

THE SCHOLAR



**WHY
HERITAGE
MATTERS**

IN THIS ISSUE

ZERO TOLERANCE ON THE US-MEXICO BORDER

WOMEN'S RIGHTS IN TURBULENT TIMES

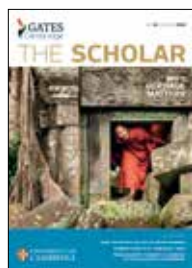
**FROM MASTER'S STUDENT TO MINISTER
IN THE MALAYSIAN GOVERNMENT**



**UNIVERSITY OF
CAMBRIDGE**

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The Scholar, 2019

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The Scholar is the publication of the Gates Cambridge community. Articles that offer a window into the lives and work of Gates Cambridge Scholars and Alumni or articles that tackle large interpretive questions relevant to the Gates Cambridge mission are particularly encouraged. Highly focused contributions are welcome, but preference will be given to submissions that are of interest to a diverse cross-section of readership in more than one discipline of study. Contributions are subject to editorial approval. Ideas expressed are those of the authors alone.

Write to us:

We welcome your comments, suggestions and questions.

Ria Roy, Editor-in-Chief
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Editors' note

Dear Reader

I am delighted to welcome you to the 2019 issue of *The Scholar* magazine. This issue contains some of the vibrant voices of our scholars and alumni writing about six different themes and providing insights into a wide array of topics – everything from DNA and the mystery of our universe to arts and equality. What stands out is how such seemingly disparate, at times tenuously linked topics, share one value in common: our deep commitment to make the world a better place – whether that be through enriching the market place of ideas, the diagnoses of our society, or the pursuit of meaningful change.

Four articles make up the overarching theme of this year's magazine, *The past and the present: looking back and moving forward*. We see a strong need to learn from the past, and so to have a more informed understanding to navigate the present. **Mandy Garner** covered this year's Annual Lecture given by Irina Bokova, the former Director General of UNESCO, who talked about "Why Heritage Matters". Bokova says that heritage sites are not simply "bricks and stones", marking something of the past, but something more: "a vision for peace" with the "power to change the minds of women and men and to shape a better future for us all". **Ria Roy** explores a curious question: why does North Korea so often appear as "enigmatic"? **Jill Paterson** talks about shattering the language barrier in Grenada, engaging with various challenges in its language use. While at first sight the link between a classicist looking at Heliodorus's 4th century novel and *Suits* may seem tenuous, **Benedek Kruchió** invites us on an interesting journey looking at a contemporary TV series from the perspective of an ancient novelist.

In *Science: inside out*, **Eddie Cano-Gamez** introduces us to the world of personalised medicine. Reminding us of a Sherlock Holmes' mystery, he informs us that we are living in an era where a single drop of blood can tell us which drug to take and what health issues to expect. While such developments are promising, Eddie discusses the unbalanced representation of certain groups in genomics. **Braxton Boren** unveils the mystery behind one of the all-time favourite Marvel comic characters, Daredevil, by offering scientific insight into the question of his hearing. Zooming out further from cells and the physics behind superheroes, **Antranik Sefilian**, discusses the changing understanding of our solar system, hovering around the curious questions concerning "Planet Nine".

In *Sustainable development and conservation*, **Ramit Debnath** approaches the question of better energy policies for those living in poverty by examining the household energy consumption of slum dwellers after they have been moved to state-owned houses. **Babette Tachibana-Brophy** in her article examines how de-extinction, despite its promise, comes with its own practical and ethical concerns, pointing out that critical consideration is vital if we do not want it to undermine the progress made thus far in conservation



efforts. Engaging with the quest for a sustainable future, **Shobana Sivanendran** discusses the need for innovations in regional energy policy in order to achieve growth in global renewable energy use.

In the *Life stories* section, we have incredible life experiences that shape who we are. While such life stories make up one aspect of their lives, these highlight the moments of a new journey, or overcoming life-changing difficulties. **Ashleigh Hildebrand Ross** shares her life's dividing moment, a moment when her quest for getting back to carbon capture and sequestration (CCS) projects was knocked aside by a diagnosis of cancer. **Greg Nance** shares his journey of why, on top of his work as a CEO and a Chairman, he ran seven marathons in seven days on seven continents to expand education access. **Yeo Bee Yin** shares her story of how she went from being a master's student in chemical engineering to becoming a Minister in Malaysia.

In *Gender, politics, and policies*, **Halliki Voolma** discusses women's rights and how progress in gender equality is being met with a growing backlash against women's rights. **Riikka Hofmann** in her work introduces an innovative approach that fosters effective collaboration between policy makers and academics. **Stephanie Gabriela Lopez** provides us with a firsthand account of witnessing immigrants, detainees and the family separation crisis in the US at the detention facilities. Stephanie speaks of the trauma and the sheer cruelty of the situation they face in a complex legal cobweb.

Finally, in *Arts and society*, **Steven Rathje** tells us about the power of theatre to change people's minds. **Iryna Shuvalova** introduces us to the world of popular culture and how it can be useful for understanding war-affected communities.

Everything has a beginning and an end and *The Scholar: 2019* is no exception. While we have tried our best to encapsulate the fascinating discussions, perhaps the pages are simply too few to capture all the voices and thoughts of the Gates Cambridge community. In a way, we hope that these pages will serve as a starter for discussions, reflecting an aspect of what took place in the minds of the scholars and alumni in 2019, but by no means an end to that vibrant dialogue. I extend my warmest gratitude to our contributors, our editorial team and our advisors at the Gates Cambridge Trust for making *The Scholar: 2019* possible.

Editor-in-Chief

Ria Roy

2017, Republic of Korea, PhD Faculty of Asian and Middle Eastern Studies

PERSONALISED MEDICINE FOR THE PRIVILEGED FEW

What is personalised medicine? Some think of it as science fiction: a world where a single drop of blood can tell us which drugs to take or which diseases to expect.

The truth is that personalised medicine is already here. For instance, it is now possible to identify individuals at risk of coronary artery disease, breast cancer or other conditions, based on their DNA. Those who test positive can begin to change their lifestyle or start preventive treatment. This is thanks to methods which use “genomics” (the study of an individual’s entire DNA, their genome) to look for genetic markers of disease. Yet, despite its promise, personalised medicine faces a familiar threat: if we don’t do something soon, only people of European ancestry will benefit from it.

The problem is that genomics relies on data. These data come from the DNA sequences of thousands of individuals, which are used to build a type of genetic “reference map”. If a person is at risk of disease, their genome will differ from this map. However, reference maps differ between populations and today 70% of genetic studies are on Europeans (Caucasians). East Asians are a distant second, accounting for a further 20%.

Particularly worrying is the future of personalised medicine for Africans and Native Americans, who are severely and increasingly underrepresented in these data. There are many reasons for this disproportionate representation. For example, most studies are conducted in countries with a large Caucasian population, like the United States. Also, geneticists often avoid mixed populations because these studies require more complex analysis. The threat here is that the difference between the reference maps we have and those that would represent these underserved populations will produce substantially different and potentially harmful results.

“it is now possible to identify individuals at risk of coronary artery disease, breast cancer or other conditions, based on their DNA.”

This situation must change. We can start by including minority populations and fostering international genetic programs. Many are working towards this. The future, however, is concerning. If we don’t make a conscious effort to make genomics diverse, we will soon live in a world where personalised medicine is only available to a privileged few.

Eddie Cano-Gamez
2017, Mexico, PhD Genomics

Biography: Eddie is a PhD candidate at the Wellcome Sanger Institute. He studies how genetic variants affect the immune system. He was raised in Mexico City.

The Physics Behind Daredevil's Sense of Hearing

As a spatial sound and hearing researcher, a superhero who has always stood out to me is Daredevil.

Daredevil is a Marvel comics character who was blinded by a chemical accident that sharpened his other senses – particularly hearing – to allow him to fight crime. Here I will examine the psychophysics, that is, the physics of perception, of Daredevil's hearing, and whether they lie within the realm of the possible.

Daredevil can hear very quiet sounds, much lower than the threshold of human hearing of about 20 decibels, through either exceptionally sensitive hair cells in the inner ear, or increased activity of the spiral ganglion in the auditory nerve. Daredevil can also tell where things are through echolocation,

a skill that many blind people have learned in the real world to detect objects around them through sound. Daredevil's spatial awareness is said to be so acute that he "sees" a so-called "world on fire" with his ears and other senses. This too, is realistic, as brain scans of echolocating blind persons have shown that auditory stimuli can lead to activity in parts of the brain associated with vision.

However, the one aspect of Daredevil's hearing that contradicts our knowledge of the auditory system is his costume. Tell me, if you were a blind superhero relying mainly on your hearing for spatial information, would you wear a costume that completely covers up your ears? In fact, much of human spatial hearing ability comes from one's head-related transfer function (HRTF), which

subtly filters high and low frequencies in a way determined uniquely by that person's head and outer ears. These can be learned like a new language, or even unlearned in laboratory conditions. But everything we know about HRTFs suggest that more fine contours, such as those on our outer ears, will give us more information about high frequency sound locations, since these frequencies have very small wavelengths. Despite the reasons for this being cosmetic (i.e., having a cool costume), I hold out hope that in future renditions of this character, we will see a little more appreciation given to the real hero of the series – his auditory system.

Braxton Boren

2009, USA, MPhil Physics

Biography: Braxton Boren is an acoustics and spatial audio researcher and an assistant professor in Audio Technology at American University in Washington, DC.



INVISIBLE ENERGY DRIVERS IN SLUM REHABILITATION HOUSING

An increase in household energy consumption is often associated with a rise in income and living standards. However, will everyone want a refrigerator, television and washing machine as their incomes rise?

The answer remains uncertain. Slum rehabilitation housing in Mumbai provides an excellent opportunity for examining this question, as it is associated with moving slum dwellers from their temporary shacks to formal state-owned houses.

The slum dwellers are displaced to these new housing units in tall, vertical structures reminiscent of high-rise apartments. These occupants tend to remain in poverty during this transition. Common sense says that the occupants should have low household electricity consumption as they own fewer household appliances due to their low incomes. However, in our ongoing investigation, we have found that household appliance ownership has little to do with income status in the slum rehabilitation housing of Mumbai. The decision for appliance ownership is driven by their household practice and the changing constructed environment. The change of the built environment from horizontal slum to vertical structures changes occupants' daily household practices. It shifts their daily outdoor activities like washing, cooking, and socialising to indoor ones, since vertical housing does not have enough communal space. Not only do the occupants feel compelled to buy appliances such as washing-machines, the usage of entertainment devices such as televisions, music devices, smartphones and computers also increases. All of this results in higher electricity bills. Increasing bills remain a grave concern for the occupants. For example, a female respondent mentioned in a household survey that she finds it difficult to socialise due to the lack of community spaces and that she tends to spend most of her time indoors watching television. She said:

"...lack of space here makes us spend most of our time indoors watching television.... the corridors are very dark. There are no real community spaces in these vertical houses... I miss the community feeling."





Energy decisions are subjective and change with the social, environmental and economic context of the occupants. It is especially so when energy services are not equitable to everyone. Mumbai has a huge income disparity across its population base, and so not everyone can afford these services equitably. The slum dwellers live in poverty, and the current slum rehabilitation process affects their community orientation, as an occupant mentioned:

“...in here, all of our daily activities like cooking and cleaning moved indoors which used to be an outdoor-social activity in our horizontal slums... Now we have to spend most of our time indoors...”

Such practice-based changes affect their daily routines and activity patterns, which has its consequence in higher electricity usage. This results in higher energy bills that they cannot pay, and this cycle continues. Change of household practices represents a critical invisible indicator of energy demand that remains understudied. My current research investigates such ‘invisible’ indicators of residential energy demand that can aid in creating better energy policies for people living in poverty.

A clearer understanding of such drivers of energy demand is essential for informed policy making for people living on low incomes. These invisible drivers also establish the link between energy use and well-being that ensures equitable distribution of resources across the income classes in the Global South. The current state-of-the-art research in demand side management of residential electricity use also stresses approaches that can enhance the current understanding of occupants’ social practices that dictate their energy demand and its effect on their overall well-being. Global North is extensively developing better policies through this pragmatic approach that links energy demand with occupants’ well-being to establish energy justice in the system. Countries like the UK, Ireland, Belgium and Sweden are actively stressing the inclusion of such invisible indicators in the mainstream demand side energy byelaws and regulations. However, it remains a theoretical concept in the Global South partly due to the infrastructural and institutional gaps in the energy sector. I think that these gaps are the silver lining for such contemporary policy applications that provide a broader bandwidth to the planners and policymakers to realise the goals of low-carbon energy transition in emerging markets.

Ramit Debnath

2018, India, PhD Urban Science

Biography: Ramit Debnath is an aspiring urban scientist whose background in engineering for sustainable development shapes his perception of engineering as a tool for reducing inequality.

WHY HERITAGE MATTERS

World heritage is not just a list of marvellous sites, but a vision for peace, carved in stone and cultural landscapes, with the power to change the minds of women and men and to shape a better future for us all, according to Irina Bokova, the former Director General of UNESCO.

Giving this year's Gates Cambridge Annual Lecture, *Why Heritage Matters*, Bokova said that the tide of extremism and xenophobia that the world has seen in recent years should be countered by renewing respect towards other cultures and understanding how all cultures, while different, are intertwined.

Culture is about more than bricks and stones, she stated. It is about how we understand the world, about intercultural dialogue as well as identity and belonging in a rapidly globalising world and, as such, it is as much about the past in as much it is about the future.

"Protecting world heritage is one of the most positive, visionary, transformative ideas that emerged in the last century," said Bokova, citing the different conventions which have been enacted over the last decades.

Bokova, who was Director General of UNESCO from 2009-2017 and was the first woman and Eastern European to head the organisation, said culture is now on the frontline of modern conflict with extremists aiming to erase history and identities by destroying it.

She stated: "When a World Heritage Site is destroyed anywhere in the world

we are all diminished, even if it is from another region, another period, another culture, another religion."

She added that protecting cultural heritage is now a key security issue and spoke of how cultural heritage is not only a victim of war, but a tool for peace, social transformation, reconciliation and healing.

War is not the only threat to cultural heritage, said Bokova, listing climate change, mass tourism and urbanism among other challenges.

She spoke too of the need for a new education of cultural literacy and mutual respect and emphasised the role the humanities play in fostering understanding of cultural diversity. "It is through the humanities that we can understand and embrace cultural diversity as a strength and not as a threat; it is through the humanities that we can foster a new global citizenship in an era of diversity. And last but not least, it is through the humanities that we can understand and find the right answers to the challenges of how to bridge the inequality gap," she stated.

Mandy Garner

Communications Officer,
Gates Cambridge Trust



Finding the missing piece of the puzzle: On comprehending North Korea

North Korea is one of those countries that we regularly read about in the headlines of newspapers. However, despite the numerous expert commentaries and analyses coming from all parts of the political spectrum, from conservatives to progressives, the enigmatic state always seems to beg more questions than are ever solved.

Despite the numerous attempts to explain North Korea and its behavior which have been made both in academia and the media, the results still feel less than successful in elucidating the state behind its veil: where is it heading, what do its people think about the recent changes, and to what extent is the state willing to collaborate with the international community? Trying to understand North Korea can sometimes feel like walking through a dark tunnel with broken spectacles. Are we perhaps missing something in our approach?

Many of the studies on North Korea so far has been carried out by scrutinizing it from the outside. That is, scholars and media commentators share their views on what they think about the current situation, and provide different viewpoints concerning the regime grounded on qualitative and quantitative evidence, theories of international relations, or satellite images, etc. While such approaches are important, this tells us only one side of the story. What has sometimes been overlooked is *not* what *we think*, but *what the regime and its people think about themselves*. That is, what do ordinary North Koreans read in their daily lives and how does that shape their political views? What kind of concerns do North Korean publications, media and textbooks raise? What kind of ideal image does the state have of itself?

Ironically, one reason for overlooking the government publication was because many regard it as a state-sanctioned rhetoric. However, whether one regards it as a pro-Party view or otherwise, this is a valuable source of information precisely because it tells us the official views, or the imposed blueprint,

of the state. Going through what ordinary people are exposed to and are required to read in North Korea is akin to placing a mirror in front of the North Korean state: we may not be able to go there, but we can at least see the blueprint of what the state purports to be.

Trying to understand North Korea can sometimes feel like walking through a dark tunnel with broken spectacles. Are we perhaps missing something in our approach?

Perhaps, the earlier approaches to North Korea were akin to a doughnut – we know how it looks like from the outside, but we have no idea what the centre looks like. What we need now, more than ever, is not an empty doughnut, but rather, a kaleidoscopic understanding of the state from the inside-out, tracing domestic debates and interpretations. A more informed understanding of the past, I believe, is the key that will help us navigate the present.

Ria Roy

2017, Republic of Korea, PhD Asian and Middle Eastern Studies

Biography: Ria researches the intellectual history of North Korea, drawing from history and political science. Ria is interested in ideas, politics, and the modern history of East Asia.



Shattering Linguistic Barriers

Conquering postcolonial language barriers in Grenada

When I think of the steely resilience of my country, Grenada, I am proud. Centuries of rebellions and the revolving doors of colonial powers did not destroy us; we emerged with a rich cultural and linguistic diversity, and as a warm, amiable people.

However, this same history has left entrenched postcolonial ideologies that decelerate our progress. Most striking to me are the language barriers we face: the 'illegitimacy' of our native tongue, the fragile state of our heritage language, and the low rates of adult literacy.

The 'unworthy' tongue

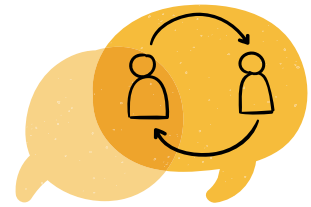
When you grow up believing you speak 'bad talk' or 'broken' English, it affects you intrinsically. I notice vibrant, expressive children

become apprehensive and seemingly incompetent when thrust into English-speaking scenarios. I also notice brilliant, competent adults judged if they sound different – a judgement which can deprive them of well-deserved jobs. So where is the disconnect?

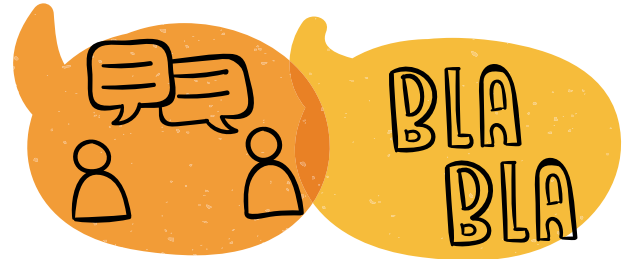
As Jamaican dub poet, Mutabaruka, explains, "The language we talk, we can't write; and the language we write, we can't talk." We have a language, Grenadian English Creole (GEC), that

resembles English, but it is not. This rift between the home language (GEC) and the target language (English) is a challenge for educators, policy-makers, and students. Although many students' mother tongue is GEC, English is not taught as a second language. Even more concerning, students are required to learn other subjects like Chemistry in English.

When people see 'bad talk', I see a beautiful language with unique rules and structures. Therefore, I am raising



LANGUAGE



"I foresee a time in Grenada when our language does not cripple us but empowers us. A time when our people are skillfully switching between their native tongue and other languages."

awareness of GEC through language training. Each workshop results in light bulb moments: *That's why English is so hard for me! I operate in two language systems. I can communicate more effectively if I know the differences.* I see their joy from learning about their heart language and their relief after years of self-deprecation. These experiences help to reaffirm Grenadian identity and break perceptions of unworthiness. By normalizing what's ours, we are saying that who we are is more than enough.

The 'slave' language

When the final speakers of a language die, the language dies with them. Our heritage language, Grenadian French Creole (GFC), locally known as *Patois*, faces that threat. When I returned home from university, I was surprised to find that more people spoke GFC than

the literature indicated. That's why I joined the fight. As part of the Grenada Creole Society, I help to document, teach, revitalize, and preserve our indigenous language.

We knew a man who spoke *Patois* fluently, but when we tried to interview him, he denied it. While we saw a reservoir of our precious history, he saw a language laden with colonial baggage. It doesn't matter that *Patois* captured his people's prayers and folklore, to him, it was not worth preserving; it was still the language of rebellion – the language of the slaves. When a language that has been instrumental in your nation's history faces extinction, your national identity is threatened. If we promote GFC, we validate it and release its burden of oppression.

The 'null' language

International statistics often report high rates of adult literacy in the Commonwealth Caribbean, giving the impression that we do not have a literacy problem; this is far from the reality. Sociohistorical reasons have limited the opportunities for basic literacy skills, affecting both social and economic mobility. The Adult Literacy Initiative of Grenada (ALIG) is tackling this barrier with free literacy classes. One of our learners told us, "I broke my shame plate. I will no longer hide and deny myself the opportunity to read and write better."

Our participants join classes for different reasons: to take national exams, read to their children, or complete forms. As the leading adult literacy organization in Grenada, we have quadrupled our operations within a year, and we aim to engage our learners with functional literacy, critical pedagogy, and the necessary tools to create their own transformations.

I foresee a time in Grenada when our language does not cripple us but empowers us. A time when our people are skillfully switching between their native tongue and other languages. A time when a generation of children speak a language that was once 'dead' and teach it to their parents. A time when our language is not a barrier to success.

Jill Paterson

2012, Grenada, MPhil Theoretical and Applied Linguistics

Biography: Jill Paterson is a linguistic consultant for educational groups in Grenada and works as a language instructor at the St. George's University School of Medicine.

WHY HELIODORUS SUITS: watching Netflix with an ancient novelist

For classicists like me, who specialise in ancient literature, the timeline raises an ideological question: What should be the function of our discipline in the 21st century? If you started reading this text in the hope of finding an answer to this puzzle, please stop now!

My aim is to give an example of how my profession has enriched my perception of contemporary culture, specifically the TV series *Suits*. While such observations will not help me explain the relevance of my work to my grandmother or potential employers, they can indicate that there is more to my engagement with literature than just adding further floors to those ivory towers.

My PhD thesis focuses on Heliodorus' *Ethiopian Stories* (4th century AD), an ancient Greek novel. A remarkable feature of this work is its use of Homeric intertextuality (its references to Homer): Heliodorus does not only create connections to the *Iliad* and the *Odyssey* that the reader, unlike the characters, is aware of (narratorial intertextuality); he also introduces figures who consciously refer to Homer's works (actorial intertextuality). The coexistence of such references raises intriguing questions. For example, Calasiris – an important character in the novel – outsmarts pirates by initiating a conflict that resembles a fight between Achilles and Agamemnon in the *Iliad*. Is Calasiris just a puppet of the author, ignorant of his ruse's literary background, or does he deliberately make use of his literary expertise?

Similar phenomena can be observed in TV series. In *Suits*, lawyers regularly entertain each other with quotes from mainstream films such as *Top Gun* and *Rocky*. As most of these quotes are fairly hackneyed, critics have found fault with them (and thus the series), calling them "unnecessary" and "childish". However, if we differentiate between narratorial and actorial intertextuality, a more favourable interpretation appears: maybe *Suits* is cleverer than its characters, and the in-jokes are a device of characterisation, highlighting the protagonists' childish nature. However, how can we tell whether this is a viable reading or a forced attempt at explaining away an annoying feature of the series?

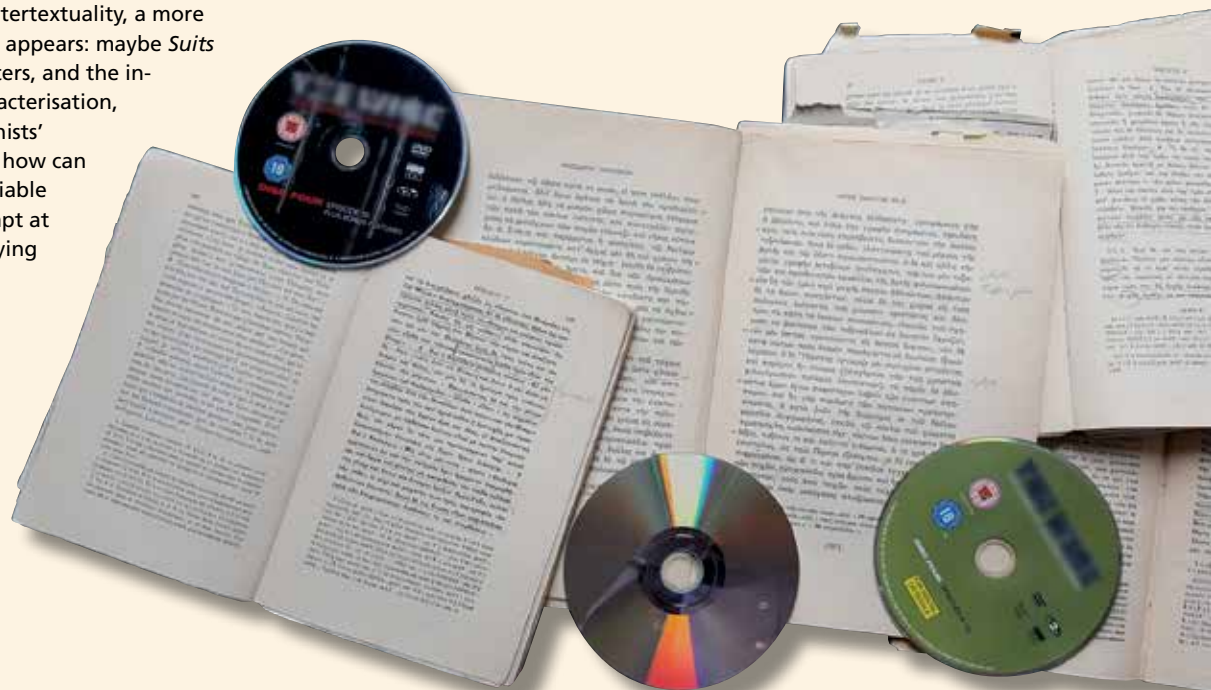
There is an instance where these movie quotes are complemented with a different kind of reference. Katrina Bennett and Mike Ross of *Suits* are fans of the series *The Wire* and frequently imitate Bunk Moreland's characteristic way of saying "Shiiit!". Things become interesting when another character enters the series: Robert Zane, played by Wendell Pierce, who in *The Wire* portrays Moreland!

From then on, whenever Katrina and Mike reheat their in-joke, our perspective is distanced by dramatic irony. We know what they do not know: the character they mimic is part of their world. It becomes clear that *Suits* is capable of more sophisticated movie jokes than its characters, prompting us to laugh at the lawyers instead of failing to laugh with them.

Of course, I am neither claiming that being familiar with Heliodorus is a necessary condition for this insight nor thinking that I could convince series fans on Reddit to study this novelist in addition to reading each other. I simply wanted to give a personal example how studying ancient literature has coloured my opinion on modern TV.

Benedek Kruchió
2017, Hungary, PhD Classics

Biography: Benedek was born in Hungary and raised in Austria. His doctoral dissertation focuses on interpretative multiperspectivity and cultural pluralism in Heliodorus' *Aethiopica*.



Before and After: Life's Dividing Moments



As I look back on my 37 years, there are two key moments that changed the course of my life. Not the gradual, milestone events like getting professional degrees, starting a family, or even my time at Cambridge. I am talking about the 1 millisecond events that divide life between a “before” and an “after.”

Fifteen years ago, in a basement computer lab at 2 am, I clicked on a link for “carbon capture and sequestration,” and I found my calling. Through an unexpected connection between a lab I toured and my parents’ tiny, rural hometown, I discovered a passion for shepherding carbon capture and sequestration (CCS) through the technology “valley of death.” My time at Cambridge and then MIT gave me the foundation I needed, and I went to work developing CCS projects professionally. As CCS fell out of favor during the recession, I turned my skills elsewhere, but two years ago began strategizing how to get back to it.

Then, while on vacation with my husband and 20-month-old son, I got a phone call telling me that I had cancer, and I found perspective. I had just turned 35, but had no lumps, and no family history, and it was likely to be perfectly fine – except it wasn’t. The job search was over before it began, and I entered a whirlwind of doctors, tests, interminable waiting, back-to-back surgeries, and choices that were made only after hours of lying in bed, staring through tears at the light coming through the blinds.

Two days before starting chemo, I saw a message asking me to apply for my dream position. I interviewed between rounds of chemo, navigating schedules to avoid the worst of the brain fog, and

had a scary close call with brain death. I did get the dream job, and I am back to developing CCS projects, just as I wrote about in my Gates Cambridge application 15 years ago.

The day of the diagnosis, my husband told me that if we put our minds and hearts to it, we could make this the best thing that ever happened to us. During one round, some of the chemo drug leaked out of my vein and caused a tornado-shaped mark on my forearm,

like the whirlwind from *The Wizard of Oz*. This Kansas girl actually loves it: cancer was my tornado, but now, the world is in colour.

Ashleigh Hildebrand Ross

2006, USA, MPhil Environmental Policy

Biography: Ashleigh is a Kansas girl who was educated at Oklahoma State, Cambridge, and MIT, and is now deploying projects to fight climate change from Houston.



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DE-EXTINCTION:

A double-edged sword

Imagine mammoths roaming the tundra again, the return of the Tasmanian Tiger to Australian forests, passenger pigeons in flocks thousands strong, and even the return of long-lost megafauna.

De-extinction promises the revival of extinct species through back breeding, synthetic biology and cloning techniques. It is easy to see the appeal. From a conservation perspective, de-extinction could jumpstart ecosystem functions by reintroducing key species, increase genetic diversity, and stimulate public interest in the environment. Scientists warn that we are experiencing Earth's sixth mass extinction event: with as many as 30-50% of all species possibly heading to extinction by mid-century, de-extinction is an appealing back-up plan. But is it simply, as Stanford biologist Paul Ehrlich quips, a "fascinating but dumb idea"?

Unfortunately, technological developments in the domain are rapidly outpacing consideration of the practical and ethical problems that de-extinction may actually create for conservation. Take the passenger pigeon, a promising de-extinction candidate: with flocks massing in the billions, passenger pigeons were widely regarded as a pest and wiped out by human hunting. Will reintroducing the species revive the very human-wildlife conflict that caused their extinction in the first place? Does the modern world still possess the environmental requirements needed for passenger pigeons to survive? It is also unclear to what extent essential flocking and courtship behaviours are genetic expressions or socially learnt. In short – can these revived pigeons actually survive in the wild?

De-extinction may also encourage a problematically cavalier attitude that all extinctions are reversible through human ingenuity. By removing the permanence of extinction, the key justification underpinning the majority of conservation efforts is eroded. The appropriateness of 'playing God' by picking and choosing species to save is also not without its ethical, ecological and economic concerns. Who, for example, will stop certain species from being reintroduced for reasons of personal pleasure or profit, rather than their ecological significance?

De-extinction techniques are already being implemented in conservation. Without critical consideration of the broader practical issues, these technological advances will continue to progress at the risk of undermining conservation efforts in the future.

Babette Tachibana-Brophy

2018, Australia, MPhil Conservation Leadership

Biography: Babette is a wildlife lawyer working in conservation, with a focus on strategic law reform to address illegal poaching, threatened species conservation and human-wildlife conflict.



BETTER ENERGY POLICIES for a renewable future



The world is in transition from fossil fuel-based energy supply to renewable energy sources. It is expected that by 2020, about one-third of the global energy supply will be from renewables. However, the main question facing us is: How can we actually make this transition?

Thus far, the falling costs of technology have enabled the global shift to renewable alternatives. For example, the cost of solar panels has dropped by 80% since 2009, making it the fastest growing renewable energy source in 2016. Similarly, the cost of wind turbines has decreased by almost 40%, making wind the most used renewable energy source in 2016. Given these trends, renewable energy options are expected to be competitive with fossil fuels by 2020. Generating power locally rather than relying on imports of fossil fuels also increases the energy security of a country. However, increasing the share of renewables in the Global South requires a different approach as its large population base living in poverty creates a different pattern of energy demand. Moreover, the growing middle-class population in the Global South contributes further to the ever-increasing energy demand. Therefore, it is crucial for these nations to develop suitable energy policies to support this growth alongside the broader agenda of 'going renewable'.

In this regard, the success stories from countries like Brazil and Costa Rica show that it is possible to reach one-third renewables with the current cost of technology by developing energy policies that are coherent with their environmental

needs. For example, Brazil has an innovative tariff system that makes renewable energy affordable to consumers, which in turn attracts more people to adopt renewable technologies. Similarly, Costa Rica powered itself for 300 days, primarily by hydropower, in 2016, through a clever financial mechanism which kept the cost of power low for consumers and provided tax reductions to industry for using renewables.

These examples show that innovations in regional energy policies are important for global renewable energy growth as it teaches governments to learn iteratively from uncertainties. With sufficient funding, capable human capital and progressive regulatory frameworks, local and regional energy policy innovations can be formalised on a global scale to power our planet with clean and green energy.

Shobana Sivanendran
2013, Malaysia, PhD Engineering

Biography: After completing her PhD, Shobana joined a Malaysian advisory firm focused on shaping national policy in various sectors, including clean energy, entrepreneurship and urban development.

Mystery at the edge of our Solar System

What is our solar system really like? Over the last two decades, our answers to this have constantly changed.

While thousands of planets orbiting other stars were being discovered, astronomers also found that our solar system harbours a belt of debris known as the Kuiper belt. The Kuiper belt is formed of thousands of small bodies beyond the orbit of Neptune, which encircle the Sun on nearly-circular paths from almost all directions.

However, the Kuiper belt has not been the only discovery. Since 2003, astronomers have also detected a population of more distant objects, known as trans-Neptunian objects (TNOs). A subset of TNOs orbit the Sun on highly-elongated paths which appear to be clustered in one direction, in contrast with the Kuiper belt. Such a phenomenon cannot be explained by the current eight-planet solar system, challenging our current understanding of the solar system.

In 2016, Caltech researchers Konstantin Batygin and Mike Brown proposed that an as-yet-undiscovered planet of 10 Earth masses – dubbed “Planet Nine” – resides in the distant solar system. This would explain the puzzling orbits of the TNOs. On the other hand, Prof. Jihad Touma (American University of Beirut) and I decided to see whether there could be another, perhaps more natural cause for the unusual orbits of TNOs. Thus, we entertained ourselves with some questions: What if one removes Planet Nine and instead replaces it with lots of small objects scattered across a wide area beyond Neptune, forming a disc? Could such a hypothetical disc, analogous to extra-solar debris, account for the seemingly odd observations without the need for an additional planet?

To answer these questions, we modelled the solar system and studied the evolution of TNOs under the combined action of this hypothetical disc and the known planets. To our surprise, we learned that a massive trans-Neptunian disc

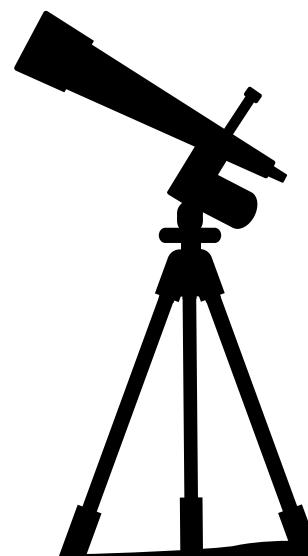
could counteract the gravitational influence of the known planets and, in the process, shepherd highly-elongated orbits of TNOs into the observed clustered configurations, obviating the need for Planet Nine altogether.

To date, we do not have direct observational evidence for either a massive planet or a disc of smaller objects. Nonetheless, as we wait for evidence for one or the other, allow me to conclude with the following scenario: the existence of both!

Antranik Sefilian

2017, Lebanon, PhD Applied Mathematics and Theoretical Physics

Biography: Antranik studies the theoretical aspects of celestial mechanics and dynamical astronomy. His work focuses on the formation and evolution of planets and debris discs.



Zero Tolerance on the US-Mexico Border

Narratives of Despair from Immigrants and Detainees

My first experience witnessing immigration court proceedings inside a detention facility was on the US-Mexico border. It was July 2018 and the family separation crisis was at its peak.

Because the US government was not forthcoming with information, a network of non-profit organizations had come together to help reunite separated families. After taking a seat in court, I watched as detainees from Latin America and Africa filed into the room. It was heartbreaking to witness the callousness of the court, which expected this group of immigrants, who did not know where their children were, to navigate the complex world of US immigration law in one short hearing. Some detainees tried to explain why they had traveled to the US, but the judge did not listen to their claims and quickly asked if they chose to represent themselves or needed more time to find counsel. If they decide to self-represent, the judge instructed them to fill out an asylum application and to provide all the necessary documentation to support their claims. Having worked at Kids in Need of Defense (KIND), a non-profit that provides legal representation for immigrant and refugee children, I realized that the judge was asking



© PHOTO BY NITISH MEENA ON UNSPLASH

immigrants, with limited resources, money, language skills and time, to produce work that typically takes attorneys months to complete. As I sat there watching the proceedings, I thought to myself; maybe if they asked for more time, they would find an attorney who could help them. However, for most of them, this would mean spending more time apart from their children, being subjected to abuse and coercion in detention and making phone calls that they could not afford. As I continued working with this population, I witnessed how immigration officials coerced hundreds of parents into signing documents they did not understand, including their own deportation orders and adoption papers for their children.

It has now been months since that trip and I am still bearing witness to the pain and trauma the US government inflicts on immigrant children and families. Nevertheless, I also see the strength and resilience that propels these families forward and that gives me hope.

Stephanie Gabriela Lopez
2014, United States,
MPhil Latin American Studies

Biography: Stephanie is a human rights advocate, who is passionate about advancing the rights of immigrants and children in the United States and around the world.

“I realized that the judge was asking immigrants, with limited resources, money, language skills and time, to produce work that typically takes attorneys months to complete.”

WOMEN'S RIGHTS IN TURBULENT TIMES

In July 2018, the Bulgarian Constitutional Court ruled that the definition of gender in the Council of Europe Convention on Preventing and Combating Violence Against Women and Domestic Violence (“Istanbul Convention”), is incompatible with the Bulgarian constitution.



One in three women in the EU experience physical and/or sexual violence in their lifetime and over half experience sexual harassment. The judges interpreted the Convention's definition of gender as meaning there is individual subjective choice of gender roles, triggering speculation that a “third sex”, is introduced alongside “biological sexes” by the Convention. This ruling is one of the starkest examples of backlash in the European Union (EU) against progress made in gender equality and women's rights in recent decades.

Gender equality is a founding principle of the EU, and in the gender equality unit of the Directorate-General for Justice of the European Commission, we work to keep the EU on the path to increased equality, especially in this context of anti-gender mobilization.

I started working with the unit in 2017 a few months before the #MeToo movement went viral. While the #MeToo movement was raising consciousness, the anti-gender movement was growing. It is fascinating to participate in this polarised political and social context where our daily work is coloured by these two opposing tensions: momentum for change and (potential) regression.

As a Policy Officer in the gender equality unit, my work directs an EU-wide communication campaign to raise awareness and change norms on violence against women. We have focused on producing communication tools to put forward a positive and accurate narrative about the Istanbul Convention. I also help facilitate EU Member States' participation in the International Labour Organization's negotiations for a Convention on tackling violence and

harassment in the workplace. If a Convention is adopted this June in Geneva, it could serve as an international legal response to #MeToo.

Must change always be met with resistance?

I hope the arc of the moral universe bends toward justice. Until then, and especially during turbulent times of opposing movements for and against social progress, let's keep working.

Halliki Voolma

2011, Estonia, PhD Multi-Disciplinary Gender Studies

Biography: Halliki shapes EU gender equality policy at the European Commission. She previously co-founded and directed a national social norms development programme in Estonia.

**The views expressed in this article are those of the author and do not necessarily represent the views of the European Commission.*

Building bridges between academic research and policy-making

There is a widespread desire to increase the use of research and evidence in policy-making. However, significant barriers exist to effective collaboration between academic researchers and policy makers, such as differences in timescale, objectives and expertise.

In 2015, the U.K. Cabinet Office and the Economic and Social Research Council initiated an innovative approach to facilitate collaboration between academia and policy-makers. They set up the Cross-Government Trial Advice Panel, selecting 28 UK-based academics, including this author, from across the social sciences as its expert members. The panel, which has now assisted with 52 projects across 18 departments, is a free-to-use service to help civil servants design and implement high quality policy trials. The aim was to make it easier for them to evaluate new ways of improving public services before putting into effect policies on a larger scale. Nonetheless, perhaps its greatest achievement has been its impact on broadening the understanding of research methods and evidence.

According to a recent report by the Cabinet Office, the Panel has fostered a change of culture in Government. Originally, the focus was on an evaluation method used in medical research called Randomised Controlled Trials (RCTs). While considered the best method for fixed questions in controlled conditions, RCTs are not always helpful for evaluating complex policy questions in real life settings. Due to the work with the panel, there has been a move to raising awareness of and stimulating an interest in a range of robust fit-for-purpose evaluation methods, setting new benchmarks for evidence quality. Implementing a culture of evaluation has enabled policy-makers to move from a focus on simple issues,

such as wording on tax letters, to dealing with complex policy areas. A successful example is the project, initiated by the British Prime Minister, on community integration by the Ministry of Housing, Communities, and Local Government. This trial, which the author supported, demonstrated a link between language teaching of immigrant-background women with limited or no English and community cohesion.

The achievements made by the Cross-Government Trial Advice Panel indicate new pathways to create impact and improve engagement between research and policy that are globally significant. Most importantly, the panel's work highlights how academic research can improve policy-making not only through its results, but through its rigorous methods and its understanding of their effective implementation. Ultimately, it also shows how generating impact requires mutual learning, an awareness of each other's perspectives, as well as a space for knowledge translation.

Riikka Hofmann

2001, Finland, PhD Education

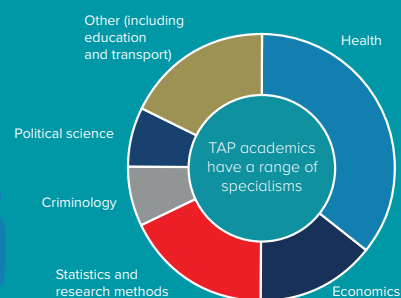
Biography: Riikka leads the research group, "Dialogue, Professional Change and Leadership," at the Faculty of Education, University of Cambridge, and is an expert member of the UK Government's Policy Trials Advice Panel.

More than
800
civil servants
receiving trial design
advice from panel
members via the
Future Leaders
Scheme

28 academic
experts

+

18 government
experts





CAN ART CHANGE MINDS?

As both an artist and a psychologist, I tell stories – whether through plays or writing about my psychology research. More than mere entertainment, stories are our way of making sense of the world. They reach us at a deep level, immersing us in worlds that are very different from our own. In doing so, they can help us build empathy for people who are different from us and change our beliefs about social and political issues. By changing minds and inspiring compassion, stories can be used as a tool to advance social change.

Before I began studying psychology, I was an actor and playwright active in the theatre community in Portland, Oregon. During my time in the theatre, I was interested in the power of art to increase empathy and to change people's minds about important issues.

Recently, I combined my interests in art and psychology to conduct a study that tests the power of theatre to change minds. Working with Stanford Psychology Professor Jamil Zaki and Rutgers Psychology Professor Leor Hackel, I conducted a field experiment in collaboration with Artists Repertory Theatre, a theatre company in Portland, Oregon.

The play used in the study was "Skeleton Crew," by recent McCarther "Genius" award winner Dominique Morisseau, a four-character drama which follows the lives of auto workers in Detroit after the 2008 financial crisis.

To test the impact of this play, we randomly assigned over 700 audience members to complete surveys either immediately before or immediately after the performance. Audience members who filled out surveys immediately after the show reported feeling more empathy toward the groups depicted in the show, such as working-class individuals in Detroit.

They also reported different opinions about a number of social and political issues after seeing the show. For instance, they were more likely

to rate racial discrimination and income inequality as very important issues than those who filled out the surveys before the show. They also expressed more support for welfare policies, wealth redistribution, and corporate regulations.

Additionally, theatre-goers who filled out the post-show surveys expressed more interest in supporting organizations that assist the homeless, either by volunteering to work at a local homeless shelter or by donating to the cause.

This ongoing study provides exciting preliminary evidence about the power of art to change people's minds about important issues, encourage empathy, and promote altruistic behavior.

When I'm not conducting psychology research, I still write plays. Playwriting gives me the opportunity to explore the same questions I explore in my research, but in a different way. To me, art and psychology are not that different – they are both creative ways to delve into the mysteries of the human experience.

Steve Rathje
2018, USA, PhD Psychology

Biography: Steve Rathje is a first year PhD candidate in Psychology at the University of Cambridge. He received his Bachelors in Psychology at Stanford University.

POPPING THE BUBBLE: understanding war-affected communities through popular culture

Pop culture's near-invisibility, coupled with its near-ubiquity, is perhaps one of the reasons why in recent decades it has grown into such a fruitful and, well, popular field of study.

In everyday life, we are so deeply embedded in popular culture that it becomes practically invisible. Always present, but rarely perceived as a source of valuable knowledge, it turns into a comfort item. A favourite artist's track does as much for our wellbeing as a time-yellowed coffee mug.

We rarely pause to think how, in the meantime, pop culture soaks up our hopes, fears and ways of behaving. As a result, it not only reflects the key patterns of production and consumption in our societies, but, perhaps most importantly, embodies our ways of thinking about ourselves and other people. That's why its analysis can help us understand how we draw the line between ourselves and the others, between friends and enemies.

When at a conference I told a fellow Ukrainian scholar that I was studying popular songs about the War in Donbas – an armed conflict ongoing since 2014 in Eastern Ukraine – she raised her eyebrows. "What do you mean 'pop songs about Donbas'? Are there any?" As I gave her examples, her eyebrows shot even higher up. "Of course, I know this one – and this one, too! I just never thought we could learn something from them."

I must confess, I did not exactly come to Cambridge to spend hours upon hours watching music videos and listening to songs which more often than not turn out to be rather

unsettling. Having started my PhD with a strong interest in oral material, I arrived at pop culture studies via oral poetry. Now, by analysing the strategies of othering employed in war songs, by exploring their language and imagery and looking into the identities they reflect, on a lucky day I end up with precious insights into the communities affected by war.

Yes, it's true that quite often I tragically and unwittingly end up humming a particularly ugly couplet from my research sample: something about the Russians proudly spitting onto America and Europe or about the monstrous enemy soldiers eating civilians alive. This is war pop after all, possibly the strangest of subgenres of popular music. Yet my subject is not without its perks. "Gee!" a postgrad friend of mine recently complained, "When I'm watching YouTube videos, I know I'm procrastinating, but you get to do it *as a part of your research*. Now I'm jealous!"

Iryna Shuvalova

2016, Ukraine, PhD Slavonic Studies

Biography: Iryna Shuvalova is an award-winning poet, a scholar and translator. Formerly a Fulbrighter, she has authored four books of poetry and won the Brodsky/Spender Prize for translation. Her poems have been translated into nine languages.



RUNNING SEVEN MARATHONS IN SEVEN DAYS

on seven continents to expand education access

My effortless stride turned into a stunted shuffle under South Africa's summer sun. Waves of nausea crested over me as sweat dripped and quadriceps convulsed in agonizing cramps. Suffering was my constant companion during the World Marathon Challenge where we ran seven marathons in seven days on seven continents. Following 42 km across Antarctica and Cape Town, I faced marathons in Perth, Dubai, Madrid, Santiago, and Miami while battling a stomach bug, dehydration, sleep deprivation, blisters and quad cramps.

As someone who received education with the help of scholarships, I was on a mission to pay it forward. While serving as a volunteer, mentor and leader for Moneythink, a not-for-profit dedicated to breaking down the financial barriers to college for students from disadvantaged backgrounds, I also began my journey as an ultra marathon runner to inspire students across the country to dream bigger. In 2019, I decided to take part in the World Marathon Challenge to raise funds for this cause, a feat only 104 people had ever completed – compared to 562 who have traveled to outer space or 4,500 who have climbed Mount Everest.

Failure was a real possibility. The challenge required more than 37,000 km of air travel, running seven marathons back-to-back, enduring grueling physical and mental tests. I reverse engineered my plan based on the obstacles I

was likely to face, and scheduled workouts of gradually increasing intensity while inventorying progress. I began each day with 4 am calisthenics before logging miles, and preferred commuting on foot to meetings so as to run an extra 80 km each week. I prepared for the huge temperature swings across seven continents by heading out for long runs without gloves, cap or coat for the Antarctic wind chill and conditioned for blazing heat with cardio sessions in the sauna to refine breathing techniques.

Beginning on January 31st with 42 km over Antarctic ice, then in Cape Town, Perth, Dubai, Madrid, Santiago, and finally, on February 6th, I crossed the seventh finish line in Miami. Tackling a big challenge taught me that obstacles are opportunities to become a stronger version of oneself. I look forward to expanding education access through my next challenges – continuing the Gates stride in overcoming global challenges.

Greg Nance
2011, USA, MPhil Management

Biography: Greg Nance is working to expand education access. He is the CEO of Dyad.com and Chairman of Moneythink. You can follow his adventures at GregRunsFar.com and on Instagram: [@GregRunsFar](https://www.instagram.com/GregRunsFar).



From master's student to minister in the Malaysian government

Yeo Bee Yin says that when she was at Cambridge she heard that Bill Gates had told scholars to make the Gates Cambridge scholarship worthwhile by using the funds invested in them to make as great a social impact as possible. Those words have had a long-term impact on her actions since.

Yeo Bee Yin, who did her master's in chemical engineering at Cambridge in 2009/10, is now Minister of Energy, Science, Technology, Environment and Climate Change in Malaysia where she has helped to set up a nationwide ban on the import of plastic waste and published a 12-year roadmap that includes a legal framework on eliminating the use of single use plastics in Malaysia by 2030.

She says she got into politics almost by accident. When she returned to Malaysia from Cambridge, she was keen to contribute to her country and started volunteering for the Democratic Action Party in early 2012. She says: "It was beyond my wildest imagination then that I would eventually run for office."

In 2013, she became the youngest state assemblywoman in Selangor. Last May after national elections swept in a new government Yeo Bee Yin was chosen as a member of a new Cabinet. Just prior to the elections she published a book on her political ideas. Her aim was to show young readers that politics is not just about greed, money and power. The book deals with the issues Yeo Bee Yin feels passionately about from education and women to sustainable development.

In her political life she has pressed for greater transparency and has faced attempts by others to defame her, which she says is just part of the job. As a prominent woman in politics she has also come up against prejudice.

She says she is passionate to make a positive change in her country: "It is my deep desire to see that every child in Malaysia, no matter where they come from, even from the most rural part of Malaysia, or what their family background, race or religion gets an equal opportunity to realise their potential in life."

Mandy Garner

Communications Officer,
Gates Cambridge Trust



How can we bring our community together for the greater good throughout our lives?

The Gates Cambridge Alumni Association was founded with this question in mind. As we build toward the twentieth anniversary of the Gates Cambridge Trust in 2020, a strong, involved and enthusiastic alumni community seeks to act toward the goal it implies.

This spring the GCAA Board of Directors welcomed three new members: Megan Sim (2010) as Treasurer, Susanna Goldfinger (2003) as Director of Membership for East Coast, USA, and Greg Nance (2011) as Director of Membership for Asia-Pacific. They join Co-Chairs Devinn Lambert (2013) and Anna Kendrick (2011), Secretary Alex Kong (2016), and Director of Membership for Europe Szilard Fájér (2005).

A slate of worldwide activities held throughout 2018–19 has built on the momentum created by the Zeitels Memorial Lecture in Boston last June. Held in warm memory of devoted alumna and former co-chair of the GCAA, Lauren Zeitels (2006), the weekend brought together over 70 alumni around a full calendar of talks, tours and social events. It also provided a critical chance for US-based alumni to come together, plan new initiatives and launch fall events.

From September, a dozen welcome events around the globe brought together alumni and scholars-elect. Alumni had the pleasure of gathering at the British Embassy in Washington, D.C. around interviews in January; the Global Day of Service with the Scholars' Council saw initiatives locally, as well as a Great Wall hike and rubbish run in Beijing in

March in late March. The focal point of the spring was a scholar-alumni summit on Brexit and the European future in the medieval town of Sibiu, Romania, in May. We hope to celebrate with many new alumni in Cambridge and other scholar hubs after graduations this summer.

The aim of the Gates Cambridge programme is to build a global network of future leaders committed to improving the lives of others. GCAA's principal responsibility is to facilitate building this network, often with the Board leading engagement, but more importantly through supporting alumni to lead. As ever before, GCAA supports alumni proposals for events and initiatives. As an additional vehicle to invite engagement, this spring we have pioneered a new collaborative small-grants initiative which empowers alumni to collaborate across years (including with current scholars) to host panels, lectures, symposia, and other events in your region. Proposals will be called twice per year. We will also be holding inaugural alumni town halls, in order to further transparency and shared governance.

We look forward to celebrating and building community with you in the year to come. If you have an idea for your region, please be in touch (co-chairs@gatesalumni.org).

Anna Kathryn Kendrick

2011, United States, PhD Spanish

Devinn Lambert

2013, United States, MPhil Biological Science (Plant Sciences)



Top left: Reception for alumni at British Embassy, Washington D.C. Top right: Indian alumni with former Minister of Health, New Delhi. Bottom left: Alumni dinner in Chicago, IL. Bottom right: Alumni hiking the Great Wall of China.



This past year has seen one of the most enthusiastic and engaged Scholar cohorts in recent years.

SCHOLAR COMMUNITY UPDATE

In October, upon our return from Orientation, Scholars organized weekly climbing sessions and regular community coffee mornings, and the Scholar Support Fund was used to support projects ranging from conferences to book clubs.

In November we held our annual Gates Gala. This year's theme was "A Brief Mystery of Time". The decor was outstanding and offered a perfect backdrop for a wide range of entertainment, from the long-time Scholar favorite silent disco to the new and interactive Murder Mystery game. November also saw the inauguration of one of the most diverse Scholars' Councils we've had, representing ten countries on five continents.

January and February saw the organization of events celebrating our Scholars' diverse and varied cultural backgrounds and personal experiences – from International Movie Nights and an International Food Festival to a Lunar New Year celebration. We also ran an evening of Scholars' Stories; another popular fixture in the Gates Cambridge calendar.

This year's Annual Lecture was delivered by the former Director General of UNESCO, Irina Bokova, who spoke about the challenges posed by contemporary politics and conflicts to preservation of the world's Cultural Heritage. We also had an inspiring Gates Conversation with Ms. Bokova in which Scholars with a particular interest in her area of expertise could ask questions and seek advice.

In March, Scholars gave back to the town and community that hosts them by volunteering in our annual Day of Engagement. We partnered with 13 charities – some of them our long-standing community partners and others new and exciting collaborations. Scholars also had the opportunity to participate in the Girls in STEM project, now in its third year and for the first time a part of the Day of Engagement.

Heading into Easter term, we look forward to hosting the Gates Day of Research, for which Dame Fiona Reynolds, the first female master of Emmanuel College and the first female Director General of the National Trust, a UK charity for environmental and heritage conservation, has accepted our invitation to deliver the keynote address. We will celebrate the summer months with our annual garden party, which traditionally features a charity auction, along with social fixtures with other scholarship programs in the UK.

As the academic year winds down, our Orientation committee will be busy making preparations to welcome our Scholars-elect, whom we will be taking to the Lake District on a 4-day retreat in keeping with another Gates Cambridge tradition.

President Marina Veličković
2017, Bosnia and Herzegovina, PhD Law

Vice President Kevin Chew
2016, Singapore, PhD Film and Screen Studies

Defending Colombia's fossil heritage

Marcela Gomez

2004, Colombia, PhD Earth Sciences



Marcela Gomez is adviser to the General Director of the Colombian Geological Survey and is helping to implement and educate people about new legislation on the country's fossil heritage.

Marcela [2004], who did a PhD in Earth Sciences, studying a fossil which she had brought to

the UK from Colombia, has one foot in the world of public policy and the other in research.

Her current role involves giving advice on how to protect Colombian heritage. She is also involved in UNESCO groups on world heritage and on the prevention of illicit trafficking of heritage. She says: "Fossils are now viewed as part of our heritage and not just scientific objects. They have a cultural meaning. This is a new page for me in the study of fossils."

Marcela, who was born in Bogota, did her undergraduate degree in Geology at the Universidad Nacional de Colombia where she did her undergraduate dissertation on palaeontology in the region of Villa de Leyva north of Bogota - a region where she continues her fieldwork to this day.

After finishing her degree, she was accepted to do a PhD at Cambridge. It focused on a fossil which Marcela had come across in the Universidad Nacional de Colombia - she later named it *Acostasaurus pavachoquensis*. The fossil is named after a Colombian priest, the father of palaeontology in Colombia, who discovered it in the 1960s and gave it to the university. It lay abandoned in the university for decades until it was recently studied and found to have characteristics which differ from other similar fossils. It is of a marine reptile from the Mesozoic era. The creature lived at the same time as the dinosaurs, but was not a dinosaur. Its body was three metres long and its head one metre in length. Other similar animals have been found in Colombia which are larger.

Marcela finished her PhD in 2008 and worked for a not-for-profit geological research organisation affiliated to the Department of Earth Sciences until she became pregnant in 2010. The family moved to Colombia in 2012. Eventually Marcela was appointed director of the museum of the Colombian Geological Survey in Bogota.

Science innovation in Poland

Maria Pawlowska

2007, Poland, PhD Earth Sciences



Maria Pawlowska has spent the last three years setting up a network of research excellence centres in Poland as coordinator of the International Research Agendas (IRAP) programme at the Foundation for Polish Science. The aim of the programme is to attract the most talented researchers from around the world to Poland

in order not only to boost research efforts globally, but to develop Poland's applied science base.

The initial funding for the IRAP programme, which runs out in 2023, came from European Union structural funds dedicated to applied science.

Each of the 10 centres, which will cover everything from biomedical science and nanotechnology to neurodegenerative diseases and quantum physics, has a budget of approximately 8m euro (US\$9m).

There is an emphasis on partnering with universities around the world and on looking outwards. Maria [2007] adds that, using international strategic partners (such as the University of Oxford and THE European Molecular Biology Laboratory), IRAP units can leverage their recruitment and employee evaluation policies and not only attract the best researchers from around the globe, but retain them too.

Maria has been the person responsible for the day-to-day running of the programme, including coordinating international panels of scientists from leading universities.

Now that the centres are established, her role is to develop them and focus on their long-term sustainability. With their leadership in place, the centres are now looking to attract post-doctoral students, junior principal investigators and others.

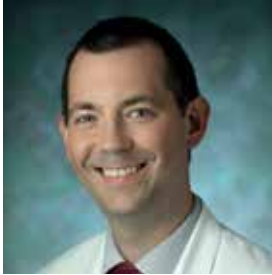
A key feature of the programme is the need for links with Polish and European society. Over the next five years therefore Maria will be looking at how the centres can collaborate with business and build the infrastructure and support systems needed to commercialise and internationalise science better in Poland.

Maria, who did her PhD in Earth Sciences and is married to fellow Gates Cambridge Scholar Jakub Szamalek [2009], says that one of the main highlights of her last three years has been participating in meetings with international scientists. "It has been thrilling and intellectually invigorating. It's a bit like being at Cambridge again," she says.

Sight saving pioneer

Tom Johnson

2006, United States, PhD Brain Repair



When Tom Johnson was a medical student, he built a community organisation that provides free vision screenings and guaranteed follow-up medical and surgical care to people with little or no resources. That organisation, the Student Sight Savers Programme, has served hundreds of people over the

past six years. Tom's contribution was recognised when he was selected as the 2018 recipient of the Reverend Melvin B Tuggle Community Excellence Award.

Tom [2006] developed the programme with Professor Harry Quigley in 2012, soon after completing his PhD at the University of Cambridge and spurred in part by Gates Cambridge's commitment to social leadership.

Tom recruited fellow medical students and trained them to conduct vision screenings. He partnered with community organisations to identify areas of need, and identified several experienced clinical ophthalmologists to supervise screenings. The work helps address the preventable causes of blindness.

Later this year Tom, who is now a Glaucoma Fellow at the Wilmer Eye Institute in the Johns Hopkins School of Medicine, will become the organisation's primary faculty mentor.

Tom first became involved in student health activism as a biology and neuroscience undergraduate at Northwestern University where he was one of the founding members of GlobeMed, a network of student organisations which sends unused medical supplies to developing nations.

After graduating, Tom spent a year working with Professor Carl Camras, a renowned glaucomatologist. Camras is best known for having discovered the most effective medication currently available for treating glaucoma.

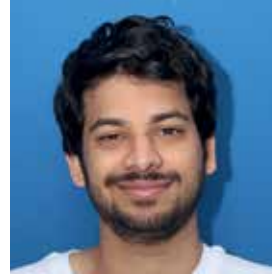
Camras inspired Tom to delay medical school to pursue research at Cambridge on the potential of stem cell transplantation for the treatment of glaucoma. A year into his PhD Tom joined the National Institutes of Health Oxford-Cambridge programme. After Cambridge he completed his medical training at Johns Hopkins University and then specialised in ophthalmology and the medical and surgical management of glaucoma.

In July he qualifies as a glaucoma specialist and neuroscientist and will be co-directing the new Optic Nerve Regeneration Initiative at JHU.

Computer science visionary

Riaz Moola

2014, South Africa, MPhil Advanced Computer Science



Riaz Moola launched his edtech start-up while he was an undergraduate student in South Africa and grew it during his time at the University of Cambridge.

HyperionDev has since got funding from organisations ranging from Google to the South African Department

of Science & Technology, won Facebook's top award for innovation in education in Africa, scaled to reach over 40 countries and partnered with a number of international and local organisations, including the British Computing Society.

In the last year the start-up has raised the funds needed to expand its coding education mission into code review and has rebranded as CoGrammar.

Riaz [2014] did his MPhil in Advanced Computer Science at Cambridge and says the Judge Business School helped to incubate his HyperionDev in its early days and increase its international reach. The motivation for setting it up stemmed directly from witnessing the depressing dropout rates in South African universities in Computer Science degrees. "With an average failure rate of 88%, I couldn't see South Africa meeting its tech demands and I wanted to change that," says Riaz.

Inspired by MOOC platforms, Riaz created an online course platform adapted to Africa which paired tutors with students trying to learn programming through a low-bandwidth, text-based resource. His initial aim was to lead a national initiative to revolutionise the fields of Computer Science and software development in South Africa through an online coding bootcamp based in South Africa. The HyperionDev bootcamps enable online students to have the skills to work in software development in under six months.

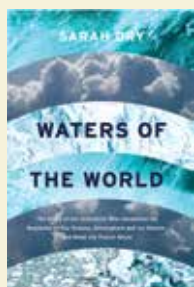
Since those days, Riaz's vision has broadened. CoGrammar sources, trains and integrates expert code reviewers into global coding bootcamp education programmes at an affordable cost. Riaz's ambition is to set the global standard for code review.

He states: "We feel that CoGrammar is uniquely positioned to become a global engine for coding education and code review, supporting millions of aspiring developers in bridging the tech skills gap. When it comes to technology education, I believe African start-ups have the edge in understanding the constraints and thinking of innovative methods of working around them."

PROFESSIONAL UPDATES

Scholars and alumni from across the community share their professional activities and accomplishments.

2003



Sarah Dry (United States, PhD History & Philosophy of Science) published her new book entitled *Waters of the World: The Story of the Scientists Who Unraveled the Mysteries of*

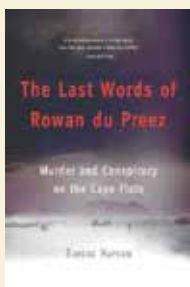
the Oceans, Atmosphere and Ice Sheets and Made the Planet Whole (University of Chicago Press/Scribe). This work covers a 150-year history of how scientists have studied water on Earth, from the glaciers of the Swiss Alps to the deep currents of the North Atlantic to the towering cumulus clouds that help drive the general atmospheric circulation.

2006

Justin Bangs (United States, MPhil Social Environmental Development) is now the Director of Student Life at West Catholic Prep in Philadelphia, PA, USA.

Pradipta Biswas (India, PhD Computer Science) was awarded the AI for Accessibility (AI4A) Grant from Microsoft.

2009



Simone Haysom (South Africa, MPhil Environment, Society and Development)'s first book, *The Last Words of Rowan Du Preez: Murder Conspiracy on the Cape Flats*, published in 2018,

was selected as one of Quartz Africa's top books from Africa in 2018. This non-fiction work provides a crime account of a murder trial that exposed and encapsulated the systemic problems in South Africa's criminal justice system.



Jakub Szamalek (Poland, PhD Classics) published a bestselling book in Poland entitled, *Cokolwiek Wybierzesz* [Whatever you choose], a thriller novel on cybercrime.

His novel has provoked a great deal of discussion about the use of the Internet in Poland, and there has been talk of it being turned into a film.

2011



Tara Cookson (Canada, PhD Geography) was awarded the American Association of Geographers' Globe Book Award for Public Understanding of

Geography for her book *Unjust Conditions: Women's Work and the Hidden Cost of Cash Transfer Programs*, published by the University of California Press.

2012

Erin Kara (MPhil, PhD Astronomy) will be starting a tenure track position at MIT. She recently published her second article in *Nature*, called "The corona contracts in a new black hole transient" (Kara et al., 2019).

Rebecca Berrens (Germany, PhD Biological Science) was awarded the Sir Henry Wellcome Fellowship. This fellowship will allow Rebecca to work across disciplines in laboratories with complementary experimental and theoretical expertise. The academic and financial independence of the scheme will help her focus on the research question she has identified while benefiting from the support of her mentors. Through the long-term financial support, the Fellowship provides a platform for tackling ambitious research questions that involve risk but promise high gain. Most significantly, this Fellowship will provide the intellectual and practical framework needed for Rebecca to achieve her long-term goal of establishing a UK-based interdisciplinary research group focused on disentangling the role of TEs in cell fate decisions.

Mona Jebril (Palestinian, PhD Education) was awarded a Research Fellow position at Cambridge Judge Business School, working on a Global Challenge Research Fund Project which investigates health in conflict-affected areas in the MENA Region. Mona has also been elected by the Governing Body at Queens' College, University of Cambridge, as a supernumerary Post Doctoral Research Associate (Q-PDRA). Mona was also invited by Cambridge Center for Science and Policy to join their Network of Evidence and Expertise.

2014

Michelle Teplensky (United States, PhD Chemical Engineering) is now working as a International Institute of Nanotechnology (IIN) Post-doctoral Fellow at Northwestern University in Illinois, USA, on novel cancer immunotherapies using cutting-edge developments in nanotechnology.

Victoria Herrmann (United States, PhD Polar Studies at Scott Polar Institute), President and Managing Director of The Arctic Institute think tank, has been named in Apolitical's World's 100 Most Influential People in Climate Policy for 2019.

2015

Jocelyn Perry (United States, MPhil International Relations and Politics) has started a new position in the University of Pennsylvania's Perry World House, a new hub for global policy engagement which brings academic research and knowledge to bear on the world's most pressing policy challenges. Jocelyn manages the Global Shifts: Migration, Urbanization, and Demography research theme. They work on research and policy related to all forms of human movement and changes – from climate-induced migration and refugee policy to urban sustainable development and changes to global family demographics. See <https://global.upenn.edu/perryworldhouse/person/jocelyn-perry>.

Margaret Comer (United States, PhD Archaeology) has begun work as a Research Assistant on "Sites at Risk: Guidelines for Best Practices", a project funded by the International Holocaust Remembrance Alliance that aims to create guidelines that will preserve and protect Holocaust sites at risk from various factors, including development, climate change, and political opposition. Ideally, in a few years, the finished guidelines will be adopted by IHRA's member countries as part of national legislation and regulations.

Asiya Islam (India, PhD Sociology) was awarded a Junior Research Fellowship at Newnham College, University of Cambridge.

Carlos Adolfo Gonzalez Sierra

(Dominican Republic, MPhil Latin American Studies) recently became an Associate Director of ACLAMO Family Centers, a nonprofit organization that provides social services, educational programs, and health education to Latinos and other low-income residents in Norristown and Pottstown, Pennsylvania, USA.

Chioma Ngonadi (Nigeria, PhD Archaeology) was featured in the *Cambridge Alumni Magazine* (CAM) issue 86, Lent 2019, discussing the diet and the lives of people in Nigeria around 2000 BC. She also participated in the Soapbox Science Outreach Event, a grassroots science outreach organisation that brings cutting edge research onto urban streets while also promoting the visibility of women in science.

Marcus Colla (Australia, PhD History) was awarded the Royal History Society's Alexander Prize for 2018, for his article 'Prussian Palimpsests: Historic Architecture & Urban Spaces in East Germany, 1945–1961' published in *Central European History*.

Aleksandr Montelli (Russian Federation, PhD Polar Studies) was awarded the Schmidt Science Fellowship, administered by the Rhodes Trust.

2016

Leor Zmigrod (Netherlands, PhD Psychology) was awarded a Junior Research Fellowship by Churchill College, University of Cambridge. Leor was also recently invited to write an article ("Brexit psychology: cognitive styles and their relationship to nationalistic attitudes") about her research for LSE British Politics and Policy.

Krittika D'Silva (Canada, PhD Computer Science) published an article entitled, "The Role of Urban Mobility in Retail Business Survival" as the first author in the *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*.

Andre Holzer (Germany, PhD Plant Sciences) has been awarded one of only five Frank Smart Studentships for 2018–2019 to support his research on algal molecular genetics.

2017

Benedek Kruchió (Hungary, PhD Classics) has published an article entitled, 'The Dynamics of Summing Up: A Metaliterary Reading of Heliodorus 10,36 and 10,39' in *Re-Wiring the Ancient Novel Volume 1: Greek Novels*.

Amarynth Sichel (United States, MPhil Planning, Growth, and Regeneration) is working on a research project funded by the Centre for Digital Britain, exploring barriers to and opportunities for using information modelling in urban planning (www.planningfuturecities.org).

Andrea Kusec (Canada, PhD Biological Science at the MRC Cognition and Brain Sciences Unit) has published two articles entitled, "Psychometric properties of measures of motivation and engagement after acquired brain injury" in *Rehabilitation Psychology* and "Motivation in rehabilitation and acquired brain injury: Can theory help us understand it?" in *Disability and Rehabilitation*.

Ria Roy (Republic of Korea, PhD Faculty of Asian and Middle Eastern Studies) has been awarded the Aoi Global Research Award for her fieldwork in Japan on "A transnational intellectual history: the afterlife of empire and the emergence of the notion of sacred kingship in modern East Asia through a study of North Korea, 1945–1985".

2018

Ramit Debnath (India, PhD Urban Science) has published an article entitled, "Evolution of sustainable energy policies in India since 1947: A review" in *WIREs Energy Environ*.



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