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THE IRON WARRIOR

THE NEWSPAPER OF THE UNIVERSITY OF WATERLOO ENGINEERING SOCIETY

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The Boat People: An International Crisis

Japan Times

The French Navy performing a rescue operation in the Mediterranean Sea

SHERWIN KWAN
4B MECHANICAL

Every year, millions of people leave their countries in search of a better life elsewhere. While some people immigrate out of choice, others feel compelled—they're not leaving because they want a better life, but because they're literally in danger of dying otherwise. Some are refugees who face so much violence or hardship at home that they would be willing to risk everything on an unauthorized journey across water. Often they are in boats so overcrowded as to not be seaworthy, sailed by smugglers, without lifejackets. Long has their plight been documented by humanitarian groups, and they have also drawn increasing attention from Western governments and media.

Who is a Refugee?

The Convention Relating to the Status of Refugees (CRSR) is the international treaty which defines the rights that refugees have. A refugee, under the CRSR, is someone who flees their home country because of targeted persecution from their government due to their ethnic group, nationality, religion, or political opinion. Many countries extend the definition to also include someone fleeing because of a war in their home country (even if the combatants are not specifically targeting the person's social group).

Under the CRSR, which has been signed by the vast majority of countries (with some notable exceptions in Asia), governments are obligated to accept legitimate refugees into their countries and must under no circumstances send a refugee back home to risk death again. Someone who flees their country for economic reasons is not considered a refugee, and the CRSR does not oblige governments to allow economic migrants to stay. However, when a person is facing both poverty and persecution in their home country, it's often difficult in practice to evaluate their status.

Sea Routes for Irregular Migrants

There are five bodies of water in the world which have been well-travelled seaways for refugees and other irregular migrants (a term I use to refer to anyone who attempts to go to a different country without normal immigration process, and which I use without passing judgement on the legality or morality of their actions) in the 21st century: the Caribbean (Cuba to the USA), the Red Sea (Somalia or Eritrea to Yemen or Saudi Arabia), the Java Sea (Indonesia to Australia), the Andaman Sea (Myanmar to Thailand or Malaysia), and the Mediterranean (Libya to Italy). I will focus on the latter two in this article, because they are traversed by the most migrants. (This is simply due to lack of space, and I am emphatically not saying that Libyan or Rohingya lives are worth more than Cuban lives.)

Mediterranean

The journey across the central Mediterranean from Libya to Italy is the most well-travelled of all the maritime migrant routes. The United Nations High Commission for Refugees (UNHCR) estimates that some 210,000 migrants attempted this journey in the year 2014. The number spiked after Libya plunged into civil war in 2011. The ongoing civil war in Somalia and the harsh conditions in Eritrea (a single-party dictatorship where the government has been implicated in numerous human rights abuses) have displaced many, and Da'esh (ISIS) coming to power in eastern Syria has not helped matters.

Irregular migrants from all these countries have congregated on the shores of Libya to seek passage to Italy, where smugglers have been willing to oblige them, often for ridiculous rates that the migrants are scarcely able to afford. The New York Times recently reported that the going rate for one ticket ranges from $400-$1500 US; by comparison, the average per-capita income, converted to US dollars, is $3800 in Syria, and $600 in Eritrea. Despite this cost, the smuggling boats are overcrowded and not very reliable—they frequently capsize halfway through leaving the migrants stranded.

In the past, the Italian Navy and Coast Guard were quite proactive at patrolling the migrant routes and rescuing migrants in distress. However, in October 2014, the Italian government stopped the operation. This was both for financial reasons (it was costing them 100 million euros per year) and in the hopes that it would discourage migrants from crossing if they knew they were unlikely to get rescued in the case of a shipwreck. The latter...

Continued as "Boat People" on Page 6

Not Having Data Shouldn't Be Such A Handicap

CAMERON SOLTYS
EDITOR-IN-CHIEF

Hello everyone! Wow does it feel weird to be writing this letter from the editor. It was less than two years ago that I went to my first meeting at the Iron Warrior, terrified that they would turn me away for having no journalistic experience. In hindsight, it was a very foolish fear, but I was a first year who had previously only ever spend one week alone in my life, and even then my parents had checked up on me every day. I had no idea how any of university worked. All I knew was that I had to study late into the night, join a bunch of clubs, and make a really awesome resume to have any chance of succeeding. As it turns out, the only thing that was true about that was that I had join some clubs—not for resume padding, but because clubs are awesome and fun.

And now two years later I am the Editor-in-Chief. It's amazing how quickly it happened. I asked Leah about how she had gotten the position when she was EIC last fall, looking to see if I could eventually do it in 3B or 4A. As it turns out, the most important step is to ask. That being said, I haven't really advanced that much since first year; I've been running around with my head cut off for the last few weeks, and it's been everyone else on the team who really brought this paper together.

My assistant editor this term is Alex Lee. I'm excited to work with him again after—he was the first editor I ever worked under. Joanna Liu and Colin Evans are doing a great job as advertising managers, and both were quick to take up the role. A big thanks also goes to Anjida Sripongworakul and Sung Eun Kim, my web editors who waited so patiently for me as I tried to find the social media credentials, only to discover that you don't actually need any to edit a Facebook page (who knew?). I also appreciate Vince Magas for taking on the role of circulation manager and thus the unenviable task of getting papers to V1 one way or another. Vince and Ethan Alter have also bravely taken up the role of photo editors, promising to go to any length to get that perfect shot.

In this issue, I recommend looking up Elizabeths' column *Too Much Information* for some rather disgusting stuff including teeth. We also have an informative piece about the rising debt load in Canadian households on page 3, and if you're looking for a new TV series to binge-watch then read Anjida's new column *Now Playing* for some ideas. A huge thanks to the small army of copy editors and layout editors who showed up to help with layout weekend and keep me company, particularily Alex and Jessica who stuck it out all day Sunday. A special thanks to Sherwin, who learned the trade of crossword making in my time of need. As well, a congratulations to my Grandparents, who celebrated their fiftieth wedding anniversary last weekend. I love you both, and I am so sorry that I was stuck doing layout instead of there to celebrate with you.

One more shout-out is in order, and that is to Google Drive. Without it, organizing and managing this paper would be an absolute nightmare. It's wonderful to be able to edit stuff from the comfort of my own room, and then crawl into E2 in the morning to put it into the paper. It's great to have all the important documents at my fingertips, and it makes updating stuff before I forget a breeze. But just because it's beneficial to have all my important files on hand anywhere I have decent internet, it doesn't mean that everything is better when you add in an internet connection.

I spent a fair amount of money on my computer. Partly it was to play video games, but partly it was because my laptop is my work station. With it, I can make projects and access my entertainment and work efficiently. I have all of my keyboard macros set up, and my files perfectly arranged in their very-hierarchal folder system. A lot of what I do involves internet, but as much as I can I make all the internet services I use conform to my pre-existing work flow.

I like my computer, and I'm familiar with all the software I have on it. So I wouldn't want, for instance, to need an internet connection to view one of my textbooks. But that's what I got when I bought a digital copy of "Calculus for Engineers" to save some money. I get that the publisher needs to verify that my copy of the book is legitimate. By all means make me download some sort of special software or check in every week to prevent the pdf from locking up. But don't make me use a browser-based, single-page-at-a-time online textbook navigated by a mouse-only interface that scrolls off the top of the screen when I try to look at the bottom half of the page. And definitely do not tie my login credentials to a hyperlink on Learn so that I lose access to the textbook when all of the course notes are removed at the end of term. This is a textbook case of where everything could have been done fine without internet, and every bit of connectivity actually makes it a little worse.

The internet-mandated mindset has worked its way into a lot of other computer applications as well, especially smartphone apps. Some apps recognize the reality that not everyone has a data plan, and make an app which retains some functionality without internet. The most notable is my BBC news app, which automatically caches all of the text, but not the photos and videos. In a similar way, my reddit app of choice, Alien Blue, lets me continue to browse the last-opened thread; this is great for text subreddits like IAMA and AskReddit (although if I open too many other apps Alien Blue will close and loses its memory).

I'm very willing to accept that a lot of applications can't operate to their full potential without internet. But as my two examples show, there are ways to provide a reduced service which is still really meaningful and useful. And there are some instances where the reduction of utility should be quite small. I was looking for a Pokémon clone last month to play on my bus ride to work, but all of the decent looking ones completely locked up without a wifi signal. For some reason I feel like I should be able to play these games without internet. Maybe it has something to do with foggy memories of originally playing them on a large turquoise brick that had only a barely-usable infrared light emitter and detector for device-to-device communication…

So I've made my case for the endemic issue of internet over-connectivity. I get that the world is very connected and that free wifi can always be found if you are desperate enough. But software that incorporates internet-free capability is a service which I really notice and appreciate.

Particularly for smartphone apps, I appreciate the importance of internet for getting ads. I get that ads are a major revenue stream for many developers, and I take them any day over having to pay for something I'll probably stop using within three days. I also understand that ads can't really be cached; the data is retrieved as needed from the advertiser's server, and the advertisers won't pay if they can't ensure that the ads are being shown. But offline capabilities are also a draw, and a way to stand out above the competition. If you offer an app I can use on the bus, I'm not going to switch to a different one as soon as I come into range of Eduroam; I'll keep using it and viewing all the ads you send me. And let's just say that if I had found a version of Pokémon that didn't need wifi, I would be using it right now instead of jailbreaking my phone for the exclusive purpose of being able to download GBA4iOS.

Issue #2 Deadline: Friday, June 5 at 6:00pm for publication on Wednesday, June 10, 2015
Send your submissions to *iwarrior@uwaterloo.ca*
Spring 2015 Publication Schedule: May 27, June 10, June 24, July 15, July 29

THE IRON WARRIOR
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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.

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Canadian Household Debt Continues To Rise

J.S. SCOTT
1B GOOGLING

A recent study by Statistics Canada confirmed that the amount of debt held by Canadian families has gone up, with most of the increase coming from families with children under 18. Between 1999 and 2012, the average debt to income ratio increased from 0.78 to 1.10. The increase in debt was possible due to an increase in asset value, with debt to asset values falling from 0.27 to 0.25 over the same period. They were also not equally distributed, with the largest increase in debt exposure held by income earners between the ages of 35-44. The increase in debt is symptomatic of a climate of years of low interest rates. Most troubling of all, the increase in household assets that is driving the debt increase fails to impact people without significant assets; university students and recent graduates.

The Survey of Financial Security (SFS) has been run three times by Statistics Canada, first in 1999, then in 2005, and lastly in 2012. It is a comprehensive survey of Canadians living in the provinces, asking questions related to income, large assets, and large liabilities in the household that would affect the financial stability of the household. The survey also collects demographic data such as the age of members of the household, education, languages spoken, and immigration status.

The survey found that between 1992 to 2012, on an annualized basis, the average Canadian has taken out 32 more cents of debt on every dollar earned over the year. The largest gains went to families with children under 18, where "median debt more than doubled" while "median assets in these families increased by $245,100 (or up 86%)." Among nuclear families in the 55-64 age group, median debt rose by $23,100, compared to a $252,700 increase in median assets.

What does this mean for Canadian homeowners? Are they becoming more comfortable with borrowing against the equity of their homes? In an economy filled to the brim with cheap credit, there is certainly no shortage of capital available for financial institutions to borrow. The prime rate for mortgages is 2.85%. The overnight interbank rate (the market rate financial institutions use to borrow from each other) in Canada is 0.75%. With rates like these, why would a financial institution not want to charge 19.99% on credit card debt? Even if the credit card holder defaults, they have made a tidy profit on their investment. And then, when threatened with bankruptcy, financial institutions are more than happy to offer home equity loans at 2.85%. As long as the borrower keeps paying, the lender is making money.

A populace content with offloading more of their debts to a mortgage would certainly explain the rising debt to income ratio. Since mortgages are secured against the value of the home, it would explain why the debt-to-assets ratio has remained constant. Since a mortgage is secured against the value of the home, financial institutions would be limited to lending against the value of the home.

So what can we do to fix this situation? According to an insider in the Mississauga mortgage market, the solution involves regulating unsecured debt. So far, the government has made strides in regulating the mortgage market. An optimist would say that this has been to create a more fiscally sustainable housing market. A cynic would say this was reactionary pandering to get votes following the 2008 mortgage crisis. The truth lies somewhere in between. However, the same measures that have made it more difficult to get mortgages have made it easier to get unsecured debt, increasing incentives to consolidate debt in mortgages.

Another solution to this problem is to increase information available to the government with regard to unreported income. Current mortgage regulations allow pre-approval of mortgages with either notice of assessment, or 12 months of previous bank statements. If implied income on the bank statements does not match the income reported on the notice of assessment, there is currently no way to verify such information. Consequently, mortgage regulation is open to loopholes where unreported income can slip through the approval process. Reining in such practices would ensure a fairer debt market, ensuring that the debt to income ratio matches the level of risk in the economy. The trouble with holding debt is that if the economy falters, the failure of people to hold incomes steady enough to pay off their debts could result in financial ruin.

But enough economics, what do these statistics mean for us students? Statistically, they mean that between 1999 and 2012, total debt for students has risen more than the median trend, with assets rising less than the median rise. The two best pieces of advice are to obtain a basic education in finances, and to engage in conversation about taxation in Canada. Being aware of loopholes in our financial system, and understanding why those loopholes exist will allow us to have more productive conversation about economic issues in Canada, and how best to create an efficient government and taxation system. If we lose faith in our tax system, we lose the ability to fund the government, and so lose the ability to fund government services. This would be detrimental to us all.

Radioactive Waste to be Stored Near Great Lakes

ELIZABETH SALSBERG
3A NANOTECHNOLOGY

Ontario Power Generation (OPG) has obtained approval from a federal joint review panel for its proposal to store radioactive nuclear waste in an underground bunker (called a Deep Geologic Repository or DGR) close to the Great Lakes. The DGR is to be located at OPG's existing Bruce Power site in Kincardine, Ontario, conveniently a mere 1.2 km away from Lake Huron.

Low and intermediate-level radioactive waste will be stored in the DGR. According to OPG, low-level waste consists of day-to-day items used at nuclear facilities such as mop heads, gloves, clothes and floor sweepings. For the time being, OPG and supporters of the DGR claim that 80% of the nuclear waste to be stored in the DGR will be low-level waste. Intermediate-level waste includes used filters, resins and reactor components. High-level waste (i.e. used nuclear fuel) is not to be stored in the DGR, as it would require a more sophisticated facility, according to the review panel and OPG.

As is perhaps hinted at by its name, the DGR will be buried 680 metres below ground, snuggled among 450-million-year-old rock formations. Environmental investigations indicated that these rock formations are mechanically strong and non-porous, meaning that liquids and gases do not easily pass through them. They are also believed to be "completely isolated" from Lake Huron: investigative tests on the fluids in these rock formations found that the fluids themselves were "ancient in age" says Mark Jensen, Director of the DGR Geoscience and Research Nuclear Waste Management Organization. On a related note, the salinity and presence of chemicals the rock formations were also tested and found to have remained stable over millions of years—meaning that they have not been in contact with Lake Huron. Jensen and DGR supporters believe that this will continue over the next several thousands of years, and that this is a safe site for the radioactive waste.

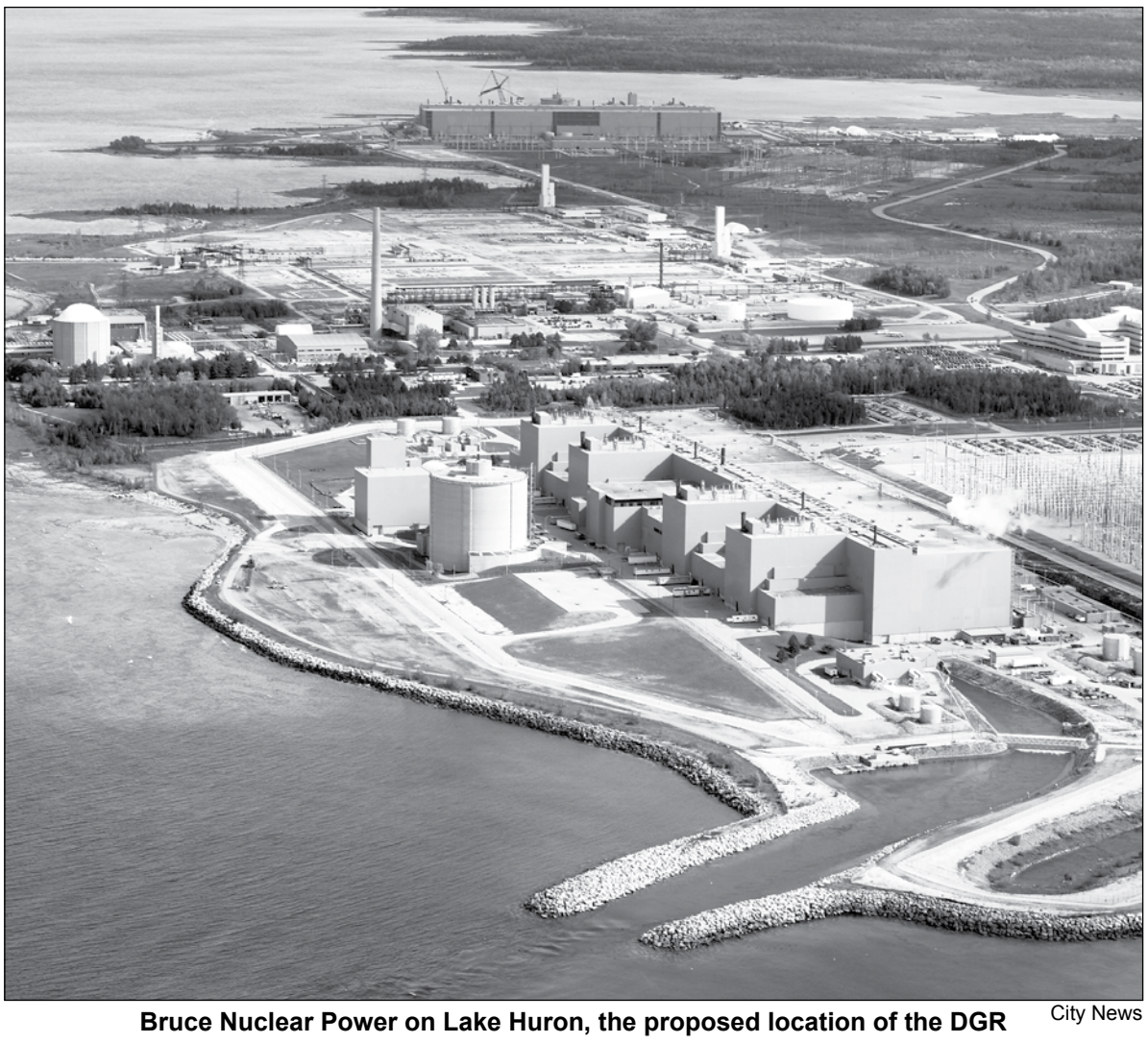
Despite the promise of the scientific evidence, the projects still needs to clear two stages. Final approval from the Environment Minister will come this September (don't expect this to be a significant hurdle given Harper's majority), but the project will also require the support of the Saugeen Ojibway Nation, whom has yet to indicate support for the project. OPG has stated that construction will not commence without approval from the First Nations.

Opponents of the project are concerned that radioactive contaminants from the DGR will hit shallow ground water, Lake Huron, and, ultimately, all of the Great Lakes since they are all interconnected. Furthermore, the existence of the DGR could tempt future generations' policy-makers or other relevant institutional people to store more waste than the DGR can handle. The effects of such an event are frankly unknown, except for perhaps contamination of the water as above.

Supporters argue that the Great Lakes are already very polluted, and that we have this nuclear waste that needs to go somewhere and something needs to be done with it… so why not this solution? Though this is of course a logical argument, it points to a far greater issue: Ontario's energy mix.

Ontario's energy mix can hardly be called a "mix": It consists almost entirely of hydro and nuclear. Nuclear generates this radioactive material that we need to "store" in facilities like the DGR. The long-term solution? Take the focus off short-term, cheap energy solutions like nuclear, and focus on cleaner renewables such as wind and solar. As for hydro, though "clean" in the sense that it does not directly pollute the environment, it certainly destroys ecosystems and has been known to wipe out species of fish and other ecosystem dwellers. This is also very problematic.

The DGR issue is just another data point in an infinitely long and frustrating list of examples illustrating Canada's unwillingness to invest in an energy solution that does not pose risk to our environment (and yes, this includes our drinking water supply). Undoubtedly, nuclear energy has created many jobs in small town and rural Ontario, which is of course a huge benefit. In the same vein, it is important to recognize that putting more effort into wind, solar and other clean, renewable energy sources will also create jobs. Most importantly of all though, it will leave future generations with a planet worth living on.



Bruce Nuclear Power on Lake Huron, the proposed location of the DGR City News

A-Society Spring Executive Elections

SOHEIL KOUSHAN
CHIEF RETURNING OFFICER

It is time once again to elect a new executive team. The outgoing executive have done a fantastic job, and you can read all about their work at *engsoc.uwaterloo.ca/tag/execspotlights*.

This term we have six candidates (one of which is a candidate pair) running to fill six positions: President, VP External, VP Education, VP Finance, VP Internal, and WEEF Director.

Unfortunately the position of VP Education has gone unclaimed, and a byelection will be held closer to the end of the term.

Below you can read about each candidate and what they hope to bring to the team, as well as a summary of important dates.

Wishing luck to all the candidates,
Soheil Koushan
Chief Returning Officer, Spring 2015
Waterloo Engineering Society A

Important Dates	
Campaigning	May 27 - June 3
Debate	June 2 11:20 - 12:30, CPH Foyer
Voting	June 4 - 8, Online
Results Announced	June 11, TalEng

Adelle Vickery: President

Hey engineers! My name is Adelle Vickery and I want to be your next Engineering Society President. The President is the face and voice of the Society and is ultimately responsible for determining its overall direction. If elected, I have many ideas to improve the three main pillars of the Society: services, events, and representation.

For services, my main idea is to implement a Mental Health Awareness Week; the goal would be to allow students to engage in activities that will help relieve stress and provide a safe space to discuss mental health and mental health services across campus.

For events, I would like to expand Education Outreach to include informing and promoting engineering to highschool students, increase and improve advertising, expand the marketing team, hold more inter-faculty events, and de-clutter the EngSoc calendar.

For representation, I would like to increase collaboration between the two societies and better align the way we run. This will allow the man-power of both Executive teams to be combined to implement more new initiatives.

I have been actively involved in EngSoc, holding multiple large roles during my time here. I recently took over the role of VP Internal, coordinating directors and commissioners and overseeing Society events and services. I have been both Student Life Commissioner and Student Services Commissioner. Aside from this, I am also a member of the Executive Review Committee, I directed Semi-Formal and EngPlay, and I have been a volunteer at Orientation Week, Fall and Spring Open House, and Canada Day. This experience and my enthusiasm and passion for EngSoc make me the ideal candidate to serve you as President.

Thank you so much for reading my platform and getting informed before voting! If you want to see some of my other ideas, learn more about my experience, or if you have any questions, comments or suggestions, visit my website *bit.ly/adelleforpresident* !

Jake Harvey: Vice-President Finance

Hi, I'm Jake Harvey, I'm in my 2B term of Mechanical Engineering, and I'm running to be your next Vice President Finance. I'm running for this position because I'm passionate about the Engineering Society and I want to make sure that it provides the best services to all undergraduate engineering students. During my past two years at the university I have been heavily involved in Engsoc, being a 2018 Spirit Director and acting in Engplay in 1A. I have been a TSN Director, POETS manager, the Communications Commissioner, and have worked in Novelties in my 2A and 2B terms.

If elected, I want to make sure that your money is being used effectively and that you know you are getting the most out of your Engsoc fee. Currently, Engsoc posts the budget for the term on their website and in the Iron Warrior. I will make sure that along with the budget you will also have access to the actual spending of the society at the end of each term.

I want to see some new products in Novelties. To do this I want to create a new Product Design Directorship so that creative people with awesome ideas can bring new products to the Novelties store.

I want to encourage students with ambitious ideas for events or services or students with questions or criticisms to be able to bring these forward to me so that we can talk about them. I will make sure that I am available and ready to listen whenever a student wants to talk to me and that I will do my best to help.

If you have any questions about my campaign, feel free to talk to me or take a look at my campaign page at *facebook.com/votejake4vpf*. And remember, a vote for Jake puts your money in the right place.

Abdullah Barakat: Vice-President Finance

Hey everyone! My name is Abdullah Barakat, but you can call me Abdullah Dolla Bills! I'm in 2B Mechanical Engineering and I'm running to be the next Vice President Finance of the Waterloo Engineering Society "A". I have been involved with the Engineering Society since I started in 1A, and have taken my involvement to new levels every step of the way. I have gained a lot of knowledge about the finances of the Society by working closely with the Society's business manager and the current VP Finance, and will prove to be a valuable asset in the long run.

When elected VP Finance, The goals I plan to achieve include working on an expansion plan for the CnD and RidgidWare, raising awareness for the committees under VP Finance, increasing the student deals portfolio, and increasing the product range in Novelties and RidgidWare.

New initiatives I plan to work on include creating an online catalogue for the CnD, RidgidWare and Novelties, improving communication with council members, expanding the external sponsorship portfolio, and revamping the POETS movie library.

For my experience as it pertains to the VP Finance portfolio, I have been a multi-time director for the Society, and I'm the current Student Life Commissioner; therefore, I understand how funds are allocated towards events and services. I have been a member of all the committees that deal with the allocation/reviewing of the Society's finances, including ECIF, the Sponsorship Committee, and the Board of Directors. As a member of EngSoc staff for over a year, I believe that my experience in the day-to-day operations of the Society will prove to benefit me in the role of VP Finance, as I will be able to make discretionary decisions accordingly.

For more information about my campaign and platform, please visit *bit.ly/abdullah4vpf*, like my page at *facebook.com/abdullah4vpf*, or follow me on twitter *@abdullah4vpf*. Thank you for taking the time to read through my article, and remember to vote Abdullah Dolla Bills as your next VP Finance!

Sarbajoy Majumdar: Vice-President Internal

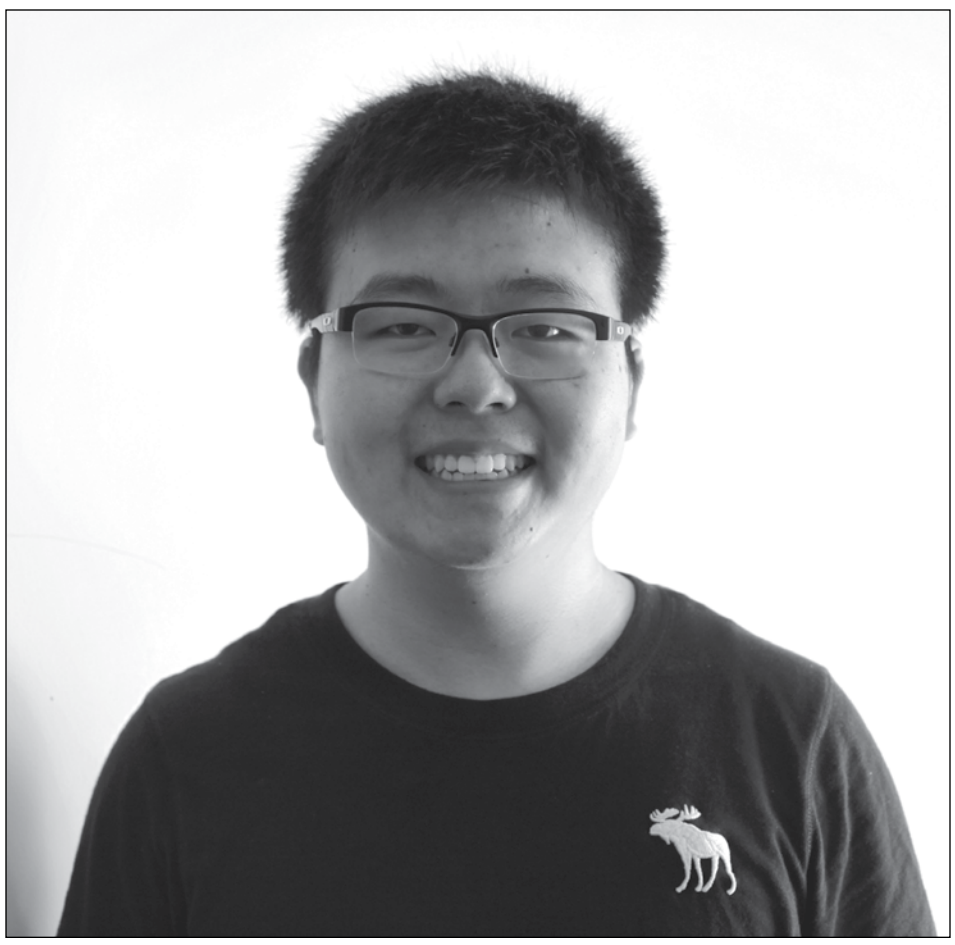
Hello fellow Engineers!

My name is Sarbajoy Majumdar, but you can call me Sarb. Some of you may know me as either the guy from Management Engineering 2018, the international kid from Singapore, the tour guide, the engineering ambassador, someone who was once involved with Midnight Sun, the guy with two O Week 2015 directorships or may not know anything about me at all until you chanced upon this article. One day, I dream to be known to everyone as the person who helped improve and inspire engagement within the engineering community. I hope to achieve this dream as soon as possible and hence am running to be your next Vice President Internal.

As said, the overall goal I have is to improve engagement within the Waterloo engineering community. Some ways I hope to achieve this are through creating a better support system for event and services directors via providing them customized deadlines and checklists, creating avenues for more inter-faculty collaborations through special events, introducing new athletic initiatives and improving the first year engagement initiatives of EngSoc. I hope to increase council engagement through working with fellow execs, commissioners and directors, and also improve the exam bank in terms of relevance of content by removing really old entries and updating them with new entries. I also want to work with the rest of the executive team to make new documents such as novelties catalogues, a syllabus bank and potentially digitized ticket sales for events.

You can find out more details about my platform and myself at my website (*bit.ly/Sarb4VPI*). Also do remember to vote for the candidates who you think would best represent you for all six positions.

Eric Shi: WEEF Director



Hello A-Society Members! I'm Eric Shi and I'd like to be your next Director of the Waterloo Engineering Endowment Foundation. I'm currently in 3A mechatronics engineering, and I have served as an Engineering Society class representative since 1A. I am very enthusiastic and approachable, so please feel free to stop me in the hall to chat if you see me.

I believe that WEEF is extremely important, and while class WEEF reps vote on funding, I feel that every student should be aware and have a say. Collectively, I want to work together with each and every one of you to ensure that funds are allocated to where they can best benefit students. This includes student teams, lab upgrades, machine shop equipment, and educational resources.

Did you know that WEEF funding proposals are reviewed and approved by undergraduate engineering students only? I will work with WEEF reps to ensure that classes are more aware of what is being funded and how they can get involved with proposals.

Another thing I would like to work on is getting students to provide feedback for which labs could use new equipment. I want to accomplish this by taking feedback from students from all engineering departments through a brief survey.

I also want to enhance the existing WEEF infrastructure. Firstly, I want to fix bugs with the WEEF website that can make submitting proposals difficult, and add a new feature to help identify underfunded and underrepresented departments. Having diverse ways of communicating with the student body is important. I plan on reviewing the existing lines of communications WEEF uses and brainstorming with class representatives about how we can better reach out to the student body. I also plan on updatingoutdated posters and running another design competition for a WEEF lab poster. “My platform and website can be found at www.ericshi.ca/weef”

Thanks for reading and remember, Vote Shi for WEEF.

Microsoft's Final Legacy

BRIAN CHAN
3A NANOTECHNOLOGY

So if you don't know about this, then you haven't been really keeping up with technology or computers are not really your thing. Maybe you don't even know what this is, since you've been using an Apple system your entire life, but for your average, friendly Microsoft Windows user the following is huge news. Windows 10 is coming out. Yay!!! Gone will be a terrible failure of in the form of Windows 8; in is an OS that will hopefully be Microsoft best and final legacy. Yes, this is the final Windows OS, and not because Microsoft went bankrupt—Windows 10 is simply going to be their final OS. That is not even the best part. The cherry on top is that Windows 10 is free!! This is definitely somewhat to be expected after their epic Windows 8 failure, thereby causing users to stick to Windows 7 or even XP. Additionally, Microsoft needs to compete with Apple's free OS--and will essentially be adopting Apple's approach: Keep the OS free and send periodic updates to the OS as Apple does now. But how they plan to update is an insignificant part of what this OS must be.

Windows 10 must be perfect. When I say perfect, I mean it. It must be flawless, because if they don't plan to release any other OS it means they have no future chance to redeem themselves. It must be something that Windows users love because that's what we must live with for the rest of our lives, choosing either to use the final Windows 10 interface devised by the programmers at Microsoft, or to stick with the legacy versions such as the great Windows 7 or the even greater XP. Another reason why it is free is to attract all customers with their previous operating systems to upgrade to the new one because Microsoft is just sick and tired of supporting multiple platforms. It is costly for them to maintain multiple platforms. Furthermore, moving everyone to one system gets them closer to the dream of being able to interface their many platforms together.

The thing is, I do not know how convinced any of the general population can be. Sure, the OSs made by Microsoft have had their ups and downs; like Windows XP, one of the greatest OSs, and something like Windows 8 which took away the Windows button and Start menu, features that made the Windows OS a Windows OS. All I can say is that Microsoft is treading very carefully this time. If they do manage to provide an OS even better than XP, Microsoft will keep its legacy running for generations to come. Else, we might all have to switch to Apple or some other Linux system.

Adventures with Arduinos

LEAH KRISTUFEK
3T CHEMICAL

AMAZING DIY

It seems harder to be a tinkerer these days. Devices just don't come apart easily like they used to. Back in the day mechanics would change out the acid in car batteries in a back room of their shop and Joe-blow-everyday-man could fix their car without having to understand computer programming. People could take apart everyday things and more importantly, they could put those things back together.

These days, with plastic cases and glued together components, you might be able to take things apart, but not necessarily be able to put them back together. It has left me with a fear of breaking things that always makes me think twice before removing the back of my laptop to clean out the fan and keeps me from taking apart my cell phone to understand what's going on. It is frustrating to say the least, and it will forever leave me hearkening back to those good old days when things were simpler.

This co-op term I decided it was time to be a little less useless. I find that sometimes it is easiest to learn when there is confirmation that things are working. So somewhat on impulse I bought an Arduino starter kit and have slowly embarked on the adventure of learning how electronics work.

An Arduino is an open source microcontroller that can be used for DIY projects. The beauty of an Arduino is that with a little easy programming and some off the shelf parts you can get visible results. My microcontroller came along with a breadboard and an assortment of components. More importantly it also came with 16 tutorials to learn how to use them. The breadboard allows you to construct circuits and take them apart again, no soldering required.

As with all things you have to start somewhere: in the first tutorial I learned how to make an LED blink. However, the possibilities are endless. Add a potentiometer and you can dim and brighten that LED. Add a photoresistor to detect the changes in light and you can make your LED into a nightlight. It is easy to take these microcontrollers and make meaningful projects. For instance, returning to my failing computer: I could use a temperature sensor to record the temperature at the point where it is heating up the most and program the Arduino so that after a certain temperature is reached a fan is turned on to cool my computer off.

There are so many possibilities. Although right now I'm still working on finishing up the tutorials, someday I might be able to do some real tinkering! Next issue I'll be back with some DIY from my co-op lair.

The Boat People

Continued from "Boat People" on Page 1

...goal was unsuccessful; in April 2015, a series of four shipwrecks happened in one week, resulting in over a thousand deaths. The captain of one of the smuggling boats survived and was immediately arrested. He will stand trial in Italy for reckless homicide.

EU leaders have convened an emergency meeting to discuss the crisis. They pledged, among other things, to step up naval patrols in the Mediterranean, accept refugees legitimately fleeing war or persecution while sending economic migrants back home, and work with African governments to prevent the migrants from leaving Africa at all. Time will tell how useful the new measures will be to resolve the crisis.

Andaman Sea

Refugees crossing the Andaman Sea are usually part of the Rohingya people, a predominantly Islamic ethnic group which lives in the state of Rakhine in western Myanmar and has faced intense oppression. The origins of the Rohingya people are a matter of controversy. While some of them are descended from the Muslim minority which has lived in Myanmar for centuries, others are descended from immigrants from what is now Bangladesh – frequent famines in Bangladesh, plus the genocide during the 1971 war between Pakistan and Bangladesh, have provided ample reasons for Bengalis to make the migration to Myanmar.

The Myanma government has denied the entire lot of them citizenship on the grounds that they are "Bengalis" (i.e. implying they are illegal immigrants from Bangladesh). The leaders of the Rohingya reply, on the contrary, that a lot of them are descended from the historic Muslim community in Myanmar and that it is utterly deplorable for the government to make every last one of them stateless because of the actions of relatively few. At the end of the day, many Rohingya have had more than enough of their oppressive conditions in Myanmar and have resorted to paying smugglers to sail them elsewhere. Their intended destination is usually Malaysia, which as a Muslim-majority country, is a place where the Rohingya feel they will be better treated. The UN estimates that some 8,000 people attempt this journey every month.

Unfortunately for the refugees, the smugglers often do not completed the journey, and destination countries have been reluctant to accept them. Due to a recent crackdown on human smugglers by the Thai government, some smugglers have taken lifeboats and sailed off on their own to escape capture whenever they spotted the Thai Navy, leaving the migrants stranded on their boats with dwindling supplies. Migrants who survived the journey reported some appalling conditions: some had been beaten by smugglers, and others had starved to death on the way and had their bodies unceremoniously flung overboard. Dehydration, malnutrition, disease, and psychological trauma were all commonly reported.

Until recently, the Thai, Malaysian, and Indonesian navies largely ignored the stranded migrants. As conditions became direr, on May 20 Malaysia and Indonesia pledged to take action to save the survivors, accepting the Rohingya as refugees but repatriating any economic migrants who still had a country to go back to, and cracking down on human smuggling in the region. So far, Thailand's military regime has remained reluctant to accept any refugees. After weeks of denying responsibility for the crisis, the Myanma government agreed to attend a conference in Bangkok with the Thais, Malaysians, and Indonesians. As of press time, nothing has been agreed to yet.

Responses

So how should irregular migrants be treated? Virtually everyone agrees that those who are drowning or stranded in the water should be rescued and provided with food, water, and health care in the short term. But after that? Many countries say they cannot afford to take a large number of immigrants. Particularly controversial are the economic migrants not facing persecution or war in their home country – why should they have the right to stay, when they essentially cut to the front of the line instead of applying to immigrate the "proper" way?

Tony Abbott, Australia's prime minister, has a no tolerance policy – irregular migrants caught trying to reach Australia shall be denied access, regardless of whether they have a legitimate refugee claim. While it has managed to prevent migrants from arriving by sea, critics charge him with failing to help legitimate refugees and lumping everyone together as illegal immigrants.

The other extreme—simply allowing anyone who wishes to enter the country to enter—is usually not considered workable.

The American policy on Cuban migrants is essentially a compromise between the two sides – if you can make it to shore without getting caught by the U.S. Coast Guard, you're allowed to stay, regardless of what reason you're trying to enter the USA for. If not, that's back to Cuba for you. This prevents the bulk of the migrants from coming, but still leaves the door open.

There are no easy solutions. Ultimately, the only way the crisis is going to be resolved is for the source countries of the migrants to become less crappy.

UNESCO Launches "Learning Without Fear"

RAEESA ASHIQUE
1B ELECTRICAL

School-related gender-based violence. SRGBV. Now that is a mouthful. So what is this exactly? SRGBV refers to acts of physical, sexual, or psychological violence inflicted on children in and around schools, usually due to gender stereotypes. It can take several forms, including but not limited to intimidation, punishment, bullying, harassment, sexual abuse, and exploitation. Imagine a world in which you can learn without fear. Now that is an easy one. Canada is by no means perfect, but our schools are safer than in much of the world, including areas of sub-Saharan Africa, South Asia, Latin America, and the Middle East. But this should be a given for everyone, no questions asked. Learning Without Fear is a campaign UNESCO (United Nations Educational, Scientific and Cultural Organization) launched with the intention of creating a safe learning environment for both girls and boys, which involves the implementation of national policies. This is the first official resolution addressing SRGBV, which fifty-eight countries signed at the executive board meeting on April 16. "It is clear that school-related gender-based violence is creating a dangerous learning environment for children all over the world," said Irina Bokova, the Director General of UNESCO. "Schools should be a safe haven for young people, especially for those in marginalised and conflict-affected countries."

Remember being ten years old? Remember playing with toys as a child? Who am I kidding: we are all engineers, and I am sure we used to take things apart as children. (Although not going to lie, I preferred to read for hours on end). Remember playing pretend, hide and seek, and lava tag? Our biggest concern was being held up at the dinner table until we finished our broccoli, and having to complete our multiplication worksheet in less time than it took yesterday. Now imagine a world much different than our own. Where ten year olds would give anything to be doing our multiplication worksheets, and instead are subjected to violence, often disguised as corporal punishment. So many are scared to go to school. Oftentimes teachers are the inflicters of sexual harassment, and threaten students with low marks if they do not consent. I agree with what one Ugandan school girl said: "Our teachers should be there to teach us and not to touch us."

Imagine a world where children are trafficked rather than sent to school. Forget being kidnapped and sold by strangers: your own family members turn against you. But you love your father; you look up to your older sister. So you hold onto hope. This will all be over soon. Just be patient. Just obey. But it continues. Adolescent girls are more likely to face SRGBV, and to be deprived of the chance to go to school, so let us digress. Because I Am a Girl is a related initiative, this one launched by Plan International, which supports a girl's right to receive a quality education.

Receiving at least a quality elementary and high school education makes a girl less likely to be subjected to violence or married young, and more likely to know her rights and stand up for change. "There is no tool for development more effective than the education of girls", said former UN Secretary-General Kofi Annan. An educated girl is more likely to grow up to raise her family to be strong. Sixty-two million girls around the world are out of school, and every single one of them has the potential to make a difference. Every single of them deserves a chance to learn, without fear or under threat of violence, sexual or other.

Education is a platform for change, and no one should be denied this basic human right. This cycle begs to be broken, and raising awareness is the first step.

Jahn-Teller Effect Seen in Conductive Materials

ALEX LEE
3A NANOTECHNOLOGY

A new state of matter has recently been discovered by an international team of scientists based in Tohoku University, Japan. The team, led by Dr. Kosmas Prassides, was studying a novel form of semiconductor composed of the carbon-60 molecules known as fullerenes, or "buckyballs." The new form of matter has been termed "Jahn-Teller Metals" after the Jahn-Teller Effect, a chemical phenomenon.

The Jahn-Teller effect was proposed by Hermann Arthur Jahn and Edward Teller in 1937, based on group theory. It refers to the geometric distortion of molecules that happens in certain electron configurations, particularly at low temperatures. The Jahn-Teller metals utilize this effect to change their conductive properties. Simply by applying pressure, one can change Jahn-Teller metals from insulators to conductors. The interesting thing is that ordinarily, metals do not demonstrate the Jahn-Teller effect; it is usually only prevalent in insulators.

The C60 molecules were interesting test materials because the distance between adjacent molecules could be manipulated by changing the pressure. This was usually done by introducing rubidium atoms into the fullerene matrix in a process known as doping. At low pressures, the fullerene behaved like an insulator. At high pressures, it behaved like a conducting metal. But the fascinating part occurred at medium pressures; this is where the anomalous properties were displayed. The fullerene was able to conduct electricity while still exhibiting the Jahn-Teller Effect that was seen only in insulators.

This is the first ever indication that there is a possible transition phase between insulating and conducting states. The truly promising thing is that the fullerene exhibited superconductivity at 35K, which is very high for superconductors; most superconductors must be kept at a temperature just above absolute zero. This is the first step to being able to make superconductors that can function at a realistic temperature for common use.

The mechanism that causes the interesting properties in the rubidium-doped fullerene has not been explained yet, and more research has to be done into these Jahn-Teller Metals. It will be a considerable amount of time before Jahn-Teller Metals will see practical application, but the potential that these materials hold is exciting.

Updates, Updates, and Even More Updates!

LEILA MEEMA-COLEMAN
PRESIDENT

Hello engineering students and welcome back for a fun filled summer term! A few updates from while you were gone on coop. The new BSoc Executive team was elected and we are in the midst of our elections right now! Campaigning starts today so look out for the posters, websites, and get informed on exactly what each candidate plans on accomplishing and the experience that backs them up. The Executives are responsible for shaping the vision and direction of the Society so if there are new initiatives you want to be see done make sure to ask those questions during elections and then hold them accountable once they take office! Once voting begins you will receive an e-mail sent to your @uwaterloo account. The email will provide you your personalized voting link. All of the on-term engineering students have an opportunity to vote; make sure that you use yours!

Second update, I hope last term you remember that A-Society held a referendum and A-Society voted "yes" to the optional fee to support E7. Since we are a joint Society we are required to run two referendums on both streams to ensure every student has a chance to participate and have their voice heard. Over the Winter term B-Society voted "no" to the referendum which means that this fee will not be implemented. What does this mean for students? This means that once the building is complete we will not have naming rights to the space and the optional fee will not be implemented. Dean Sullivan wrote an article last term for the Iron Warrior which goes more into detail on the referendum results so if you are interested I encourage you to view that on the Iron Warrior website. (*http://iwarrior.uwaterloo.ca/pdf/w15i5.pdf,* page 1)

And finally, an update on some initiatives I've been working on. One item I started working on in the Fall term was the implementation of an elective syllabus bank. While it has been going slower than I hoped, we are making good progress and I am optimistic we will have a basic framework in place by the end of the term. On the note of banks, I know there have been concerns about the exam bank and the switch from the old bank. We have been listening to the feedback and are working to implement the increased search functionality as well as some new features not possible on the old site.

Lastly, another large initiative I have been working on is with the Executive Review Committee formed last September. We will be proposing a new Executive structure at this summer's Joint Annual General Meeting. This change will hopefully work to more align the Executive positions with the mission and vision of the Society and give them more freedom to implement new initiatives.

Anyway thats all for now. Don't forget to vote and if you have any questions send me an e-mail at *president.a@engsoc.uwaterloo.ca* :)

Meet the New Exec

ADELLE VICKERY
VP INTERNAL

Hey Engineers!! I hope your first few weeks of class have been excellent!

For those of you I have not had the pleasure of meeting yet, my name is Adelle Vickery and I am the Engineering Society VP Internal this term. This may be confusing to some of you, since I was not writing these updates last term. Unfortunately, the previous VP Internal, Puneet Natt, resigned from her position. To fill the vacancy, a vote was taken at the first EngSoc council meeting of the term, and I was elected to fill the position.

Now that you know why I'm here, I'll tell you a little about me. I'm currently in 3A Chemical Engineering and I have a lot of experience under the VP Internal portfolio: I directed EngPlay and Semi-formal, and I was both the Student Life Commissioner and the Student Services Commissioner. I am very excited to be taking on an even larger role within the Society.

This term, I will be taking on all the responsibilities associated with the role, working with the rest of the Executive team on Society improvements, coordinating with directors and commissioners, and overseeing Society events and services.

As always, there are a lot of things happening this term. One of the new(ish) things happening is our technical workshops series. Every other week, starting May 26th, EngSoc will be hosting a different workshop in the Multimedia Lab (CPH 1346). The first two are on beginner and advanced excel, followed by SolidWorks and MatLAB later in the term.

If you have any questions related to this article or the Engineering Society's events or services, please send me an email at *vpinternal.a@engsoc.uwaterloo.ca*, or you can visit me in the Engineering Society office (CPH 1327). Looking forward to serving you all this summer!

Come on Out and Volunteer

HEATHER SMITH
VP EXTERNAL

Hey Engineers and welcome back! I hope all of you have had the chance between assignments and whatnot to enjoy the warm weather...when it actually co-operates. There are a lot of awesome outreach events coming up this summer, with chances for you to purple yourselves for charity, volunteer at THEMUSEUM in Kitchener leading kids through fun and interactive science and engineering experiments, march with EngSoc in the Toronto Pride Parade, volunteer for Canada Day at CIF, not to mention a whole bunch more!

I wanted to talk about the charity for which EngSoc has been and is currently raising funds, oneROOF. This is an organization located in downtown Kitchener that works towards maintaining the health and safety of youth aged 12-25 that are facing or at-risk of homelessness. Funds that we raise through our charity initiatives will go towards providing food, medical attention, services, and education to those in need as well as educating the public on homelessness and related issues.

Over the Spring 2014 term, members of A and B Societies voted on which charitable organization they wanted to see their money go towards for twelve consecutive months, starting in September 2014 and ending in August 2015. Over the Fall and Winter terms, we have collectively raised a total of over $3600! Thanks to everyone who donated or participated in EngSoc's charity events so far, your money is going towards an excellent cause.

Get excited for all of the awesome charity events we have in store for you this term! Check out the calendar to get involved and hopefully, by the end of the term, bring our grand charities total to $5000! If you want to learn more about ROOF, check out their website at *http://oneroof.org/* and feel free to shoot me an email at *vpexternal.a@engsoc.uwaterloo.ca* if you have any questions, comments, concerns, or want to get involved in charity or any other initiatives. Thanks for reading and have an awesome-tacular-ific day :)

Upcoming Events Calendar

Wednesday May 27	Thursday May 28	Friday May 29	Saturday May 30	Sunday May 31	Monday June 1	Tuesday June 2	
Game Lunch in POETS! 11:30AM - 1:30PM, POETS EngSoc Meeting 2 5:30PM - 7:30PM, CPH 3067 **CCA** Matacs: Skills of Communication 9AM - 5PM, TC 2218	Charity Grilled Cheese 11:30AM - 1:20 PM, CPH Foyer **CCA** Résumés for Grad Students 10:30AM - 12PM, TC 2218 Make Networking Count 2:30PM - 4PM, TC 1208	**CCA** Careers 601 10:30AM - 12PM, TC 2218 Academic Interview 2:30 - 4PM, TC 1208	EngSoc Goes to THEMUSEUM 9AM - 3PM	Quidditch 2PM - 4PM, V1 Green	**CCA** Work Search and Networking 10:30 AM - 12PM, TC 1208 Project Management as a Career Option 2:30 - 4:30 PM, TC 1208	EngSoc Elections - Open Debate 11:30 AM -12:30 PM, CPH Foyer EngProv 6:30-8:30 PM, POETS **CCA** Interview Q&A 10:30 - 11:30AM, TC 1208 Are You LinkedIn? 1:30 - 3PM, TC 1208	**Check out up-to-the-day event postings on the EngSoc website at *engsoc.uwaterloo.ca/event-calendar*** **NEW FEATURE: CCA events being offered by CECA. See *uwaterloo.ca/career-action/* for details and to register**
Wednesday June 3	**Thursday June 4**	**Friday June 5**	**Saturday June 6**	**Sunday June 7**	**Monday June 8**	**Tuesday June 9**	
Game Lunch in POETS! 11:30AM - 1:30PM, POETS **CCA** Teaching Philosophy Statement 10:30AM - 12PM, TC 1208	Charity Grilled Cheese 11:30AM - 1:20 PM, CPH Foyer Amazing Race **CCA** Successfully Negotiating Job Offers 10:30AM - 12PM, TC 1208	**CCA** Mitacs: Networking Skills 9AM - 5PM, TC 2218	WiE Picnic 2- 4PM	EngSoc Goes to the Ball Game 11AM - 5PM	**CCA** Writing Successful Grant Proposals 1:30 - 3PM, TC 1208	EngProv 6:30 - 8:30 PM, POETS Advanced Excel Work 5:30 - 7:30 PM **CCA** Career Interest Assessment 10:30AM - 12PM, TC 1214 Career Exploration and Decision Making 2:30 - 4:30PM, TC 1112	

University of Waterloo Engineering Society 'A' Budget

May 1, 2015 - December 31, 2015

KEVIN MCNAMARA
VP FINANCE

Hello Engineers! Welcome back to campus for the spring term, and also my last term as VP Finance. There is a lot going on with my portfolio to watch out for this term. First off, you can check out the budget for the spring term on this page. This outlines where your EngSoc Fee ($15.45) is being spent for the term. Each line represents an EngSoc event, service or expense, each of which goes towards supporting engineering students at Waterloo. Make sure to check out what we offer to get the most out of your EngSoc fee this term.

Novelties and RidgidWare are now both open. If you need to stock up on some engineering swag or want to work on an electronics project, then definitely stop by and see what we have to offer. Novelties is open every day from 11:30 to 1:30, and now has extended evening hours for those of you who can't make it during lunch – Tuesdays 5pm to 6pm, and Thursday 6pm to 7pm. RidgidWare is open Tuesday and Thursday during lunch from 11:30 to 1:30. Both shops are convienently located in CPH Foyer.

Once again we are accepting Sponsorship applications for the spring term. Sponsorship is a portion of the EngSoc budget each term that goes towards funding student teams and groups on campus. For more information on how to apply, visit *https://www.engsoc.uwaterloo.ca/attention-student-groups/*. Applications will be due on Friday May 29th at 11:59pm, and presentations will be Sunday June 31st.

If you haven't already come by the EngSoc office to pick up a student deals sticker, make sure to. Being a member of the Engineering Society allows you to receive some special discounts at places in the University Plaza like Aunty's Kitchen, Molly's, and Sweet Dreams, just by showing the sticker on your WatCard. For more information visit the website at *https://www.engsoc.uwaterloo.ca/services/student-deals/* and then stop by the office any day to get a sticker of your own.

As always, if you have any questions about anything related to the Engineering Society and finances, feel free to send me an email at *vpfinance.a@engsoc.uwaterloo.ca*, or swing by the Engineering Society Office (CPH 1327), I'm usually around. See you next issue!

	Budgeted
Revenues	
Student Fees	$ 45,500.00
Orifice Sales	$ 800.00
Total Revenues	**$ 46,300.00**
Expenses	
Fixed Costs	**Budgeted**
Payroll/Operations	$ 27,878.00
ECIF	$ 2,275.00
Orientation Week	$ 800.00
Iron Warrior	$ -
Sponsorship	$ 5,000.00
Total Fixed Costs	**$ 35,953.00**
Discretionary	**Budgeted**
Executive	$ 1,500.00
President	$ 1,000.00
VP-Finance	$ 75.00
Total Discretionary	**$ 2,575.00**
President	**Budgeted**
Carebear	$ 410.00
Chief Returning Officer	$ 355.00
P**5	$ 500.00
TSN	$ 100.00
Total President	**$ 1,365.00**
VP External	**Budgeted**
Canada Day	$ 559.00
Education Outreach	$ 80.35
Environmental	$ 223.50
PEO Representative	$ 244.36
Pride Parade	$ 120.25
WEC	$ 1,475.00
Women in Engineering	$ 37.00
Total VP External	**$ 2,739.46**
VP Internal	
Student Services	**Budgeted**
Exchange	$ 50.00
Interview Skills Workshop	$ 150.00
Mental Health	$ 253.00
Resume Critiques	$ 350.00
Total Student Services	**$ 803.00**
Student Life	**Budgeted**
Arts	$ 152.00
Athletics	$ 205.00
Beach Day	$ 296.00
Coffee House	$ 160.00
EngPlay	$ (1.00)
EngProv	$ 140.00
Genius Bowl	$ 320.00
Hackathon	$ 375.00
Jazz Band	$ 515.00
LAN Party	$ 30.50
OT's	$ 925.00
Semi-Formal	$ (23.04)
Special Events	$ 125.00
TalEng	$ 525.00
Total Student Life	**$ 3,744.46**
Total VP Internal	**$ 4,547.46**
VP Finance	**Budgeted**
Meeting Food	$ 2,700.00
POETS	$ 185.00
Total VP Finance	**$ 2,885.00**
Total Expenses	**$ 50,064.92**
Net Total	**$ (3,764.92)**

What's Going on This Term

JOSHUA KALPIN
VP EDUCATION

Hi everyone and welcome back to another term! I hope everyone had a great co-op term. In my first executive update this term, I wanted to go over my plans for my last four months as VP Education and a little bit about co-op. A couple of these are continuing from the fall, while a few are new things that have recently come up.

First up, let's talk about Waterloo Works. I've been meeting with a number of different folks within CECA and seem to have made some progress on getting the dialogue with students improved. That being said, I can confirm a few things. First, it is delayed indefinitely for performance reasons. However, IST has run performance tests on the new hardware and it has performed as expected. My best estimate at this point is that we'll see Waterloo Work next year, but I have not received any dates from CECA. Please hang tight, and expect a lot more information to be flowing about the project in the coming weeks.

Next up are Work Term Reports. The faculty recently passed changes to the overall work term report guidelines that lets programs create their own work term report courses. These new courses must follow some very specific guidelines in terms of content, credit weight, etc. I will be working to send out a survey in the coming weeks to get some general feedback on Work Term Reports so that we can ensure students have a say in these potentially new courses.

Third is academic reps. I'm going to be holding an all-academic reps meeting later in the term. This meeting will have some guest speakers from organizations within the university that more fit the portfolio of academic reps versus EngSoc reps. I will also be reaching out to the individual program reps to hold program specific meetings to get some more information about the positives and negatives in each program.

Last up is a little update on something I have been working on with Chemical Engineering. In the fall I proposed running a number of surveys and focus groups with Chemical Engineering students to help the department understand what students' expectations are for co-op. This idea has evolved a bit and I've handed it off to the department. They will be running these with both students and employers to try to figure out if there is a missing piece with co-op employment. I hope this leads to long-term improvements to Chemical Engineering co-op numbers and the program as well.

There are lots of other things I could go into, but I've hit my word count for this issue. As always, if you have any questions, comments, concerns or just want to talk about education related things fire me an email at vpeducation.a@engsoc.uwaterloo.ca. Best of luck to you all with the co-op hunt and I'll be back in two weeks.

Point Vs. Counterpoint

Should paper receipts still be given for everyday purchases?

POINT

MICHAL KONONENKO
2B NANOTECHNOLOGY

Here we are in 2015, and after we buy our lunches, the clerk still hands us a paper receipt. Sometimes we read it. Sometimes we can save them for tax reasons. But the majority of the time, we throw them away without giving it a second thought. The businesses that issue these receipts to us are acutely aware that we do this, so why do they keep giving out paper receipts? The simple answer is convenience and reliability.

Consider alternatives to giving paper receipts—email, phone, or texting—as proof of transactions. At first glance, these methods seem to alieviate some of the problems of paper receipts. They don't require businesses to keep running their receipt printers, they're certainly better for the environment, and when paying with plastic, the business would know where to send proof of purchase. However, we cannot simply look at how we can make such a system usable, we also need to examine how we can break it. And the simple truth is that electronic receipts pose significant security and implementation problems that paper receipts do not have.

The first issue is one of security. When sending a proof of purchase, it is required that the communication be secure. This means that any mode of communication needs to withstand tampering (intentional modification of the receipt prior to it being sent), and eavesdropping (overhearing the receipt on the way to the customer). Paper receipts fill these criteria handily, as it is printed in front of your eyes, and only one copy is sent to you. Any attempt to compromise on paper receipts wouldn't scale very well, as a potential malfeasant would need to get his own receipt printer, and would need to learn the format of the receipt in order to forge it.

Now consider if the business sent you an electronic receipt. How would they go about sending the receipt to the customer? Email? That would require the customer to give out their email address. Text message? That would require you to take down a customer's number, adding time to an already busy queue. Can we get the customer's credit card company or bank to send the receipt to them? Who would the customer then go to if he didn't get the receipt? His credit card company? The store? What if the customer is paying in cash? Electronic receipts, while saving paper, do require more information from the customer in order to actually work, and so paper receipts are more useful to both the customer and the business than their electronic alter-ego.

Paper receipts are also a much more reliable form of giving out transactions than electronic receipts. Once the receipt is printed and delivered to the customer, both parties know that the receipt was exchanged and that the customer received the receipt information. Even if the customer throws out the receipt within a few seconds of getting it, he has been made aware that a transaction has taken place, and been offered the ability to review it. Compare this to electronic receipts. No matter how efficient the infrastructure will be for receipt delivery, there will always be a time lag between the sending of the receipt, and the customer receiving the receipt.

So what can be done about alternative receipts? I believe that the answer lies in letting the customer choose the medium by which they get their receipts. People who find e-receipts advantageous could opt in to a program to get e-receipts. This would provide a win-win approach with businesses and consumers as businesses would get information about their clientelle, and consumers would be able to get e-receipts securely. E-receipts could also be tied in to customer loyalty programs in order to improve the rate of customer return.

An apt comparison can be made between paper receipts and plastic bags. Because they are more useful to us than they are wasteful, both have managed to survive to 2015. This counterpoint is not an attempt to disprove that fact, but is instead an acknowledgement that artificially restricting their use would mean foregoing all the benefits that paper receipts provide.

Freedom of choice for businesses in this matter will allow paper receipts to compete against e-receipts, and allow customers to decide in what form they wish to receive confirmation of their transactions. Until then, paper is still the method of choice for customer protection and proof-of-purchase.

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.

COUNTERPOINT

MEAGAN CARDNO
3A NANOTECHNOLOGY

Alright, I know that this argument is pretty much the epitome of a #FirstWorldProblem, but it's one that is actually rather serious in the issues it represents for our first-world society. Receipts are something we've come to expect and don't even think about as we are handed them at the checkout, only to throw them into the nearest waste bin, or to stuff them into our pockets and dump them on our desk at home to be thrown out (eventually) instead. Maybe you are one of those odd people who actually keeps track of your funds from receipts in a colour-coded excel spreadsheet separated by month and type of expense, and while that's quite… fun… you are certainly a rare creature in today's day and age. I keep track of my expenses online as, apart from the tuition's worth of cash I give to the C&D over the course of a term, I pay for everything with either credit or debit.

Paper receipts are nothing but sad morsels of trees that I am forced to send to their doom in a landfill (since there never seems to be any recycling containers handy, but that's a rant for another day). They are relics of an age in which goods or services were exchanged for hard cash, which created the dilemma of having no proof of purchasing said goods or services, which reduced to discrepancies one person's word against the other. But with cash quickly becoming a dying breed of payment, receipts are also very rapidly losing their relevancy in today's society.

The modern-day receipt appears to have two main purposes for the holder. Firstly, it is a way to keep track of purchases and money spent for budgeting, especially for those who are paying in cash and would be required to otherwise memorize the purchase for later use. Secondly, receipts act as a proof of purchase for, again, mainly cash purchases, and this is required for returns or refunds when desired. But in our age, the 21st Century, is the paper receipt really the ideal answer? Is it even a logical answer anymore?

Keeping track of purchases, aside from those made in cash, can be easily managed through online banking and other electronic bookkeeping methods. The fact that paying with debit or credit sometimes even produces two receipts (one from the store's point-of-sale system, and one from the debit or credit machine if it is not integrated into said point-of-sale system) is absurd; neither of the receipts tell me anything that I couldn't have simply viewed online with my banking services.

In a similar vein, having a paper document as the dedicated proof of purchase for any good or service is similarly archaic. It makes as much sense as having your online browsing history archived in printed documents, sorted into file folders; while it gets the job done, it is a system that becomes easily disorganized, with records misplaced or even accidentally destroyed, leaving no records of anything having existed at all. It would not be a difficult project to develop an online service (preferably separate from online banking services just to allow for two separate records, as well as separate from any given retailer) that would serve as an online archive of goods and services purchased — not only would it eliminate the need for frustratingly easy to misplace scraps of paper, it would make filing taxes far simpler.

While cash purchases do not have this same advantage of online records, there is also the fact that the majority of cash purchases are small in size, as regularly carrying a large amount of cash on-hand is not highly recommended. Unless an individual is very particular about maintaining a record of all purchases, regardless of size, the vast majority of these purchases likely do not even warrant a receipt, and should only be given if the customer demands one.

If tomorrow magically began totally receipt-less and we were required to come up with a way to track and prove purchases were made, I cannot imagine the proposed solution of paper receipts printed for every customer going over well. Immediately, someone would point out the large associated cost with the plan— not only for the obvious constant need for the resupply of paper and ink, but for the cost in producing and selling small-scale printers that would produce receipts only a few inches wide. The fact that the proposed solution would require retailers to initially purchase hardware and then have an maintenance cost for the entire time it is in use would not be appealing for any company.

A statistic from 2013 claims that every year, the United States alone consumed 250 million gallons of oil, 10 million trees, and 1 billion (yes, billion) gallons of water solely for the production of receipts— which then resulted in approximately 1.5 billion (that is again billion) pounds of receipt waste. Each receipt alone may seem infinitesimal in cost, but over the course of a single fiscal year each company invests a considerable amount of money and precious natural resources into these relics of a different age. Doing away with receipts almost seems like free profit.

Unfortunately, time has proven that society will almost always prefer the status quo, with much-needed changes to ourmodus operandi only coming slowly and painfully, if at all. But it is a change that I do not think should be neglected. It's time that paper receipts find their way into our history books, not our pockets.

The Creepier Side of the Digital Age

ANJIDA SRIPONGWORAKUL
4A MANAGEMENT

NOW PLAYING

Welcome to Now Playing!—A column in which I'll be introducing little hidden gems of the entertainment world, films and television series alike. Keep reading, keep watching, and let me know what you think. You never know what you might discover.

Press the Home button on your iPhone, have your Android on standby. Shut down your laptop and turn off your TV. And what's staring back at you but that black mirror. That empty screen. Blank, unresponsive. But the damage's already done. Technology's in your system. The internet is flowing throw your blood. We're addicts, our generation. We check our smartphones constantly. Rely on our laptops and television for a large part, if not most, of the time. We tell ourselves we can't live without them, these devices, and in some cases, that rings alarmingly true.

The late 1950's had *The Twilight Zone*, Rod Serling's famed sci-fi television series whose macabre effects played on the dark side of human psyche, the not-so-fanciful possibilities of extraterrestrials, and that beloved idea of a dystopian future. Inspired by the series, Charlie Brooker, British satirist, served up the 2010's with his original, acerbic creation: *Black Mirror*. *Black Mirror* started off strong and haunting, grabbing its viewers' attention from the first scene of its premiere episode in December 2011. The storyline is deceptively simple and prevalent; a fictional royal princess is kidnapped, and a specific ransom demand is made to the Prime Minister of the UK. Except this wouldn't be *Black Mirror* without the underlying complications: the ransom video is uploaded onto YouTube, and the demand involves the Prime Minister engaging in a grossly indecent, personal act—one that could drastically injure his reputation and family relations. The consequences are predictable but disturbing, and *Black Mirror* rolls them out, unflinching and brutally honest. The internet speculates. Twitter blows up, and the Prime Minister's reputation hangs on a fragile string held by the public. The episode, aptly titled "The National Anthem," explores the disparities between our private and public personas. Each scene is well-executed, gripping, and—towards the end of the episode—even difficult to watch. Rory Kinnear, one of Britain's leading Shakespearean actors, pulled off a flawless performance in the role of the conflicted Prime Minister. What awaits him at the episode's denouement is a grim fate that would leave a sour taste in one's mouth and spark a series of doubting questions in one's mind long after the credits roll.

The next *Black Mirror* episode lands the audience in a "nightmarish Orwellian future," as termed by Charlie Brooker. Each *Black Mirror* episode is a different cast, a different reality, a different ambience. The audience gets a fresh perspective of another dark corner in *Black Mirror*'s world. "Fifteen Million Merits" stars the UK series *Skins*' Daniel Kaluuya as Bing, a citizen living in a world in which its population bike to gain credits to trade units for food; for continuous, omnipresent entertainment brought by corporate advertising; and for a digital presence. The citizens' bedrooms and workout rooms are entirely surrounded by screens, which monitor and pause its "entertainment" whenever the citizens choose to "block their vision." The only way out is through an Britain's Got Talent-like contest, called Hot Shot. When Bing falls for Abi (*Downton Abbey*'s Lady Sybil, Jessica Brown-Findlay), an amateur singer with a lovely voice and an even lovelier face, he trades his credits to pave her a path into the contest, a trigger that crumbles up his entire world. *Black Mirror* takes our obsession with reality shows to the extreme in Bing's world, and mocks the empty existence which seems to be the next step from our indulgence in applications and in these non-human interfaces, backed by corporate advertising.

Facebook stalking. Sounds familiar? I'm not accusing anyone here, but it's that prevalent concept, a stranger to none of us. *Black Mirror*'s "The Entire History of You" dramatizes the concept in a stark, believable way. Everyone in Liam's (Toby Kebbell) world has a "Grain" implemented in their eyes, an invisible device that allows one to replay, zoom in, and pause on any memory one has experienced. When suspicion waltzes into Liam's house in the form of his wife Fifion's (a fantastic Jodie Whittaker, Broadchurch) old fling Jonas (*Downton Abbey*'s Count Gillingham, Tom Cullen), the Grain has Liam digging further back into of his and his wife's trail of personal information in such scruntiny that threatens to disrupt the stability of his life. The story is cliché and has been told before, I hear you, but this is *Black Mirror*. Nothing is what it seems, and the role technology plays in this soap opera turn of the show lays bare the thin line between "natural impulses and ubiquitous technology," according to Brooker. Humans, when given the chance and cornered by circumstances, can impulsively drown themselves in unsurprising negativity.

That concludes an overview of *Black Mirror*'s Season One, all episodes of which I enjoyed and was shocked by. Season Two's highlight is the Hayley Atwell-led (*Captain America*'s Peggy Carter) episode, "Be Right Back," in which a woman mourning the loss of her boyfriend becomes attached to almost an exact, but digital, replacement of him, built entirely upon the information he, a social media addict, had posted online. Domnhall Gleeson (the charming lead man of *About Time*, also on screen now as the software developer entangled in an artificial intelligence existential crisis in the brilliant *Ex Machina*) co-stars as the boyfriend, Ash. The episode's build up was teased from the beginning, yet expected and dreaded. Hayley Atwell single-handedly carried the episode, without turning her grief into cliché or a caricature of one, subtly allowing the audience into her desolation, and you'd root for her without even knowing how.

The first episode of the latest season, Season Three, is a particular favourite of mine, a Christmas special told in five parts and possibly the best episode *Black Mirror* has ever done. White Christmas ropes in Matt (*Mad Men*'s Jon Hamm, in a delightfully evil Don Draper role) and Joe (Rafe Spall, the usual supporting man as he was in *What If*, in a superb acting showcase, the kind you have never seen him in before) in a remote cabin house with a lone window looking out to an eternal snowing season. Joe, the more tactiturn of the two, refuses to converse with a cheerful Matt, all done up in a Christmas spirit. When Matt talks, he reveals his past hobby as a virtual pick-up artist, and the web is spun. The concept of "blocking," as you would do on Twitter or Facebook, actually exists in this reality—you could "block" people in real life. A rich person could even pay to have a miniature virtual copy, a "cookie," of his/herself work to serve him or her. As to how the two concepts tie into Matt's and Joe's stories, and how they intertwine to a terrifying twist, I'll leave that for you to watch. I was exclaiming a huge, "WHAT!" in disbelief, my voice strangled and my heart bruised—I can tell you that much.

If your favorite series is on hiatus, and you're looking for something fresh and unique to fill that 45-minute break, definitely give *Black Mirror* a chance. Watch an episode and try to silence those thoughts ringing in your head.

Now: turn off your TV, laptop, or phone screen, and see if you still look back at them the same way.

No Underdog in Stanley Cup

ELIZABETH SALSBERG
3A NANOTECHNOLOGY

THE BENCHWARMER REPORT

Hockey fans—we are down to the final four! Next up—the Stanley Cup Final. In the West, the Chicago Blackhawks are taking on the Anaheim Ducks, while in the East, the New York Rangers (2014 Stanley Cup finalists) are facing off against the high-scoring Tampa Bay Lightning. The fact that these teams have made it this far is hardly a surprise. But who will get to the Final and win the Stanley Cup?

As it stands, Anaheim leads Chicago 2-1 in their best-of-seven series, with game 3 set to go in Chicago. After losing game 3 at home, the Hawks are looking to break even with a win in game 4. Games 2 and 3 have both been decided by just one goal, with game 2 requiring triple overtime and a fluky goal to decide it. Chicago has significantly more playoff experience than Anaheim, with all the key cogs (Jonathan Teows, Patrick Kane, Corey Crawford, Marian Hossa, Duncan Keith, Brent Seabrook, etc.) still in the mix. Anaheim has loads of young talent combined with known stars in Ryan Getzlaf, Corey Perry and Ryan Kesler. Defenceman François Beauchemin has essentially become Anaheim's Duncan Keith—and is playing an absolutely critical role shutting down Chicago's flashy stars.

With both teams very strong offensively, this series will likely come down to defence and goaltending. One would initially think that Chicago has the edge in the goaltending department, but Crawford has not been in his best form. Furthermore, Duncan Keith can only play half the game... That being said, the same goes for Beauchemin. Andersen, on the other hand, has been sensational for Anaheim throughout the playoffs, and is a major factor in how they managed to get this far. Bottom line: Anaheim in seven.

Over in the East, the resilient New York Rangers have knotted the series at two games apiece. After two somewhat sub-par performances, Henrik Lundqvist has bounced back to his regular Kingly self. Steven Stamkos and company were at a loss to score while Ben Bishop and the Tampa D struggled in game 4 as the Rangers coasted to a 5-1 victory. The series heads back to New York for game 5.

Offensively speaking, Tampa definitely has the edge: It's great if you can somehow manage to negate Stamkos, but if you can't stop the triple threat (Tyler Johnson—18 points, Nikita Kucherov—16 points and Ondrej Palat—13 points in the playoffs), you're sunk. The Rangers have gotten timely goals from key players throughout these playoffs, but realistically they will need a stellar performance from Lundqvist if they want to go the distance. This series will come down to whether or not Ben Bishop and the Tampa defense can stay airtight through the remaining 3 games—something they have not had success at so far. If they can't, it will come down to Lundqvist. This series is a classic example of the age-old goalie conundrum: You only go as far as your goaltender takes you. Thought this one is extremely difficult to call, here goes... Bottom line: Tampa in seven.

China's Second Great Wall

VINCENT MAGAS
2B MANAGEMENT

The world knows about the Great Wall of China, ever vigil standing tall to protect the borders of ancient long-gone Chinese states. Fast-forward to the year 2015, and the modern world looks East towards China's direction once more. In the South China Sea, a second great wall is in construction. Countries around the world watch warily as China expands its territorial reach with an imposing wall of sand.

What started a year before as China's decision to relocate oil rig HD-981 into the Paracel Island snowballed into the ongoing disputes along the claimed territorial waters of Vietnam. The initial spark which ignited the tense disputes occurred when a confrontation between Vietnam and China caused a collision between ships resulting in the sinking of a fishing boat and the deaths of 20 people.

Moving forward to 2014, China began construction on its second great wall of sand. Located in the heavily disputed Spratly Islands, China continued to ruffle the feathers of the Indonesian, Malaysian, Philippine, and Vietnamese governments. Although it is not uncommon for China to have a slew of disagreements amongst its neighbouring countries regarding territorial waters, its bold move to create a man-made island and wall have caught the attention of the world.

China's sand wall and island construction project is by no means low-key or insignificant. In total five structures have been built among the Spratly islands, with two more in progress. The latest man-made island is a colossal four square kilometers spanning over coral reefs. The project has been criticized as being extremely damaging to the ecosystem, causing both pollution on the neighbouring Spratly islands and directly into the disputed waters. China is creating the islands by destructive means, resulting in the loss of coral reefs. Using dredging vessels, it has dug up tonnes of sea sediments which are subsequently dumped on the surrounding coral reefs. The reefs are then covered in cement and landfill to make up the base of the man-made islands.

The project which many have called an aggressive land-reclamation attempt have earned the ire of its neighbours and raised concern amongst world leaders. Many countries bordering the Spratly Islands have raised concern above the strategic positioning of the Spratly Islands, claiming the potential for China to build off-shore military sites. In the recent statement by the Association of Southeast Asian Nations (ASEAN): "[China's man-made islands] may undermine peace, security and stability".

Even amidst the heavy criticism and environmental consequences, China has remained steadfast with their second great wall.

Retro-Video Games Part I: The Video Game Arcade

VINCENT MAGAS
2B MANAGEMENT

HIT REPLAY

It's the summer of 2015 and the sun is out, the grass is green and the University of Waterloo ushers in a brand new term! The Iron Warrior comes in at full blast welcoming a fresh new set of vintage items and retro-cool magic with this term's Hit Replay! Hit Replay kicks-off the term to bring you back to a past-time that has dominated the world for the past two decades. We take everyone back to the 80s and early 90s with this issue, to the sound of 8-bit music and pixelated landscapes. That's right, we start this term talking about our beloved retro-video games!

What better way to spend your sunny afternoon than sipping an iced tea in front of your Nintendo 64 or Atari 2600 playing classics such as Paper Boy, Duck Hunt or the Legend of Zelda? Perhaps you were an arcade lover, preferring change devouring arcade games such as Pac-Man (no, not the boxer), Space Invaders or Heiankyo Alien! Many of these games have made their way into the hearts of society, often to the point of utter yearning and nostalgia the moment we hear an 8-bit melody.

The video game industry finds its roots in Video Game Arcades which developed from the earlier penny arcades. In the 1970s, video games hit the early stages of commercialization with devices such as the console prototype the Magnavox Odyssey with games such as pixel table tennis and target shooting. Other companies soon followed suit, releasing games such as Atari's Pong and Bill Pitt's Galaxy Game. The commercial success of Pong's coin-operated arcade style platform shaped the video game industry we know today. By the 1980s Video Game Arcades started popping up all over the world, gaining wide popularity namely in Japan and the United States. Companies such as Namco (well known as the creator of Pac-Man) and Atari dominated the market. The 80s saw these two video game giants wrestle for control over the rapidly growing market. The strong demand for video games allowed companies such as Sega, Capcom, Bally/Midway, Taito, and Konami to thrive. Video Game Arcade machines were everywhere to be seen, ready to cater to both young and old. There was no venue without them, as they appeared in shopping malls, pubs, bars, restaurants, diners, and of course dedicated video game arcades in every corner.

This golden era opened the doors of opportunity for video game technology and hardware development. The modern world of video games entered the scene with the introduction of vector display monitors, more diverse controls providing more options than the original button & joystick combo, more advanced light-guns, and life-like steering controls for racing games. The Golden Era of Video Games found themselves into mainstream and popular culture! Namco's Pac-Man up hit worldwide popularity, becoming synonymous with the video game industry itself. Up to today, Pac-Man is still in production by Namco, being the only game from the era still on the market! Classics such as Space Invaders, Donkey Kong and Super Mario have also made a lasting impact in culture.

Moving forward in the years, many independent video game arcades closed their doors as hand-held and home-based consoles dominated the market. Full-scale national chains such as Chuck E. Cheeses and Dave and Busters came to take their spot, moving away from the original concept of a video game–specific arcade to an entertainment center approach. The end of the Video Game Arcade however, did not mean the end for the video game industry as we all know. Video game giants such as Capcom, Nintendo, and Sega made their way into a whole new era of video games. Games such as The Legend of Zelda, Pokémon, and Super Mario have lived and survived until today! On the next issue of Hit Replay, we look through the era of hand-held and TV consoles!

Shell Arctic Expedition for Black Gold

BRIAN CHAN
3A NANOTECHNOLOGY

You may think black gold is just gold bars painted black, but in society today there is something that is just as valuable or maybe even more so than gold — oil. According to the International Energy Agency, crude oil was the number one energy source used by countries worldwide in 1973. Oil alone made up 48.7% of worldwide energy consumption with the runner-up being coal at 13.7%. As of 2012, oil is still the primary energy type that is consumed worldwide but it has dropped to about 40.7% of worldwide energy consumption, with the runner-up being natural gas at 15.7%. It may look like total oil consumption has dropped, but in reality it hasn't. If one looks at the amount of oil consumed between 1980 and 2013, the world has gone from using 59,929 thousand barrels a day to 90,354 barrels a day which definitely isn't a reduction at all. Therefore oil is truly important for society, and we are running out.

Do you know why gas prices in Canada are so high? It's because of the lack of oil we have coming in from Alberta, forcing us to import it from other countries. Because of that, and due to the law of supply and demand, we have ended up spending an atrocious amount of money on the oil we require for our cars. With the installation of a new pipeline, oil will hopefully become more inexpensive, with the possibility of the price going down to less than 100 cents a litre.

There are some pressing concerns though with the new pipeline being installed. Because the oil is located in a place where there is mostly water, if a spill were to happen it would cause massive commotion and danger to all of the surrounding environment. Picture the oil spill accident at the Gulf of Mexico. If this drilling is mishandled then there will be so much at risk. On another note, due to the extremely cold subarctic conditions up in the great white north, the chances for equipment failure are high since cold and machinery never go well together. We must hope against hope that Shell does not pull a BP and cause a similarly huge oil spill catastrophe. Billions of dollars will have be put into responding to such an incident and it will take years, even decades before the arctic ecosystem could go back to what it once was.

This truly is a dilemma. On the one hand, oil is something that the world really needs but on the other it has the capability of causing irreparable harm to Mother Nature. It begs the question to each and every single individual, is it worth it?

The Extraordinary Ones

MICHELLE LIU
2B CIVIL

I messed up my life pretty badly at the start of grade twelve. There was a point when I felt like I had nothing to work for anymore, until I saw how much one of my teachers still believed in me. Her kindness was life-changing, and it motivated me to go on and do everything I did that year. I kept up straight-nineties while participating in dozens of extracurriculars, and ended up winning something like seven awards. Seven awards that I never showed up to accept. I also didn't go to graduation, and never collected my diploma. None of those meant anything to me because I knew I had already gotten the most valuable thing anyone could ever take away from high school, and all it took was one teacher. The opportunities she gave me that year made me a better student, but most importantly, she taught me to be a better person.

****

I spent this past work term at the Ministry of Transportation in Saint Catharines. Throughout the term, a lot happened in my life outside of work. Everyday was harder than the last, until I started talking to my boss. I have amazing friends, but none that I have ever been able to talk to as easily as I can to her. She never turned me away, always knew what to say, and supported me in every way I needed. Outside of managing me as her co-op student, she contributed to my well-being and development as a person. That, in my opinion, is rare and truly respectable. I hope that someday, I can be as incredible to someone as she was to me.

The reduction in Arctic sea ice is opening the north to exploration and exploitation

Five Things You Didn't Want To Know About Chewing

CAITLIN MCLAREN
3N CHEMICAL

TOO MUCH INFORMATION

As anyone who has studied history (or read this column last term) knows, people in the past were pretty darn gross. They haven't improved since last term, either. Let's have a look at some more of the awful things our ancestors have done.

The British used to blow smoke up people's asses, literally

If you rescue someone who has almost drowned, what do you do? Try to get the water out of their lungs? Perform CPR? If you're an English doctor in the 1700s, you get out your pipe and a pair of bellows, and pull down their pants. For some inexplicable reason, this was considered to be a sure-fire way of resuscitating a dying person. In fact, it was such a popular method of first-aid that sets of pipes and bellows were hung strategically along the Thames, and people were expected to know how to use this necessary emergency equipment. Doctors believed that the smoke would make a person's insides warmer and drier. I can only imagine that this worked quite well in a few cases.

Bystander: "Oh no! This person has nearly drowned! Whatever shall we do?"

Doctor: "Remove their trousers, my good fellow, and commence the tobacco enema!"

Drowned person: "No! Noooooooo! I'm all right! I'm fine! Get that pipe away from me!"

Also, imagine what happens if the hot coals from the pipe get in?

Alcohol can be made from everyone's spit

Chicha is a kind of alcoholic beverage from South and Central America, usually made of corn. Traditionally, it could be made of saliva as well. In some (not all) areas, people would prepare the drink by chewing up balls of corn, and then either drying it or spitting the balls into a container. Note that this was a community effort: everyone would join in with the chewing. It would be rather effective, as the enzymes in the saliva would break down the starches in the corn. The resulting paste would contain more sugar, leading to better fermentation.South America isn't the only place for this - in more ancient times, other cultures would chew their alcohol before brewing it. In fact, not just alcohol can be prepared this way—some native American meat recipes would involve the fat being chewed up beforehand in order to make it juicier.

Make reindeer more tame!

The Saami (also known as Lapps) live in the northernmost parts of Finland and Norway, and have been famous for herding reindeer for millennia. No one knows more about handling reindeer herds than the Saami. With male reindeer, herders have a dilemma. Fully-grown male reindeer are mean and ornery. They also focus on mating all the time, instead of working or surviving the winter. On the other hand, if you castrate the reindeer, they aren't as big and strong. The solution: Half-castrate them! You may think that this means"remove only one testicle," but the reality is far more disgusting.

Chewing on the testicles destroys them enough that the reindeer buck becomes sterile, but still produce a certain amount of testosterone. These reindeer are more gentle, and grow larger and stronger than uncastrated bucks. Thus, about half of the males will at some point be half-castrated. The men will hold him down, but the chewing is traditionally done by women. Are the men sympathetic to the reindeer's plight? Are they afraid of getting kicked in the face? Or do the women do it to threaten their husbands and keep them in line? Take your pick. I have the feeling that Saami men tread very carefully around their wives.

The Lioness and the Cheese-grater (Rule 34 away!)

The Ancient Greeks had just as much interest in sex as we do, obviously. They also had equally dirty minds. "Crouching like a lioness on a cheese-grater" is something so dirty that we aren't even sure what is today. In the play "Lysistrata" by the Greek playwright Aristophanes, the women of the city agree not to sleep with their husbands until they resolve the war they are in the middle of, as the women are tired of the constant fighting, They swear an oath not to perform numerous acts, one of which is the aforementioned "lioness-on-a-cheese-grater." It might have been just a joke, except that when archaeologists found the menu for an ancient brothel, the most expensive item was our old friend the lioness caught in a compromising position with kitchenware.

Scholars are still not certain what this means, though they suspect it might have something to do with the fact that ancient cutlery often had handles shaped like animals. (And yes, scholars have given a great deal more thought to this than is strictly necessary.) We sincerely hope that that is the case, as sex and cheese-graters don't mix well. Trust me. If you can think of a more likely meaning for this expression, feel free not to write to us. Keep it to yourself.

And speaking of romance…

Of course, as mentioned in a previous article, the ancients had numerous love potions and anti-love-potions. Because there is no limit, let's see a few more. I love giving my readers ideas. For example, if you are in love with someone who doesn't love you, but are too ethical to use a love potion, why not put their poop in your shoes and walk around? That will cure you of your infatuation. Smearing mouse poop on your skin as a cream also works. Some more tips from the ancient Romans: putting bull's poop in a drink is an aphrodisiac, as is the bull's pee applied to the genitalia. If you want to prevent your wife from loving anyone else, stab a frog with a reed through the cloaca until the reed comes out of its mouth, then dip the reed in her menstrual blood. (Note to anyone who does this: your wife is not staying with you because she loves you. She is staying with you because she is terrified of you, because you are clearly a serial killer.)

The Chinese recommended that men boil a sheep's eyelid in hot tea (Why the eyelid? Who knows.) and then rub it on their member to improve performance. Presumably they should wait until it cooled down, though.

And that's all the creepy romance we have time for today.

Steel Bridge Team

DYLAN DOWLING
STEEL BRIDGE TEAM MANAGER

The University of Waterloo Steel Bridge Design Team is a new addition to the wide array of student teams found at the university. The team was founded in 2014 under team leads Andrew Easton and Dylan Dowling, and quickly exploded to over 70 members. It is responsible for designing, fabricating, and constructing a 1:10 scale modular steel bridge. Three sub-teams led by captains are each responsible for the major tasks leading up to the competition. Once we're at competition, there are two things remaining: a timed build and a load test. The construction team is timed as they build the bridge: the faster the build, the better. About 2500 lbs are loaded near the midspan of the bridge during the load test. The best bridge is one that is quick to build and has low deflection under 2500 lbs, an often conflicting set of objectives.

On the way to competition, the steel bridge team faced a number of issues. These ranged from a large number of connections (requiring a large amount of time) to fabrication tolerances that wouldn't allow bolts to slip through. This passionate group of engineering students came together to finish creating the 19'-7" bridge prior to departing. Working from the early morning until late at night, the fabrication and construction teams finished welding and grinding with scant hours to spare before departure.

The team competed from April 16th to 18th at West Point, NY in the American Society of Civil Engineers (ASCE) competition. Despite driving for over 8 hours after writing exams, the team quickly got to work finalizing the build plan. The team performed very well for their first year, coming in 8th of the 12 teams there. Some of the teams present had competed for more than 15 years, and yet we still outperformed 4 of them! While at competition, the team also did more than just build a bridge. Other events included a scavenger hunt, a 'mystery' event involving a virtual firing range, and technical presentations.

The rules for the next year's competition will be released in mid-August. From there, the design team will work towards optimizing a bridge that could range from 16' to 24' using software used in industry such as SAP2000 and SolidWorks. After finalizing connections and other details, the design and fabrication team will collaborate on a set of shop drawings, with continued collaboration throughout the fabrication process. The fabrication team will start cutting, milling, grinding, and welding the various pieces of the bridge. While all of this is going on, the construction team will be practicing with the existing bridge. Once the new competition bridge is nearing completion, the construction team will start practicing building it in preparation for the 2016 competition in Buffalo, NY.

The team is always looking for fresh faces and new talent. If you're interested in joining, come out to the weekly Wednesday meetings in E5-2004 at 3:00pm. If you aren't able to make it, you can also send an email to the team lead, Dylan Dowling, at *ddowling@uwaterloo.ca.*

Steel Bridge Team

The Steel Bridge Team with their creation, a bridge nearly twenty feet long

Not the Skin Off My Back

MEAGAN CARDNO
3A NANOTECHNOLOGY

Ah yes, another article about a cool, scifi-esque, and useful technology coming from a novel application of 3D printing. I'm really starting to see a trend here. Just recently in the spotlight is beauty company L'Oréal's endeavours to 3D print human skin in order to help facilitate the research and testing of products.

It's a very smart idea, since human studies are ideal for determining the effects of products on other humans, but are far from pleasant to conduct; there is great difficulty in controlling variables, not to mention the few people who researchers can actually find (and pay) to do the study assuming they even have a large enough sample size from which to attain valid results.

Unfortunately, this method won't be able to remove the need for full human studies anytime soon, as all consumer-grade products require clinical testing before they can be sold to consumers. However, it will allow for skin samples to be prepared in a methodical, repeatable way, as well as will reduce the complexity of the experiment to allow for pinpointing of specific factors that cause certain observable effects. In this way, general observations can be made about the chemical's affects before bringing in the expensive human guinea pigs.

It's not just L'Oréal's hand at work here though; Organovo, a company specializing in bio-printing functional human tissues, primarily for medical research, is working in collaboration with the beauty company to pool their respective resources and experiences on the subject matter.

The 'bio-ink' used in the 3D-printer made of, unsurprisingly, human tissue donated from plastic surgery clinics, collected from tissue biopsies, or provided from stem cell resources. While the printing process itself involves the use of a template matrix that holds the form of the desired sample, it is removed within twenty-four hours of the print, leaving no synthetic structures or scaffolds that could compromise the validity of testing results.

The Organovo-L'Oréal 3D printed skin is said to be a scientifically capable of mimicking the form and function of living human tissues. In addition, they boast of the ability to print different varieties of skin as well, including different age groups and ethnicities to compare across testing and research. Although it is still in the earliest stages of development, it will be definitely be a project to keep an eye on for how it changes the way we perform not only cosmetic testing, but consumer testing as a whole industry.

Fort McMurray, also known as Fort McMoney

JESSICA KEUNG
2B CIVIL

SMALLEST VILLAGES

Welcome back to the Spring 2015 term and to my column on the smallest towns in Canada. This past winter, I was able to live in one of the smaller towns in Canada, Fort McMurray. Although Fort McMurray isn't a "small town", Fort McMurray is one of the most isolated "urban" service areas in Canada. Fort McMurray is located 435 kilometres northeast of Edmonton, almost a 5 hours drive away connected by one of Canada's deadliest highway, Highway 63. Edmonton being the closest city to Fort McMurray, highway 63 experiences a lot of traffic from workers travelling down to Edmonton for the weekend or hauler trucks driving up goods for the residents up north. Most of Highway 63 is a two lane undivided highway, but highway twinning projects—where they plan on constructing a two-lane portion of the highway—just south of Fort Murray is under way. Fort McMurray has an official population of 70964 as of 2012, but this number does not include the thousands of people that live in town as temporary foreign workers and contractors from southern cities. Since Fort McMurray is located near the Athabasca Oil Sands, the town is the heart of Alberta's and Canada's oil production, and is home to oil sands companies including Syncrude, Suncor, Shell, CNRL, and Nexen.

In the late 18th Century, Fort McMurray was inhabited by the Cree, where the surface deposits of oil sands were used to waterproof their canoes. When the European explorers arrived, a trading post was set up by the Athabasca River. Oil exploration in Fort McMurray played a significant role in the history of the petroleum industry in Canada. The technology to produce oil from the oil sands did not become viable until the 1930s where the company Abasands Oil successfully extracted oil from the oil sands through hot water extraction. In 1967, the Suncor plant known as the Great Canadian Sands, opened and Fort McMurray's growth began. More oil sands plants opened after 1973 when the oil prices spiked because of political tensions and conflicts in the Middle East. The population grew from almost 7000 in 1971 to 31 000 in 1981. The city continued to grow quickly but after the collapse in world oil process, the population declined from its peak of 37 000 in 1985 to 34 000 in 1989. With the high cost of extracting oil from the oil sands, the low world oil price made oil sands production uneconomical. It would not be until the early 2000s where the oil prices increased enough to make oil extraction profitable again. With the current low oil prices, many contractors and employees of the major oil companies have been laid off and the streets of Fort McMurray have quieted once again.

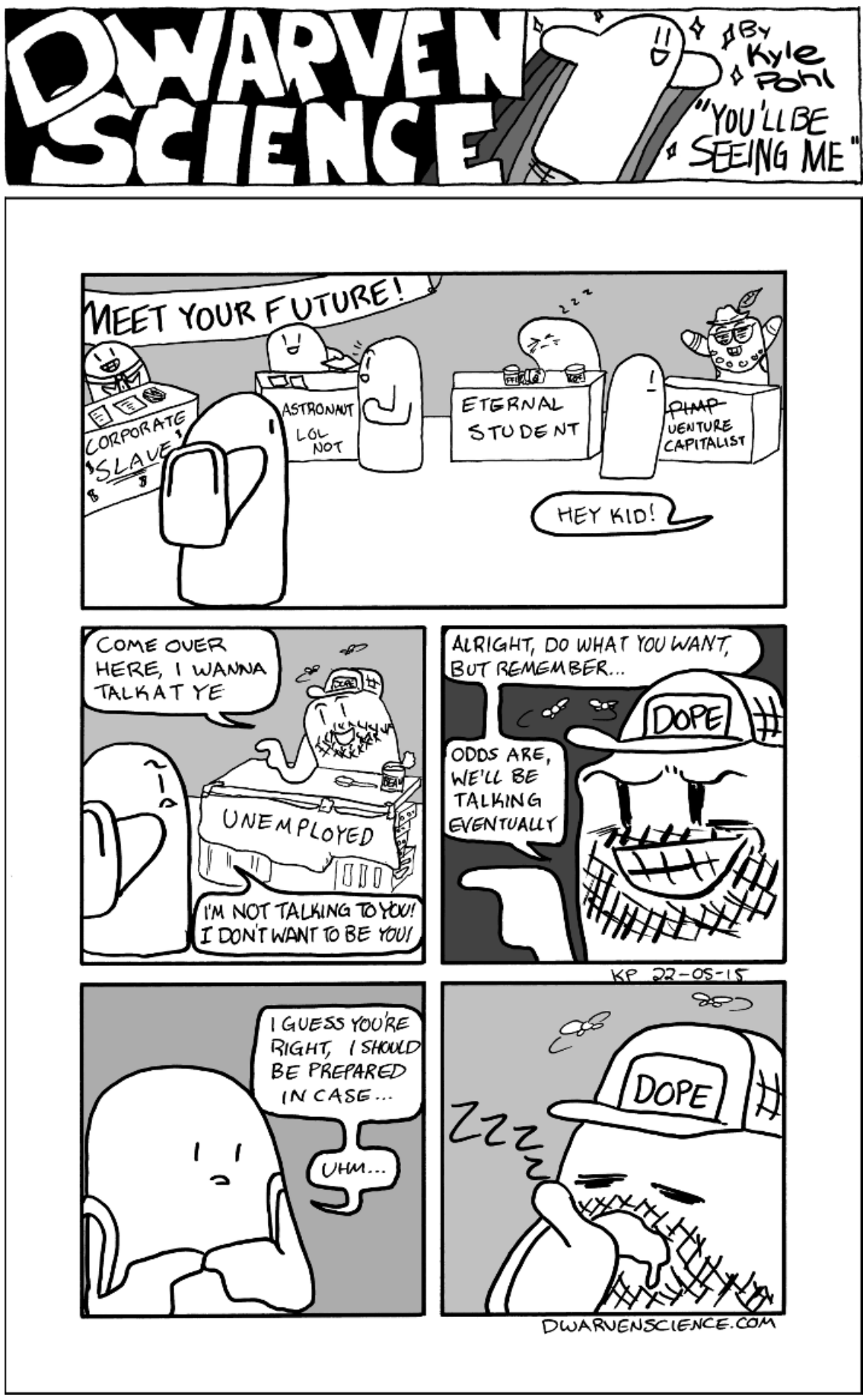
Fort McMurray, though isolated, is not the most boring place to be. For a town of population sub 100 000, the public transit system is very good. The price for one fare is $1.25 and can get you to major points of interest in a reasonable amount of time. Major tourist destination include: the Oil Sands Discovery Centre, where you can learn about the local history of oil production; and the Giants of Mining display located next to the Syncrude Plant Site, where old mining equipment is put on display for the public to see. If you do live in Fort McMurray, one place to go to for a good lunch is Mitchell's Chef's Table where they have fresh made bread and the best sandwich you will ever eat. Other places you can go to are the many bars and pubs, especially the Wood Buffalo Brewing Company that makes the best beer I have ever tasted. There is also McDonald Island, a community and fitness centre with the best indoor athletic facilities I have ever seen and a giant football stadium for holding CFL games.

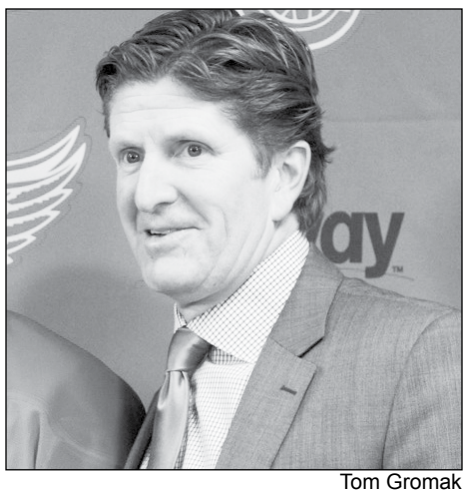
Danapit

As a very large small town, Fort McMurray has some larger machinery than the tractors and trucks you usually find in small towns

There were a lot of adjustments I had to make to live in Fort McMurray. One was milk that comes in plastic jugs. I could not pour milk without spilling it everywhere with a 4L jug, there is just too much milk. Milk in bags contains 4/3L per bag which makes pouring milk more manageable than a full jug of milk and helps prevent spillage all over the counter. Another thing is that very few retailers had plastic bags available for purchase or for free. If you went to the Peter Pond Mall in downtown Fort McMurray, none of the retailers would be able to provide plastic shopping bags. The only retailers that would provide plastic bags were the many liquor stores. Though the price of food was marginally more expensive than that in southern Ontario, the entire province of Alberta only has the federal sales tax of 5%. One of the best experiences I had in Fort McMurray was discovering the Newfoundland section of the grocery store and seeing foods that were foreign to me but are made for Canadians. For example, Crush Birch Beer, a soft drink that has flavours similar to root beer but not exactly.The Northern Lights appeared quite frequently in that part of Northern Alberta, especially during the solar storm event that had occurred last winter. Many times walking home after a few drinks, there would be bright green lights in the night sky.

Fort McMurray is a great town with a bad reputation. Known for being full of drugs, transient male workers and prostitutes, people avoid visiting due to its reputation and their concern for safety. Like with many towns and cities, there are safe areas and unsafe areas. The suburban areas are quiet and safe to walk through alone at all times of day, where the biggest threat to your safety is not other people but the bears and coyotes in the wooded areas. Fort McMurray has a small town feel and is home to one of Canada's largest industries. Just like any place else, it is a great place to live and work if you avoid the seedier parts of town.





Tom Gromak

Babcock is the Leaf's new coach

Mike Babcock Takes Reins of Leafs Nation

ELIZABETH SALSBERG
3A NANOTECHNOLOGY

THE BENCHWARMER REPORT

It's official. Hockey's man of the hour is in Toronto: Mike Babcock has signed an eight-year, 50-million contract with MLSE, knowing full well that the Leafs are far from the calibre of the Detroit Red Wings franchise he left behind. This contract makes Babcock by far the highest-paid coach in the NHL—and certainly has the look of an offer that can't be refused. Despite the obvious salary temptation, Babcock insists that the massive "mountain" that needs to be overcome was part of his motivation to come to Toronto.

Shanahan and company hid no truths from Babcock. There would be a rebuild; existing players of some quality, namely Dion Phaneuf and Phil Kessel, would be readily exchanged for prospects or other talent. This would be a clean slate, and it would likely be at least three years before they'd be remotely close to playoff contention. With all that, Babcock still decided to sign with the Leafs.

Toronto fans should be happy with this acquisition. The Wings made the playoffs every year with Babcock at the helm, and won a Stanley Cup in 2008. He also led Team Canada to back-to-back gold medals in the Vancouver 2010 and Sochi 2014 Olympics. If Shanahan and Co. can stick to a good rebuild plan... the sky will be the limit in Leafs Nation.

BBQ Potato Salad

CAMERON SOLTYS
2B MECHANICAL

COOKING WITH CAM

Welcome to my new cooking column! Here you will learn all you need to know about making delicious, quick meals that will leave your friends (sometimes violently) begging for more. I should lay out a few ground rules though; Cam doesn't do "directions" or "recipes." Cam does good food.

First, measurements are for boring people. If you identified with the Sackville-Baggins or would have left the ring with Tom Bombadil, you are not welcome here. A tablespoon is about the size as a normal spoon, and measuring cups have no useful purpose (except as a small food-safe container in which to mix sauces and dressings). Cooking isn't a science—it's an engineering.

Second, if you don't have an ingredient, you don't need it. Maybe some people have the time and money to run to the store to get $5 on a jar of honey for their pie. For the rest of us, there's sugar, water, and vanilla extract.

Third, every meal is salvageable. In my two-year career of intense, twice-per-day and thrice-on-the-weekends cooking, I have only once produced a meal that was inedible. Everything else was at least damn-near delicious, and often the thing I ended up with had no resemblance to the vision I had when starting.

So, on to the salad. Potato salad is a great summer treat. Stick it in the fridge for a while and it's as effective as ice-cream at cooling you down after a long day in air-conditioned lecture halls. I figured with summer coming, I should have a dish in mind in case I get invited to any parties or barbeques; I hate coming empty handed almost as much as I hate spending money. So this was a trial run, to make sure it was as simple to make as I thought.

Start with a few handfuls of potatoes. Wash them, slice them into thirds, quarters, or eighths (the less time you have, the smaller they should be), and put them in a pot. Add water and a couple shakes of salt. Put them on the stove and leave them to cook for a while. They are done when sticking a fork in the largest piece results in a dissection (don't torque the fork). While I was cooking my potatoes, I found I had too many and the pot kept boiling over. I took out a couple of pieces, placed them on a damp towel, and microwaved them for two minutes to make some easy oil-free potato fries. Once your potatoes are cooked, drain the pot.

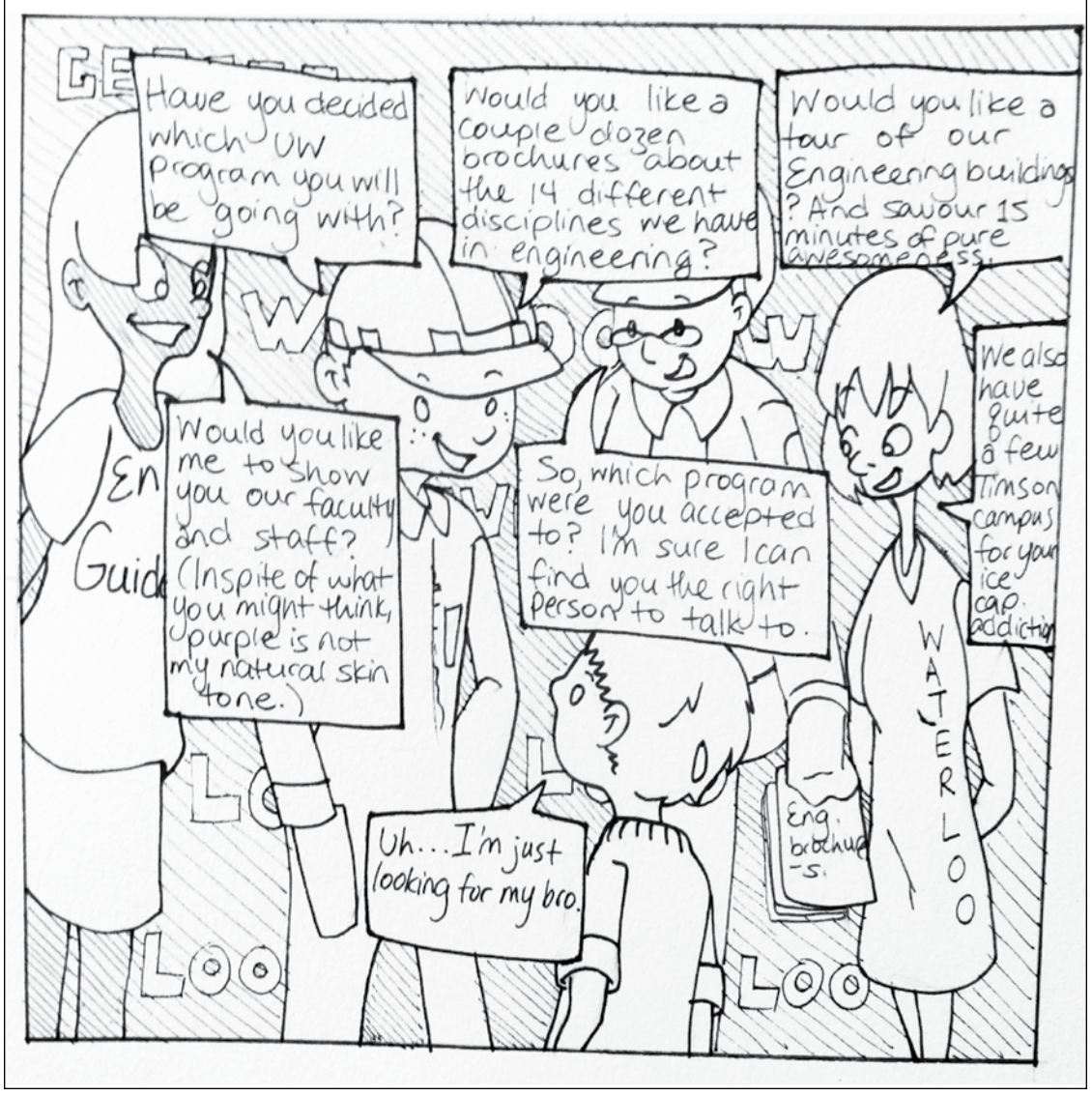
At this point, you have two options. If you—like me—don't have a dishwasher or man-servant I would recommend running a stream of cold water on the side of the pot to cool it down, then putting it in the fridge. If you have a man-servant, have him or her put the potatoes into a large bowl for you. Either way, you should now have potatoes in a not-boiling-hot container. Next add a few dollops of mayonnaise, some spices (I recommend paprika) and any other dressings you like. My favourites include mustard, chives, and sliced hard-boiled egg (from which the water and pot can then be used for the potatoes to save energy and heating time). When I was making my dish, my mustard container ran out. Not wanting to waste the substantial amount of food left inside, I added some vinegar, shook, and poured the resultant mixture into the bowl. It worked so well that I would recommend anyone following this article add some vinegar to the mixture even if they don't have a condiment container to clean.

And that's all there is to it. If you can think of any alterations to it, they'll probably work pretty well and might even be better. And remember, if you don't have any of the foodstuffs I used, you should be able to make a pretty good substitute by combining the first three things you read on the ingredients list in appropriate-looking proportions.

You @ Waterloo Day

Our passion is real

JOANNA LIU
1B CHEMICAL



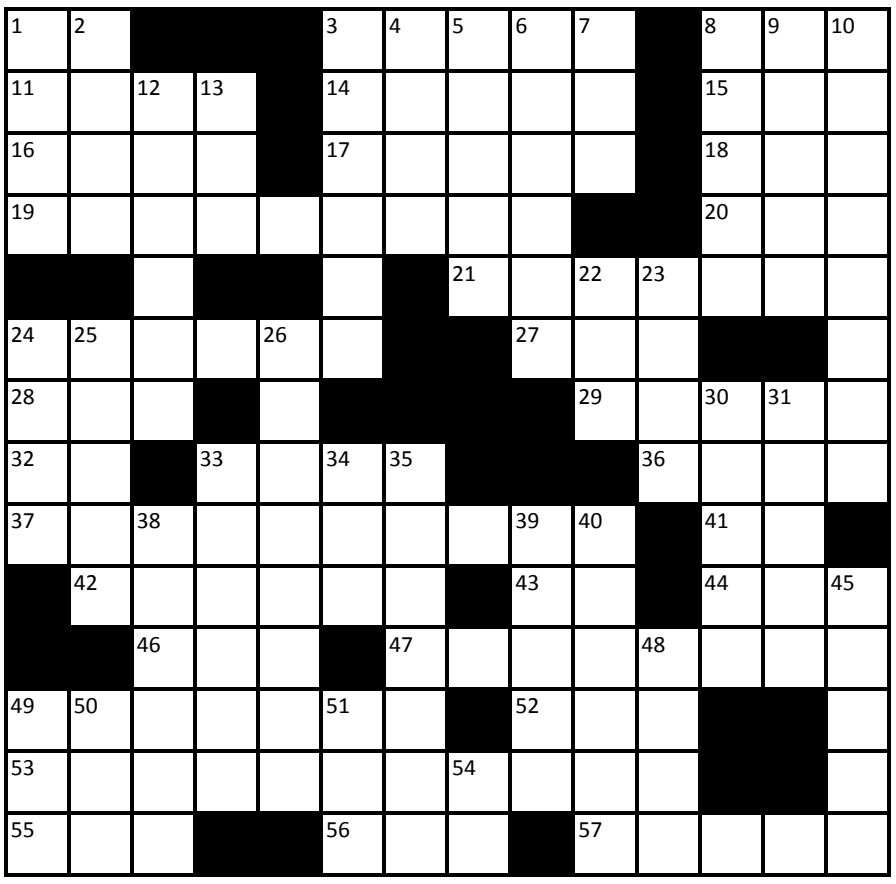
King of the Puddle

BRIGITA GUBINS
1B ENVIRONMENT

The Iron Crossword

[F]irst Time, Please Be Kind

SHERWIN KWAN
4B MECHANICAL



ACROSS

1 Avicii or Skrillex
3 Applied to the skin
8 First of the animal signs in the Chinese Zodiac
11 ___ awakening
14 ___ to: 7-Down in modern English
15 Rating algorithm used for chess, women's soccer, or LoL
16 City in Yemen
17 Long, narrow feature on Moon or other planets
18 Professional governing body for U.S. physicists (abbr.)
19 The most prestigious prize for those who perform 6-Down, 57-Across, etc.
20 Unit of force used in 49-Down (abbr.)
21 Brittle material, perhaps
24 Look!
27 Affirmative
28 __ and King (abbr.): location of Menchies and Mozy's Shawarma
29 To falsely accuse
32 Physician's title
33 Singer Lorde's given name
36 One of the few times UW engineering students have to write an essay (abbr.)
37 What Apple did for the slate-form smartphone (British spelling)
41 Universe in which Lord of the Rings takes place; also a game development company (abbr.)
42 One who discriminates against those of a different ethnic group or skin colour
43 Top-level domain for Poland
44 Party where newly-obligated students caress the TOOL (abbr.)
46 Type of power plant which outputs both electricity and useful heat (abbr.)
47 To artifically supply water to help plants grow
49 Birds known for copying human voices
52 __ __ glance (2 wds.)
53 REM and non-REM (2wds.)
55 Tyrion Lannister
56 U.S. science foundation (abbr.)
57 The climax to a sequence which begins with 46-Down, 24-Down, and 6-Down

DOWN

1 Opposite of thrust
2 Japanese martial art
3 Jam, peanut butter, or nutella
4 Desert-like
5 Light purple colour
6 Serve and ____: proactive tennis strategy
7 Shakespeare's Othello: "I kissed thee _ I killed thee"
8 Kingdom
9 "It wasn't me; I was in Hawaii!"
10 The goal in many computer games is to beat this (2 wds.)
12 Oracle in ancient Greece
13 Conclusion
22 On-campus housing (abbr.)
23 Mechanical equivalent of IEEE
24 Device used to enforce slow-speed-limit zones
25 It's a trap!
26 Android 5.0
30 Greek city-state which hosted the ancient Olympic Games
31 Not together
33 Trick-taking game with bauers
34 __ Vegas
35 Musicians and painters are ___
38 Pacific Repertory Theater (abbr.)
39 Asymmetric hourglass-shaped component, used in a clutch to allow rotation in one way only
40 Examples include Lorelei, Bruno, and Lance
45 Initiates the sequence which may be followed by 24-Down or 6-Down
48 Last ___
49 Unit of pressure (abbr.); or a unit of population for the Protoss
50 Donation given to the poor
51 Video played at events in POETS; also a TV network
54 French airline (abbr.)

Sudoku

#2015-06

CAMERON SOLTYS
2B MECHANICAL

Easy

3		9	4		6			
	4					2	7	
			8			4		3
	6		3			7		1
		2				3		
8		7			1		6	
7		1			8			
	5	4					8	
			6		4	9		7

Medium

		4	2		1			6
					3	8	4	
		3			4	5		9
5			4				3	
4				6				7
	6				8			4
3		8	7			4		
	4	1	8					
7			3		9	1		

Hard

			5		1	8		
		3	4					
	9						2	5
	8		1		4		6	7
		6	9		3	2		
7	3		2		6		9	
9	4						3	
					2	7		
		8	6		9			

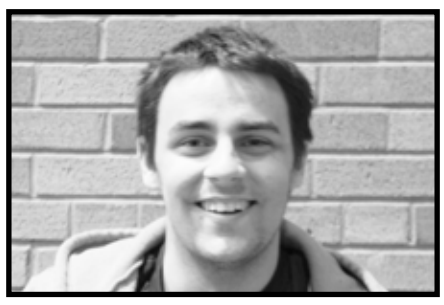
Solutions for previous crosswords can be found on *The Iron Warrior*'s website at *iwarrior.uwaterloo.ca/distractions*.

THE IRON INQUISITION

Jessica Keung, 2B Civil & Vince Magas, 2B Management

"With what would you replace the uWaterloo geese?"

"Oh, it's irreplaceable."
Calvin Poon, 2B Management



"Dead geese."
Julien D'Alessio-Doucet, 2B Mechanical

"With little Ryan Goslings."
Julie Yu, 2B Management

"Chemical waste and napalm."
Daniel Lahey, 2B Civil

"Cheese platters."
Cam Sweetname, 3A Geological

"Puppies."
Heather Smith, 4A Chemical