SYDNEY ALUMNI MAGAZINE

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SAM

THE UNIVERSITY OF SYDNEY

Reflections on a trailblazing career

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CULTURE

Bruce Beresford calling the shots

SCIENCE

How native oysters can clean up Sydney Harbour

1891

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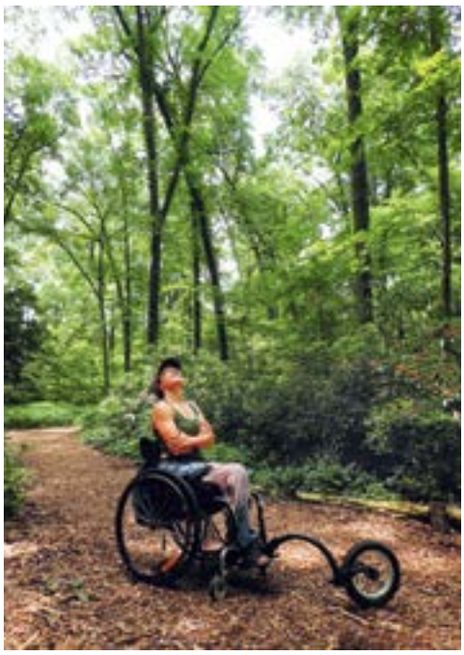

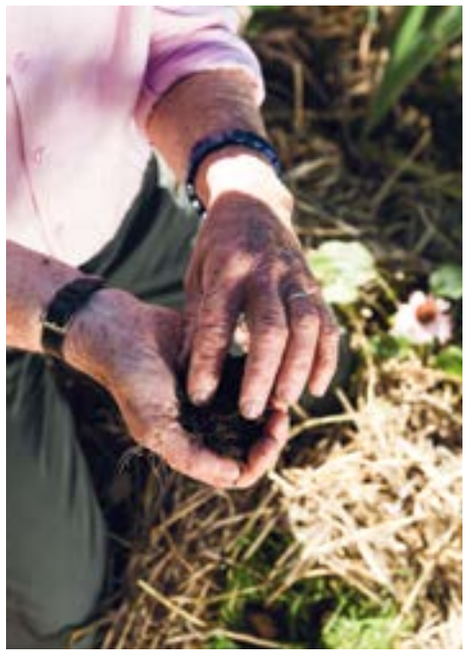

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BEYOND RESEARCH

The research conducted by people at the University of Sydney strives to understand the largest objects in the universe and particles so small they operate outside the laws of physics; the biggest threats to human welfare and the most influential cultural movements. And of course, some significant scientific and cultural advances come through serendipity, which is why we will always give space for brilliant minds to roam where they will.

The University's research culture and achievements are assessed through our inclusion in the Excellence in Research for Australia (ERA) initiative, run every few years by the Australian Research Council.

In the 2015 report, the most recent to be released, our University scored highly, with 100 percent of our research work rated at world standard or above; this achieved in a relatively austere funding environment where government support for higher education is uncertain. Which means we can be even more proud of our dynamic and diverse research environment.

Research like that done at the University's Australian Centre for Field Robotics (ACFR), where they have produced a robot that can examine crops for diseases, assess soil quality and generate real-time information to help farmers maximise harvests and protect the land.

In archaeology, new technologies are letting us see the very layers that make up precious objects and artworks from antiquity. These insights will give a whole new dimension to Nicholson Museum exhibits that will eventually move to our new Chau Chak Wing Museum.

In geosciences, a team is working to re-establish the native oyster reefs in Sydney Harbour. These reefs will attract and shelter other harbour creatures, and as filter feeders, will help clean the harbour water (read more about this work on page 42).

One thing that links all the projects discussed here is the invaluable donor support that comes through our successful INSPIRED philanthropic campaign.

This support is a powerful driver of all the things we do to make a better world for all of us, and it directly connects our community of alumni and friends with many of the great advances that our researchers have and will make.

Belinda Hutchinson AM (BEc '76), Chancellor

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

Managing Editor: Pia McMorran
Publishing Editor: George Dodd

Alumni and Development
The University of Sydney
Level 2, F23 Administration Building, NSW 2006
02 9036 9222
sam@sydney.edu.au

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Inside cover: Workers in 1910 with the remains of the first Engineering School. Photo from the University of Sydney Archives G3_224_MF374_0255.

Inside back cover:
The RD Watt Building restoration (L), and the new Faculty of Arts and Social Sciences (FASS) building takes shape.

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With koala numbers declining, more information could lead to better solutions.

◀ SCIENCE

It took a supercomputer and a consortium of Australian and international research organisations to achieve this world first: the full sequencing of the koala genome. Co-led by the University's Professor Katherine Belov, the project mapped more than 26,000 koala genes to a high level of accuracy, allowing a powerful insight into these iconic and threatened animals and how they might be protected. The Koala Genome Consortium has made the information freely available to scientists around the world.

MEDICINE

Stepping out of the FoG

Freezing of gait syndrome (FoG) is one of the most distressing and accident-inducing symptoms of Parkinson's disease. As the name suggests, FoG freezes people in place as they walk.

Now, a new trial at the University's Brain and Mind Centre is pointing to a way forward. The trial found that cognitive training can reduce the severity of FoG and daytime sleepiness, as well as improving overall cognitive processing speed. It's still early days, but patient feedback so far has been positive.

▶ TECHNOLOGY

Actually, I can do that, Dave

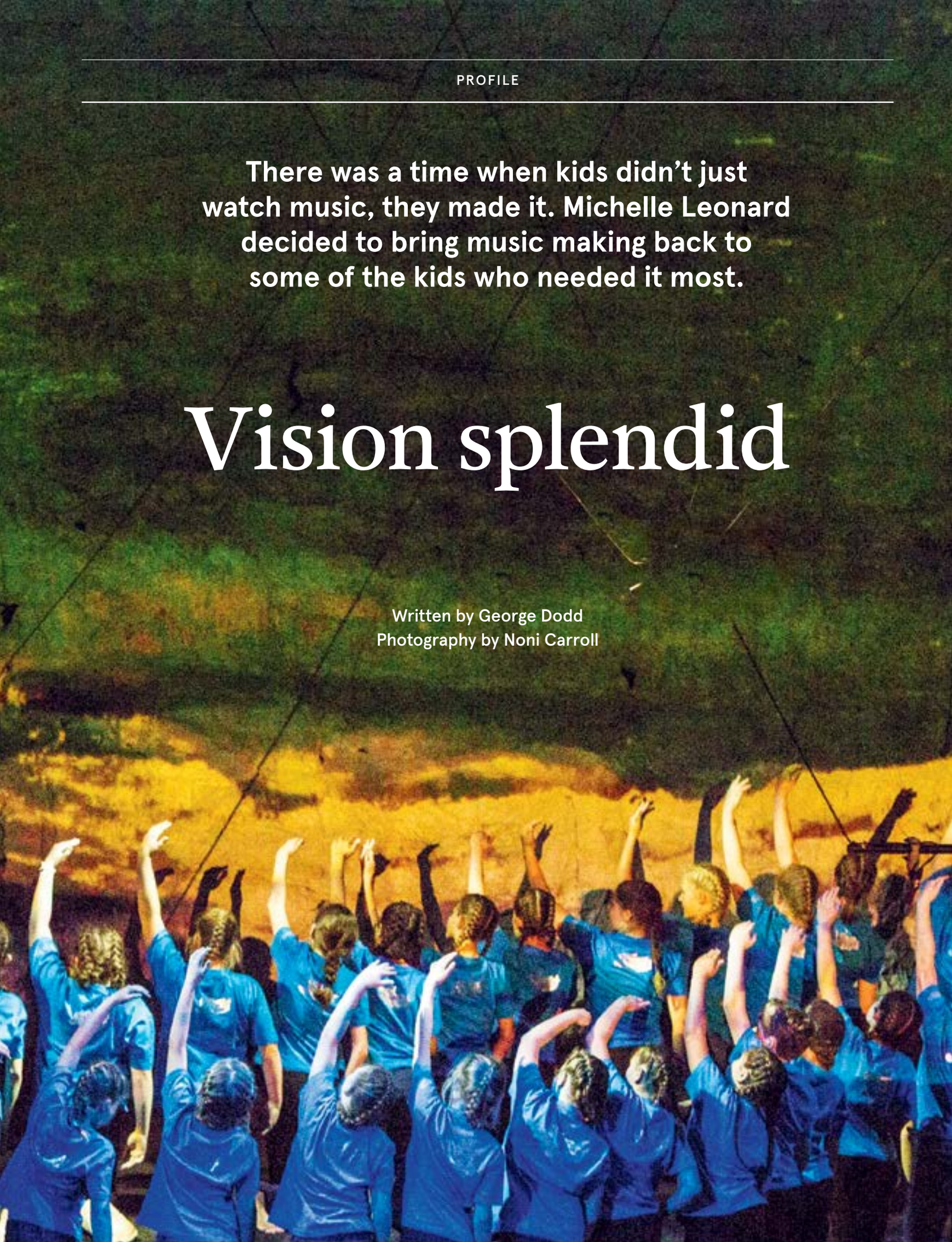
Artificial intelligence (AI) and machine learning are hungry beasts. To give our researchers plenty of capacity to work, the University has unveiled the third expansion of its Artemis supercomputer. The first iteration in 2015 had its power tripled just a year later. Now, it has expanded again, with capabilities measured in multiple petaflops and teraflops – terms best Googled. Artemis has already worked on the evolution of bees, traffic flows in cities, urban optimisation and the spread of the Ebola virus through West Africa.

▲ The Artemis supercomputer can make sense of vast amounts of data.

There was a time when kids didn't just watch music, they made it. Michelle Leonard decided to bring music making back to some of the kids who needed it most.

Vision splendid

Written by George Dodd
Photography by Noni Carroll



▲ Inspiring thousands of school kids and four of her own. Leonard with her youngest, Sebastian.
▶ Younger singers might later move on to the high-school-aged MAXed OUT company.

"Elena, let's rock it, man."

It's fair to say this is an unexpected turn of phrase in a recording studio filled with classical musicians, about 40 choristers and a small audience invited to bring some live energy to the performance. Even more so because the Elena in question is celebrated classical composer Elena Kats-Chernin, who wrote the piece that's about to be sung and who will "rock" the piano as part of the orchestra.

Smiling along with everyone else at her moment of levity is the person who's about to conduct the piece, and who brought all the elements of this recording together: Michelle Leonard.

A moment later there is total silence as Leonard raises her hand to begin.

The sound that fills the room is lush and instantly attention-grabbing, with Leonard guiding the choir using a fluent language of hand signals for diction, clarity, listen and stop, all responded to instantly. The piece itself is thoughtful, layered, melodic, uplifting and unmistakably of Australia. As it ends, more than one person is in tears.

What makes the choir even more remarkable is that it's made up of high school students from regional New South Wales who have never had access to a qualified music teacher. They are part of Moorambilla Voices, which started 14 years ago when Leonard had a characteristically ambitious idea.

"When I was growing up in Coonamble, there was a town band; we did a musical every year," she explains. "Schools had orchestras. Classical music was one of those things that people valued."

"I STUDIED IN THE OLD CON BUILDING ... THE STAFF DEMANDED THAT WE BECOME EXCEPTIONAL, AND SOMEHOW WE DID."

— Michelle Leonard

▲ Once inhibited school kids have enthusiastically embraced not just singing but also dance, through Moorambilla Voices.

Michelle Leonard

DEGREE
Bachelor of Music Education '93

MOST ADMIRED PERSON
I admire the world view and determination of my parents

PERSONAL MANTRA
Relentless positivity!

Leonard thought the disappearance of music from schools would be temporary, that Moorambilla Voices would be a stopgap. Instead it has become increasingly necessary.

Earlier this year Leonard and her team spent nearly a month travelling to 51 towns in northwest NSW, from Brewarrina to Bourke. They delivered 74 music workshops to children from 105 schools, involving more than 3500 students in all.

It's a gruelling exercise that happens every year, but it allows Leonard to personally identify children with potential, increase skills in music literacy and connect with communities.

About one-third of the kids who take part are Indigenous, but when asked whether Moorambilla Voices has an Indigenous program, Leonard pauses for a moment. "The answer is no," she says, but continues, "Do we sing in language? Do we support Indigenous cultural capacity building? Of course we do. I'm just normalising it. I want it celebrated and placed in the middle of everything we do."

Leonard feels privileged to have built strong relationships with Indigenous community elders. "I am not an Indigenous female but I have been given opportunities to share and learn," she says. "This has been given with a spirit of great generosity, which is very much how the program operates."

▲ The creative bar is set very high by Leonard. She says the kids not only clear it every time, they are capable of even more.

Like those before them, this year's standout children were invited to attend a camp to dance, sing, compose, paint, weave, play drums and learn about the cultural traditions and stories of their landscape, all guided by professional musicians, performers, composers, choreographers and visual artists drawn in by Leonard's creativity, vision and ambition.

The program's website (**moorambilla.com**) features pictures of ambitious staging, full instrumentation and young people focused and energised by what they're doing. It's no wonder some kids actually stay on at school just for this, school attendance being a prerequisite for taking part.

But talk to Leonard and you realise the program goes beyond the music. It's about showing the kids that they are more than they think they are. That there are lots of things in life they can be, if they put in the work. And they do. The kids themselves talk about the sustained concentration required, the lengthy rehearsals, the long and boring bus trips for performances. They also say it's all worth it.

It was especially worth it in May this year when a Moorambilla Voices choir sang at the openings of Hillary Clinton's speaking engagements in Melbourne and Sydney.

"The halo effect of the program is amazing," Leonard says. "It's not just with the mental health of the adolescents themselves: there's the volunteer staff and particularly the more isolated parents. It's an incredibly enriching space for them all."

It goes without saying that Leonard is a one-off. Few people could hammer an amorphous idea like giving regional kids the chance to make music into a multilayered organisation that has given literally hundreds of schoolchildren unique life experiences. Leonard has done this with optimism, fearlessness, boundless energy and a heartfelt love of the music produced by Moorambilla Voices. She feels the program has now reached a point of critical mass, where anything feels possible. But it's taken a while to get there.

"For the first decade there was resistance, mostly around the children's capacity to achieve what I wanted them to achieve artistically," Leonard recalls. "There was no benchmark. As well, other programs would receive funding for only a couple of years, then disappear. For the schools and the communities, it was like relationship fatigue. Once we'd done 10 consecutive years, it was obvious to everyone we were there to stay."

Leonard's dedication dates back to her time at the Conservatorium of Music, when expectations were high and resources stretched thinly. "The Con significantly shaped me," she reflects. "I studied in the old Con building. You could hear a lot of music making happening. The staff demanded that we become exceptional, and somehow we did."

So exceptional have been Leonard's achievements that in 2017, she was awarded a Medal of the Order of Australia (OAM), and this year the University honoured her with an Alumni Award for Cultural Contribution.

Another feature that helped her develop the program is her aptitude for business, though she laughs at the thought. With limited government funding, a significant portion of the Moorambilla Voices budget must be found every year through the generosity of private donors. The recording being made in the Sydney studio is for a fundraising CD.

Keeping afloat is a big challenge but it's one made easier by Moorambilla Voices' dedicated staff, volunteers and board of passionate believers who can see the national importance of Leonard's work.

"My darling father put it to me that not-for-profit also has to mean not-for-loss," Leonard says. "We all have a vested interest in Moorambilla's success, because success creates more artistic opportunities for our kids." ●

RECOGNISING GREAT ALUMNI

Michelle Leonard is a 2018 Alumni Award winner. Do you know any outstanding alumni like Michelle? Recognise their work by nominating them for a 2019 Alumni Award.
Make your nomination at sydney.edu.au/alumni-awards

It led me to fight for people who can't.

Hannah Solomons
Juris Doctor

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The man who looks everywhere

Written by Gabriel Wilder
Photography by Ahmad Zamroni

Corruption has been a long-time problem for Indonesia. As other obstacles to economic and social progress have been tackled, Laode Syarif is taking on perhaps the most dangerous challenge.

Long hours and a lot of pressure. That's a fact of life for Laode Syarif, who is one of only five anti-corruption commissioners in Indonesia's Komisi Pemberantasan Korupsi (Corruption Eradication Commission), or KPK.

Laode Syarif

DEGREE
PhD (Law) '08

HAPPY PLACE
Fishing and swimming on the island of Muna, where I grew up

ALTERNATIVE CAREER
Teaching and academia

"It is a very dangerous job," Syarif says. "It affects my life a lot – not just for myself but my family and even my mum. My sons, when they go to school, they must be accompanied by police officers every day."

Syarif has good reason to be cautious. In April last year, senior KPK corruption investigator Novel Baswedan was walking home from morning prayers at a mosque in North Jakarta when two men riding a motorcycle threw acid in his face. Recovery took months of treatment, and Baswedan remains partly blind.

Still, the investigation he was working on caught a big fish. It resulted in the conviction, a year later, of the speaker of the House of Representatives, Setya Novanto, and implicated dozens of other officials.

The KPK may have some powerful enemies, but it also has the unwavering support of the Indonesian people. Since its establishment in 2003, its public approval rating has hovered around 80 percent. And the nation's citizens play an important role in its operation, phoning in around 7000 corruption tip-offs a year to its 24-hour secure hotline.

"Compared to the Suharto time, I think corruption in Indonesia has lessened," Syarif says, referring to the former president whose 1968 to 1998 term became known for the large-scale corruption that ultimately led to his forced resignation. "But there is still a lot."

Suharto was ousted two decades ago, but he casts a long shadow. It's not easy to forget the man who reportedly stole up to US$35 billion in state assets and was named the most corrupt leader in the world by both the United Nations and the World Bank. And if the KPK's successes are any indication, it seems there are still some who seek to emulate his style.

Successful KPK convictions have included high-ranking police officer Djoko Susilo (sentenced to 10 years for corruption and money laundering), former chief justice of the Constitutional Court Akil Mochtar (jailed for life for bribery and money laundering), former sports minister Andi Mallarangeng (four years for bribery) and the aforementioned Novanto (for the embezzlement of funds causing US$165 million in state losses; he was sentenced to 15 years and ordered to repay US$7.3 million).

Indonesia is made up of hundreds of ethnic groups and more than 260 million people, many of whom are very politically engaged. Even as the economy gains strength, it is held back by corruption.

> “The Indonesian people are sick of corruption. But too many in government have close connections to business, and they still want to continue the good old days.”
>
> — Laode Syarif

Syarif believes the eradication of corruption is key to Indonesia’s future. The country is rich in natural resources including gold, copper, nickel and oil, but much of this wealth has been squandered by decades of mismanagement and corruption, keeping too many of Indonesia’s 260 million people close to poverty.

“The Indonesian people are sick of corruption,” Syarif says plainly. “But too many in government have close connections to business, and they still want to continue the good old days.”

The KPK prosecutes an average of one case a week, a rate that Syarif says he could double if he had the resources. While the commission is independent, it relies on funding from the government, some members of which would rather it didn’t exist. “Sometimes the parliament tries to make our life very hard,” Syarif explains. “So if we apply for a big budget, they always say, ‘No, this is not important.’”

For this reason and others, the job can be frustrating at times, but Syarif firmly believes his work makes a difference and that it is vital that he persist in doing it. “My background is as an anti-corruption activist and an environmental activist, so I know how it is: you have to have a belief,” he says. “You have to keep fighting, otherwise they are going to win.”

Syarif grew up on the small Indonesian island of Muna in Southeast Sulawesi province, far from the fat cats of Jakarta that are the focus of his life today. The family lived without electricity until his father came home one day with a generator. He remembers this life fondly, and he returns to the island whenever his schedule allows. On his Twitter feed he posts videos of the tranquil beaches and translucent green waters near his home.

“It was a happy place,” he says, his voice softening as he recalls a childhood spent fishing, swimming and playing badminton and soccer on the island he describes as “just beautiful”.

On graduating from high school, Syarif applied to study engineering or law at Hasanuddin University in Makassar, South Sulawesi province. He was accepted for the latter and chose international law because he wanted to travel. Scholarships allowed him to further his studies at Queensland University of Technology, and then to pursue a PhD in International Environmental Law at the University of Sydney, where he also taught.

As a result of these studies, Syarif was recently named the 2018 Alumni of the Year by the Australian Government Australia Awards program, which originally granted him the scholarship that made his Australian studies possible.

During his time in Sydney he connected with Anjelita Malik, whom he’d previously met in Jakarta where she worked in the Australian Embassy. They married, and although their twin boys were born after their return to Jakarta, Syarif playfully refers to them as “Australian made”.

Looking back on his time in Sydney almost as fondly as he does his childhood in Muna, Syarif says he was tempted to stay but was drawn back to his homeland because he wanted to put everything he’d learnt at the University into practice. On his return to Indonesia, he developed anti-corruption programs for law enforcement agencies and the Supreme Court, and assisted the KPK, which subsequently appointed him a commissioner in 2015.

Indonesia was once infamously named a world leader in corruption, thanks to former president Suharto. Now the KPK has turned it into something of a leader in anti-corruption. The British ambassador to Indonesia, Moazzam Malik, recently praised the country, saying it had successfully met 17 of the 19 commitments ratified in 2016 anti-corruption summits in London.

While Syarif’s contribution to the cause has been significant, soon the KPK will have to do without him: in 2019, his four-year term will end and it will be time for him to move on. So what will be next for this dogged yet mild-mannered professor-turned-crime-fighter?

“If the government wants me to contribute with my skills, I am always open,” Syarif says. “But teaching is my passion. I like the smell of libraries; I like the smell of universities. My KPK office does not have the smell of libraries.”

ONE FOR ALL

Being an outsider as a child gave Ming Long a strong understanding of the importance of inclusion. As she climbed the corporate ladder, she was determined to make it easier for those who followed.

Written by Lenny Ann Low
Photography by Stefanie Zingsheim

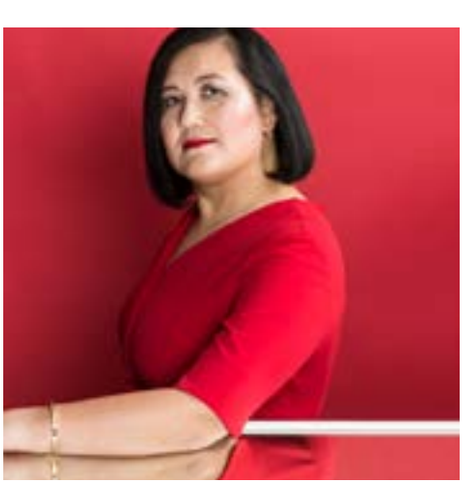
On a crisp morning, Ming Long is walking her two dogs in the winter sunshine while championing gender equality: "Essentially, I'm trying to advocate for change because I believe our country can be so much better than it is today," she says.

Long, an energetic advocate for diversity in Australian corporations, is the first and until recently, only Asian woman to lead an ASX 100 or 200 company, having become Group Executive, Fund Manager of the $2.5 billion Investa Office Fund in 2014. She remembers clearly how she had to make her own way up the corporate ladder with very few in the way of Asian – or, indeed, female – role models.

"In some respects, the issues of bias around gender apply twice as much for people with an ethnic background," she says. "We need to change our culture and ask how we can promote different people into leadership. We need to change how we see what leadership looks like."

Ironically, it was the 2007 global financial crisis (GFC) that propelled Long's career to the highest executive level. "There's the glass ceiling, but there's also the glass cliff," she explains. "That's where you give the job to a woman because you believe the place is going under anyway."

Long was handed the reins of the company where she worked just as the GFC had started to devastate the economic landscape – but things didn't play out as expected. Thanks to her leadership, the company emerged strengthened for ongoing prosperity.



"WE NEED TO CHANGE HOW WE SEE WHAT LEADERSHIP LOOKS LIKE."

— Ming Long

Considering the prevailing corporate culture, which prioritises profit above all else, her game plan was unconventional. "I knew people in the company who might lose their homes if they lost their jobs," she says quietly. "I made decisions, where I could, to avoid that happening. People were the priority for me."

Today, with more than 20 years' experience in financial management and real estate, Long has a full work diary, but she still makes time to talk as widely as possible about inclusion. She recalls one talk at a high school, where she rallied her inner geek for the cause.

"It happened to be May the 4th – Star Wars Day," she says. "So I was saying, 'When you look at the X-Wing fighters in the *Star Wars* movies, there's only ever been one female pilot. And this is what we're feeding boys and girls – that women shouldn't be flying planes.'"

She also told the students about the CEO of Qatar Airlines who earlier this year said that a woman couldn't run his airline "because it is a very challenging position".

"It's all linked," Long says simply.

Ming Long

DEGREE
Bachelor of Economics '92
Bachelor of Law '94

MOST ADMIRED PERSON
My grandfather, a pastor for the prison ministry in Malaysia

BEST ADVICE RECEIVED
You are enough

HIDDEN TALENT
I love woodworking

Long is also active on a number of boards: she is the deputy chair of Diversity Council of Australia, a non-executive director of Chartered Accountants Australia and New Zealand, and a member of the advisory board for Melbourne's YBF Ventures Fintech Hub.

She is careful to make sure that any board she joins knows what they will get from her if she signs on. "It's important that I can still be part of the public conversation around what matters to society. Understandably, not everyone is comfortable with that," she says. As well, she reserves the right to challenge the status quo, clearly seeing the necessity of speaking truth to power.

Long also serves as chair of AMP Capital Funds Management, whose parent company recently attracted the ire of the financial services royal commission, and she sees some similarities between this role and her breakthrough position all those years ago. "In some ways it's a bit like how it was during the GFC," she says. "It's galvanising the company. There are really good people working very hard to do the right thing and to make sure it doesn't happen again."

As is often the case with people working passionately for change, Long's commitment to diversity can be traced back to her own early life. Her family moved from the bustling Malaysian capital of Kuala Lumpur to the small Blue Mountains town of Lithgow, 150 kilometres from Sydney, when she was just nine years old. It was 1980, and Long's was the only Asian family at her school. "When we arrived, there wasn't even a McDonald's," she says with mock outrage.

Her greatest hurdle was school itself. Due to differences between the two countries' education systems, Long had to go straight from Year 2 in Malaysia to Year 4 in Australia. This put her behind the game, and outside the group. "To this day, that feeling of being the odd one out has never really left me," she says.

She did well at high school, becoming dux in Year 12, before studying economics and law at the University of Sydney. Her three siblings, also Sydney alumni, all studied medicine and are now doctors, but a visit to a University of Sydney Open Day when she was 17 convinced Long to pursue a different career.

"I went to the medical faculty and they had all these bodies there," she recalls. "I could see what dissection was about and, honestly, I just couldn't ... I went out and I changed all my preferences."

"AN ASIAN WOMAN IS STEREOTYPED TO BE MEEK, GOOD AT LISTENING, WILL DO AS SHE'S TOLD AND IS A FOLLOWER, NOT A LEADER."

— Ming Long

It was a good move. A highly successful career in financial management and real estate has seen Long recognised as one of the Australian Financial Review's 100 Women of Influence in 2016, and as a Telstra Business Women's Awards finalist in 2014. She has also made her mark as an instigator of Property Male Champions of Change, which works within the property industry to drive gender equality and increase the number of women in leadership roles.

Of many achievements, being the only Asian woman to lead an ASX 100 or 200 company is a title Long was happy to lose (to the new CEO of Macquarie Bank, Shemara Wikramanayake), but she'd like to see faster progress. "That's why I started talking about a 'bamboo ceiling' in Australia," she says. "For many Asians that exist within organisations, we know they are extraordinarily intelligent and have a fabulous work ethic. They have so much to contribute to the success of our country."

But for too long, she says, climbing the corporate ladder has been akin to gymnastics for people like her. She herself had to bend into all sorts of shapes in an effort to advance her business goals while still conforming to the Asian woman stereotype. A non-conforming Asian woman made people uncomfortable, she explains – including people who could affect her career advancement.

"An Asian woman is stereotyped to be meek, good at listening, will do as she's told and is a follower, not a leader."

These days, such career gymnastics are behind her, and Long is now a role model for young men and women who desire careers in corporate Australia. It's a role she takes seriously, because for all her achievements, Long has never forgotten that her first real opportunity came about because a family friend recommended her for a job. It was in the accounting firm where she would later discover her love for economics.

"Someone gave me that first opportunity," she says. "I wasn't fabulous at everything – I didn't do that well at university – but someone helped."

IN FOCUS: GERRYMANDERING

Democracy is under pressure, and even threat, in the United States of America. Alumna Ruth Greenwood is on the frontlines fighting to protect it. As Senior Legal Counsel for the non-partisan, non-profit Campaign Legal Center headquartered in Washington, her focus is on voting rights and redistricting. Representing two sets of plaintiffs who are alleging partisan gerrymandering (in Wisconsin and North Carolina), she has taken both cases to the Supreme Court of the United States.

Written by Ruth Greenwood
Illustrated by Rod Clement

I remember laughing when Guns N' Roses said they would release an album called Chinese Democracy, because it was so clearly an oxymoron. I never thought "American democracy" might end up with the same fate.

In 2008, I boarded a plane to a country I had long revered: the United States of America. I arrived in New York ready to study constitutional law and to experience firsthand the country that had influenced so much of my life, my country and, frankly, the world.

Obamamania had gripped young people everywhere, including me, so I asked if I could help out in the November election, even though I was a foreigner. I was told that one useful role I could perform involved voter protection. "What do voters need protection against?" I wondered.

I found out when I was assigned to a polling place in Virginia. The weekend before Election Day, signs posted around the black neighbourhoods – falsely suggesting they had been issued by an election authority – warned voters that unprecedented turnout was expected, and so to handle the crowds, Republicans would vote on Tuesday and Democrats would vote on Wednesday.

My heart sank. Spreading misinformation to suppress the vote was something I expected in Russia or Venezuela, but not America. I had come to learn about constitutions and democracy from the country that invented the former and exported the latter. But, with voter suppression rife, could it be that this country wasn't even a democracy?

As I applied for a two-year work visa in 2009, I had no idea I was about to witness a period of the most extreme gerrymandering in modern American history.

America conducts a census every 10 years in the zero year (2000, 2010 etc), and redistricting occurs in the year following. Redistricting means drawing the electorate boundaries for things like congressional or state legislative districts.

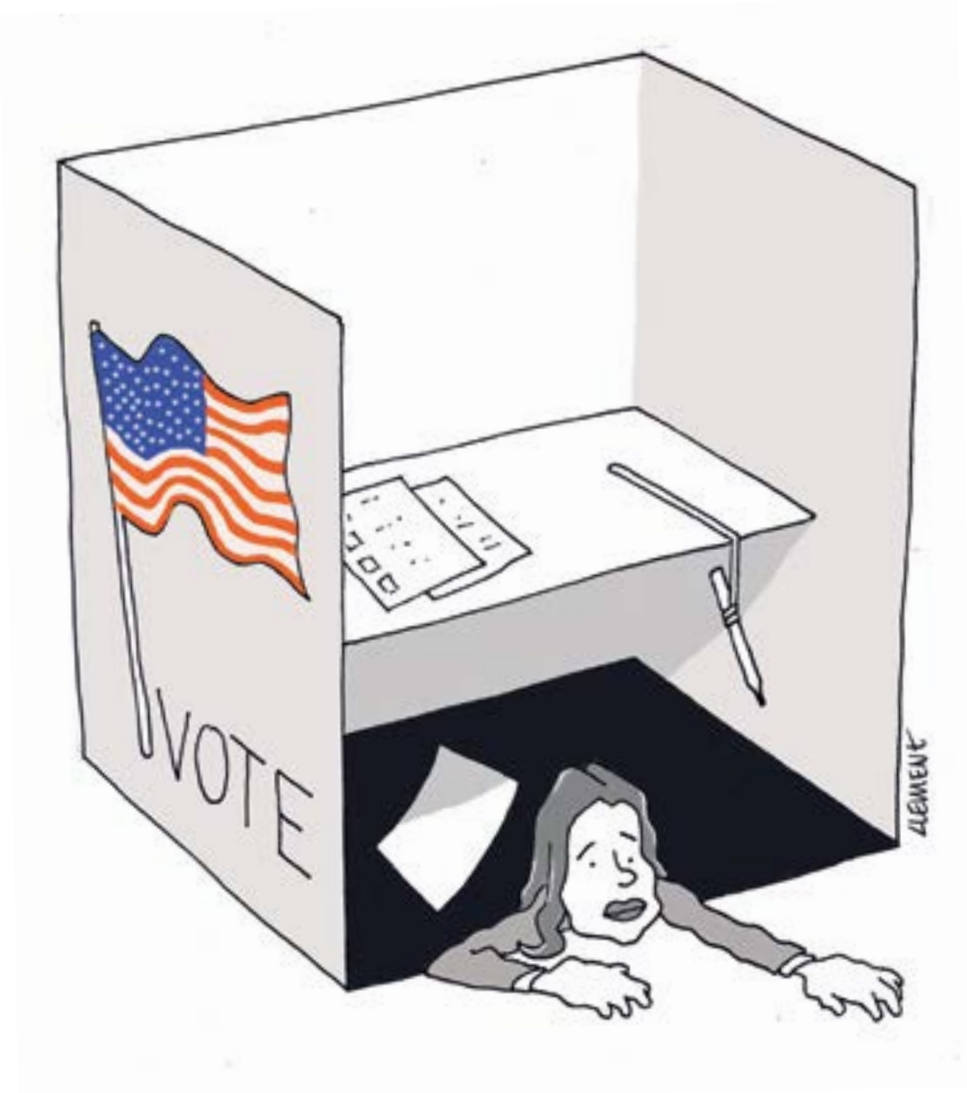
In 2011, I witnessed a redistricting frenzy. Democrats and Republicans across the nation retreated to secret locked rooms with computers and voting data for everyone in the country. With surgical precision, they divided up voters into districts designed to secure advantage for one side for the next decade. In the places where they did a good job, elections would become almost irrelevant, an afterthought. For example, in 2012, 1.4 million more people voted for Democratic candidates for Congress, yet the Republicans wound up with 33 more seats.

How did this happen?

America, unlike Australia and the rest of the sane world, has not switched to using independent people to redraw district lines. The very people who will run for office get to draw the districts from which they will run. That is, the politicians get to choose their voters, not the other way around. It is madness.

In some states, people are able to fight back through referenda, and demand independent redistricting commissions. Places like Arizona and California were early adopters, and this year four more states (Michigan, Colorado, Utah and Missouri) will vote on whether to change to the commission model. But for the states that don't allow citizens' ballot initiatives, there seemed to be no hope.

Enter Nicholas Stephanopoulos. He started as my boyfriend, then became my co-counsel, and is now my husband. He thought we could set a national judicial standard declaring partisan gerrymandering unconstitutional. The Supreme Court had toyed with the idea since 1986, but most people thought it was a lost cause. I didn't. I knew America could do things differently because I come from a country that got



> "In 2012, 1.4 million more people voted for Democratic candidates for Congress, yet the Republicans wound up with 33 more seats."
>
> – Ruth Greenwood

Ruth Greenwood

DEGREE
Bachelor of Science (Hons) '04
Bachelor of Law (Hons) '06

HIDDEN TALENT
Jigsaw puzzling

OCCUPATIONAL HAZARD
Overambitious scheduling

beyond the "Bjelkemander" (a word referencing Queensland premier Joh Bjelke-Petersen, who benefited from a notorious gerrymander in the 1970s and 1980s).

Nick and I teamed up to argue that the federal constitution prohibits partisan gerrymandering and that it can be measured using political science metrics. Nick, the academic, wrote the briefs. I, the advocate and trial lawyer, took depositions, cross-examined witnesses and garnered support in the media from both Democrats and Republicans.

We became the first plaintiffs to win a partisan gerrymandering case at trial, with co-counsel from Wisconsin. The decision was appealed, and due to a quirk in federal law, the appeal went directly to the Supreme Court of the United States. We expected either outright rejection or, preferably, resounding victory. Instead, in June 2018, the Supreme Court used a procedural issue called "standing" to kick the can down the road – sending us back to the trial court to add more information to the record, before it will rule on the merits of the case.

Luckily for us, we have another case with a more developed factual record that is likely to be finalised in the coming months, and will probably end up back at the Supreme Court in the October 2018 to May 2019 term.

Unluckily for us, Justice Kennedy – the so-called "swing" justice, because as a conservative, he made a number of unexpectedly progressive judgements – suddenly retired in late June. President Trump is likely to appoint an extremely conservative new member to the Court.

But I'm not giving up just yet. I hope we win. I hope America stops being "exceptional" in letting politicians draw their own district boundaries. I hope the voices and the votes of the people can be equally acknowledged. But even if we lose, I'll keep looking for new ways to improve the system.

American democracy has been such a great experiment for more than two hundred years. It would be a shame to lose it all now. ●

In a time of dramatic change, conserving precious places becomes even more important. But it takes more than good intentions. It takes detective work and new thinking.

Saving grace

Written by Louise Schwartzkoff (BA(Media&Comm) '07)
Photography by Andrzej Liguz

She has explored ancient tombs in Egypt and seen churches made entirely of earth in the Peruvian Andes. But ask conservation architect Susan Macdonald to name a favourite building and the one that springs to mind is a house on a residential street in Sydney.

It's a place in Longueville that's more than 100 years old. For Macdonald, it was home for most of her childhood. She remembers its elegant proportions and constantly leaking roof of French tiles. "I loved that gracious house," she says. "I hope its new owner treats it gently. It deserves a respectful, timeless approach."

For the past 10 years, Macdonald has lived in Los Angeles, working for the Getty Conservation Institute. As Head of Buildings and Sites, she leads a multidisciplinary team of conservators, architects, engineers and other professionals working on iconic structures around the world, from Tutankhamun's tomb to masterpieces of modern architecture.

The institute's work helps keep important buildings and objects in good shape. But its broader goal is to improve the way conservation work is done. "We're asking: what are the big problems in conservation and how can we solve them?" Macdonald says.

When she studied architecture and fine arts at the University of Sydney in the 1980s, she loved the soaring Gothic towers of the Quadrangle. She was among the last of the University's architecture students to be taught art history by Australian landscape artist Lloyd Rees. It meant a lot to Macdonald to learn about the art of the early 20th century from someone who had lived it.

Throughout her career, she has focused not just on centuries past, but also on more recent architecture. "Traditional buildings often have no-one to speak for them," she says. "But with a modern building, you may be talking to the creator. That's one of the things I like about conservation. You're working at the interface of past and present."

Standing in the famous Eames House of Los Angeles, Susan Macdonald believes there should be more effort to conserve significant modern buildings.

The earthen Church of Kuño Tambo in Peru is threatened by earthquake activity. Macdonald is part of the Getty team looking for ways to protect it. Photo supplied by The Iris: **blogs.getty.edu/iris**

"You have to be good at historical research and science to understand, for example, why materials are decaying and what might happen next."

— Susan Macdonald

▶ The Great Hall at Chastleton House, Oxfordshire, where Macdonald worked to uncover its history. (Photo ©UK National Trust/Peter Greenway)

Susan Macdonald

DEGREE
Bachelor of Science '83,
Bachelor of Architecture '86

PERSONAL MANTRA
Reflect back, aspire forward

FAVOURITE ARTIST
Leonardo da Vinci,
a genius and the true
Renaissance man

STANDING THE TEST OF TIME

This year, the Sydney School of Architecture, Design and Planning has been celebrating its centenary. For 100 years the school has pioneered teaching and research across the built environment.
If you have memories of the school, share them at:
sydney.edu.au/architecture/100-years

Early in her career, Macdonald mainly focused on old buildings such as the 19th century home in which she grew up. After a period working for architecture firms in Australia, she headed to the United Kingdom in search of structures with roots deeper in time. Here she delved into the secrets of historic buildings, including Chastleton House, a 400-year-old Jacobean manor down a winding lane in the Cotswolds.

Before it was given into the care of the National Trust, Chastleton House had belonged to the same English family for most of its history. Macdonald worked with the architectural team to uncover the manor's stories and preserve them for visitors.

"Working on that house was like reading a book," she says. "You'd discover things about the building and its materials, but you also needed to understand things about the people who'd lived there and why they did the things they did."

She ended up working for English Heritage (now Historic England), the government organisation responsible for England's historic places.

Architectural conservation mixes technical and scientific knowledge with history and design. There are big questions about what should be conserved and why, along with all the practical hows. For Macdonald, it's an ideal mix. As a teenager, she was so interested in science, she wanted to be a doctor, like her father. He convinced her to explore her interest in design and history at Sydney.

"My work is very multidisciplinary," she says. "You have to be good at historical research and science to understand, for example, why materials are decaying and what will happen next. Will what you're doing create long-term harm or will it be OK?"

In Peru, the Getty's architects and engineers are working to protect traditional earthen buildings from earthquakes. Macdonald has travelled there with her team, sharing meals of guinea pig with the locals and working with them to preserve their heritage. They want to introduce technology that will help the buildings stand firm while preserving their special features.

Her team in Egypt has faced some thoroughly modern problems in one of the world's most ancient built environments. Their work in the Valley of the Queens and Tutankhamun's tomb – curtailed by the conflicts of the Arab Spring but now resumed – aims to preserve the wall paintings and tomb interior while creating tourist-friendly spaces. "You have to find a way to circulate air and manage dust so you don't have people passing out," Macdonald says. "And you have to find a way of circulating visitors efficiently without causing damage."

In recent years, there has been an international push to protect the architecture of the 20th century, particularly buildings of the modernist period. This has become a specialty for Macdonald. It's a challenging field; concrete is difficult to conserve without replacing much of the original material. What's more, conservators sometimes have a hard time convincing the general public that modern buildings should be preserved at all. "Part of our work is an education process – changing people's opinions about what's important," Macdonald says.

In Los Angeles, she is working on the famous Eames House, a glass and steel expression of modernism designed and constructed in 1949 by husband-and-wife team Charles and Ray Eames as their home and studio. The glass box of a house is full of valuable (and sunlight-sensitive) Eames furniture and objects. The challenge is to protect the collection without altering the sense of light and space that makes the building special.

Discovery is a crucial part of the Getty's work. There are plastics and timber veneers throughout the Eames House and, says Macdonald, "we don't quite know how to conserve them yet". But history is a work in progress, and so is keeping it in shape. ●

ON MY DESK: SHELLEY WICKHAM

Dr Shelley Wickham (BSc (Adv)(Hons) '05 BA '06 MSc '07) has a beguiling accent, reflecting a life on the move. Born in Australia to a New Zealand family, she completed a PhD in the United Kingdom followed by five years of postdoctoral study in the United States. Her professional dream is to build nano-robots from DNA that can diagnose diseases. The sci-fi version is nano-robots actually curing diseases. She is happy to be in *SAM* for what she calls "science show and tell".

Photography by Louise Cooper

▲ 3D PRINTED MODEL OF A DNA BASE

I 3D printed this in the University library ThinkSpace. It's hard to explain the geometry of the DNA double helix to students, so I started printing these with the idea of assembling them as a larger model; the bits click together like puzzle pieces. This is a DNA base that has the code AT. It's part of the backbone of DNA.

▲ TEAPOT

I'm a 100 percent tea person, mostly Darjeeling. Never tea bags. To be a grown-up scientist, I needed a teapot. There are actually quite a few people in the School of Chemistry who like tea. We send messages to each other saying: shall we have some qual-e-tea?

▲ FRAMED PHOTOGRAPHS

My brother is a professional photographer and these are his. I like their intersection between science and art. The image on the right looks like a chemical thing but it's actually watercolour pigments. The other is the world's largest camera – you walk inside it and it takes a full-size photo of you.

▼ WESTPAC RESEARCH FELLOWSHIP AWARD

They only gave out two of these in Australia, and I got one of them. Normally for a fellowship, you just apply for a grant and get a yes or no. But for this, I was interviewed by maybe 10 people – senior people from Westpac, the government and other universities. It was a bit frightening, but they were really kind and also interested. Getting this award was really amazing because it told me I'm on the right track.

▶ MEMENTO FROM THE OPENING OF SYDNEY NANO

At the launch of Sydney Nano, they gave me this silicon wafer printed with an image of the old jacaranda. I was in the United States when I heard about Sydney Nano. For a long time, interdisciplinary work wasn't popular in Australia. That's why I left. The celebration at the opening of Sydney Nano told me the attitude was changing. It was also about embracing younger people, early in their career. This is what drew me back.

◀ OLD PACEMAKER AND DEFIBRILLATOR

I work in material science partly because my dad did. He was a great inspiration. From a young age, I saw him bring engineering and medicine together, so it felt natural to me. He worked for pacemaker companies and gave me these old demonstration models. Coincidentally, my Westpac fellowship is about understanding how blood clots form on medical devices.

He helped define Australia's cinematic voice, and is the only Australian director to nab an Academy Award for Best Picture. Bruce Beresford is a quiet big achiever.

Calling the shots

Written by Monica Crouch (BA(Hons) '95)
Photography by Lisa Tomasetti (MDP '12)

On the set of *Ladies in Black*. Bruce Beresford (L), with Nicholas Hammond as Mr Ryder.

Bruce Beresford has enjoyed a very full and wide career and shows no signs of stopping now. He's made more than 30 films in five decades, several of which have entered the Australian canon, including *The Adventures of Barry McKenzie* (1972), *Don's Party* (1976), *The Getting of Wisdom* (1978), *The Fringe Dwellers* (1986), *Paradise Road* (1997) and *Mao's Last Dancer* (2009).

And that's before we even get to the Oscars. *Breaker Morant* (1980) earned Beresford and his co-writers a nomination for best adapted screenplay; *Tender Mercies* (1984) won best screenplay (by Horton Foote), garnered Beresford a best director nomination and saw Robert Duvall win best actor; and *Crimes of the Heart* (1986) netted a best actress nomination for Sissy Spacek.

Then came the big one: the hugely popular *Driving Miss Daisy,* which took out a swag of Oscars in 1990, including the career-changing best picture, as well as best actress for Jessica Tandy.

The dizzying heights of Hollywood are a long way from the modest western Sydney suburb of Toongabbie, where Beresford grew up. But then, so is the exclusive King's School in nearby Parramatta, which Beresford attended for two years in the late 1950s. How did he end up there?

"It's a long and complicated story," he says.

The story starts with Beresford's local high school not offering the leaving certificate. Keen to continue his education, he pleaded with his mother for an alternative. "Next thing I heard, I was accepted at King's School," he says. "But I never found out how she pulled that off."

It was at King's that Beresford got an early taste of professional movie making, when in 1956 he and a friend visited the set of *The Shiralee*, an English film being made locally. "I wanted to see them working," he says. There is a photograph of the then 15-year-old Beresford on set, testing a light meter, and the kit looks archaic. That technology has since gone digital and leapt forward light years, yet many of the essential elements of filmmaking remain unchanged.

"All the digital technology in the world can't write a good script," Beresford says. "You still need creativity, you still need well-written scripts and talented actors to make them, and talented people on the production side." Likewise, good directing. "You need something to say," Beresford emphasises. "A feeling for character, a passion for plots and telling stories."

Beresford brings all of these qualities to the production of his latest film, *Ladies in Black*, based on the book *The Women in Black* by Sydney alumna and novelist, the late Madeleine St John (BA '63).

1.

2.

Bruce Beresford

DEGREE
Bachelor of Arts '64

MOST ADMIRED PERSON
Polish-British novelist,
Joseph Conrad

WHAT ELSE YOU MIGHT HAVE BEEN
An archaeologist

1. Your actual ladies in black. (L–R) Alison McGirr, Angourie Rice, who plays Lisa, and Rachael Taylor.

2. A laugh with the cast. Beresford (L), with Ryan Corr, Vincent Perez and Julia Ormond.

3. Image conscious. Beresford (R), discusses shots with cinematographer, Peter James.

Set in 1959, it tells the funny and warm-hearted story of Lisa, who takes a summer job at a department store that looks very much like Sydney's iconic David Jones. She's waiting for her high school results to come through as she dreams of attending the University of Sydney. It's a coming-of-age story for Lisa, but this was also a time of great change for Australia, and the film explores the nation's cultural awakening, the breakdown of class structures and the increasing emancipation of Australian women.

Lovingly detailed department store sets were created for *Ladies in Black* at Sydney's Fox Studios, peopled with dozens of period-dressed extras. When *SAM* visited, the lunchroom was a curious mixture of 21st-century canteen functionality and mid-century chic.

On set and behind the camera, Beresford himself is relaxed yet meticulous. As much as directing a film is an intensely demanding process, there's also the tortuous process of getting the production up and running in the first place.

"The studios make money by selling certain star names," Beresford explains. "It's very hard to get a film financed without one or more of those stars in the film." Think A-list stars like Cate Blanchett, Tom Cruise, Jennifer Lawrence and George Clooney.

This approach might have made sense in the past but, as Beresford points out, in saying no to good projects because their stars aren't 'big enough', Hollywood is now shooting itself in the foot. "Oh, it's wonderful for television," he adds. "In the past 10 years, a lot of the finest writing has been done for TV, not movies."

3.

Beresford himself is also a writer, whose screenplay credits include *Breaker Morant* and *Paradise Road* as well as the adaptation for *Ladies in Black*. Less well-known is the fact that he has also directed numerous operas, both in Australia and in the United States, including Verdi's *Rigoletto* for the Los Angeles Opera in 2000, and an adaption of *A Streetcar Named Desire* featuring Teddy Tahu Rhodes for Opera Australia in 2007.

When Beresford arrived at the University of Sydney in 1962, he quickly fell in with a group that revelled in exploring many points of view. It started when he joined the Theatrical Society, where his creativity flourished. It was also here that he had one of his earliest film production experiences, directing a six-minute short called *It Droppeth as the Gentle Rain* for use in an absurdist theatre piece. The film was quickly banned by government censors, but Beresford was hooked.

"For the first time I met a lot of people who were interested in the same things as me – acting, theatre, movies, painting, art," he says. "It was the first time I'd met a concentrated group with a similar range of interests. I made a lot of friends, many of whom I still have."

These friends included actors John Bell (BA '63 DLitt (Honoris Causa) '96) and Arthur Dignam, feminist writer and intellectual Germaine Greer (MA '63 DLitt '05), author and broadcaster Clive James (BA '61 DLitt '99) and the "unexpectedly prickly but quick-witted" novelist Madeleine St John, who died in 2006.

Beresford disagrees with the suggestion that his time at the University was a 'golden age' of arts and letters in Australia. "I think there's been a hell of a lot of gifted painters and filmmakers since that group – it's just that they were probably better at publicising themselves," he adds with a laugh.

The first time *SAM* spoke with Beresford, he was in Toronto, wrapping up the telemovie *Flint* and preparing to return to Australia to shoot *Ladies in Black*. A year later, his schedule is as busy as ever and shows no sign of slowing down – which is fine with Beresford, who says he still has goals to kick.

"I have a film I'd like to make about Italian artist Modigliani – but I doubt I'll ever get the money," he says matter-of-factly. But it's not all bad news: "My unrealised dream for a long time has been *Ladies in Black*. Now that dream is realised at last." ●

A TIME AND A PLACE

While Beresford himself might downplay the idea, a case can be made that he was part of a golden era of arts and letters at the University in the 1960s. The people mentioned in this story developed their talents here, along with many others including theatre director Richard Wherrett; publisher Richard Walsh; art critic and writer Robert Hughes; renowned Aboriginal activist and influential Canberra bureaucrat Charles Perkins; and writer Frank Moorhouse.

Her studies were almost over and Helen Smith had plans. Then a single event meant she had to reach her goals via a very different path.

Freewheeling

Written by Louise Schwartzkoff (BA(Media&Comm)'07)
Photographs supplied

In many ways, the bushwalk through Wolgan View Canyon in Wollemi National Park was like dozens of others that Helen Smith and her friends had previously done together.

The eight of them had been going bush for years, since their student days, when they'd met through the Sydney University Bushwalkers club. And Wolgan View Canyon – a deep, dry fissure through sandstone that winds its way west to Wolgan Valley – was an easy walk by the group's usual standards. There was no abseiling, and no water to wade through. But there was something different about this trip last June: it was the first that Smith, 31, had done using a wheelchair.

Three years ago, on a canyoning expedition planned to celebrate the submission of her PhD in biology, Smith stepped on a rock that gave way. She fell 12 metres and broke her back in three places. She is now a T10 paraplegic, unable to move from her waist down.

To tackle the canyon in her chair, Smith attached an extra wheel to the front for stability on rough terrain. Some members of the group walked with ropes attached to Smith's chair to ensure that everyone was moving at the same pace and to give her a hand on steep uphill slopes. Where there were logs or other obstacles across their path, her friends would lift the chair up and over them.

The bushwalk ended with spectacular views across the valley. "It was just awesome to have made it to the end," says Smith. "That feeling of being alive and outdoors and free: that was a feeling I thought I'd never have again."

Since her days as an undergraduate science student at the University of Sydney, Smith has been driven by her love of wild places. She chose to do a PhD – investigating whether the reintroduction of native bush rats could stem the invasion of black rats – to get the skills she'd need to work as a wildlife ecologist. "I had this really clear idea that I wanted to work on a remote property for the Australian Wildlife Conservancy," she recalls.

While that dream is no longer a practical option, Smith has worked hard to create new possibilities. In the past three years she has achieved things that seemed impossible in the weeks and months that followed her accident.

She can't remember much about the fall itself, but she does remember its aftermath. Regaining consciousness in the bush, struggling to breathe. Hearing her friends set off the electronic distress beacon they'd carried just in case. Lying on a stretcher in a helicopter. Landing on the rooftop helipad of Royal North Shore Hospital. Waking in intensive care after emergency surgery, feeling hungry, wanting a muffin and a coffee.

In the six weeks she spent in hospital, Smith clung to the hope that she might walk again. The grief she felt when she realised she wouldn't was shattering. It lasted about two years and felt as though she'd lost a person she'd loved. "And in a way, you have," she says now. "You're experiencing the death of a part of yourself. I think it's probably only this year that I've come to the point where I don't feel that deep sadness anymore."

After hospital, Smith moved to a rehabilitation centre in Ryde. The fellow patients she met there all had different goals: some wanted to relearn to play musical instruments, others to paint.

"For me," says Smith, "it was about being able to live independently, staying active and working out how to build the skill set to do outdoor activities again."

First, though, she had to relearn skills that had once seemed automatic. How to move from bed to a chair. How to put on pants. How to make a cup of tea. How to get around. "It felt like doing a PhD all over again," she says.

It was while she was still in hospital that Smith did her first bushwalk using a wheelchair – a circuit of Narrabeen Lagoon, on Sydney's Northern Beaches. "It's about eight-and-a-half kilometres," she says, "but at that point I didn't have a lot of upper-body strength. I got about two-thirds of the way around before thinking, 'This is the hardest thing ever.'"

These days Smith does that circuit regularly – "It's a piece of cake" – but points out that, under the Australian grading system, that track doesn't qualify as wheelchair accessible. "Which is crazy," she says, "because it's one of the best and most inspiring options in Sydney."

For a bushwalk to be classified as wheelchair accessible in Australia, it must be no longer than five kilometres, with no steep sections, and a flat, even surface. For a person like Smith, that's pretty dull.

"The standard ones are really unfulfilling," she says. "It takes longer to get out of the car than it does to do your bushwalk. The thinking has been that we have to concrete everything – to take the urban standard and plonk it into the bush. But New South Wales is covered in fire trails and bike tracks that you can tackle by thinking outside the box. The challenge is to find them."

It was out of frustration that Smith emailed Matt McClelland (BLeisure&Hlth '00), producer of online bushwalking guide *Wildwalks* and activities manager with National Parks Association of NSW. She wanted to know if he could recommend any more challenging tracks.

Instead, McClelland suggested they start a project together. With funding from the Department of Family and Community Services, they developed Naturally Accessible (naturallyaccessible.org), a new

"It's one of life's great pleasures to do the things that people think you can't."

– Helen Smith

Helen Smith

DEGREE
Bachelor of Science '09
PhD (biology) '15

MOST ADMIRED PERSON
Author and camel trekker, Robyn Davidson

BEST ADVICE RECEIVED
Take up scuba diving, it's like bushwalking underwater

approach to accessible bushwalking that emphasises information rather than infrastructure. Online track notes provide details about conditions, terrain, facilities and likely barriers along the way. "It's about moving away from saying this track is or isn't accessible, and instead giving enough information so the user can make their own choice," explains Smith.

The system is useful not only for people who use wheelchairs but for anyone with mobility challenges, from parents with prams to people with heart or lung conditions. The project has been so successful that last year Smith won a prestigious Churchill Fellowship, which supported her on an eight-week trip to Canada, the US and Europe to share the Naturally Accessible framework and research other ways to make outdoor life more accessible to everyone.

Despite this success, Smith's original passion to work in conservation kept tugging at her heart. So, when an opportunity came up in Canberra with the Department of the Environment and Energy, she decided to take it. In June this year she started work as an Australian Science Policy Fellow under a new program that employs research scientists in government departments to improve and update policy.

Having been in Canberra only a few weeks, Smith's routine already includes pushing herself to work in her chair and doing circuits around Lake Burley Griffin, and she's planning to join a local outrigger canoe club. It's all training for her next big adventure: a 250-kilometre journey along the Camino de Santiago, an ancient pilgrimage route that winds its way through various parts of Europe.

Smith and her friend Lisa Edmonds, who also uses a wheelchair, plan to push through coastal villages, farmland, forests and vineyards from Porto in Portugal to Santiago de Compostela in Spain, blogging about their trip along the way (at pushingtheway.com). While they're expecting to encounter mud, stairs and steep slopes, "my hope is that we'll be moving through some wine country, too," says Smith with a smile.

But the trip, supported by a grant from women's adventure magazine *Travel Play Live*, isn't just about fun, she adds. "We want to show what's possible with a bit of innovative thinking – to show that wheelchair users want better access to natural places and are willing to push to the extremes. It's one of life's great pleasures to do the things that people think you can't." ●

FIND OUT MORE

Smith is a keen blogger. Find out more about her current activities at www.pushwalk.com

BOOKS THAT CHANGED MY MIND: STEPHANIE FYNN

Illustration by Harry Slaghekke

Stephanie Fynn (MIDEA '14) creates sensory worlds for people with disabilities by using interactive projections, so she has to stay technology-aware. But first and foremost, her work is about people and giving them stimulating life experiences. This book made her think differently about her approach.

The Philosopher and the Wolf (2008)

by Mark Rowlands

I began reading *The Philosopher and the Wolf* while planning my semester break trip to the steppes of Mongolia, where the wolves run wild. The book traces the lessons learned by a philosophy lecturer from a wolf he adopted. The lesson on the importance of mechanical learning is the one that stood out to me the most.

Mechanical learning has a lot to do with embodied and embedded cognition theories, where intelligent behaviour emerges from the interplay between brain, body and world.

Rowlands discusses how the dog has been embedded in a very different environment to the wolf. As a result, both animals' psychological processes and abilities have developed in very different ways. Specifically, the dog has been forced to rely on us. If a dog encounters a mechanical problem it finds difficult to solve, it enlists human help. The wolf, on the other hand, has evolved to become more mechanically intelligent. When the wolf is faced with a problem in the wild, it has to use its body and mind to solve the problem creatively.

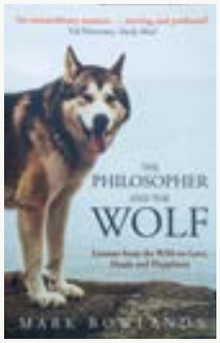
As I was succumbing to the digital age, the book made me reflect that my reliance on computers was making me forget how to use an embodied approach to problem-solving.

I realised I was enlisting the help of the computer and losing my mechanical problem-solving skills.

While I was travelling in Mongolia, I discovered that the nomads still employed mechanical problem-solving in their day-to-day living. Mechanical intelligence holds so much weight that a woman is not allowed to get married unless she completes a series of hands-on puzzles prior to the wedding day to prove her mechanical intelligence.

Since reading this book, I have tried to develop a more hands-on, tactile and embodied approach to my design process. I have been focusing on creating interactive projections so people have the opportunity to use their whole body, rather than just a keyboard and mouse. I am looking to nature to find my way forward.

> "The book made me reflect that my reliance on computers was making me forget how to use an embodied approach to problem-solving."
>
> — Stephanie Fynn



The humanitarian crises that most of us only read about are often witnessed firsthand by Rosemary Morrow, as she travels the world helping displaced people put down new roots.

Moving heaven and earth

Written by George Dodd
Photography by Louise Cooper and supplied

In June this year, the Iraqi government banned the country's farmers from planting their summer crops due to a disastrous water shortage. While the blame game played out in that damaged country, Rosemary Morrow spent two weeks "on a vinyl sofa in sweaty Hanoi", waiting for a visa to allow her to get over there and help.

It wouldn't be her first visit to Iraq. But this time she had business near Mosul, the northern city so recently the scene of ISIL atrocities and of a merciless battle that had rendered it a virtual dust pile. Morrow had been asked to come and teach skills to a group of Internally Displaced People (IDPs) who were being sent back to their levelled neighbourhood.

"These are ordinary people just like us," she explains. "Ordinary, good citizens now living with their families under canvas in a place that can be minus-15 degrees in winter and 50 degrees in summer."

"You must know that what you teach works. You can't play with peoples' lives when they're hungry."

— Rosemary Morrow

No water, no toilets. Morrow says this Internally Displaced Persons' camp in the middle of Kabul could offer much more to the people who have to live here.

Rosemary Morrow

DEGREE
Bachelor of Science/
Agriculture '69

MOST ADMIRED PERSON
Socrates, for his integrity
and truth seeking

FAVOURITE MUSIC
JS Bach, folk, country
and western

WHAT GETS YOU THROUGH THE TOUGH TIMES
The gift of life – I gasp at least
once a day to know I'm alive

The skills that Morrow teaches are in permaculture, a term coined in Australia in the 1970s to describe a set of design principles for creating permanent, self-sustaining food production systems by mimicking nature's ecosystems. The principles also apply to water, shelter, education and technology. It is, in effect, ecosystem rehabilitation with a social dimension.

This means Morrow could help the Iraqi farmers squeeze more out of their water-starved land, regenerating it in the process. "In Mosul, we'll discuss food, water, housing, solar energy and feeling safe," she says, with the assurance of someone who has confronted many similar situations. In fact, her dedication won her a 2017 Advance Global Award that recognises exceptional Australians working internationally.

Morrow started this work in Vietnam in the mid-1990s, when the Vietnamese government was establishing a program called Doi Moi, meaning 'Reconstruction'. She was approached to make that trip by Quaker Service Australia, later becoming a Quaker herself, moved by the religion's humanity, service and dedication to peace.

Thinking back to that first trip to Vietnam, Morrow realises what an ordeal it was. "It was as if the people were transitioning from one century to another," she says. "We were in an old jeep with canvas seats, and the roads were terrible. Today the trip would take about three hours, but then it took us three days."

She remembers always being sick with infections – stomach, eyes, ears – but says it was the same for the locals. She felt privileged to be among a people working for enduring peace, and remembers moments of transcendent beauty.

"There were no bridges, and so our jeep had just been pulled across a river on a raft," she recalls. "Suddenly a bridal party arrived, all on bikes – the bride in white, sitting on the handlebars. They invited us to join them, and share their rice."

Since those early trips, including one to Cambodia where she was caught up in a Khmer Rouge road ambush and someone in the vehicle ahead of her was killed, Morrow has crisscrossed the world at the invitation of humanitarian organisations and governments.

"Recently I've moved to the gift economy," she notes. "I don't accept money anymore. They pay accommodation, airfares and transport."

Morrow has worked all over Africa, in Albania when its dictator fell, in Kashmir, and many times in Afghanistan, where she says the soil of the capital, Kabul, is yellow and lifeless. "You'd be shocked at how few plant species, including trees, there are in the cities of these countries and provinces," she says with a note of despair.

Morrow recently worked in the Solomon Islands, invited there by the Solwata (Saltwater) people who live on the lagoons and have always fed themselves from the ocean. Now they are learning to farm instead of fish, because rising sea levels mean they must soon leave their lagoon homes.

"Everywhere I've been invited, the land and the people have been on the edge of immense changes," she says.

Now Morrow herself is determined to create change. She is deeply distressed by the plight of refugees and IDPs – people who struggle with loss, violence and rejection by the international community – and she wants to do something about it.

"We can transform refugee camps from places of misery, enforced suffering, idleness and degradation of land and spirit into humane, integrated settlements for refugees, run by refugees," she says.

"We can transform refugee camps from places of misery, enforced suffering, idleness and degradation of land and spirit into humane, integrated settlements for refugees, run by refugees."

— Rosemary Morrow

Kurdish Syrians in a refugee camp in Kurdistan. Their final assignment was a plan for the refugee camp they live in, with a population of about 9000 people.

Morrow knows this is possible. She is also aware there are plenty of government and other agencies that will throw up obstacles.

With characteristic frankness, Morrow tells *SAM* that she didn't really like the agriculture degree she completed at the University in the late 1960s. It treated land as a commodity to be exploited, she says, rather than as a resource to be cherished. She was particularly horrified by classes in which students were taught the easiest ways to bring down the greatest number of trees.

As she planned a career working on cattle stations for the Department of Agriculture, she knew she wanted a very different relationship with the land, but she wasn't aware of any alternatives. Then a friend suggested she look into this new thing called permaculture.

It was a turning point – and it also made Morrow look at her agriculture degree differently. "it gave me the biology, chemistry and physics evidence I needed," she says. "And people took me seriously because I could talk about them and integrate them. Permaculture is really applying these sciences through design principles."

Talking to Morrow on the phone, she has the voice of a teacher: modulated and precise. In person, her face gives away more of the joy of what she does, but also the frustrations and the disbelief of desperate situations that she knows need not exist.

She lives simply in the Blue Mountains, west of Sydney, and has transformed what were once the front and back lawns into a productive and wildlife-friendly permaculture garden, doing most of the work herself using mostly recycled materials. She plans to use the same approach in Mosul: teaching people how to treat the wreckage of their city as the building material for what will come next.

"You must know that what you teach works," she says. "You can't play with peoples' lives when they're hungry."

After two weeks of waiting in Hanoi, Morrow had to get back to Australia to teach another course. On the way she attended a training course in France, visited some former students in the French Alps who are learning to be permaculture teachers, and took a side trip to work with a small but dynamic team from Greece, Italy, Spain and the Philippines who have started a program called Permaculture for Refugees.

At the time of writing, due to changes to Iraqi visa rules, Morrow still doesn't have the visa she needs to get to Mosul.

"I'm going back," she says with a twinkle in her eye. "I'm not giving up."

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THE UNIVERSITY OF SYDNEY

Sydney's oysters once helped to build the city. Two centuries on, they're helping to build ideas that could clean up urban estuaries all over the world.

HARBOURING AMBITION

Written by Louise Schwartzkoff (BA(Media&Comm) '07)
Photography by Stefanie Zingsheim

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Between the bricks of some of Sydney's oldest buildings are hidden clues about the city's past. The mortar holding together buildings such as Vaucluse House and Hyde Park Barracks is studded with shell fragments – many from creatures that have all but disappeared from Sydney's harbour and other estuaries.

In the early days of white settlement, the harbour was full of oyster reefs, so large ships had to navigate around them. The colonists harvested them – along with shells they found in Aboriginal middens – and used them to make the mortar that built the city.

Today, most of Sydney's oyster reefs have been wiped out by fishing and industry. The area is still home to a smaller number of Sydney rock oysters and the invasive Pacific oysters originally from Japanese waters, but a once-common variety of native flat oyster – *Ostrea angasi* – has vanished.

Now, the oyster reefs are set to make a comeback, thanks to researchers at the Sydney Institute of Marine Science (SIMS).

Over the next five years, a SIMS team led by the University of Sydney will work to restore the reefs around the city, and perhaps even bring back the lost angasi species. The project, a collaboration between the University of Sydney, the University of New South Wales, Macquarie University and University of Technology Sydney, could have long-term benefits for the harbour's health.

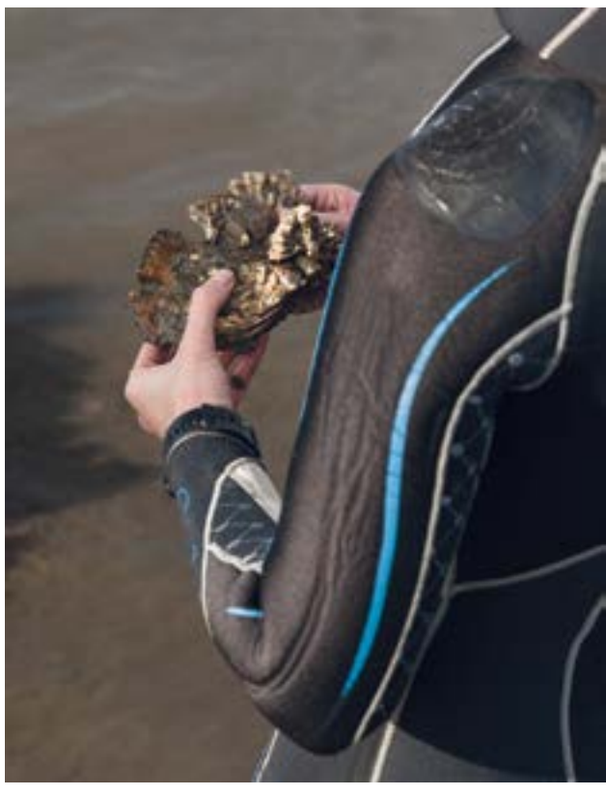
Oysters, says Associate Professor Paul Gribben, director of the Sydney Harbour Research Program, are "the kidneys of the water", filtering out excess nutrients and heavy metals. For this reason, it's not a good idea to eat harbour oysters, but in restoring the reefs, the scientists hope to not only improve water quality, but also create hotspots for biodiversity.

Oyster reefs provide a habitat for all creatures: snails, crabs and other invertebrates, which in turn attract fish.

The reefs can even help buffer the shoreline from wave damage – a growing concern thanks to the predicted consequences of climate change.

Working out where to place the new reefs will require careful thought and preparation, with the first step being a thorough assessment of Sydney's remnant natural reefs.

That's what brings a small group of marine scientists to the boat ramp at Port Botany on a bright, cold day in June. It seems an unlikely spot to begin a quest for one of the city's last remaining natural reefs. Planes roar as they take off from the airport nearby. Cranes loom above warehouses clustered along the shore.



▲ Shell game. The research team (L–R) Dr Ana Bugnot, Dr Katherine Dafforn, Associate Professor Ana Vila Concejo, Associate Professor Paul Gribben and Associate Professor Ross Coleman.

> **“We’d like to put angasi back into Sydney Harbour, where angasi should be.”**
>
> — Associate Professor Ross Coleman

But as the researchers’ tinny pulls away from land, the industrial landscape recedes and the water is unusually clear. At the tiller is Associate Professor Ross Coleman, from the University of Sydney’s Centre for Research on Ecological Impacts of Coastal Cities. Also aboard are marine biologists Dr Ana Bugnot (PhD(Research) ’14) from the University of Sydney and Dr Katherine Dafforn from Macquarie University.

From a distance, the reefs look like long, flat slabs of brown rock just breaking through the water. Draw closer and their surfaces are crusty with the shells of thousands of creatures. While oysters on sea walls or breakwaters grow in a single layer, natural reefs like this one can build up many layers of oysters, clinging to nothing but each other.

Over the next few hours, the scientists will wade through the water to collect sediment samples and make observations. They hope to use this reef as a control, comparing it to the new ones they will create.

“We want to check out the habitats around the reefs,” says Dr Bugnot. “We’re also interested in their size and how healthy they look, and whether there are any oyster predators on the spot.”

All of this will inform the rest of the project. The locations of the new reefs are yet to be determined, but the focus will be on estuaries in the Sydney area, such as the harbour and Botany Bay – well away from paddlers and swimmers.

Once the researchers have selected the sites, they will plant structures made of concrete. The hope – backed by existing research – is that oysters already in the water will settle on the concrete, kickstarting the growth of natural reefs.

Oysters prefer company, so the scientists may plant some living specimens to help the new reefs grow. This is how they plan to bring back the lost angasi species.

Angasis were particularly popular with the early settlers. They closely resembled the flat oysters of the northern hemisphere and were easy to harvest. Where other species in Australia prefer to attach to rocky surfaces, angasis could be found loose in silty or sandy-bottomed estuaries. The Europeans harvested them almost to extinction.

“We’d like to put angasi back into Sydney Harbour, where angasi should be,” says Associate Professor Coleman.

The long-term plan is to seed reefs with angasis bred in laboratories or fisheries. The process will be carefully managed within the quarantine rules that govern the movement of oysters between habitats.

Oyster farmers elsewhere in Australia are already experimenting with angasis – the variety’s strong flavour is making it increasingly popular with foodies. The native oysters are seen by some as a potential solution to recent disease outbreaks that have decimated the more traditional varieties.

Despite these intriguing culinary possibilities, the research project is aiming only to create a recipe for rehabilitation. The scientists hope to develop guidelines for restoring oyster reefs that could be used in similar environments elsewhere.

For now, prepare for the Sydney Harbour water view to include re-established oyster reefs. ●

SUPPORT MARINE RESEARCH

The oyster restoration project is possible thanks to a generous donation from the Maple-Brown Family Foundation. You can support this research or find out more by phoning +61 2 8627 8818 or email development.fund@sydney.edu.au

A GREAT FIRST IMPRESSION

The new Sibyl Centre at the Women's College was never conceived as an easy build. The effort put into funding, designing and building it came together in a celebratory opening ceremony.

1.

2.

3.

There's little doubt that the newly opened Sibyl Centre will become one of the best-known buildings on the University campus. Already, passers-by stop for photographs and to fully take in the eye-catching façade.

The building is the first addition to the Women's College campus in nearly 50 years, joining Langley, Reid and the grand Main Building. All sit on University land, but the Women's College is an independent and secular entity that provides accommodation and community for female University students, and has done so since 1892.

The new structure evokes the past while looking very much to the future. It provides spaces for study, music practice, lectures and performance. A driving force behind its construction was the Women's College principal, Dr Amanda Bell AM (BA '80), who has been closely involved in building construction in previous roles, but nothing like this.

"There's not a straight wall in the building," she says, remembering a wide-ranging creative process. "It needed attention to detail and craftsmanship, which the architects and builders certainly brought."

Elements of the new building pick up on the heritage features in the rest of the college: bronze rails, Flemish brickwork, copper highlights – the most obvious copper element being that singular façade which takes on an unexpected 3D quality when lit at night.

The façade image was created by punching computer-guided holes into metal sheeting to build an image of one of the best-loved photographs hanging in the Main Building. The photo is from 1913 and the Women's College production of *A Mask*, with the central character named after the female oracles of Greece; Sibyl.

Sibyl, and indeed the production, contemplated the history of female achievement and the great things women would achieve through education.

The centre was opened in March this year by Dame Quentin Bryce (LLD (*Honoris Causa*) '09), a previous principal of the college. To a booked out and energised house of alumnae, staff, students and friends, she described the building as "A truly beautiful expression of all that inspired the college's past, that embraces the imagination of women now and into the future."

1. Under construction.
2. Carefully designed to fit in with the existing buildings.
3. The Sibyl Centre opening was a joyous event.

CLASSNOTES

More stories of alumni at work around the world. We love hearing what our alumni are doing. Help us keep track by updating your details at alumni.sydney.edu.au/updatedetails

MICHAEL GOLDMAN
BA(Hons) '15

With a background in the humanities but a career in business strategy and management, Goldman maintains a balance between his work goals and other activities that support social justice. At the University, he was Asia–Pacific head of 180 Degrees Consulting, the world's largest student consultancy, established to help non-profits improve their social impact. Now with Monitor Deloitte, Goldman has worked with international teams on strategies, mergers and product launches, as well as helping senior executives to author and publish thought leadership. In 2017, he took a team of 180 Degrees students to South Africa to advise the multi-award-winning organisation Community-based Prevention and Empowerment Strategies in South Africa (COPESSA) on reducing gendered and domestic violence. His next move will be to Deloitte's headquarters in New York.

KATE LEAVER
BA '11

Leaver has worked as a features editor at *Cosmopolitan* magazine, senior editor at *Mamamia* and producer for financial analyst and journalist Ross Greenwood. She moved to London in 2015 where she started working for JK Rowling's website, *Pottermore*. She now writes about women, mental health and pop culture for publications including *The Guardian, The Independent, London Evening Standard*, *Refinery29, Vogue, Vice* and *Elle*. She has appeared on *BBC Radio* and *Channel 4 News* as well as on television and radio across Australia. She has just published her first book, *The Friendship Cure*, a non-fiction work on the importance of friendship during a loneliness epidemic. She's currently planning her second book.

DR GORDON CABLE AM
MBBS '88

Pursuing a childhood passion, Cable learned to fly as a junior resident medical officer, subsequently obtaining his private pilot's licence. The field of aerospace medicine has allowed him to combine his passion with a professional medical career. He is now a Senior Aviation Medical Officer with the Australian Defence Force, and Head of Training at the RAAF Institute of Aviation Medicine. He is an honorary life member of the Australasian Society of Aerospace Medicine, as well as chair of the Space Life Sciences Committee, and holds fellowships with the Australasian College of Aerospace Medicine, Aerospace Medical Association, Royal Aeronautical Society, and International Academy of Aviation and Space Medicine. He is proud to contribute to the safety of passengers and aircrew.

JULIET DUFFY
MSustMgt '08

Ten years ago, Duffy started occupational health and safety consultancy Regional Enviroscience out of her rental property garage in Dubbo. Today, the company provides specialist services in asbestos remediation, education and testing, employs more than 23 local people and provides opportunities for young and mature-age workers in science, technology, engineering and maths (STEM). A sought-after speaker at national and international industry conferences, Duffy also frequently travels the state educating government and other organisations. Her enthusiasm for STEM has seen her mentor young women and take voluntary board positions with Regional Development Australia Orana and Orana Arts. She is also chair of the Western Research Institute.

DAVID HUSH
BA '80 BMus '80

Hush was the first Australian to be awarded a Graduate Fellowship in Music at Princeton University, where he studied with the influential composer and theorist Milton Babbitt. After earning a Master of Fine Arts and a PhD, he remained at Princeton until 1993 when he returned to Australia and took up a composer residency at the Sydney Conservatorium of Music. Hush has written works spanning solo instrumental, chamber ensemble, choral and orchestral pieces that have been performed, recorded and broadcast in North and South America, the UK, Europe, Australia and South Korea. American violinist Zina Schiff premiered Hush's solo piece *Dream* in Israel in 2017; the premiere was followed by a suite of three more Hush pieces for violin.

CATHERINE TANUJAYA
BMusStud '12

A year into her Bachelor of Music (Performance) majoring in piano, Tanujaya was offered a partnership with Singapore National Academy, an international school in Sidoarjo, Indonesia. The project was to establish a music school as part of its after-school program. Transferring to a Bachelor of Music Studies so she could graduate sooner, she took the position and in 2012 became CEO of the Piano Institute. Now a leading international music school, the institute teaches hundreds of students and inspires them to see music as a way of enhancing their lives.

PHILLIP GLOVER
BScAgr '78

This has been one of the toughest years ever for Phil Glover. Like a lot of farmers, the 'monster drought' sees him make huge decisions every day. Starting out as an agronomist scouting insects in the cotton industry, he worked with Bayer Australia for 12 years running its cotton business. In 1989, he became Agronomic Manager at Colly Farms, then Australia's largest cotton farm, before going to Abbott Laboratories in 1992, producing and selling biological insecticides and naturally occurring plant hormones. He later travelled internationally to engage Abbott customers. Abbott became Sumitomo and Glover's work there continues. He also went back to his first love, animal husbandry, buying a farm in Gunnedah now known as the Weetaliba Poll Hereford stud.

JUST THE FACTS

Dealing with vast amounts of information is just another day at the office for many of the University's researchers. Here we've asked two to explain just one idea that is at the centre of their current work.

ON SYNTHETIC INTELLIGENCE

The world is infatuated with artificial intelligence (AI) right now but, as a physicist, what I find more compelling is synthetic intelligence. Unlike AI, which is based on computer software algorithms that make statistical predictions using data, synthetic intelligence is based on physical hardware designed to mimic the brain. I'm especially interested in the physics behind synthetic intelligence: the nanotechnology used to build synthetic synapses and the emergent functionality of synthetic synapses connected to form a complex architecture like the brain's neural network. Such devices can already emulate memory and learning, which are essential requirements for intelligence. An intriguing question for me is: can these devices emulate 'thinking' and, if so, what's the physics behind that?

Professor Zdenka Kuncic
(BSc '92 MSc '93, GradCertEdStud '14)
Often working where physics intersects with medicine, she is currently developing nanoscale atomic switch networks that will be able to emulate brain-like features, as well as nanoparticles that will allow the detection of tumour cells with unprecedented sensitivity.

ON PREVENTING ANAEMIA

One of the greatest challenges facing humanity is nourishing a growing human population in a warming world with increasingly scarce natural resources. Anaemia affects more than half a billion women of reproductive age worldwide, impairing their health and increasing the risk of adverse maternal and neonatal outcomes. In 2011, 496 million (29% of) non-pregnant women and 32.4 million (38% of) pregnant women aged 15–49 years were anaemic, and it's estimated around half of these cases are due to iron deficiency. One food-based solution is to supplement cereal-based diets with bioavailable micronutrients, such as haem iron and protein that has an optimal balance of amino acids. In many parts of the world, these are best sourced from animal-based foods including meat, chicken and fish, which is a key reason why I work to maintain healthy, sustainable animal populations in regions where anaemia is a threat.

Robyn Alders AO
(BSc (Vet) '83 BVSc '84 DipVetClinStud '86)
For more than 20 years she has worked closely with small-landholder farmers across Africa and Asia to control avian Newcastle disease, in order to maintain the health of their small poultry flocks and help women to provide nutritional and financial support for their families.

YOU AND SAM

Where in the world do you read your *SAM*? The best three photos we receive will appear in *SAM* and win a University of Sydney hoodie. Send your photo to sam@sydney.edu.au

Harsh Jain (MMgt (CEMS) '18) in Mathura, India where he works in business development for one of India's leading corporate groups.

Annie Zhou (MEd '17) in Suzhou, China, where she supports alumni activity and events at the University of Sydney Centre in China.

Daughters of Alison Winstone (BA '97) Left to right: Sasha and Zara of Sydney, Australia, liked the cover and wanted some *SAM* stories read to them.

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