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CHAIR'S REPORT

A MESSAGE FROM DAVID COLTMAN



Greetings colleagues, and welcome to the first Department of Biology Alumni Newsletter!

As the new Chair of the Department of Biology, it is perhaps fitting that I am writing this welcoming note for the new Western University Biology
Alumni Newsletter. When I interviewed for the Chair position, I was asked, "Why do you want to come to Western?" While I wasn't unhappy as the Chair of Biological Sciences at the University of Alberta, Western has always had a draw for me, having grown up in Southern Ontario. I wanted to be a part of Western's vibrant community and the Western Biology family. It is about who we can be and what we can do to make the world a better place.

I was motivated to come to Western Biology in part by the shared vision I see for Western under its new leadership, encapsulated in the new Strategic Plan with its unifying themes of achieving *Greater Impact*, building our *People*, *Community and Culture*, and realizing *Western's Place in the World*. As we are in the early stages of building a new strategic plan for the Faculty of Science, and planning the future strategy for

Biology, it is timely to reconnect with each other as we hopefully emerge from the long shadows of the pandemic and look towards Western at 150 (which will coincide with the 25th anniversary of the Department of Biology). This newsletter is a place to help us to connect and engage, and the timing of the launch is no coincidence.

A key goal of this newsletter is to build our community - by sharing stories about who we are and how we have made our way in the world. In this issue you will see three alumni profiles and learn about some of the impactful things that our colleagues in Biology have accomplished. The Alumni Newsletter is a place where we can share some successes and celebrate accomplishments. Our stories also point to our shared values and aspirations, coalescing around who we are and our place in the world.

We are Western Biology.

Cheers.

David Coltman

Professor and Chair, Department of Biology Western University

Preventing Collisions

BIOLOGY PhD CANDIDATE BRENDON SAMUELS IS MAKING WESTERN AND LONDON, ONTARIO SAFER FOR THE BIRD POPULATION

By Louise Milligan, Professor Emerita

Did you know that collisions with building windows are the second leading human-caused source of bird deaths in Canada? It is estimated window collisions kill about 25 million birds in Canada each year, with most collisions occurring at residential homes. It was these startling facts that motivated Brendon Samuels to pursue his graduate work in bird vision and cognition in Biology at Western. If we can understand the science of how birds see and process visual cues in flight, then we can better understand how to design effective deterrents to bird-window collisions. Ultimately, Samuels hopes to develop a model that can be used by industry to assess the effectiveness of deterrents to bird collisions.

As part of his work, Samuels recruited volunteers to conduct systemic surveys of bird-window collisions on Western's campus. To help raise awareness, this group documented and collected birds killed by specific buildings. Over the course of two years, Samuels collected enough data to convince Western to retrofit those buildings with the most collisions. Subsequent surveys have shown an effective reduction in bird deaths. Now, Western is committed to incorporating bird-

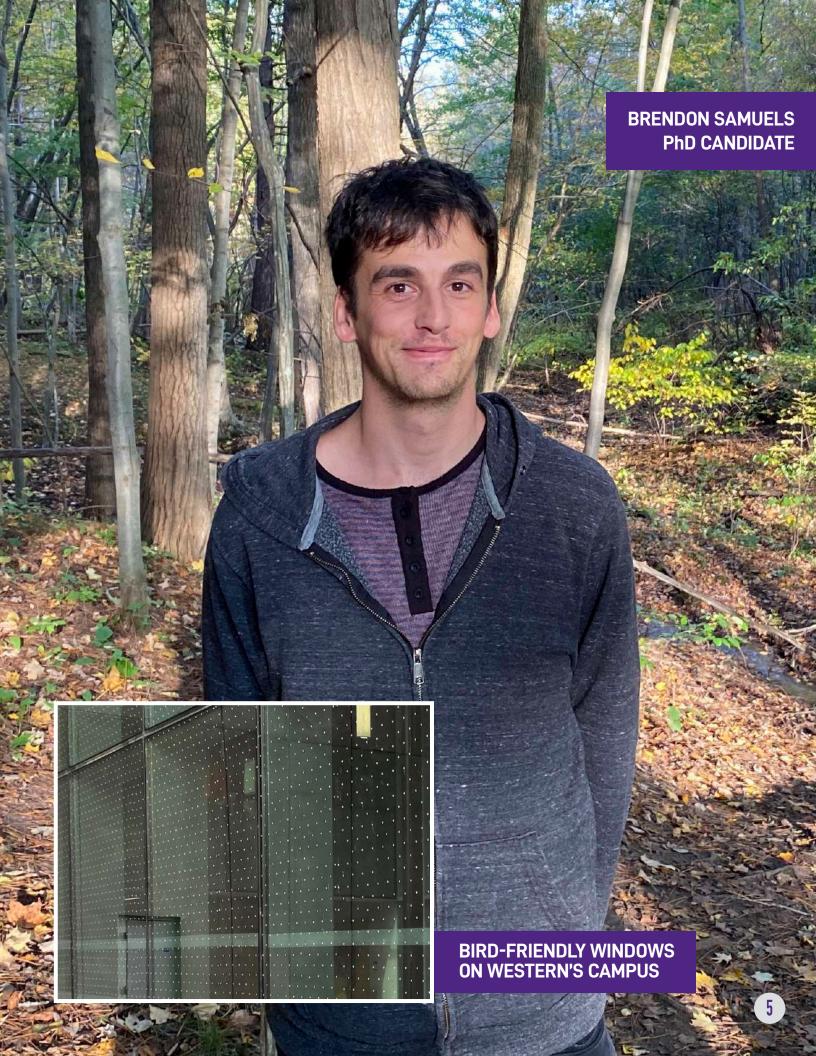
friendly design in new buildings, as part of the University's overall commitment to sustainability.

The impact of the work of Samuels and his colleagues has not stopped at the Western gates. Now, the City of London is a Bird Friendly City certified by Nature Canada, and the move is on to make change at the Provincial level through updating the Ontario Building Code to include bird-friendly building design requirements. Samuels is taking science from the lab to the community for real world impact!



LEARN MORE

- → Read about Brendon Samuel's work to make buildings more bird-friendly in Western News.
- → Learn how to reduce bird-window collisions and conserve birds by visiting <u>Bird Friendly London</u>.





Surviving the Brutal Cold

BIOLOGY POST-DOCTORAL SCHOLAR MEGHAN DUELL INVESTIGATES IF THE EMERALD ASH BORER CAN SURVIVE MANITOBA WINTERS

By Louise Milligan, Professor Emerita

Winter is a time for skiing, hockey and indoor activities. As we stay warm inside, most plants and animals are dormant or die from the cold and lack of food. While unseen in winter, invasive pests like the emerald ash borer spend winter under the bark of ash trees getting ready for summer when they emerge to invade and kill more ash trees. Researchers at Western are interested in how these pests survive ultra low Canadian winter temperatures and how we can use that information to stop their spread.

Emerald ash borers originated in East Asia and the Russian Far East. They were first detected in Detroit, Michigan, spread to Windsor, Ontario in 2002, and have spread widely across the United States and Canada. In their wake, they destroyed 99% of the ash trees they encountered and

continue to spread to any remaining ash forests. These insects spend their winters as larvae or pupae, burrowed under the bark of ash trees.

How can we stop the spread?

Canadian winters can be brutally cold which might minimize the damage wrought by this invasive species. Will they simply freeze to death? Will the cold winters limit their northern migration? Maybe not. We know emerald ash borers survive in Southwestern Ontario and can withstand temperatures of -32°C without freezing. This is because they make an antifreeze - glycerol - which accumulates in the body as they acclimate to colder temperatures and prevents freezing. However, emerald ash borers die if they freeze. The questions is: Can they manage to avoid freezing below -32 °C? Those super cold

Polar Vortex days where lows can reach -40°C or below are the perfect test of the emerald ash borer's cold endurance. **Do they survive?**

To answer these questions, Biology post-doctoral scholar Meghan Duell teamed up with Brent Sinclair, a professor in Biology at Western, and colleagues at the Canadian Forest Service in Sault Ste. Marie, Ontario, and looked to Winnipeg, Manitoba for their experiments. Winnipeg experiences temperatures colder than -32°C and has a resident population of emerald ash borers.

The team uncovered that Winnipeg emerald ash borers also accumulate glycerol in their body fluids, just like their more southern counterparts, but they have a whole lot more! These super high concentrations of glycerol allow them to prevent freezing at temperatures as low as -50°C. Based on the studies of Southwestern Ontario populations, the emerald ash borer shouldn't survive temperatures as low as -50°C, but they do.

"A portion of emerald ash borers will freeze and die before reaching -50 °C, so a polar vortex or similar conditions might slow them down. However, we can expect them to eventually reach every forest containing ash trees if we don't prevent their movement through careful control," says Duell.

The emerald ash borer demonstrates phenotypic plasticity - in this case, the ability to alter antifreeze production in response to environmental temperatures. This can throw a wrench into our attempts to understand and predict how environmental changes, like those



A PREPUPA, THE MAIN OVERWINTERING STAGE OF THE EMERALD ASH BORER

associated with climate change, impact invasive species movement. The next step is to take these data on winter survival and fit it to maps and models of winter temperatures across Canada.

Where will emerald ash borers emerge next?

Duell is encouraged by ongoing Canadian Forest Service activities. "Hopefully we can prevent more spread by limiting the movement of infested wood. I'm also excited to see if biological control like parasitic wasps will help with this."

Stay tuned for updates as the team continues their research.



LEARN MORE

→ Read more about how insects survive the cold from The Sinclair Lab.

Biology Alumni Profiles

CARLOS BARRETO PhD '21

By Shayla Kroeze, BSc '19 and MSc Candidate

Carlos Barreto, PhD '21, started his studies in his home country of Brazil, receiving a Bachelor of Biological Sciences from the Universidade Federal de Minas Gerais. He started working in his field after graduation and moved into positions where he was managing a number of biologists. From there, he applied to Western University and became the first direct-entry PhD student in the Department of Biology, working with Zoë Lindo. His doctorate work focused on the diversity of oribatid mites in boreal peatlands. Oribatid mites are soil mites that play a significant role in decomposition and nutrient cycling. More specifically, his research aimed to understand the impact of climate change on mite diversity and how this relates to ecosystem services that peatlands provide such as carbon storage. There are only a handful of people in the country with the taxonomy skills needed to identify oribatid mites to the level Barreto did during his studies.

Upon completing his PhD, Barreto began working at the Ontario Ministry of Northern Development, Mines, Natural Resources, and Forestry. His current job title is Soils and Water Research Biologist at the Ontario Forest Research Institute in Northern Ontario where he informs the Ontario legislation on wetlands. This involves conducting

analyses on soil nutrients and changes to ecosystem respiration, which inform important decisions on how land in the province can be developed sustainably. Though he no longer works with mites, he hopes to continue using his specialized identification skills in the name of science. Researchers in Poland even contacted him recently for his expertise on their samples from Siberia.

Some of Barreto's fondest memories at Western include the collaborative environment of his lab group where he could count on his lab mates and supervisor to provide meaningful academic feedback. He also loved hanging out at the beach or the Grad Club. Barreto felt he found his identity as a scientist during his degree at Western – each day he became more confident in his abilities. Being the first direct-entry PhD student helped prove to himself that he was a capable academic.

Barreto encourages current students to take advantage of the incredible resources on campus that helped him, such as <u>Public Service Alliance</u> of Canada (PSAC) and the <u>Society of Graduate</u> Students (SOGS) and to consider the amazing opportunities available outside of academia. The best life advice he ever received was from his PhD supervisor who encouraged him to always aim high, because there is no point in aiming low.





ALEXANDRA DOLGANOW BSc '19

By Arvind Satishkumar, BSc Candidate

As a freshman coming into university in 2014, Alexandra Dolganow, BSc '19, did not expect her career path would change so dramatically throughout the years. Like many science undergraduates, she had her mind set on a career in medicine. However, a detour at Agriculture and Agri-Food Canada opened her eyes to alternative careers. Following her third year at Western University, Dolganow joined the internship program and was in charge of running her own research project in a microbiology lab at Lallemand Health Solutions. Here she investigated the effects of heavy metals and probiotics on soil and made lifelong friends in the process. She also found that lab work might not be the best match for her skillset.

"Understand the job you're doing. Don't be afraid to leave if it's not who you are."

"I felt like being in a lab was isolating at times, and I'm a very bubbly person so I didn't enjoy it," said Dolganow. She added advice for future students, "Understand the job you're doing. Don't be afraid to leave if it's not who you are."

Dolganow then reached out to the career centre and attended career panels. She also found that her classmates gave her more ideas of different career options.

Ultimately, she uncovered a match in her interests to sales, and after talking to a few people in similar positions, she decided that it was the perfect fit for her. As a Genetic Analysis Inside Sales Specialist for Thermo Fisher Scientific, her daily tasks are comprised of reaching out to potential clients to offer both consumables used in testing, as well as the testing instruments themselves.

Dolganow finds that her current job is a great way to use her degree without being in the actual lab, and she owes it all to her internship year where she was able to apply lab techniques that she would normally just read about. Even though she decided to go into an alternative path than her original plan, she loves her job as a sales specialist.

When asked what advice she would give her third-year self, she stated, "It's scary graduating, but it is not the end of the world. Keep your options open and make sure you have your credits!"

SUNNY UPPAL BSc '08

By Ryley Yost, BSc '17 and PhD Candidate

How do you get from a degree in biology to becoming Chief of Staff to the President of the Public Health Agency of Canada? Find out how Sunny Uppal, BSc '08, did.

Uppal's journey started at Western with a degree in biology, which sparked his interest in environmental science and policy. Uppal then completed a Master's in Environmental Health Policy from Columbia University. Thus began a series of opportunities where each move forward in Uppal's career would bring new and exciting challenges. With an interest in applying the principles of biology and environmental science to policy, Uppal started his career working for the United Nations in Geneva, Switzerland, on a convention to investigate the impacts of air pollution around the world.

Uppal brought his expertise back to Canada and joined Environment and Climate Change Canada where he worked on international agreements pertaining to chemicals management and air pollution. He then transitioned to the International Climate Change team. In this role, Uppal represented Canada in discussions and negotiations under the United Nations Environment Programme pertaining to short-lived climate pollutants, including methane and



black carbon. Showing an interest in leadership, he became manager of Bilateral Policy and Relations to strengthen relationships around climate change and environmental issues with the European Union, India, and China. Uppal then transitioned to serve as an Advisor in the Deputy Minister's Office at Environment and Climate Change Canada, where he advised the senior most official in the Department on various issues and priorities.

In the wake of COVID-19, Uppal was appointed as Executive Director of Partnerships and Engagement for the COVID-19 Vaccine Rollout

Task Force, where he focused on bringing together key partners including Provinces, Territories, Indigenous groups and industry to effectively support the country's vaccination campaign.

In January 2022, Uppal was appointed as Chief of Staff to the President of the Public Health Agency of Canada. Uppal is responsible for managing the Office of the President, offering strategic advice to the President, working with Vice-Presidents, the Office of the Chief Public Health Officer, and other departments including Health Canada to ensure the Agency continues to deliver on its mandate effectively for Canadians.

Looking back at Uppal's time at Western, his most memorable moment was meeting his wife, Dr. Ruchi Murthy, BSc '07, in Elgin Hall in addition to the lifelong friendships he made. Uppal continued his connection with Western by serving on the Board for Governors for the Alumni Association and comes back regularly to speak to students about career opportunities in the Federal Public Service.

"Strive for excellence every day, put your best foot forward, foster and invest in your network, and treat every individual with kindness and respect." Some of the most important advice Uppal has received is to "strive for excellence every day, put your best foot forward, foster and invest in your network, and treat every individual with kindness and respect." He also says to always remember the value of balancing one's work and personal life as a solid personal foundation often leads to better productivity and excellence in your professional life.

WANT TO BE FEATURED IN OUR NEXT ISSUE?

If you are a Western Biology alumni and want to share your story, reach out! We would love to hear what you have been up to. **Contact Louise Milligan at milligan@uwo.ca**

Make a Difference

ALUMNI, YOU CAN SUPPORT THE GREAT WORK HAPPENING IN BIOLOGY

Welcome to our inaugural Western Biology Alumni Newsletter.

The alumni from our Department of Biology are a continual source of pride for the Western Science community and an inspiration for the exceptional students who follow you.

I hope that through this newsletter, you will feel a sense of connection and have a source of information to keep you up to date on news from the Department and from fellow alumni.

We are always seeking ways to enhance your opportunities to engage with your alma mater. This newsletter is one example. Other opportunities exist, such as participating in departmental events, attending talks and seminars, or supporting a fundraising priority that inspires you.

As David Coltman mentioned in his letter, the Faculty of Science is currently developing a new strategic plan. This will inform not only the Faculty's and Department's direction, but also our fundraising priorities. I will provide updates on the plan through this newsletter as that process unfolds.

Right now, my team is working diligently to raise funds to support the *John S. "Jack" Millar Field Course Award*. John "Jack" Millar helped

transform biology field school education at Western University when he joined the Faculty of Science in the 1970s. Taking it from a primarily theoretical study to a hands-on approach, he enabled students to get their first taste of the field early in their training, giving them a leg up in the pursuit and acquisition of their first jobs and, ultimately, their careers.

To this day, field courses continue to be a memorable and impactful part of biology undergraduates' education.

If you wish to learn more about supporting this important fund, please **visit our website**.

You also are welcome to reach out directly to me to discuss the nature of your personal engagement with the Department of Biology or if you have any questions.

Warm regards,



Paula L. Luchak
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Relations & Development,
Western Science
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SAVE THE DATE

WESTERN SCIENCE HOMECOMING BBQ Saturday, September 24 at 11 a.m.









