SYDNEY ALUMNI MAGAZINE

ISSUE 5 — SEMESTER TWO 2017

SAM

THE UNIVERSITY OF SYDNEY

THE DANGEROUS WAR ON TRUTH

WELCOMING THE NEW JACARANDA

A NEW APPROACH TO AUTISM

THE MYSTERIOUS CLOUDS OF SATURN

How our bees might get stung

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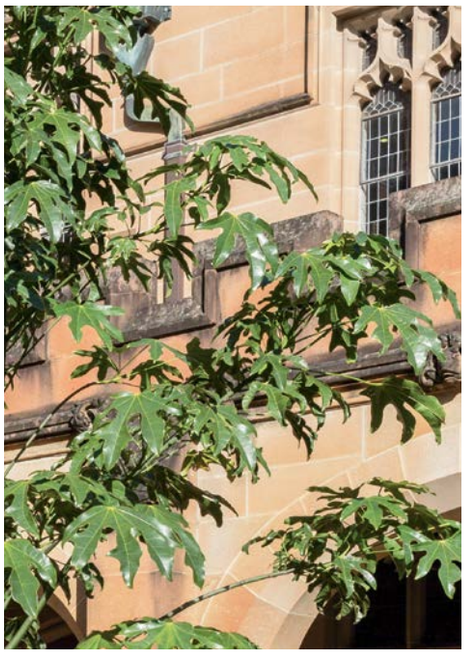

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Produced by
Marketing and Communications
The University of Sydney
Printing managed
by Publish Partners

Cover: Professor Ben Oldroyd and an *Apis mellifera*. Photo: Stefanie Zingsheim.
Inside cover: MacLaurin Hall with women students, 1916
Photo supplied by the University of Sydney Archives G3_224_0834

Inside back cover: MacLaurin Hall, 2017. Anderson Stuart Building on right. (Drone photo)

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17/6602 ISSN 1834-3929

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The awards celebrate the exceptional achievements of alumni who have established careers, and those who are just getting started.

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Make your nomination now

Please note: Alumni Award nominations close on 27 November 2017.
Alumni Council nominations close on 1 December 2017.

WHY WE MUST LEARN TO UNLEARN

Everybody understands that a university is all about learning. Less often spoken about, though, is the importance of a complementary activity – 'unlearning': the process of questioning everything that was thought to be true.

By definition, the creation of new knowledge means that old knowledge must be reassessed. In 1970, futurist Alvin Toffler referenced the idea that "the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn".

It is through this process of unlearning that the real breakthroughs often happen. Take nanoscience, for instance, where our researchers have had to unlearn so many apparent 'facts' about the way matter behaves, to harness the power of the quantum world.

We at the University of Sydney are committed to both learning *and* unlearning: that is why we have reimagined our undergraduate curriculum, so that our students are better prepared for a changing world.

Still at the heart of this curriculum is depth of disciplinary excellence, the critical thinking skills so essential to unlearning, and the communication skills to argue convincingly for new ways of thinking.

These skills will be matched with a capacity to work in multidisciplinary ways, bringing together different expertise and ways of thinking to make discoveries and forge new insights. As a capstone experience, students will be involved in an extended team project with a civil society organisation or company in which they will need to bring those skills to bear on a real-world problem, learning and unlearning in context.

We want our students to build the integrity, confidence and resilience to manage challenge and uncertainty. We want them to be able to work across cultural boundaries and become influential people so they can make a positive contribution to society.

A tall order? Perhaps. It's certainly ambitious. But if Toffler is right, and we believe he is, we have a duty to our students to make sure not only that they learn, but that they can also unlearn and relearn, so they can fulfil their potential and lead productive and meaningful lives.

▲ Belinda Hutchinson AM (BEc '76), Chancellor

▲ Dr Michael Spence AC (BA '85 LLB '87), Vice-Chancellor and Principal

SLEEP PATTERNS

Should employers be aware of how their staff members sleep? The answer is yes, according to University of Sydney Business School research.

Researcher Dr Stefan Volk says the innate circadian rhythms in all of us not only decide whether we are day or night people, but also how our energy levels peak and trough during the day.

"We looked at how different circadian rhythms in a team affect the performance of that team," Dr Volk says.

The findings suggest that a surgical team should have matching circadian rhythms so they are at peak performance simultaneously. However, on long-haul flights, the crew should have different patterns, so one is always fully engaged.

Throughout our lives we're taught important lessons. We learn how to talk, to write, even how to behave. But there's one important lesson most of us never get – a lesson in unlearning. It's only by challenging the established, questioning the accepted and being brave enough to break down old rules, that we can write new ones. That's why we've been doing some unlearning of our own. We've reimagined the way we teach, so our students can reimagine the world.

a lesson in unlearning.

See how we're changing education at sydney.edu.au/unlearn

THE UNIVERSITY OF SYDNEY

Leadership for good starts here

CRICOS 00026A

CLIMATE

A DRY ARGUMENT

Why would koalas leave the safety of the trees during the day? As surprising video footage has shown, it is to search for water.

It's known that koalas get the moisture they need from the leaves they eat. But what if more intense droughts mean leaves are drier? Cameras set up by a team of University researchers to observe a koala population in Gunnedah found the answer is thirsty koalas.

According to postdoctoral researcher Dr Valentina Mella (PhD(Research) '14), the results are concerning. "It is believed that koalas are particularly vulnerable to climate change because they rely exclusively on trees," she says.

Koalas are already listed as vulnerable in both national and state legislation.

Learn more and watch the video at sydney.edu.au
Search for 'koalas driven to drink'

CULTURE

HIGH PRAISE

There's no better excuse to go to Wales than winning the prestigious International Dylan Thomas Prize, one of the world's richest prizes for young writers.

Creative writing lecturer, Dr Fiona McFarlane (BA(Hons) '01), picked up the award after her second book, *The High Places*, impressed the judges. They said the collection of 134 short stories showed mastery of the form.

Apparently, there was intense debate among the judges about the six books on the shortlist, but *The High Places* became the unanimous choice.

McFarlane is no stranger to writing awards, with her debut novel, *The Night Guest*, winning the Voss Literary Prize and a NSW Premier's Award. It was also shortlisted for major awards including the Miles Franklin Literary Award.

ENVIRONMENT

ROOM TO MOVE

Would you power your exercise routine on sugar, salt and caffeine? If you drink most sports drinks, you already do.

Professor Fariba Dehghani and her team at the School of Chemical and Biomolecular Engineering are working to change that by developing a mushroom-derived sports drink.

Mushrooms are healthy, with potassium, phosphorus, magnesium, and the only non-animal vitamin D, but a mass-produced mushroom sports drink would have an environmental benefit as well.

There is currently a massive amount of mushroom waste in the world, with 80 percent of mushrooms being thrown away because they don't look perfect. Future athletes could drink away some of the landfill.

PARTNERSHIP

At the launch of the 'Travel health and wellbeing' partnership, clockwise from top left: restaurateur Neil Perry, Qantas CEO Alan Joyce, Professor Stephen Simpson AC and Vice-Chancellor Dr Michael Spence AC.

UP, UP IN A BETTER WAY

Australians tolerate long-haul flights that reduce most other nationalities to tears. But the University's Charles Perkins Centre and Qantas are now collaborating to minimise the in-flight ordeal.

Ahead of the introduction of the Boeing Dreamliner later this year, a multidisciplinary team from the centre will research on-board exercise and movement, menu design and service timing, the cabin environment and ways to reduce jetlag. Some project data will be collected by passengers wearing technology that can track biorhythms and other information.

At the project launch, the Director of the Charles Perkins Centre, Professor Stephen Simpson, said: "There is the potential for extraordinary health, science and engineering discoveries and innovations to come out of this research partnership."

Photography by Bill Green, Louise Cooper and Verity Leatherdale

Top left: On a sunny Saturday, hundreds of people visited the University for a new-tree celebration.

Middle left: They were engaged under the old tree, so Laura Dalton (BA '08 BSW '10) and Dr David Wood (BE '05 PhD '11) brought their two children to welcome the new trees.

Bottom left: The 150 guests at the official ceremony included descendants of Eben Waterhouse, the professor who planted the original jacaranda in 1928.

Main photo: The new jacaranda in its new home.

Bottom right: At the official ceremony, there was a performance by youth dance company the Jannawi Dance Clan.

TREE'S COMPANY

The famous jacaranda that once graced the Quadrangle has been replaced by a clone of itself. The new version of the jacaranda will now share the Quad with a native Illawarra flame tree.

▲ An artist's impression of how the new jacaranda and Illawarra flame tree will one day look together

On the chilly evening of 20 July this year, a team of tree planters moved into the Quadrangle with trucks and earth-moving equipment. They were there to begin a new chapter in the University's history, by planting a jacaranda sapling in the place where the previous and iconic tree had been.

Though it's a clone, some things for the new tree are different. The previous tree had stood for most of its 88 years, magnificent but alone. The new one has the company of a native Illawarra flame tree, planted in the opposite corner.

The flame tree was chosen to acknowledge that the University is built on the lands of Australia's first peoples who have taught and learned there for tens of thousands of years.

"A lot of preparation works took place prior to planting; soil and drainage improvements," says Mark Moeller, the University's landscape and grounds manager. "It was a relief to finally see them both in the ground."

The next day, under a pristine winter sky, preparations began for two days of official and community events to welcome the new trees. More than 1000 staff, students and alumni came to the Quadrangle to relax, play lawn games and see the three-year-old trees in what should be their home for the next 100 years.

The trees, which both currently stand at around 4.5m high, are expected to take a couple of years to settle in.

"I would hope to see them both double in size in the next three to four years," Moeller says.

Since the trees usually flower at the same time, the day will come when the lush purple of the jacaranda and the intense red of the flame tree will provide a stunning backdrop for countless graduation photos.

Moeller is proud to have been part of the planting. "A few of us who planted them have small children, and we did comment how one day we hope to tell our kids when they graduate: 'I helped plant those trees'."

YOU'RE INVITED

You can visit the new trees at the University any time. And to ensure you're invited to future events, update your contact details at alumni.sydney.edu.au/updatedetails

A world without bees is a world without oranges, carrots, apples, broccoli, grapes, coffee and many other food staples. Bees are fundamental building blocks of our food security. They are also under threat.

Hive of activity

Written by Jocelyn Prasad
Photography by Stefanie Zingsheim

Of the 1500 species of bees living in Australia, we rely on just one to make our honey.

Western honey bees (*Apis mellifera*) first arrived here in 1822 on the ship *Isabella*. They took to their new home like wildfire, with large, feral populations established just 10 years after that first arrival. Today, Australia's agricultural prosperity largely depends on both feral and domestic honey bees.

"It was a deliberate introduction and very successful," says Professor Ben Oldroyd (BScAgr '81 PhD (Agriculture) '86 DSc '07) from the School of Life and Environmental Sciences who, with Professor Madeleine Beekman, co-founded the University's Social Insects Lab in 2001. The lab focuses on bees, and examines how we can ensure Australia's bee population continues to thrive in the face of global threats.

The Western honey bee's feral population is largely responsible for the pollination of crops such as apples and pears, says Oldroyd. Other agricultural crops rely on Australia's estimated 500,000 commercial bee colonies, including the rapidly growing almond industry – worth $1 billion in 2015 according to the Australian Nut Industry Council. "It's because almonds flower in August in Australia, when there are no wild bees about. So almond farmers have to buy or rent bee colonies," Oldroyd points out.

▲ Sitting among some of the University beehives, Professor Madeleine Beekman works to understand imminent threats to local bees.

Image on page 9: There are 20 honey beehives and 10 native stingless beehives on campus, all overseen by Professor Ben Oldroyd.

He thinks the almond industry alone will demand another 100,000 colonies over the next four years; meaning that nearly all of the existing hives in NSW, Victoria and South Australia will need to be involved in almond pollination, or new players must join the industry.

The global bee population has seen a significant drop in the last decade, as colonies collapsed in Europe and the United States. A third of the world's food comes from crops requiring, or benefiting from, insect pollination, so the crash is reason for concern.

Australia has mercifully been spared from the phenomenon, dubbed Colony Collapse Disorder, but threats to local bees loom large.

The causes of plummeting bee numbers are moot. Beekman says claims that the major bee killer is neonicotinoid pesticides – which are chemically related to nicotine, and more toxic to insects than birds and mammals – are exaggerated. In Australia, she adds, bees are more reliant for pollen on native bush such as eucalyptus, so are less exposed to neonicotinoids used in commercial crops.

"The biggest threat to the wild bees all over the world is destruction of habitat. We're destroying their floral resources, we're destroying the potential for them to nest, and that really is the biggest issue."

Of greater concern to Australian beekeepers and horticulturists is the potentially devastating threat posed by the Varroa mite. Varroa is an ecoparasite, but its blood-sucking habits aren't so much of a problem as the fatal viruses it spreads. In particular, the deformed wing virus has wreaked havoc on honey bees in New Zealand, North America, the Middle East and Europe.

By dint of good fortune and a rigorous biosecurity effort, Varroa is yet to take hold in Australia, so the country's bee population remains in pretty good shape. But when it arrives (an inevitability, says Beekman) we'll be in trouble; a field trial conducted by Oldroyd some years ago found that, unlike some international populations, Australia's honey bees have no resistance to Varroa.

What should we do when Varroa comes to town? The best ecological solution would be to do nothing and allow our bees to gradually develop an immunity to the mite and its virus, say Oldroyd and Beekman. But this solution would destroy bee-reliant food crops and honey producers.

Beekman spends a lot of time studying Varroa in South Africa, where the mite hasn't infected local bees with the virus. There (and in South America),

Varroa is prevalent but the virus has not occurred. Elsewhere, there are populations that have developed resistance to the virus. “We also know of populations that carry the mite *and* the virus and the bees are quite happy,” says Beekman.

Such a result takes time though. “If your livelihood depends on having bees, you’re not going to be happy with this suggestion because it means, for a few years, you won’t have enough bees.”

One answer could be vaccinations. Work by Dr Emily Remnant, from the Social Insect Lab, to immunise bees against the virus, won her top honours at this year’s Science and Innovation Awards for Young People in Agriculture. Developing pesticides targeting the mite is another solution, as is importing Varroa-resistant honey bees from the United States.

Unfortunately, many honey bees in the US are the notoriously dangerous ‘Africanised’ honey bees, which are European bees crossed with an African bee strain. The aim was to produce a bee that produced honey more easily in tropical climates, but the resultant bees are also much more aggressive. Obviously, Australian beekeepers don’t want a bar of them.

“The biggest threat to the wild bees all over the world is destruction of habitat.”

— Professor Madeleine Beekman

Dr Nadine Chapman (BA ’05 BSc (Hons) ’05 PhD ’10), also in the Social Insects Lab, has developed a genetic test to prevent these bees from entering the country.

For now, our honey bees thrive, but it’s not something we can take for granted. Oldroyd and colleague Dr Tanya Latty’s research includes investigating the density of wild honey bees across Australia’s cropping areas.

“We put up a helium balloon with a pheromone lure that smells exactly like the queen bee and we suspend it in the air,” says Oldroyd. “The males find it irresistible and go into traps that are also suspended beneath the balloon. We can get several hundred drones in a few minutes.”

Oldroyd and Latty use this technique to estimate how many colonies live in the surrounding area and whether they are sufficient to pollinate local crops. Oldroyd lets his third-year students conduct similar pheromone-trapping experiments on Oval No. 1 at the University. “They love it,” he says.

Across the board, Oldroyd says there is a growing interest in urban beekeeping. He was heartened to see a lot of young hipsters “getting into bees” at a recent NSW Beekeepers’ Association Conference.

“They’ll probably have to shave their beards off pretty quickly because bees get stuck in them. But it’s all good.”

As beekeeping becomes an urban pastime, the long-term health and economic viability of the wider Australian bee population is being enhanced by the work of University researchers.

THE BUZZ ABOUT BEEKEEPING IN SOUTHEAST ASIA

Our influence on beekeeping spreads beyond Australia’s borders. Some of the University’s agriculture and environment researchers are teaching the basics of beekeeping in Southeast Asian universities. The courses aim to help local communities expand their farming industries and protect vital bee populations from extinction.

Find out more at sydney.edu.au Search for ‘beekeeping plan bee’

▶ Students catch bee drones at the University, using pheromones. Photograph by Ben Oldroyd.

DAVID McGONIGAL

David McGonigal (BA ’71 LLB ’75) loves Antarctica, and his generous donation to Indigenous scholarships from that chilly location means the University has now received donations from every continent on Earth. After graduating, David worked in insurance law long enough to save for a four-year round-the-world motorbike trip. This led him to travel writing, and his role for the last 16 years as an Antarctic Expedition Leader. He has favourite things everywhere.

Photos supplied

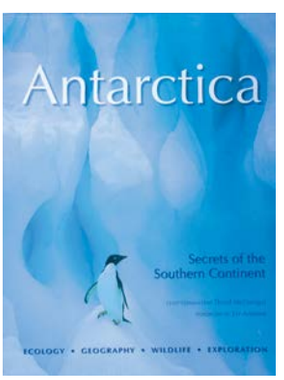
MY FAVOURITE

ANIMAL

Of course it’s penguins. More specifically, the endlessly cute Adelie penguins with their monochromatic feathers, mad eyes, pink feet and flat heads.

CONTINENT

That’s Antarctica, of course. I first wrote to the Australian Antarctic Division when I was at the University of Sydney but didn’t get there until almost 30 years later. It’s a place of endless space and beauty where humans are irrelevant. There’s also the history. I studied in the Edgeworth David Geology Building so it was a special thrill to walk in the footsteps of the professor and Sir Douglas Mawson on the shores of the Ross Sea.



◀ One of the books about Antarctica co-authored by David.

ROAD TRIP

I rode around the world again 20 years after my first trip, aiming to ride through all 24 time zones. On that expedition I was the first person to ride a motorcycle on all seven continents. It covered the world, from Vladivostok to Morocco, and it's still pure joy to hit the road, feeling the wind, yet locked away with my thoughts inside my helmet.

PLACE

South Georgia Island resembles a slice of the European Alps dropped in the South Atlantic Ocean. It is crowded with penguins, seals and nesting albatross and has an abundance that is hard to describe. Standing on Salisbury Plain or Gold Harbour and looking across a vista of tens of thousands of king penguins is awe inspiring.

ENCOUNTER

I was transferring new passengers by Zodiac from a dock in Greenland around 2002 and recognised a passenger as the now-retired Associate Professor Bob Young, who had been my inspirational geography tutor in first-year geography. He still has the ability to make rocks come alive and I learned a lot about the landscape on that voyage.

ACTIVITY

On the road it's photography and capturing the moment. At home it's using the mental discipline I developed in arts and law to endeavour to write articles that both capture place and inspire others to visit.

People are usually happy if a photograph catches a nice smile or a beautiful landscape. Fabian Muir wants his photographs to capture a lot more, and he travels to some of the world's most ostracised countries to take them.

Prism of perception

Written by Rebekah Hayden
Photography by Fabian Muir

◀ Part of the *Urban Burqa* (2017) series. Muir created the images to stimulate discussion around immigration and assimilation.

Looking at the big picture – literally – is what drives photographer Fabian Muir (LLB '91).

Muir's work is a journey into the unexpected. From the stark black-and-white shots of his Sydney series *Emerge* to his humanist treatments of "outsider" countries such as North Korea and Iran, disrupting traditional narratives about place and people is a key feature of his work.

Muir himself is sincere, funny, genuinely interested in people and, at times, delightfully cynical. We don't get to meet, but he talks on the phone from his apartment in inner Sydney's Paddington, where his mobile surprisingly sputters in and out of reception. His voice is warm, and the conversation is littered with jokes. He is not a hard subject to interview.

Muir grew up in a family heavily embedded in the arts scene; his mother, Elke Neidhardt, was an actress and opera director; his father, Christopher Muir, a documentary film director and head of drama at the ABC; while Norman Kaye, his stepfather, was an actor and musician. Surrounded by art and discussions on literature, theatre and art-house film, it was perhaps inevitable that he would follow a creative path, though for a teenage Muir, the last thing he wanted to do was follow in his parents' footsteps.

Muir explains: "If my parents had been lawyers I might have said I want to be a filmmaker or an actor or something like that. But they had pre-empted me, so I thought right, I'm going to become a lawyer."

While studying law, writing work with publishing house Studio Magazines led to a job offer as the Spanish correspondent for their newly launched photography publication, *Black & White*. Reviewing photography and photographers helped him develop a visual aesthetic and

▼ Muir says life in North Korea is not what we might think from media reports. This was taken in the playroom of a provincial orphanage.

an internal philosophy that would serve him well when he finally took the plunge to leave law after several years in practice. Being completely self taught as a photographer, it was a leap that took courage.

As it turned out, Muir's law studies have also played a role in his work as a photographer, "Studying law gives you a forensic approach," he says. "It also helps you find some kind of 'objective truth' in your subject matter."

This is expressed in his fondness for exploring human nature within complex political backdrops, which has led him to Iran, Cuba, North Korea and 15 former Soviet countries. After many years living in Berlin, he now spends six months of the year in Sydney with the rest of the time working on his continuing projects overseas, where he has found that speaking a number of languages (German, French, Spanish and "terrible" Russian) helps greatly. He believes being multilingual is invaluable for photographers.

Anticipating potential situations forms a big part of his photographic process, and he often waits long periods for the right elements to emerge. This measured process was challenged when he went to North Korea, and had to take photos in the constant company of minder-guides. In typical Muir fashion, he is expansive towards his guides.

"They're constrained by the rules as much as you are. I tend to be less harsh on minders than other people – certainly there are journalists who see them simply as this impediment and forget that they're human beings as well. If you can establish a good rapport with them, they'll help you as much as they can."

▼ Muir's series taken in Iran shows how different the lives of Iranian men are compared to women.

◀ Top left: From the *Blue Burqa in a Sunburnt Country* (2014) series. Muir knows these images present more questions than answers, but he also wants them to give hope.

◀ Bottom left: The Mansudae Grand Monument in Pyongyang is where North Koreans can pay their respects.

▶ Right: Kindergarten shows are regular events in North Korea and taken very seriously. Fabian Muir, bottom right.

On his first visit to North Korea in 2014, he was surprised to discover a complexity he had not expected. "It was the things that ran counter to the established narratives that surprised me the most," he says. "Children playing and laughing and coming up pinching you and that sort of thing. I thought – that's really worth exploring ... It's an incredibly layered place. It's too simplistic to just sit back and rely on the clichés."

He is cynical about tourists who say they've risked their lives to smuggle pictures out of North Korea. In his experience it is what you bring into the country that the authorities are interested in – his pictures get checked on entry, not on exit.

One of his most challenging assignments was in Abkhazia in 2008 when the Russo-Georgia war broke out. Despite his vulnerability taking photographs in a country at war, the Russians were remarkably tolerant. There is the sense he is able to defuse tough situations by sheer virtue of his amiability. When I put this to him, he laughs.

"I'm not trying to particularly charm anyone or manipulate them, but I'm just completely normal. I would talk to a North Korean minder in exactly the same way I'm talking to you now. You know, throw in some jokes – not in an attempt to soften them up, but just because it's my nature to throw in some jokes."

In a similar way, Muir's work aims to bring out the best in the viewer. Nothing sums up this approach more aptly than the series *Blue Burqa in a Sunburnt Country* (2014), which sets a woman in the distinctive blue of an Afghani burqa within central Australia. The work emerged out of the tense political landscape in Australia regarding its treatment of refugees.

"I wanted to put together an artistic visual response to this, over and above the kinds of articles appearing in the newspapers," he says. "I really do believe in the power of an image to have an instant impact that is more visceral and longer lasting than even the most eloquently put together article."

He developed the series further this year with *Urban Burqa* (2017). In the final image (shown on page 14-15), striking visual compositions that play strongly on angle and colour are put into juxtaposition – the shadow of a skater reaching out to the woman in a gesture of solidarity. Much like the man himself, the image suggests and provokes fundamental questions of humanity and the value of benevolence.

A WIDER VIEW

You can see more of Fabian Muir's work or buy his images on his website www.fabianmuir.com

Opening up the human genome presents previously unimagined possibilities for understanding and treating a huge range of conditions. For one pioneering researcher, it offers the possibility of restoring sight.

Seeing a way forward

Written by Sian Powell
Photography by Sarah Rhodes (BA ’96 MPub ’09)

Dr Robyn Jamieson (PhD(Medicine) ’98) first became interested in the possibilities of medical advances in genetics early in her career, long before the human genome was fully sequenced.

“A lot of the diseases back then, you couldn’t get to the fundamental answer,” she remembers. “We were just treating symptoms – we didn’t really understand what was causing them.”

Now, of course, the science of genomics is rocketing ahead at an astounding speed. Jamieson’s work has been concentrated on the eye and it has led to significant advances in the treatment of certain debilitating genetic eye conditions.

One focus of Jamieson’s work is the White family from Sydney’s north-west. Beth White and her three children all have an extremely rare genetic eye condition – so rare, it doesn’t yet have a name, which has left Beth blind, and the children – Kathryn 15, Samuel 13, and Matthew 10 – with progressively deteriorating vision.

They share a defective gene that Jamieson and her team managed to isolate from billions of possibles.

“What’s been really amazing has been the whole next generation sequencing revolution,” she says. “A lot of the patients we were seeing had many, many possible underlying disease genes. It was impossible with the

previous technology to get answers. It wasn't fast enough, and it was too costly."

Identifying the gene is only a first step. Now a treatment must be designed. But the Whites themselves are very aware of what a big first step this is. "They had said 'don't get excited, they may never find it'. It's that hard," Beth White said. "They found it in five months. That's huge."

David White – Beth's husband – adds: "There are some groups that have spent five years, 10 years and mega-millions and never got anywhere near the traction that's been built up, which is really only over a few years."

Genetic diagnosis via sequencing has opened the door to a whole new realm. At the same time the advent of gene-editing technologies such as CRISPR, which can add, remove, or alter DNA within a cell, has expanded that realm even further. Yet finding a way to harness gene therapy to cure these rare diseases requires yet more scientific advances – to find both a suitable therapy and method of delivery.

With her team, Jamieson, who is Professor of Genomic Medicine and the Head of the Discipline of Genetic Medicine at the University of Sydney Medical School, has recorded significant breakthroughs, providing some hope for families dealing with congenital diseases.

Originally from western Queensland, Jamieson studied widely, including postdoctoral research work in Britain on genomics and disease gene analysis. She returned to Australia to set up her own research group that would do clinical work with patients and, simultaneously, undertake lab work to accelerate the genetic research. Her ideas were in advance of their time and some scientists then were actually doubtful of the benefits of combining genetic research with clinical studies.

"To me, this sort of work and being at this point is just amazing. But it's such a delicate balance in giving people hope."

– Dr Robyn Jamieson

◀ In her lab, Dr Jamieson is working at the forefront of what's happening in genomics.

▲ The White family (from left): Samuel, David, Beth, Kathryn and Matthew, with their dog.

▲ The research is painstaking, but every step forward could have profound benefits.

Bursting with energy and sheer intellect, Jamieson is also extremely compassionate; concerned about her patients and their relatives, and always worried that scientific advances won't live up to their hopes and expectations. Still, she knows her work has tremendous potential.

The condition affecting the Whites has now been recreated as a laboratory model at the Children's Medical Research Institute, giving the possibility of developing a treatment.

"We have used whole genome sequencing to identify novel disease genes in several families – genes not previously known to be associated with these types of conditions," Jamieson explains. "So we've made model systems for some of those conditions and we used the CRISPR technology to model the exact mutation. This technology can also be used to determine if we can provide a cure in the model systems. And then that's proof of principle to go on to the human."

She adds that the discovery of the novel disease gene serves to help the Whites understand their condition, and later down the track it will give the children information about the exact gene change, something their parents never had. But the Holy Grail is treatment for the existing condition – either to fix it, or stop it progressing.

"To me this sort of work and being at this point is just amazing. But it's such a delicate balance in giving people hope. When you're a patient, or when you have a child with the condition, while the hope is great, you want treatment now."

Meanwhile, work is also underway to determine the best way these sorts of potential treatments can be delivered. A stem cell treatment perhaps, or a type of CRISPR fix could be injected into the eyeball as part of an attenuated virus.

"At the start of my clinical career, I was seeing people and being able to give them basically no information," she says. "We just had nothing. So much has changed. For families like the Whites, with genetic disorders, hopes are high that any number of new treatments are appearing just over the horizon."

HELP US FIND ANSWERS

To help support this groundbreaking research, please call Rachel Love on +61 2 8627 8818 or email development.fund@sydney.edu.au

ON MY DESK: JENNIFER FERNG

Dr Jennifer Ferng (GradCertEdStud ’16) is a lecturer in architecture. Her concern for refugees has led to a junior faculty fellowship at the Harvard University Asia Centre to investigate how the architecture of incarceration reflects community attitudes and can defy ethical boundaries.

Photography by Stefanie Zingsheim

◀

ROCKS

Buildings in earthquake zones have to be flexible. The Harbour Bridge is also an amazingly elastic structure. If you walk across it, you can feel the bridge move with each vehicle. As architects, we often borrow methods pioneered by other disciplines. But we need to be more on the front foot and put more of how the world behaves into our designs.

▶

CAVES

This is my favourite picture of Fingal’s Cave off the coast of Scotland. It reminds me of when I first came to Sydney and I trekked through the Jenolan Caves and saw the Three Sisters in the Blue Mountains. It was amazing to see the physical forms within these spaces, the shapes, the lighting, the textures. I think there’s a lot we can learn about where geology meets architecture.

▲

NORWEGIAN CHURCH ORNAMENT

I bought this ornament outside of Oslo, Norway, which has these wonderful wooden churches that were once all across Scandinavian Europe. Now there are only a few left. They’re such fascinating examples of European medieval architecture. I love seeing how other cultures build, and I think it’s so important to preserve these structures so we can continue to learn from them and be inspired.

▽

POSTCARD FROM TREVOR

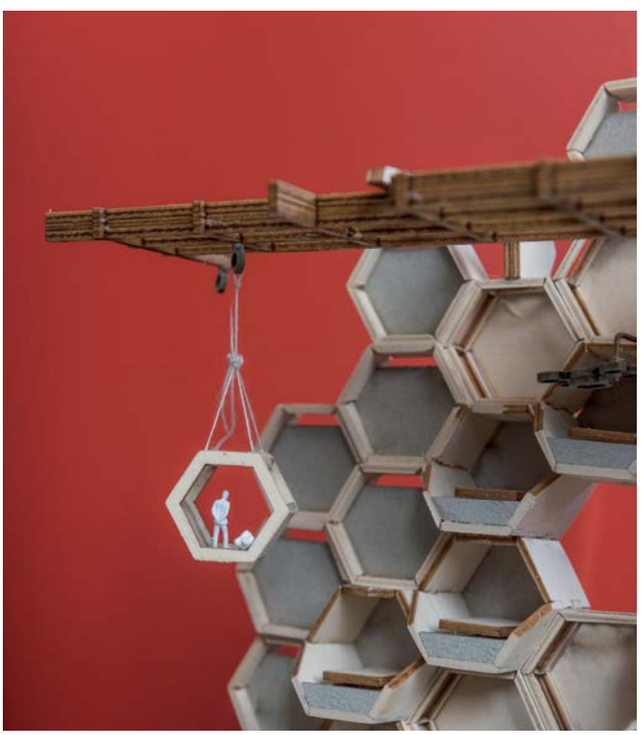
My colleague and good friend Trevor Howells sent me this postcard from the British Museum. He sadly passed away a few years ago and I love this postcard because the message on the back reminds me of who he was. He says to eat delicious yum cha with my family and "try to be good, only when they're looking". Trevor's still with me in spirit, and this postcard is such an important reminder never to forget the whimsical side of life.

MARVIN THE MARTIAN'S SIDEKICK K9

I used to draw caricatures and cartoon characters at a theme park to make money when I was in high school. People would always ask for their caricature in different scenarios like "can you draw us getting married?" or "can you draw me on the roller coaster?" I wanted to study fine arts, but my parents said "you're valedictorian, you can't go to art school".

FIRST-YEAR STUDENT MODEL

This was a model from a talented former first-year student, Agie Wiriahadi. I set a task to redesign the 'Darlo Bar', a popular pub in Sydney's Darlinghurst. It's a tricky, triangular site, so he created a capsule tower inspired by the Japanese Metabolists of the 1960s, who fused ideas about megastructures and organic systems. It has a groovy '60s vibe and I can imagine people eating space-age food in there.



RED CRABS

I bought this squishy crab toy from the only post office on Christmas Island. I remember seeing this wave of red that turned out to be a mass migration of red crabs. I'd never seen anything like it before. On the island, I also observed Australian Navy ships intercepting an asylum seeker boat. This was the catalyst for my interest in researching the architecture used in mandatory detention centres.

They were risking their lives by being there. But as Hellen Rose began to sing, they all dared hope that some progress is finally being made by the women of Afghanistan.

With one voice

Written by George Dodd
Photography Stefanie Zingsheim
and supplied by Hellen Rose

Rumours that a woman would sing for other women on International Women's Day had spread like wildfire around Jalalabad, one of the largest cities in Afghanistan. Any woman doing such a thing was risking her life, and in 80 years of prohibition, no woman had dared. Many in the city didn't believe it could happen. But this year, 2017, a woman had been asked to sing and she had agreed, fully knowing the danger.

The woman was Hellen Rose (BVArts '97 BTeach MTeach '01), a self-described "girl from the 'Gong", meaning the coastal city of Wollongong, south of Sydney. Her travels have taken her a long way from Australia into some of the world's most troubled locations, not in the way of a journalist or an aid worker – but as an artist and a teacher.

▲ Part of the audience that came to be present when an 80-year prohibition was broken. Hellen Rose is at bottom right.

Image on page 26: Through her many trips to Afghanistan, Hellen Rose has gained real insights into the lives of the local women.

Sitting outside a café in an inner suburb of Sydney, Rose has an energy that conveys she wants to make something out of every moment. She is talking about what drives her. “People think it’s a bizarre and crazy idea,” she says, smiling. “But my thing is, I want to declare education on war. I want to declare love on war.”

Singing in Jalalabad was like that; using music to help break down some of the worst oppression of women the world has seen. The most visible element is the full burqa, which Rose herself, an ardent feminist, often wears when she’s there.

It’s a suffocating, hobbling, torture implement,” Rose says. “It’s 50-degree heat and the women are wilting, with no utilities or amenities. I put the burqa on because I’m there to work, but I know I’ll take it off again. That’s not true for my sisters, students and mothers.”

Wearing a burqa, Rose arrived at the performance venue by armoured vehicle, with soldiers blocking off the streets as they went. The day before, extremists had bombed a hospital in Kabul, killing more than a hundred people, and they had threatened to do the same here to prevent the performance. Rushing from the vehicle past edgy, heavily armed soldiers, Rose quickly found herself in a very different space.

She was in a room with more than 3000 women, all there to be part of a moment that would symbolise, for all its danger, that the future for women in Afghanistan might be a little bit brighter. Might be more free. The women’s movement in Afghanistan is very underground, but there were women from all parts of the country, rich and poor.

So the question has to be asked, how did Rose find her way from Wollongong to Jalalabad? The short answer is, through her life partner, the artist, filmmaker and 2015 Sydney Peace Prize winner, George Gittoes.

They first met when Rose was 23 and Gittoes was in his 30s and married. At the time, Rose was a squatter with other artists in a rundown but historic Sydney building called the Gunnery. It was part of the punk art history movement.

“I was a radical feminist performance artist, an avant-garde actor and I sang in bands. People found me very difficult to deal with because I had so much energy and so many ideas,” Rose remembers. “I also wasn’t backward in coming forward about issues like paedophilia and homophobia.”

One night she woke to find herself surrounded by police with dogs. “It was tough times,” she says simply.

Reconnecting with Gittoes when she was older and he was separated from his wife saw an intensely bonded relationship begin immediately. A reality soon dawned on Rose: Gittoes

▲ A turning point. Hellen Rose sings a traditional song that no woman had sung in public for decades.

▲ Hellen Rose (left) at the Yellow House in Jalalabad.

“Singers can be just as brave as soldiers. Artists are as brave as soldiers.”

— Hellen Rose

was constantly in the world’s most troubled areas – Somalia, Bosnia, Iraq, Palestine, Rwanda – making art and documentaries and promoting peace.

“I thought, I’m not going to be sitting at home,” she says. “I just couldn’t bear that if anything happened to him, I wouldn’t be there.” Gittoes was reluctant, but soon after Rose went with him to Pakistan. They are now an artistic and activist partnership, working on projects everywhere together. Next is a documentary about the broken communities of Miami that have become like war zones, complete with child soldiers.

Rose was invited to sing that night in Jalalabad by Afghanistan’s Regional Director of Women’s Affairs, Anisa Imrani, a woman who had seen her two predecessors killed in front of her. The invitation wasn’t because of Gittoes, it was because Rose herself is now a well-known and respected figure in Afghanistan, largely through her work in the Yellow House.

In the early 70s, Gittoes was a founder of the famous Yellow House art collective in Sydney. He has now recreated that sense of free-flowing creativity with another Yellow House; this one in a walled garden of Jalalabad. It’s a place where the local people, who are surrounded by destruction, can come to learn new skills and create. The local people, particularly women, are hungry to learn. For the freedom the Yellow House offers, Rose and Gittoes know that the threat from extremists is always there.

“My family are school teachers,” Rose says. “So I thought, okay, I’ll go to the University of Sydney and become a teacher. I’m just so glad I did it. It made me stronger. From what I’ve seen, I now realise that teaching is a revolutionary act.”

In her turn, Rose has been taught by the people of Afghanistan. “I was taught Pashto, the official language of Afghanistan, by singing the songs of the Pashto people,” she says.

That night in Jalalabad she sang two ancient and beloved Pashto songs that even elderly women in the audience had never heard sung live. As the second one ended there was silence, but Rose could see eyes in the audience sparkling with tears.

“After a long pause, applause and chatter broke out,” Rose says. “I tried to speak to, and hold the hand of, every woman who came up to me – there were hundreds.”

She still remembers what she thought when she was first asked to sing, “I just thought, I’m bloody well going to do it. Singers can be just as brave as soldiers. Artists are as brave as soldiers.”

A rapidly growing world population is threatening food security and driving unsustainable soil degradation. The challenges are enormous, but part of the answer could come from an unlikely source – the humble legume.

Finger on the pulse

Written by Vivienne Reiner
Photography by Stefanie Zingsheim and Joshua J Smith

Supermarkets don't give much in the way of star treatment to legume products. Maybe a little to baked beans and peanut butter (yes, peanuts are a legume, not a nut), but the others, like chickpeas, kidney beans and lentils, will likely be relegated to the lower shelves and niche aisles.

It's fair to say that in Australia legumes are not a glamour commodity. So why did the University of Sydney recently open a multimillion dollar research hub devoted to the study and nurture of the legume?

The answer is that – quite simply – world agriculture needs to get its legume act together.

Near the top of any list of looming challenges for humanity you'll find the need to dramatically increase food production, stop global soil degradation and meet the protein needs of a rapidly growing population. Though you wouldn't know it to look at a tub of mung beans, legumes can contribute to tackling all three.

Associate Professor Brent Kaiser is Director of the University's legume research hub. He has a background in plant molecular biology and worked for a number of years improving grape production in South Australia. In his easygoing Canadian/Australian accent he explains what the hub is about. "We're doing selective breeding to make legumes an even more attractive proposition for Australian farmers," he says. "There are environmental benefits for them, but also financial benefits."

Not many people would know it, but Australia is the second largest

▲ A green thumb. Associate Professor Brent Kaiser is excited by what's possible in improving food security.

producer of chickpeas in the world, with about 90 percent of our crop going to the massive markets in India, Pakistan and Bangladesh, where it's a staple. Demand outstrips supply so chickpeas go for $800-$1200 per tonne. Wheat, by comparison, currently draws just $250 per tonne.

So why doesn't every farmer in the country plant chickpeas?

"The chickpea is a difficult plant to grow," explains Associate Professor Kaiser. "It has significant disease and physiology issues that can make it less reliable. Basically, it's missing the 50 to 60-year headstart of focused breeding and selection that other crops like wheat have had."

Associate Professor Kaiser is now part of a multidisciplinary team of researchers spanning universities, government and the private sector working to bring, not just the chickpea, but eventually the broad bean, field pea and soybean up to speed. This includes toughening them up for a world where temperatures are rising and droughts are more intense.

Reflecting a government grant, the full name of the hub is the acronym-unfriendly Australian Research Council's Industrial Transformation Research Hub, Legumes for Sustainable Agriculture. It has labs and glasshouses at Camden in Sydney's southwest, with an extension of the facility about 530 kilometres away in Narrabri, northwest New South Wales, where test crops can be grown and studied on a commercially relevant scale.

Dr Angela Pattison (BScAgr ’07 GradCertInn&Ent ’12 PhD (Agriculture) ’14) PhD(Research) ’14) is from Sydney but moved to Narrabri to do postdoctoral research. She’s now both a Narrabri local and a staff researcher looking for the genetic threads that might be used to weave stronger and more productive plants. She has collected 1000 separate chickpea varieties from around the world, including wild seeds, and selected some 250 of those for further trials. Just six made it through for pre-breeding, and these varieties have already demonstrated that there is potential for significant yield improvements.

“The process of plant breeding isn’t that different to breeding dogs,” she explains. “You want the equivalent of the nice nature of labradors with the intelligence of kelpies.”

Legumes, which are called pulses when they’re dried, have two key superpowers. They contain a high proportion of protein (more on this later), and they perform what’s called nitrogen fixation. Plants need nitrogen to make photosynthesis happen. It’s also a building block of their cells and DNA. Most plants take the nitrogen they need from the soil and legumes extract the nitrogen they need from the air. What they don’t use ends up in the soil, ready to be used by other plants.

So a crop of cereal grains will take nitrogen out of the soil, but a crop of legumes will put it back in. Rotating crops this way was, historically, how farmers recharged their soil with both nitrogen and organic matter. But after the Second World War, factory-produced, petroleum-derived nitrogen fertilisers took legumes out of the planting cycle.

▲ Dr Angela Pattison works at the 480 hectare Narrabri site of the University's multi-site Planet Breeding Institute.

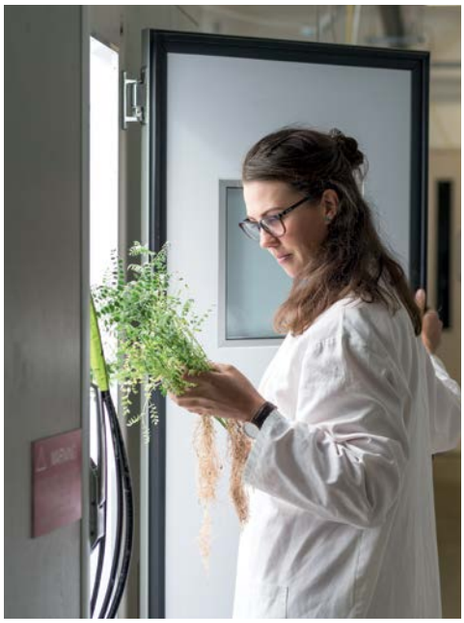
▶ In a few weeks, this field in Narrabri will be green with new, selectively bred crops.

“We’re doing selective breeding. There are environmental benefits but also financial benefits.”

– Associate Professor Brent Kaiser


chickpea
PBA
Boundary
Salinity
Stress
7/06/17
Hero


COMPRESSED AIR
HYDROGEN
HELIUM
CARBON MONOXIDE
UHP NITROGEN
UHP OXYGEN



◀ The selectively bred crops at the Narrabri facility will maximise the potential of Australian agriculture.

◀ Far left: chickpeas are grown under various stresses, here salinity, to identify more resilient strains.

◀ Centre: the labs at the Camden facility need a range of gases to run equipment like mass spectrometers and laser diode machines.

◀ Right: agriculture students work with researchers to track plant characteristics.

“It will be five to 10 years before improved chickpeas will be available and only if the offspring embody the good qualities of the parents.”

— Dr Angela Pattison

There is no question that synthetic nitrogen fertiliser has allowed huge improvements in food outputs – but the downsides are considerable. It is increasingly expensive to use, because over-farmed soil becomes less fertile, requiring more of this energy-intensive finite resource. Runoff takes it into streams and ground water, where it spoils water quality and promotes algal blooms.

As it breaks down, it gives off nitrous oxide, a greenhouse gas that is 300 times more potent than carbon dioxide and affects the ozone layer. Plus, synthetic fertilisers don’t add any organic matter, part of the reason we now have serious soil degradation threatening global food security.

Putting legume crops back into the planting cycle will provide nitrogen, effectively for free, and organically recondition soils. Plus there’s the added benefit delivered by their previously mentioned protein content. Where 100g of durum wheat has about 14g of protein, the same of chickpeas has 19g. As world demand for protein skyrockets, plans are evolving to shift away from supplying that protein through environmentally damaging and resource-heavy meat production, towards plant-derived protein.

There are plenty of important goals to be kicked at the hub and there is a great sense there of what can be achieved, though Dr Pattison knows the process can’t be hurried. “It will be five to 10 years before improved chickpeas will be available,” she says. “And only if the offspring embody the good qualities of the parents.”

▲ Building a better chickpea is a painstaking process.

Associate Professor Kaiser agrees but points out there will be valuable research outputs and industry engagement happening during that time. Getting a food variety translated from an idea stemming from genetic research into farms and onto supermarket shelves within a decade is industry standard.

Standing in the lengthy hallway of the Camden facility, with labs dotted left and right behind him, he’s also enthusiastic about the people working there.

“Agricultural campuses can attract a highly diverse researcher and student mix, often from countries pursuing similar productivity and security food goals,” he says. “I’d like to see even more people from more places sharing their energy and ideas. The hub certainly has that capacity.”

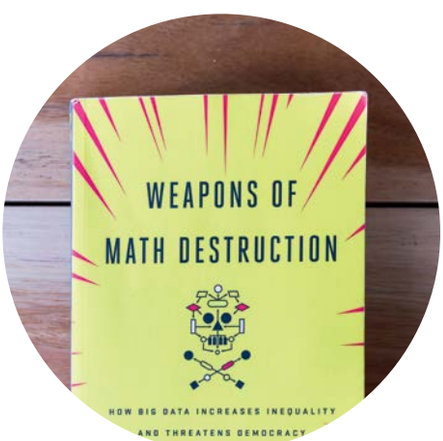
BOOKS THAT CHANGED MY MIND

Big guns like Oxford and Yale did their best at the 2017 World Debating Championships in the Netherlands, but the winners – James Leeder and Emma Johnstone – were students from the University of Sydney. By winning, the pair maintained Sydney's position as the most successful university in the competition's history. James and Emma talked their way into the history books – now they talk about the books they value.

EMMA JOHNSTONE

WEAPONS OF MATH DESTRUCTION: HOW BIG DATA INCREASES INEQUALITY AND THREATENS DEMOCRACY

By Cathy O'Neil



Most people think numbers can be relied on to describe things in an accurate, dispassionate way. *Weapons of Math Destruction* showed me that isn't the case.

I read it in the lead-up to the debating competition after hearing a podcast. The book's premise seemed to combine my interest in mathematical modelling with issues of social justice and structures of poverty and inequality. In particular, it challenges the idea that 'objective' data and modelling will in fact undercut inequality and discrimination. It explores the way in which the theoretically value-neutral field of mathematics is used and manipulated to produce models for companies and government that, whether they are explicitly aware of it or not, can be skewed, often with significant consequences for vulnerable populations.

The reframing of the social consequences of data collection use, often with the shield of eliminating bias, as in fact justifying further oppression for many people, helped me see the problems with a lot of, often necessary, models used in society. In particular, the need to question claims despite an amassing of evidence – but what does that evidence actually mean?

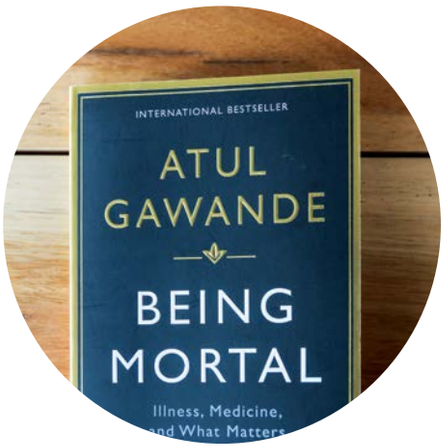
This book helped me think critically about what objectivity really means, and how the way that criteria are defined can determine outcomes in a desired way. For example, 'objective' bank ratings can actually lock in cycles of poverty when what they identify as risk factors are closely tied to underprivileged, often racial-minority, communities. It also re-enforced the issue of accurate and functional science communication, which often goes absent. Misunderstandings and simplifications of modelling and big data, when the general population is not given accessible and engaging information about scientific fields, only escalates possible negative consequences from too much faith and too little questioning of such models.

This book reminded me to remember the power of both mathematical modelling and consciously keeping it in check.

JAMES LEEDER

BEING MORTAL: MEDICINE AND WHAT MATTERS IN THE END

By Atul Gawande



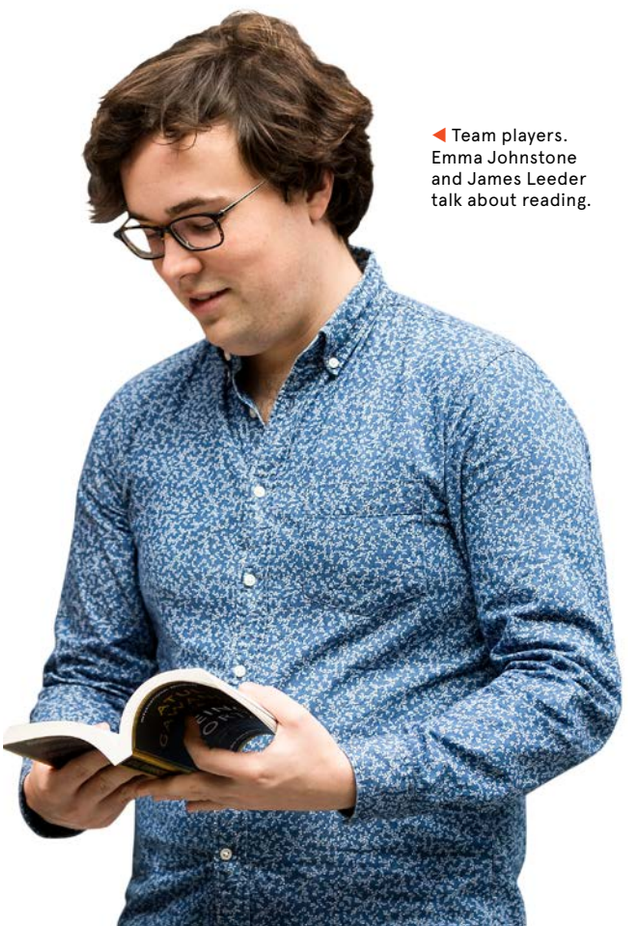
Despite the abundance of medical documentaries and melodramas, rarely is the end of someone's life portrayed honestly or realistically. Certainly, my vision of this difficult time was dominated by the tropes of the popular imagination: hurried, attractive 20-somethings making spur-of-the-moment decisions and hoping to keep the patient alive, whatever the cost. In reality, the majority of us will face death after a long decline and the decisions we and our doctors have to make will be complex and imperfect.

This difficulty is compounded when the medical system is profoundly ill equipped to deal with decisions that have no easy answers. As we age, do we want to be cared for and supported but lose our autonomy, or preserve our independence at the risk of accident or injury? In the face of terminal illness, do we want more time but with potentially more treatment side-effects, or less time but in a state better able to enjoy life's simple pleasures?

These questions and the problematic way the medical system answers them are at the heart of Atul Gawande's excellent book *Being Mortal: Medicine and What Matters in the End*.

Gawande is a professor of surgery and public health at Harvard University in the United States, in addition to being a staff writer for *The New Yorker* for almost 20 years. These roles contribute to the success of his book. In it, he combines the close focus of the surgeon with the macro view of a public health researcher. Studies of patients confronting their own mortality, whether in old age or due to illness, are presented with extreme sensitivity. Thankfully, Gawande's book is more than just a diagnosis of the current faults in our approach to ageing and dying, but also a considered work with practical suggestions.

I first read this book last year, shortly after the passing of my grandmother at the age of 96. Much of what Gawande discusses I had seen first hand. In my grandmother's case, external care was a necessity and was well managed, but it wasn't hard to note the difficulty of it all. Now, as a medical student, I've returned to his book several times as I have met elderly and infirm patients in need of wise decisions, and I'll continue to do so. In my opinion, this is essential reading for all, not just those in the health system.



◀ Team players. Emma Johnstone and James Leeder talk about reading.

The word 'spectrum' is used to describe autism for a reason. The condition expresses itself in many ways and intensities, but a new approach could offer a medical treatment for its most isolating symptoms.

Unlocking the secrets of autism

Written by Katie Booth
Photography by Louise Cooper

From a beckoning index finger or slight tilt of the head to an expectant facial expression and direct eye contact, there are many ways that you can signal for a child to walk towards you.

Our social world is so full of these subtle signs that our brain barely registers the huge number we receive in a day. Rather, we react to them automatically, as if speaking an inherent language.

For about one in every 88 children, the ability to recognise these non-verbal signs of communication is not in-built – they don't understand the language. In fact, for these people, the process of interpreting and then responding to a sign can be overwhelming, frustrating and confusing. When this is the case, they're said to have a lifelong developmental condition called autism spectrum disorder.

Professor Adam Guastella is a senior clinical research fellow at the University's Brain and Mind Centre. He has studied autism spectrum conditions for more than 10 years.

"When I first trained as a psychologist in the mid 1990s there was a view that there wasn't much you could do for autism," Professor Guastella remembers.

▲ Professor Guastella is opening up autism research to previously under-explored territory.

Early intervention and therapies can dramatically improve outcomes for people with autism, and these approaches were common at the time. However, any sort of medical treatment targeting social behaviour was uncharted territory.

Fast forward to 2015 when a breakthrough trial challenged that view. Professor Guastella and a team of researchers at the Brain and Mind Centre undertook a clinical trial with 31 autism-affected children aged between three and eight. The team used a nasal spray to administer a synthetic version of a hormone called oxytocin.

During childbirth, oxytocin is the hormone that signals the womb to start contracting, and it's often used to artificially stimulate the child birth process. But it has another function. Oxytocin promotes mother-child bonding, and for humans in general, it underpins emotional bonding and social connection – processes that people with autism find difficult to navigate. Together with the Co-Director of the centre, Professor Ian Hickie, the researchers undertook the five-week trial using a crossover design; meaning that, at times, every child also received a placebo. The results were encouraging. About one in three of the children benefited from the oxytocin treatment. The parents were overjoyed. One said: "It's helped my child to bring things together and to make sense of things to respond more accurately." Another said: "My child is able to put things together so much more effectively than before."

Autism is a mysterious condition. Despite what might be said in parliament or circulated on social media, there is one certainty – autism is not caused by vaccinations. What actually does cause it is still unknown, except for some strong indicators that it is genetic. In the 1950s and 1960s, they had other ideas. Autism was about parental coldness that caused the child to withdraw. The term "refrigerator mother" was directed at households that were struggling to raise children who might have some very challenging behaviours.

Emerging in the early years of a child's life, the first sign of autism might be delayed language, with about 40 percent of children never speaking at all. People with autism

> “When I first trained as a psychologist … there was a view that there wasn’t much you could do for autism”
>
> — Professor Adam Guastella

commonly have a strong preference for set routines and dislike change. They can also have repetitive behaviours or develop obsessive interests and become highly skilled or knowledgeable in a niche subject. Autism is four times more common in boys than girls, which again suggests a genetic link.

With that being said, autism expresses itself differently in every individual. “I think of autism as three-dimensional,” says Professor Guastella. “While about 40 percent of people with autism have an intellectual disability, there are others who struggle with understanding others’ emotions. And still others who might have emotional regulation issues where, for example, there’s a new environment or new stimulation. That in itself has its own spectrum.”

Today, the very definition of autism is evolving to encompass conditions like Asperger’s syndrome, which used to be seen as similar, but separate. People with Asperger’s don’t have childhood language issues and in fact can be highly articulate from a young age. Even though they might be gregarious by nature, it can be hard for them to ‘fit in’. They also have obsessive qualities.

For one man, this meant an 'obsession' with ghosts and law enforcement, which led to the creation of the blockbuster, *Ghostbusters*. Writer and star of the 1984 film, Dan Aykroyd, has spoken about his Asperger’s diagnosis, though today he would instead be said to be on the autism spectrum.

Many prolific artists and groundbreaking scientists throughout history were thought to have been on the autism spectrum, including Michelangelo, Stanley Kubrick, Mozart and Albert Einstein.

While the expression of autism varies from person to person and within different contexts, research shows that the right environment and support can make a world of difference. This is another area of research for Professor Adam Guastella and the team at the Brain and Mind Centre. They see people from age two to 50, with a view to minimising the social effects that their autism has on them. Trying to find new approaches is how Professor Guastella started to consider oxytocin.

“As a trained psychologist I was doing a lot of psychological therapies such as cognitive behavioural therapy,” recalls Professor Guastella. “I was interested in the neurobiology of social learning so I started reading a lot more about oxytocin. At the time a psychologist looking into animal and nursing data was unheard of.”

With numerous trials over almost a decade, Professor Guastella and his team developed a body of research that showed oxytocin could increase eye gaze, the encoding of social memories and emotional recognition.

It is still early days for the oxytocin treatment, with key questions still to be answered. For example, why did the trial work for some children and not others? Upcoming clinical trials will look for an answer. One will see if oxytocin’s effectiveness would be improved by administering a potentially more effective oxytocin stimulant through subcutaneous injection. Another will put a marker on the oxytocin molecules so researchers can track each individual molecule to better understand areas of the brain to target.

Professor Guastella is eager to make progress. “What makes me excited is that we’ve been able to take something that was a theory and turn it into what could be a first, actual treatment for autism.”

LOOKING FOR VOLUNTEERS

Professor Guastella and his team are looking for men with autism, aged 18 to 65, to take part in studies. For more information about the studies and selection criteria, please contact the research coordinator at med.actr@sydney.edu.au or +61 2 9351 0808.

It's been said that a lie can travel halfway round the world while the truth is putting its shoes on. Social media and politics are currently demonstrating the truth of that idea, and its consequences.

Ain't it the post-truth

Written by Elliott Richardson
Photography by Louise Cooper

As the forces of the French Revolution began to swirl in the late 1700s, a new element had become part of the political discourse: pamphlets. The invention of the printing press made it relatively cheap and easy to print pamphlets that could be quickly circulated around the country.

Some of the greatest political thinkers of the time wrote pamphlets, as did gifted slanderers and outright liars. Marie Antoinette was viciously smeared by the pamphleteers, adding to the hunger for her execution.

The French called their pamphlets *libelles*, a word that lawmakers have repurposed as libel.

The similarities between those revolutionary pamphlets and the current post-truth environment has not been lost on commentators. In fact, it's easy to point to any number of events and situations, historic and more recent, where obvious falsehoods have gained more traction in national conversations than verifiable facts – Iraq and the non-existent 'weapons of mass destruction' being an obvious one, with continuing ramifications.

If there is a difference between what's happening now and past events, it's that the internet and social media have turbocharged the effect – as the printing press once did. For Professor of Linguistics, Nick Enfield, the forces working against truthful reporting and honest political discourse could have even more profound consequences.


WIN THIS SYDNEY PENTHOUSE OR $2M GOLD
'Australians first': PM cracks down on job visas
One door closes and a Cantonese joint opens
The Sydney Morning Herald
WestConnex bill to soar past $45b, says council
WE ARE NOT AFRAID
THE MAZDA EFFECT
Sunday treat for fans gives hope for the season ahead
Lockout laws push violence to suburbs
MORE JOB LISTINGS AND STILL MULTIPLYING
first employee daunting task
The truth about getting investment
Pengana plan lifts
So good it's hard not to mention Waugh
courtesy of Matt's bat attack
Young buyers locked out

"We live in a time when we must act quickly and make serious decisions around things like climate change," he says. "So it's important that those conversations are based on facts."

Post-truth might feel like a new term, but it was actually coined in 1992 to describe the Iran-Contra scandal and the circumstances around the Gulf War. Then, from 2015 its usage spiked 2000 percent, driven by Brexit talk in the UK and Donald Trump's presidential nomination in the US. In 2016, *Oxford Dictionaries* bought in by making "post-truth" its international word of the year.

The significance of post-truth isn't politicians telling lies – that's hardly new territory. The significance is that large parts of the population are willing to believe the lies despite all evidence to the contrary.

There are lots of theories on how this evolved. The complexity of the world has caused people to embrace gut feeling rather than facts. The 2008 global financial crisis destroyed faith, not just in banks, but in news media and educational institutions. One commentator even pointed to advertising and its focus on brand rather than the substance of products.

To confront the situation where people buy into emotions or prejudice rather than facts, Enfield has assembled a group of cross-disciplinary University academics to create the Post Truth Initiative (posttruthinitiative.org). The group includes representatives from the fields of physics, philosophy, media and communications, linguistics, and government and international relations.

They meet regularly to arm-wrestle concepts like 'truth' and get up to speed with new thinking on the post-truth universe. These ideas are put into circulation through well-attended public forums on subjects such as the problems created by scientific fraud and psychological insights into why people are convinced by stories but not by facts.

The Post Truth Initiative is also building a Bullshit Detector. The name suggests something that might be able to determine whether a statement is bullshit. But that's not how it works.

"It's about making it easier for people in the community to look at politicians and know what they really represent," Enfield says. "The extent to which they're a bullshit artist or not."

Enfield had the idea after reading about the advances in voice recognition technology and how it's now possible for a computer to 'listen' to a recording and tell you, for example, how many times China is mentioned. If it's possible to pick out words, maybe it would be possible to pick out ideas, he thought.

That's when Dr Joel Nothman (BSc(Adv, Uni Medal) '09 BA '09 PhD '14), from the Sydney Informatics Hub came into the picture. Nothman is a software engineer and data scientist with expertise in linguistics. An unusual combination of skills, you might think. But no.

"Language and computer science are both about patterns," he says. "A lot of people who do computing and maths also have an interest in the structure of language."

With artificial intelligence, it's already possible for machines to not only 'read' law documents, but make recommendations. Nothman and Enfield are now working together to teach a similar set of skills to the Bullshit Detector. This means grappling with some tricky ideas: what does language look like when someone talks in favour of something? Or talks against something? And how do you teach a computer to even recognise that something's on topic?

Nothman adds: "I'm also interested in when people don't speak. It's easier for a machine to identify those silences than for people to do it."

When all these and other subtle modes of language and communication are modelled and assimilated into the Bullshit Detector, it will be able

"It's about making it easier for people in the community to look at politicians and know what they really represent."

– Professor Nick Enfield

Image on page 43: Reading between the lines. Professor of Linguistics Nick Enfield works to educate the community about the dangers of post-truth.

Image on page 45: How do you teach a computer to understand the nuances of truth? It's Dr Joel Nothman's job to do just that.

to quickly scan vast amounts of information looking for people, topics, attitudes and contradictions, and display them visually on a timeline.

When you think that searching Hansard – the verbatim record of all the proceedings of the parliament and its committees – for the term "Great Barrier Reef" currently presents you with more than 10 pages of references, the Bullshit Detector will be an invaluable tool for researchers and people interested in what is happening around issues of public concern.

In fact, the hope is that one day the Bullshit Detector could encompass not only Hansard, but all the information generated by the broader news media. It will give a complete picture of how people in the public eye deal with the issues of the day.

All this is still some time off. For now, we're in a war of ideas where people, and indeed democracy, are trying to see a path through the post-truth cultural shift. Enfield himself takes a longer view.

"Truth will always matter, so it will have the last laugh," he says, before adding a caveat. "They say 'the truth wants to be free' ... well, bullshit wants to be free too, and today's communications revolution makes all assertions equally free as a bird."

PROMOTING EXCELLENCE

The Post Truth initiative is supported by the University's Strategic Research Excellence Initiative 2020, which helps University researchers test new ideas, push disciplinary boundaries and find ways to scale up their research.

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When Jorja Chalmers was a student at the Sydney Conservatorium of Music, her ambitions were modest. She just wanted to work in music. Today she tours the world as Bryan Ferry's saxophonist of choice.

Living the dream

Written by Lauren Sams
Photography by Neil Turner

Jorja Chalmers (BMusStud '04) is in her Berlin hotel room when I call her over Skype. It's mid-morning there, and Jorja is surprisingly fresh-faced and friendly for someone whose day job is really a night job that can extend to all hours. With sun streaming through the window, she laughs as she recalls her years at the Sydney Conservatorium of Music, 2000-04.

"I was a rock'n'roll chick in a classical environment" she says. "I was a bit out of my depth the whole time I was there, but in a way that sort of suited me."

Chalmers is a classically trained saxophonist who now tours the world with Bryan Ferry – of Roxy Music fame – and his band. After Berlin, the tour will take her to Denmark, Sweden, France, Spain, and coast to coast in the United States. It's "the dream gig", she tells me. "Honestly, when I was at the Conservatorium, I thought I might be a music teacher. Sometimes I can't believe I get to do *this*."

So was she a good student, I ask? Jorja laughs. "I could have been better. I always did really well with the practical exams, but with the theory … not so much."

Born in Sydney's northern beaches, Chalmers is a long way from home – she now lives in London, a far cry from that back-up career as a sax teacher. So how does a girl who says she came to play the sax "almost by accident" end up with one of the most coveted gigs in the world?

"My mother was a singer in a country band," says Jorja. "And my Dad was always very musical. He built his own

▶ Before a concert at Hampton Court in London. Jorja Chalmers shines on the saxophone but is a multi-instrumentalist.

sound system, and he was always listening to really diverse music – everything from Pink Floyd and the Doors to Jimmy Hendrix, Kraftwerk and David Bowie. And classical, too – he introduced me to works like Rachmaninoff's 'The Rock'. I just loved that."

Chalmers was just 13 when she taught herself to play piano using the sheet music for the soundtrack to the film *The Piano*. Soon after, she picked up the sax. "I don't really know why," she says. "It was early high school, and I really wanted to join a band. It could have been any instrument," she says, "I just wanted to play. I loved it."

At high school, a teacher, who was studying at the Conservatorium herself, encouraged Chalmers to apply for a place. "I didn't really think I had a shot," she says. "I hadn't been playing for that long compared to other students." Her teacher cautioned her that the audition might be nerve-wracking, and it was. But Chalmers also felt a strong determination, "That was a big sign to me that I was on the right path – it just felt like the right thing to do."

Though she jokingly says she was an "awful" student during her time at the Conservatorium, her teacher, Christina Leonard (BMus '96 MPerf '99 DipLangStud '03), remembers it rather differently. "She always worked so hard," says Leonard, who has taught at the Conservatorium for more than 20 years. "She had this incredible drive. She wanted to do well, and I'm not at all surprised that she has."

◀ As part of Bryan Ferry's most recent tour, Jorja Chalmers played around Europe, then in the US.

"Jorja had this incredible drive. She wanted to do well, and I'm not at all surprised that she has."

— Christina Leonard

After that study, Chalmers taught the sax to high school students but soon found she had itchy feet. She landed in London in 2004 and joined New Wave band Hotel Motel while temping in PR agencies by day. "I was having a ball," she says. But one morning after a Hotel Motel gig, Chalmers saw a message on MySpace. "It was Bryan Ferry's PA, asking me to come and play for him." She did, and she's been on the road ever since. Ferry has sold more than 30 million albums worldwide (including his work with Roxy Music) and was made a Commander of the British Empire in 2011 for his contribution to music. He tours almost constantly, meaning that Chalmers is one of those rare musicians who is always working. "I'm extremely lucky," she says, "because I get to tour with Bryan and then come home and make my own music in London."

Ferry, says Chalmers, is "an incredible songsmith", whose professionalism and creativity have continued to school her, long after she graduated from the Conservatorium. From her first gig with the band at the iconic London nightclub, Annabel's, to the present day, Chalmers says she's always motivated by Ferry's attention to detail. "The standard of his performances is so high," she says. "You really have to push yourself to keep up."

Though she didn't study composition at the Conservatorium, Chalmers now says she wishes she had, as writing is her "true passion". When she's at home with husband Alistair Renn (also a musician, and owner of the record label VIVOD) and their young daughters, Olive and Audrey, Chalmers composes music for soundtracks.

"Right now, I'm working on a Synth Wave project. It's nostalgic soundscapes that work for drama, horror and sci-fi, stuff like that," she says, adding that her ultimate goal would be to compose dramatic soundtracks, "My classical training makes it natural for me to write that way."

After 10 years on the road with Ferry and side gigs with the Ting Tings, Patrick Wolf and 90s boy band Take That ("They started doing their synchronised dancing … it was a bit different from working with Bryan – he's such a cool cat!"), Chalmers says the buzz of performing never gets old.

"We've played for 200 people, we've played for 70,000 people. On every level, it's just an amazing feeling." Does she ever get nervous, I ask? "Well, the 70,000-person gig, yeah," she says. "But it still feels very comfortable for me, very natural. I couldn't do it night after night if it didn't."

ON MY MIND: ANNE FAWCETT

Dr Anne Fawcett (BA(Hons) '00 BScVet(Hons) '03 BVSc(Hons) '05 GradCertEdStud(HigherEd) '14) is a lecturer in Professional Practice at the University of Sydney School of Veterinary Science. She is a strong advocate for the welfare of animals used for farming and science.

Would you trust a doctor who happened to also eat people? Not the actual patients who come to see her, just others that have been farmed, pre-prepared into a healthy snack and ready to reheat.

It's a strange question, but one I asked myself because – as a veterinarian – I can eat animals not all that different from the ones I treat. I've come to the conclusion that this is a conflict of interest. As someone who has a healing relationship with animals and interacts with them as individuals, can I really be serving the interests of my patients if I am dining on their relatives?

As a Sydneysider I am spoilt for choice when it comes to food, unlike the vast majority of people on the planet. But what I ate wasn't about considered choice. It was driven by habit, convenience and the daily "I need to eat something now so I can get on with the next thing on my list." I did not feel I had the time to seek out high-welfare meat, or query the labels on egg or milk packaging.

That changed when I studied animal welfare science.

I rarely meet a human being who doesn't utter the phrase "I love animals". But as John Webster, known as the father of the Five Freedoms of Animal Welfare, wrote, "What matters to animals is not what we think and feel, but what we do."

His point is simple, but powerful: even with the best intentions, we can get it wrong. You might want to provide your pet guinea pig with the biggest possible enclosure, yet overlook the fact that guinea pigs are positively thigmotactic; they like contact with the wall and are terrified in wide-open spaces.

In 2012, I was still a quasi-vegetarian ("Oh, you put bacon in the pasta sauce? Well, it's already in there so I may as well eat it, since that won't alter the animal welfare costs …"). That same year a group of eminent neuroscientists gathered at the Francis Crick Memorial Conference and signed what was boldly called *The Cambridge Declaration of Consciousness*.

It concluded that we don't have a monopoly on consciousness. Other animals, not just primates or pets, have the equipment to generate consciousness. The implication of the declaration is that, unless there is compelling evidence for the absence of consciousness, we need to assume that animals are thinking, feeling, to some extent self-aware, beings with emotions and interests.

We derive a lot of benefits from companion animals, laboratory animals, farm animals and animals used in recreation and display. The costs to these creatures is rarely considered, yet as a veterinarian I am confronted with the welfare costs of animal use on a regular basis.

Animal welfare legislation, standards, guidelines and policies are designed to minimise these welfare costs. And it would be great if they could magically make such costs disappear, but they can't.

In light of this I've been forced to consider the impact of my own behaviour on the welfare of animals. The conservationist Giovanni Bearzi, in his powerful essay *When Swordfish Conservation Biologists Eat Swordfish*, writes: "We think of ourselves as professionals who are aware of environmental problems and work hard to solve them, but we pay little heed to what we do, buy, and consume."

For me, I realised there was an inherent conflict of interest in advocating for animals as part of my job, and consuming animal products – knowing the associated welfare costs – between consultations. So I stopped doing the latter.

Australia is indeed a lucky country. Here, many of us are in the lucky position of being able to choose what we buy and consume.

I feel that I have the responsibility, as a scientist, of altering my behaviour in the light of evidence; at least where I may be harming others. And I can easily make choices that reflect my deeper values.

It has been relatively easy for me to choose not to eat meat, and continue to support local producers of high quality food. It strikes me that more and more people are choosing to consume compassionate, sustainable products. And that raises a question worth asking: what differences can you make with your choices?

Photo courtesy of Pierre Mardaga, mydogsterritory.com.au

CLASSNOTES

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Jen Dalitz

Jen Dalitz (MBA(Exec) '04) started her master's degree as a customer strategy specialist and graduated as an entrepreneur, having started her own consulting practice. Specialising in the financial services sector, she leads major transformational change. After launching two thriving businesses in gender diversity and agriculture, she was listed in the inaugural '40 Young Business Leaders List' by *In The Black*. She was also a Telstra Business Awards finalist and the recipient of an Edna Ryan Workplace Award for improving the working conditions of Australian women. As a 20-year member of Certified Practising Accountants (CPA) Australia, Jen is helping to rebuild its governance practices. She is an in-demand speaker on the advancement of women, and now guides people and businesses through change.

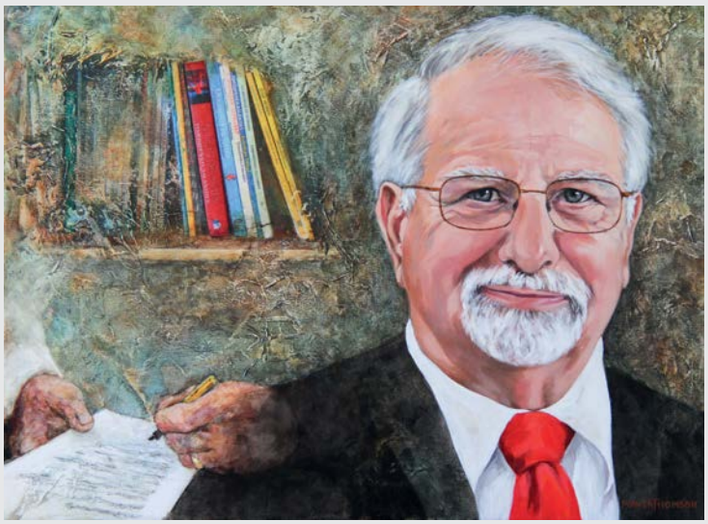
Jessica Watson-Thorp

Jessica Watson-Thorp (BVArts '98) is a professional artist. Though primarily a painter, she is trained in sculpture, drawing and print making. Having been involved in fine art educational and museum programs in both New Zealand and London, she became an independent artist in 2003. Jessica exhibits mainly in the Middle East where she has lived for 14 years. Now living in Dubai, she paints for international collectors, exhibits and runs writing workshops for corporates and women. She also participates in creative outreach programs with underprivileged youth in Africa. Her most recent exhibitions were in Tanzania, Dubai and New York City. She is currently working towards a 2018 exhibition in Hong Kong.

José Bordogna

José Bordogna (MIntBus '13) spent a summer in Australia some years ago. Impressed by what he saw, he returned from Argentina for his master's degree. Now back in Buenos Aires, his Australian connection continues through work with Austral Gold Limited, a precious metal company dual listed in Australia and Canada, with operations in Chile and Argentina. Currently the Chief Financial Officer, he enjoys working in a company with a strong international footprint and exposure to the Americas and Australia. At a recent business roundtable, he met Ms Julie Bishop, Australia's Minister for Foreign Affairs, and Noel Campbell, Australian Ambassador in Argentina, and he sees real business opportunities for Australia in Latin America. José is a keen soccer and tennis player.

▲ Left to right: Jose Bordogna, Noel Campbell (Australian Ambassador in Argentina), Julie Bishop (Australian Minister for Foreign Affairs) and Pablo Vergara del Carril (Director of Austral Gold)



Timoshenko Aslanides

It was a "terrifying decision" for Timoshenko Aslanides (BA '67) to leave his public service career in 1985 and become a full-time poet. He was encouraged to do so by one of Australia's most treasured poets, Judith Wright, whom he met after he won the British Commonwealth Poetry Prize with his book, *The Greek Connection*. He was the first Australian to win the prize. Wright became his mentor and friend. He has since published 15 books of poetry, two with prefaces by Peter Sculthorpe, who taught him musical composition at the University. His latest book, and he says his last, is *Troubadour: poetry and original music for violin,* featuring violin music inspired by some of his poems in the book.

◀ Acrylic and watercolour portrait of Timoshenko by Judi Power Thomson

Lucy Polkinghorne

Lucy Polkinghorne (BA '07 MMediaPrac '09), always wanted to be a sports reporter and she shaped her choices around that. While doing her master's degree, she was a production assistant on Channel Seven's *Sunrise* program before going to *Sky News* as a digital news producer. Her first reporting role was with *Prime Seven News* in Tamworth, then she went to Adelaide to join *Today Tonight*. When she returned to Sydney she finally went into sports journalism, reporting with *Fox Sports News*, then in the digital media space with sportsfan.com.au. Now reporting for *Today Tonight* in Sydney, she is also co-MC of the Sydney Swans.

David Sheils

David Sheils (BA '99) is the Director Media Licensing at the Australasian Performing Right Association and Australasian Mechanical Copyright Owners Society (APRA AMCOS), which has 89,000 members who are songwriters, composers and producers. David oversees the licensing of music used by broadcasters, digital music services, digital video on-demand services, websites and record labels. He has been involved in groundbreaking licensing deals for new models and platforms, particularly in the digital media and services space.

Erin Young

After graduating, Erin Young (BCom(LibStud) '11) took a graduate management position with the Intercontinental Hotel, then founded Zen Green Tea, which is now the leading matcha green tea company in Australia. While nurturing her business, Erin worked at PriceWaterhouseCoopers as a management consultant for 18 months before becoming Director of Operations at the Mejico Hospitality Group, overseeing the opening of three restaurants and the management of four in total. She now works full time running her tea business, doing this remotely while living in different places around the world. Her aim is to build a collection of online product retailers.

ASK SYDNEY

If you have a burning question, we'll find an expert at the University who can answer it for you. Nothing is too obscure. Just email your question to sam@sydney.edu.au

Q. A photo of Saturn's North Pole taken by Cassini shows that the clouds crowning the pole have a hexagonal configuration. Why on Earth – no, Saturn – does it happen?

A. Clouds are fluid. Like all fluids they are complicated things. They don't simply circle the planet, but they rub up against one another and swirl amongst themselves. We don't know exactly what's happening in Saturn's atmosphere, but experiments have been done here on Earth to try to reproduce the effect. Using a tank full of water, glycerol and white tracer particles, researchers in Oxford University's Department of Physics did just that. It was the result of multiple unstable currents interacting. However, that can't be seen as definitive, as what happens in a water tank on Earth is not exactly what is happening in Saturn's atmosphere, but it offers some interesting clues.

Professor Geraint Lewis (GradCertEdStudies '04) is an astrophysicist looking at the influence of dark energy and dark matter on the evolution and fate of the universe. He also studies galactic cannibalism, where dwarf galaxies are torn apart by the massive Milky Way and Andromeda Galaxy. He is the co-author of *A Fortunate Universe: Life in a Finely Tuned Cosmos*.

Q. What are the little floating objects that you can sometimes see in your field of vision? Or is that just me?

A. The little black dots and shapes we see in our vision are due to condensations in the vitreous gel. They often move across the vision when reading or doing computer work and annoyingly continue to move after the eyes come to rest. This is because the floaters are in the vitreous gel that continues to move after the eyes stop. Vitreous gel is clear and fills the eyeball between the lens and the retina. We all have floaters, however, if lots of new ones suddenly appear, particularly large floaters, this can be a sign of a retinal detachment occurring and you should be reviewed by an eye specialist.

Associate Professor John Grigg (MD '12) is head of the Discipline of Ophthalmology at the University of Sydney's Save Sight Institute and consults at Sydney Eye Hospital and the Children's Hospital, Westmead.

▲ Hexagonal cloud formations above Saturn, photo courtesy of NASA/JPL-Caltech/Space Science Institute

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Countless people are grateful to Eleanor Wood.

Her bequest in 1962 still helps students enhance their studies.

It also funded the organ in the Great Hall.

Eleanor Wood's legacy?

Filling the Great Hall with glorious sound, and the world with brilliant people.

What will your legacy be?

Speak with our bequest team on +61 2 8019 7964.

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