me differently because of part of my identity.

Besides, this show incorporates other elements that we have likely all

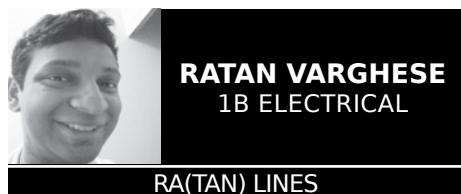
experienced at some point in life. One of my favourite numbers, Peter's "Role of a Lifetime" pretty much describes any teenager's moment in time when they felt like they were forced to hide an important part of themselves from the rest of the world.

Ivy's "All Grown Up" brings to mind moments in time where I wished that I could be a little girl again so that I wouldn't be held accountable for the mistakes that I've made—perhaps not to Ivy's degree, but you see the point I'm trying to make. It's a reminder to us that screwing up is a part of life, but the real mistake is not learning from them.

bare is definitely a classic piece of music theatre for any teenager or young adult. Its story, characters that find themselves in melodramatic versions of the situations in which we have or will find ourselves, and edgy tunes are sure to win any young audience over.

(Ra)Tan Lines

Dan Carlin's Hardcore History



RATAN VARGHESE
1B ELECTRICAL

RA(TAN) LINES

Dan Carlin's *Hardcore History* is a marathon. It is a never ending avalanche of blood and steel, shining a harsh light onto the dark past of our species. Each episode is a mammoth: all the episodes made in the last two years are over 3 hours long. The 5 episodes from 2012 and 2013 during which Carlin discussed the Mongol conquests were each a "mere" 1 and a half hours long, give or take.

A bland description of troop movements in the First World War could conceivably have taken 10 minutes. Carlin is not so

pedestrian. He is not a textbook writer, banging out curriculum points one after the other. Nor is he motivated by ideology or nationalism (hear *Common Sense* by Dan Carlin for a look at his views on his country's current-day foreign affairs). He is unbound, free to say anything and everything. He discusses the political and economic forces leading to a conflict (quoting from dozens of different sources, in most cases), the cultural views adversaries in the conflict had of each other, the conditions under which people lived during said conflict (quoting from first hand accounts) and the differences between his subject's value systems and his audiences'. That last part is crucial; it is one thing to know that sixteenth century heretics were burned at the stake, and quite another to know that crowds of people would show up to these

burnings and found them both correct and entertaining.

Why were the people in such distant times so horrible to each other? They were all humans, but their circumstances and mindsets had radical differences from our own. Differences that Carlin explains at length: of course, he makes no attempt to cut the ancients (or the moderns, during his series on World War I) any slack.

His metaphors are entertaining and repeated several times. Indeed, Carlin is very repetitive in general. This is a good thing considering that pretty much nobody would listen to a full episode in a single sitting.

While most podcasts which feature some form of dialogue, *Hardcore History* is a constant stream of Dan Carlin's rough, raspy voice. There are no guests on the show, but there is a lot of quoting, always

preceded by the word "quote", executed with a grander-than-usual voice, and terminated by the phrase "end quote".

If you are interested in dark humour, discussions of military legends, and hearing Darius the Great compared to Steve Jobs, Dan Carlin's *Hardcore History* is the podcast for you. The current topic is the Achaemenid Persian Empire, so tune in next ... hold on one more thing.

Dan Carlin's *Hardcore History* updates once in a blue moon. The last episode was released 3 months ago, and in all of 2015 only two were released. Probably best to subscribe, listen to the old episodes (starting with "Wrath of the Khans I", the episodes prior to that were pay-to-hear) and spend your time listening to some other podcasts until the random lucky day when *Hardcore History* updates.

The Movie I've Been Waiting For My Whole Life

What's With All the Hate?



DONOVAN MAUDSLEY
3A MECHANICAL

I liked *Batman v Superman: Dawn of Justice*. I really, really liked the *Batman v Superman: Dawn of Justice* Ultimate Cut, which was director Zach Snyder's original cut of the film. In order to decrease the three hour run time to a more reasonable two-and-a-half hours for theatrical release, studio executives cut out parts of scenes and sometimes whole subplots. We've all heard the divisive reviews given to the theatrical cut, and the extended version avoids almost all the pitfalls.

The first act of the theatrical version felt rushed and somewhat awkward, but when the scenes were restored to their full glory it ran smoothly and cleanly. The theatrical cut had many moving parts, and the clues to Lex Luthor's overall plan were fuzzy and implied. The extended cut added scenes and pieces here and there which helped spell things out in a way audiences could handle a lot better. The added explanation behind the opening desert sequence made it so much better.

One big critique of the theatrical version was the portrayal of Lex Luthor.

The studio executives cut a lot of Jesse Eisenberg's screen time, which made his arc seem strange and random. One deleted scene in particular, titled *Communion*, shows Lex conversing with a large demonic looking hologram inside of the Kryptonian genesis chamber. After he is interrupted by Metropolis SWAT

units, the hologram disappears, but it is clear that something has changed. The whole "the bell has been rung" sequence in the prison makes total sense now that we know that Luthor's strings are being pulled by a super villain in another galaxy. This character, although he doesn't quite look like Darkseid, who has been teased

as the villain for the Justice League movies, is definitely either a new version of him or a servant to Lord of Apokolips.

There was a lot of talk in the lead up to *Batman v Superman*'s release about who was going to be playing whom, and the buzz was especially loud concerning Jena Malone. The Hunger Games actress was thought to be playing Barbara Gordon, aka Batgirl. With Snyder's *Batman* having lost a Robin, it was thought that Batgirl might have replaced him. Malone's role was cut out of the theatrical cut, but in the extended it turned out that she was just playing a lab technician who helps out Lois Lane. Probably a good call, as she doesn't look a whole lot like J. K. Simmons, who's been cast as Commissioner James Gordon.

I also want to talk about my favourite sequence from the film, the *Batman v Thugs* battle. I'm a big fan of the Arkham series of videogames, and *Batman* in general, so seeing him in full brutal action was amazing. Christopher Nolan's *Dark Knight* Trilogy had some truly amazing moments, but honestly the best choreography in those movies is probably the training sequence with Liam Neeson. Zach Snyder has a reputation for having really intense choreography (just check out 300), and *Batman v Superman* delivers.



beni siswanto via YouTube

The extended cut of *Batman v Superman* fills in many of the gaps for which the theatrical version was heavily criticized.

The Benchwarmer Report

Euro 2016: The End is Near...



**ELIZABETH
SALSBURG**
3B NANOTECHNOLOGY

THE BENCHWARMER REPORT

The 2016 Euro Cup has been as exciting a tournament as ever! Football fans across the world have been watching, and it's been a treat so far, full of the expected... and the unexpected. The semi-finals are to be played this week, ahead of Sunday's final. Here's a look at what's to come, and what has been for the final four of Euro 2016.

Semifinal #1: Portugal v. Wales

On Wednesday July 6, Portugal kicks off against Wales in Lyon. On paper, neither team would normally be expected to have made as far as the semis in any major tournament. Despite the presence of Cristiano Ronaldo, Portugal is not nearly as strong as they have been in the past. They needed penalties to get past Poland in the quarters—and the Poles certainly gave them a run for their money on the field. Ronaldo et al. will need to be firing on all cylinders to go through to the final. Plus, they will need better defense than they had against the Poles. If they make it through, it seems unlikely that they'd be any match for traditional powerhouses like Germany or France...

As for Wales, they upset the heavily favoured Belgians in their quarter final, winning 3-1, after conceding the first goal. This was after they upset England in the Group stage to take first overall in Group B. For the Welsh, it's already been

a phenomenal Euro Cup debut. But does the buck stop here? The main problem facing the Welshmen is yellow card accumulation: Two of their most valuable starters (Aaron Davies and Aaron Ramsey) will not be allowed to play after each man picked up his second yellow in the quarters. Davies' defense will be sorely missed, while Ramsey helped set up the eventual game-winner in the Belgium upset. Indeed, this could give Ronaldo and Portugal a significant advantage.

Semifinal #2: Germany v. France

A day later, Germany faces off against host and fellow powerhouse France at Marseille. It a shame one of these two teams has to go out in the semis, as this would make a juicy final. Nevertheless, it is what it is - but one thing is certain - this will be the most exciting match of the tournament.

The Germans squeezed out of a highly tactical, defensive match against archrival Italy, finally annihilating the voodoo of never having beaten the Azzurri in an international match. They needed 9 rounds of penalties to finish the job, going on to win it 6-5 behind solid play from renowned keeper Manuel Neuer. Defender Jonas Hector was the hero in the nail-biting penalty contest. The score after regulation time was 1-1, with Italy getting their goal on a penalty courtesy of German defender Jerome Boateng. It is fitting that Germany came out on top in this one, being the only ones to score a goal the right way, if you take my meaning.

Meanwhile, the hosts made short work

of underdog Iceland in their quarterfinal match. At a score of 4-0 at halftime, France was in control while it still mattered. The final score would go on to be 5-2 after 90 minutes. The last time France hosted the Euro in 1984, they went on to win it... but can they repeat that feat in 2016? They should not be counted out, particularly given the stellar play of forwards Antoine Griezmann and Olivier Giroud, sitting 1st and 2nd respectively in the race for the Golden Boot. These

two fellas put on a clinic on how to read defense in their semifinal. The Germans will need to be just as sharp defensively as they were against the Italians. That being said, the French made it all too easy for Iceland to poke a couple through, something the defending World Champs will easily take advantage of, should the opportunity arise.

Likely Final: Portugal v. France.
Likely Champion: France.



Melvin S7ven via YouTube

WATERLOO | ENGINEERING

Learn what a
graduate degree
in Engineering
can offer you!



WEDNESDAY, JUNE 8, 2016

5:00 - 6:00 P.M.

E5, Sedra Student Design Centre

GRAD STUDIES INFO RECEPTION

Speak with faculty members and current grad students about the benefits of a graduate studies degree. All engineering departments will be represented.

- » Food and beverages provided.
- » All undergrads welcome!

uwaterloo.ca/engineering

 UNIVERSITY OF
WATERLOO

Five Things You Don't Want to Know

Canada Day



CAITLIN MCLAREN
3T CHEMICAL

5 THINGS YOU DON'T WANT TO KNOW

Happy Canada Day, readers! I'm sure you are all happy to be in Glorious Mother Canada, wrestling moose, eating beaver tails, and downing Timmies left and right. Surely, you say, Canada is a modern and sensible country. Surely, there is nothing left that you don't want to know.

Of course, regular readers will know that that is ridiculous. We are just as silly as everyone else. Here are five things about Canada that you may not want to know.

Toronto's First Lighthouse is Haunted

The Gibraltar Point Lighthouse is one of the oldest buildings in Toronto, and its first keeper was a gentleman with the awesome name of John Paul Radelmüller. Unfortunately for him, he was very good at brewing beer, and one fateful day a couple soldiers came to the lighthouse to get drunk. The drunken soldiers got into a fight with Radelmüller and ended up throwing him off the lighthouse, killing him. Terrified, they supposedly tried to hide their crime by chopping his body up into small pieces and burying the pieces in different places. Come on, you idiots, maybe you could have made it look like an accident at the beginning but that just makes you look more suspicious. Of course, the bits of him were found and the soldiers were caught, but there wasn't enough proof and they were acquitted. That, of course, didn't satisfy Radelmüller's ghost, so he goes around making mysterious creepy noises and shit, as ghosts do.

Something Must Have Happened

There are several weird old laws in Canada that must be there for a reason. For example, in Toronto it is illegal to drag a dead horse down Yonge street... on Sundays. All these guys dragging corpses around on weekends! It's getting to be too much. In case you are disposing of a horse, pick another day.

In Alberta, it is illegal to set someone's

wooden leg on fire. Some things really should go without saying. It is a common enough problem (or prank?) that a dedicated law is necessary.

In Newfoundland, it is illegal to drive cows through the streets... after 8 AM. Make sure you do it in the middle of the night. (These laws about livestock seem to be simultaneously obvious and too specific to be useful.) Meanwhile, in Fredericton, it is illegal to wear a snake or lizard in public.

Finally, it is illegal to pretend to be a witch. Actually being a witch is fine.

To all the rascals who necessitated these laws, I take my hat off to you.

We Hosted a Sex Cult Over A Hundred Years Ago

After all, the state has no place in the bedrooms of this nation. Still, sometimes things can be taken too far, as they were by a gentleman named Edward Arthur Wilson

in the 1920s. Since his own name was boring, he took to calling himself Brother XII ("Twelve", not "Xeeee"). He started a commune on Vancouver Island and took money from his followers, while having sex with a variety of women because come on, what other reasons are there for leading a cult? He also claimed to be a reincarnation of Osiris. Eventually his followers got fed up with him and the Province tried to stop him, but the witnesses fainted in court and the judge made animal noises, allegedly due to Brother XII's black magic (Y'all got a better explanation?). Eventually his organization was dissolved, but some loyal followers remained. Then he got a new mistress who called herself Madame Z. She turned out to be a sadist who forced his followers to work with a whip, and finally those last few turned on him. The two cult leaders then absconded with all the money to Switzerland, and Brother XII either died there or faked his death.

Feet in the River

Since the early 2000s, no fewer than 16 human feet have been found washed up on the shores of the Salish Sea in the west coast. They belong to various ages and sexes, and only five were identified (they belonged to 4 people).

Although it isn't unusual for feet to come off decomposing bodies naturally, there are several weird statistical anomalies that make one suspect that it doesn't come from the...normal...number of drownings? In the first place, sixteen feet in one area, and no other body parts. Secondly, and rather creepily, all but two of them are right feet. The two that are left make a pair with some of the other right feet. Still, what happened to all those other left feet? And the bodies? Why are these feet found so close together time-wise, when the last naturally separated foot of a drowned person was found in 2014? Is it a serial killer who only awakens every hundred years?

Some numbskulls also made hoax feet, with animal bones and meat and such, for God only knows what sick reason.

Surely, things would be better without these mysterious feet...

Dude Without Feet, Also Without History

In 1863, a small boy in Nova Scotia discovered a strange, swarthy looking man on the beach. Both of his legs had been surgically removed, quite well by the standards of the time, and he couldn't talk. However, he could growl, which he did at people he didn't like. The people called him Jerome, because he did make noises that sounded like that. Eventually, the people who found him decided to hand him over to the French-Canadians, on the grounds that he "looked Catholic" which is as good an excuse as any, and the French-Canadian village nearby took care of him for the rest of his life. They also charged admission for people to come and see him, and apparently made a lot of money that way. Doesn't everyone want to gawk at some poor guy with no legs?

There are a lot of rather wild theories about who he was and where he came from, but no one knows to this day. Some say he was royalty, but that theory doesn't really have a leg to stand on.



HordeFTL via Wikimedia Commons



Miguel Andrade via Wikimedia Commons

Other countries know us for Mounties and maple syrup - keeping these five facts from them is probably in our best interests.



Sandford Fleming Foundation

Professionalism.
Leadership.
Communication.

There's more to an engineering education than engineering.

The SFF Memorial Leadership Award Nominations

In recognition of the late Professors Saip Alpay and Wm. C. Nichol, and Sam Ceccerallo, Robert Elligsen, later former students of the Faculty of Engineering

The Leadership Award is granted to an intermediate-level undergraduate student in the Faculty of Engineering who has demonstrated outstanding contributions to the Faculty in the promotion of extra-curricular activities, including, but not limited to: Intramural Athletics, promotion of Engineering Society and Sandford Fleming Foundation events, competitions, etc., and for the support of associations, both on and off campus.

Nominations for the Memorial Leadership Award can originate from student groups, faculty members, or other individuals. A Letter of Nomination and Letters of Support from colleagues, faculty, and others familiar with the nominee's accomplishments are extremely important and form the major basis upon which the Executive Committee of the Sandford Fleming Foundation will form its decision. Nominations must be submitted to the Foundation by August 31, 2016 and/or before the last day of the student's 3A term.

The Memorial Leadership Award consists of a Certificate plus a citation, and an honorarium of \$1,000.

Nominations Must be Submitted to SFF Office Manager by August 31, 2016

**E2-3336, Extension 84008, sff@engmail.uwaterloo.ca
www.eng.uwaterloo.ca/~sff**

Electricity Helps Chocolate Get Less Fatty



RATAN VARGHESE
1B ELECTRICAL

During a study funded by Mars Chocolate, scientists developed a method of cutting the fat content of chocolate by applying an electric field to it in liquid form. The new chocolate is both healthier and better tasting than conventional chocolate, apparently.

During most of its time in a factory, chocolate exists as a liquid, flowing from one machine to another. Liquid milk chocolate is composed of fat and oils (mostly cocoa butter) with particles of cocoa, sugar, and milk solids among other things. The researchers found out that particles (including cocoa) could take up a maximum of 64% of the volume of the chocolate, making fat constitute 36% of the volume. If the ratio

shifted any further in cocoa's favour, the liquid would stop flowing altogether, like the second coming of Augustus Gloop.

By applying an electric field along the flow direction, the normally spherical particles of cocoa (and sugar and whatnot) can be aggregated into short lines (also along the flow direction). These are referred to as "chocolate worms" by ... nobody, nobody does that. This process reduces the viscosity along the direction of flow. It increases the viscosity in every other direction, but previous studies suggest this will improve the overall flow by reducing chocolate turbulence and preventing the formation of dreaded chocolate vortices.

In a controlled experiment, the fat level of the chocolate was reduced by over 10 percent with at most a measly 0.1 μA of current. Yes that's right, 0.1 μA : time to break out the lunar panels and gentle breeze turbines. The current may have been even

lower, 0.1 μA was just the researcher's limit of measurement. A taste test revealed that this reduced-fat chocolate tasted better than fatty chocolate.

This is all well and good, but the added sugar in chocolate presents a much larger health concern than the fat. Furthermore,

certain Hershey's products replaced cocoa butter with vegetable oil to cut costs, suggesting that this is all actually a ploy to -

END OF MESSAGE. ENJOY THE DELICIOUS TASTE OF THE NEW DIET SNICKERS, COMING SOON TO STORES WORLDWIDE.



Evan-Amos via Wikimedia Commons

Mmm... chocolate.

Fire in London, Ontario, Destroys Businesses



DONOVAN MAUDSLEY
3A MECHANICAL

The Canada Day fireworks in London, Ontario were dampened by another type of fire. Eighteen businesses were damaged or destroyed in a fire at 1700 Hyde Park road,

a strip mall in the city's West End. The fire started behind Porcino's Italian restaurant, and was discovered by an employee at around 6:30 pm on Thursday. Millions of dollars in damage was done to the mostly small and family owned businesses in the plaza. By the time the dust settles many families will have completely lost their livelihoods. Porcino's and the rest of the plaza were evacuated before the fire could

spread to the building, but once it did it spread quickly to adjacent businesses.

Corey Short, an off duty firefighter, was in the neighbourhood and responded immediately to the fire. The first on the scene, he stated that the fire was fully involved by the time he arrived, meaning that the fire crews could not access the inside of the building until water streams were directed into it. A relatively small but

extremely hot fire, the heat of the flames could be felt around 100 meters away.

Although less than a day has passed between the extinguishing of the fire and the time of writing, the community has already responded. London City Councillor Josh Morgan, whose ward includes Hyde Park Road, has said that he plans to meet with the business owners as soon as possible.

In Defense of the Human Engineer



TIFFANY CHANG
1B CHEMICAL

It's a day like any other day: I'm scrolling through my Facebook timeline to see if anything interesting has happened in the world.

Brexit, an analysis of *Game of Thrones* in *The Economist*... the usual.

One story, however, catches my attention. A sweet 91-year-old woman gave her Muslim doctor some crocheted stuffed animals she made, to show that she would stand in solidarity with him and other Muslim-Americans in response to what she called "hurtful" comments made by Donald Trump on a radio show.

This uplifting news got me thinking: On a fundamental basis, why is there so much conflict in the world right now? Where did we go wrong?

Are we getting dumber? Quite the contrary, really. In many countries, increasing numbers of people are receiving post-secondary education. Results on IQ tests have been consistently going up, a phenomenon known as the Flynn effect.

But is what we know enough to keep us out of trouble? How about what we *feel* and what we *think*?

When was the last time you critically thought about something? And I'm not talking about trying to solve a calculus problem—I'm referring to deep contemplation about something that has happened to you, or, if you're willing to delve a bit deeper, a world issue of some degree. Why did this event happen? Who's involved in it, what stance does each involved party take, and for what reasons?

Personally, what comes to mind is an English assignment from over a year ago. I knew what evil was—or so I thought before the assignment. After having read ten essays and news articles attempting to define or exemplify evil, you don't really know what stance to take. You want to be

honest, but you don't want anyone—at the time, this was my teacher—to think you're immoral or politically incorrect at any point in your own thoughts.

So I went for the tempered approach. And, honestly, conceding with statements that you personally disagree with or devising counter-arguments to refute statements that you personally agree with but contain logical fallacies is difficult as hell. In fact, if I attempted to write the same essay again at this very instance, I would definitely hit a brick wall before even formulating a thesis statement since I'm so accustomed to thinking in black-and-white terms of right and wrong nowadays.

After all, hard subjects (e.g., sciences, engineering, and mathematics) tend to be in terms of right and wrong, whereas soft subjects (i.e., the liberal arts) tend to involve mental gymnastics of an entirely different sort where there is often no single right answer.

As much as I love the hype for STEM subjects (i.e., science, technology, engineering, and mathematics), —it's why I'm here for university, after all—I'm an advocate for an appreciation of the softer side of human knowledge regardless of what education or career we pursue.

In the end, we're all people—not robots. We all have the capacity to emote, empathize, understand, have compassion, and—most importantly—think for ourselves.

Now, I'm not suggesting to any of you to drop out of engineering. Keep chasing your passions in this area of society. But do make an effort to seek the softer side of being human and apply it to everyday life. Question all that is going on in the world according to the media. Question my argument—perhaps 1B has finally driven me bonkers, which wouldn't be too extraordinary of a statement.

Make an effort to seek out the positive things we are accomplishing in the world, and think about how we can bring positive change to areas in which we are not

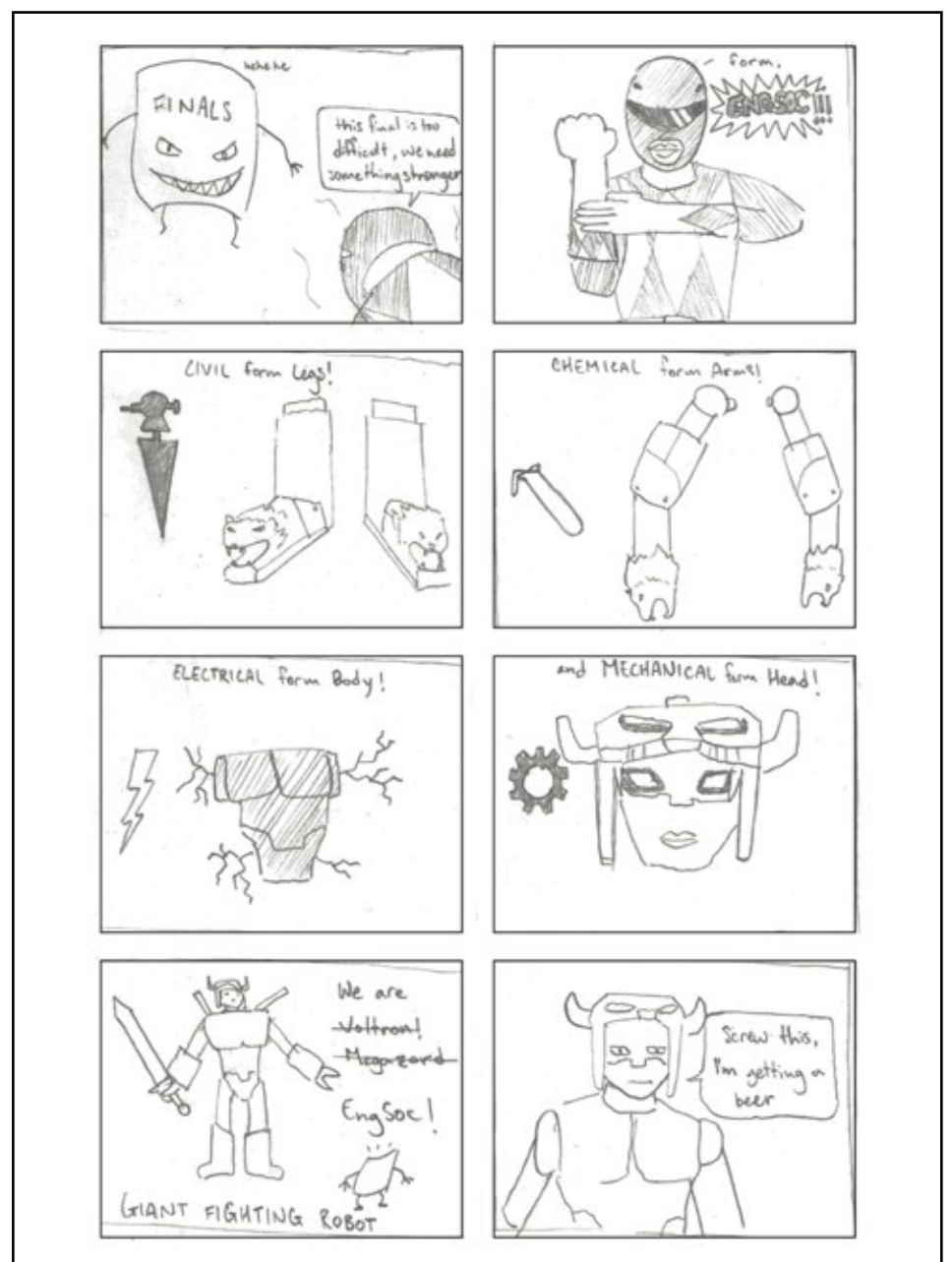
doing so well.

Remember that math and science—though considered hard subjects—are merely the tools used by engineers to ac-

complish tasks and projects. Engineers do not serve their tools, but rather other human beings, in the form of products, ideas, and services.

Voltron

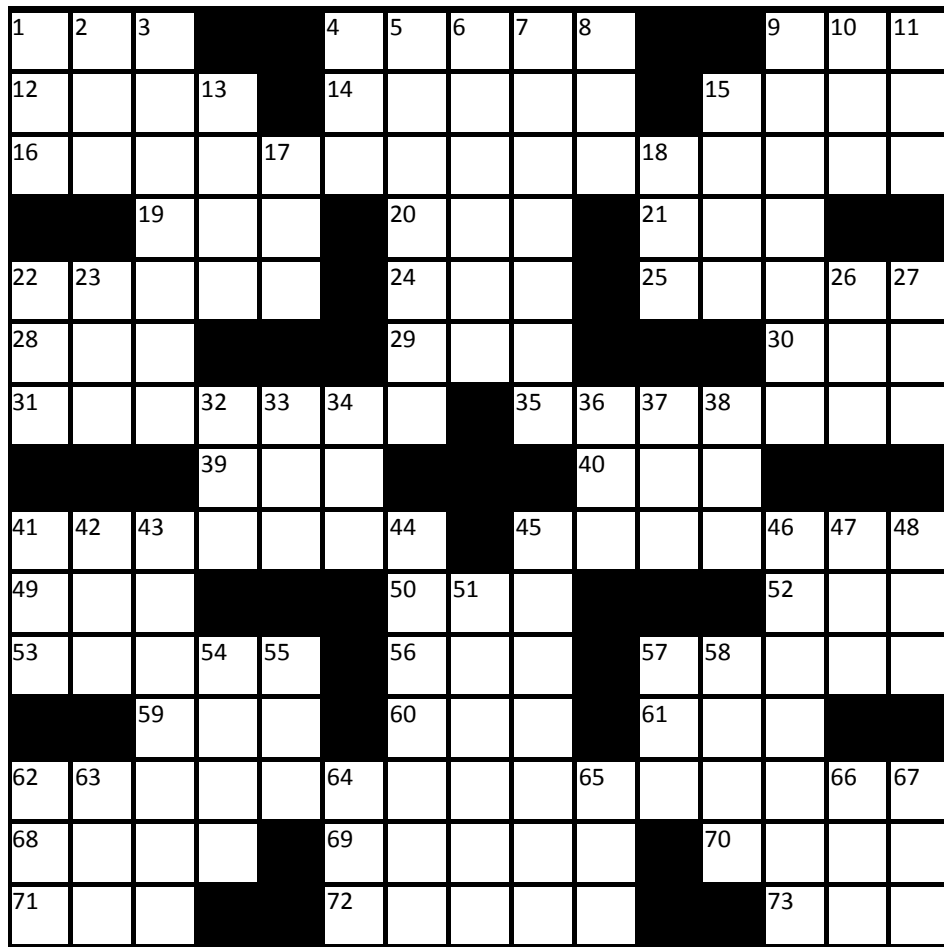
by Al Coholic



The Iron Crossword

Arts

CAMERON SOLTYS
3N MECHANICAL



ACROSS

- 1: Student leaders of University Orientation activities
- 4: French for Tuesdays
- 9: Organization for car drivers in Canada (abbr)
- 12: Lump of semiliquid substance
- 14: Un Cow
- 15: alpha union beta
- 16: Body shape comparable to a timepiece
- 19: Bubonic plague vector
- 20: Smurf who talks to animals
- 21: Canadian band of "Brian Wilson"
- 22: "If ___ a million dollars" (3 wd)
- 24: Not smart
- 25: the middle part
- 28: Old cloth
- 29: Head of Security of Deep Space Nine
- 30: Anagram for "one"
- 31: ___ Harper, ex Prime-Minister
- 35: Artist specializing in colouring canvas
- 39: Oxford University Press (abbr)

- 40: Mass of fish eggs eaten as food
- 41: Used to infuse hot water with flavour
- 45: European country associated with Greenland
- 49: TV Channel of Oprah
- 50: Single
- 52: Fees payed to the government
- 53: Involuntary servants in colonial Spain
- 56: Stuck in a ___
- 57: One more carbon than methyl alcohol
- 59: Harry, Curly, and ___
- 60: Approximate duration until entrance
- 61: Black gold
- 62: "Art it is a ___" Ralph Emerson quote
- 68: ___ bearer, honoured funeral position
- 69: Upright stone, for instance a grave-stone
- 70: Carve or inscribe
- 71: Man
- 72: Like PST
- 73: Type of star that has no hydrogen (abbr)

DOWN

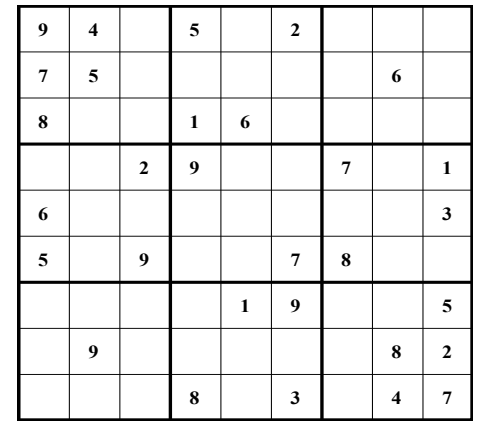
- 1: CDE
- 2: 3D printer designed for smartphones
- 3: Needed by the Lion in "The Wizard of Oz"
- 4: ___ Reynolds, captain of the spaceship Serenity
- 5: Leave behind, without expectation of recovery
- 6: Spoke again
- 7: Long-handled broom for dry debris
- 8: If and only if
- 9: Was unable to
- 10: Pirate exclamation
- 11: ___ Lincoln, American President
- 13: ___ Pitt, actor in "Fight Club" and "Ocean's Eleven"
- 15: ___ Kai, an Avatar: The Last Airbender duelling style
- 17: Larger York Region
- 18: Maker of the Watson Supercomputer
- 22: Party for the fourth year engineering students
- 23: Clothing for the head
- 26: Sense with eyes
- 27: Web browser that hides people's identity
- 32: 4chan board for white supremacists
- 33: Colour or shade
- 34: US agency that protects the environment (abbr)
- 36: We ___ the engineers
- 37: Light rail system coming to Waterloo
- 38: March, for Engineering advocacy
- 41: Opposite bottom
- 42: Baby lamb
- 43: Something that is out of place
- 44: Places with a large population of trees
- 45: Specific information
- 46: Sports player
- 47: Death ___, supervillain weapon
- 48: Controversial North American pipeline (abbr)
- 51: Spice from the same tree as mace
- 54: The top of a head
- 55: Used to make a website more popular in search results (abbr)
- 57: Party put on by EngSoc at the completion of school (abbr)
- 58: Two on a bike and four on a car
- 62: Picture format that degrades images
- 63: French for water
- 64: Country to the south of Canada (abbr)
- 65: Placed oneself upon a chair

Sudoku

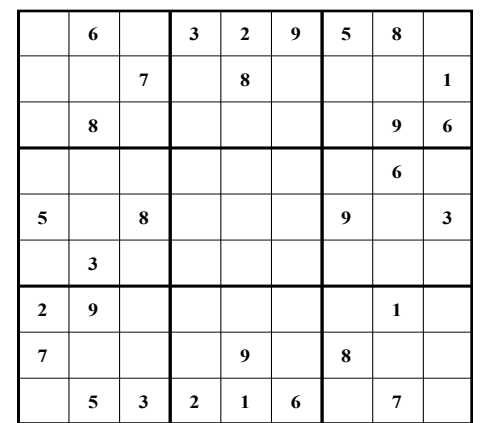
#2016-09

BRYAN MAILLOUX
2B MECHATRONICS

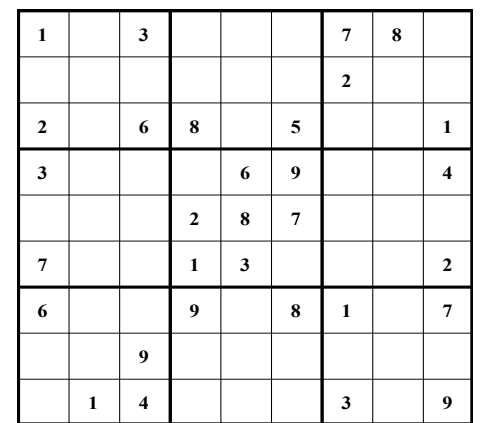
Easy



Medium



Hard



- 66: Campus building with bookstore and Tim Hortons
- 67: Female third person singular

Solutions for previous crosswords can be found at iwarrior.uwaterloo.ca/distractions.

THE IRON INQUISITION
Gabrielle Klemt, 1B Geological

"What is your Canada Day ritual?"



"Drinking in a field."
Theresa DeCola, 1B Comp (ft. "Birthday Girl"
Emma Xie)



"Dance around the fireworks and summon Canadian maple leaves."
Katie Chin, 4A Mech



"Match fireworks to personalities with Chelsea."
Sabrina Huston, 2B Nano



"Run EngSoc Canada Day."
Katie Arnold, 1B Mech



"Playing drinking games in Ottawa."
Kieran Broekhoven, 3A Tron



"I sacrifice goats and chant hymns to Tezcatlipoca."
One thing you didn't want to know about
Caitlin McLaren

\$2million

in funding available
for student entrepreneurial ventures

Waterloo Engineering has partnered with Spectrum 28, a Silicon Valley venture capital firm to establish a student venture program for **engineering** undergraduate and graduates students who are seeking ideas or have an idea for an entrepreneurial venture and need cash, mentoring and resources to make it happen.

- Pop Up Classes** **Fast Feedback Day** **Demo Day**
 June 10 & 11, 2016 July 13, 2016 April 2017

If you're successful at the Fast Feedback Day you move on to further idea development with mentoring opportunities until Demo Day in April 2017. At that time winning companies are awarded funding by Spectrum 28, founded by Waterloo alumnus Lyon Wong, Systems Design Engineering '03.

**WATERLOO
ENGINEERING**

SPECTRUM 28
STUDENT VENTURE PROGRAM

For more information and deadlines visit:
<https://uwaterloo.ca/engineering/entrepreneurship/funding>



A TRADITION BEGINS

ENGINEERING DAY

JULY 22, 2016

hosted by Engineering Alumni Affairs

11:00 AM – 1:00 PM
 COLOUR THROW AT NOON | CPH COURTYARD

**CELEBRATE WATERLOO ENGINEERING
 WEAR WHITE TO GET YOUR PURPLE ON**

- » Purple Colour Powder Celebration
- » Heavenly Dreams Ice Cream Truck /
Sugar mama's Mini Donuts / Boggan Burgers
- » The Tool Bearers
- » Dunk Your Prof Tank
- » Giant Gaming
- » Photo Booth

FREE FOOD. NO KIDDING.
 BECAUSE THE FRIENDS WE MAKE HERE AT
 WATERLOO ENGINEERING WILL LAST A LIFETIME

#WEARETHEENGINEERS

WATERLOO | ENGINEERING
 EDUCATING THE ENGINEER OF THE FUTURE



It's never too early to start building your global Waterloo Engineering network.
 Join tenthousandcoffees.com/hub/waterlooeengineering

 **UNIVERSITY OF
WATERLOO**