



THE UNIVERSITY OF
SYDNEY

SAM

Natural genius:

THE MAGIC
IN MIMICKING
NATURE

ARCHITECTURE

Future cities
made of wood

ECONOMICS

Doing the numbers
to beat famine

MEDICINE

A place for the
placebo effect







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of New South Wales



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A PARTNERSHIP THAT WORKS

It is not just people who sometimes need to take stock. Organisations should do the same.

This year, the University has had an opportunity to take stock, made possible by the successful close of our \$1 billion INSPIRED philanthropic campaign. As many of you know, this decade-long effort was an unprecedented achievement for our community, made possible by more than 64,000 donors across Australia and beyond our shores.

When we reflect on what INSPIRED means for the University, we return again and again to the motivation behind it: to drive innovation, advance knowledge, pursue discoveries and leave an indelible mark on the wider world. We know that the figures actually represent one billion votes of confidence in the many stories we tell, some of which are covered in this magazine.

In partnering with our donor community, we have made 2000 more opportunities possible through scholarships, including one for Jon Won, who struggled to balance the needs of his family with his studies. The help he received meant that he is now a qualified and dedicated emergency nurse.

Over the last 10 years, we have been able to establish more than 35 academic chairs, which in turn have attracted international researchers in a variety of disciplines and given our existing researchers the chance to push their ideas further. One of those is Professor Robert Park, who is a world leader in wheat rust research. As Chair in Sustainable Agriculture, he heads a team that is developing disease-resistant crops that have saved the wheat industry more than \$600 million a year.

We can reflect on the \$368 million added to our medical research efforts, looking into areas of community concern like diabetes, asthma, Alzheimer's disease, medical cannabis and prostate cancer, where Professor Vanessa Hayes is exploring genetics to develop a better understanding.

When we take stock and reflect on everything that INSPIRED has impacted, it is hard to convey the scale of what it has made and will make possible. When reading the stories recounted here, we want you to know how grateful we are for the endorsement of our donors. On behalf of us all, we want to express our heartfelt thanks for your support and desire to partner with us.



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(BEC '76), Chancellor



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Professor Thomas Maschmeyer was a driving force behind the development of Cat-HTR technology, which will help make plastic recycling more widespread and routine.

NEWSBITES

ENVIRONMENT

Taking out the garbage

The world's first plastic-neutral country could be Australia's near-neighbour, Timor-Leste.

Using a plastic recycling technology called a catalytic hydrothermal reactor (Cat-HTR), developed in association with the University of Sydney, Timor-Leste aims to recycle the 70 tonnes of plastic waste it produces every day.

The Cat-HTR technology has been given to Timor-Leste free of charge by Mura Technology Limited. All financial surpluses will support community initiatives and develop livelihoods for waste collectors. It will also allow Timor-Leste to create an almost zero-waste circular system as the Cat-HTR converts plastics into new plastic, fuels and industrial lubricants.

A key advantage of the technology, developed by University researcher, Professor Thomas Maschmeyer, in collaboration with Dr Len Humphreys, is that it can recycle mixed and contaminated plastics, meaning there's little need for labour-intensive sorting.

"This is an exciting collaboration," says Timor-Leste's Secretary of State for the Environment, Demetrio do Amaral de Carvalho.



TRANSPORT

Rocky road

Australian transport is quickly heading for the most consequential disruptions in history, according to a report from the Sydney Business School's Institute of Transport and Logistics Studies (ITLS).

The source will be a significant increase in the number of electric and autonomous vehicles on the road. Without government intervention, the report warns, Australian cities could see even greater urban sprawl and "intolerable" levels of road congestion.

On the plus side, the combination of smartphones and autonomous vehicles will provide an integrated transport offering called 'mobility as a service' (MaaS), that will give greater mobility to everyone including the elderly and disadvantaged groups. It could also lead to fewer people owning cars.

HEALTH

Had enough of spin?


Apart from its symptoms – intense dizziness, vomiting, not being able to walk – a big problem with severe vertigo is that it's hard to diagnose the cause.

The characteristic eye movements have often stopped before a patient sees a doctor. For Associate Professor Hamish MacDougall from the University's Vestibular Research Laboratory, the question was "how could patients record their own vertigo events as they were happening?" The answer? Swimming goggles with a small video camera.

With funding from the Garnett Passe and Rodney Williams Memorial Foundation, the goggles have now helped patients suffering vertigo from a range of causes and a research lab has been established at Royal Prince Alfred Hospital.

Front *and* centre



A photograph of Margaret Beazley, the 39th Governor of New South Wales, sitting on a plush red tufted sofa in a grand, dimly lit room. She is wearing a red dress and a black blazer, smiling at the camera. In the background, there is a large arched doorway leading to another room with a chandelier and a fireplace. A grand piano is visible to the right.

**Moving house is one
thing, but moving to
Government House,
that's something else.
Just ask the 39th
Governor of New South
Wales, Margaret Beazley
and her husband,
Dennis Wilson.**

Written by
George Dodd

Photography by
Louise M Cooper

👉 Arriving at Government House, there's an immediate sense of a meticulous environment.

The grandly furnished rooms are dust-free with no hint of the staleness you might expect from a house built in 1845. While formal and less formal events happen here four to six times a week, there is a sense of serenity.

SAM is shown to a side drawing room where a staff member in full and pristine military uniform genially explains the protocols. The Governor is 'Your Excellency' or 'Governor'; her husband is 'Mr Wilson'. You should stand when they enter the room. The Governor and Mr Wilson are attending a ceremony at the Cenotaph in the city, so they must leave at seven minutes to eleven.

Soon after, the military staff member re-enters the room, formally introduces SAM to the Governor and Mr Wilson, then leaves us to our conversation.

Allowing that Margaret Beazley has only been Her Excellency since May 2019, a matter of months, the opening question seems obvious: how have the last few months been? The vice regal couple look at each other for a shared answer.

Finally, Beazley says with enthusiasm, "I think they've been wonderful!" Wilson agrees, "Yes, really wonderful."

The Governor is measured in how she speaks, though this serious demeanour doesn't stop her laughing, easily and freely, often at a wry remark dropped gently into the conversation by Wilson.

Where she does become visibly uncomfortable is talking about the characteristics that allowed her to achieve so highly. It's left to Wilson, who lists them easily in a way that says he has a deep understanding of his wife, now the Governor of New South Wales.

"Brilliance, insight, humility, empathy, occasionally sympathy," at which they both laugh heartily. "And patience."

Finally, Beazley, still with some reluctance, adds one more thing: "I like people and I like to interact with people."

This makes the significant community aspect of the Governor's role a real joy for

them both. They talk with equal passion about meeting volunteers, which they do through events at Government House and regular trips throughout the city and regional New South Wales.

"You quickly realise that volunteers are so terribly important, and they come from every part of the community," Wilson says in his deep, rounded voice. "I don't know where we'd be without them."

Being acquainted through their shared profession of the law, it was some years before Beazley and Wilson joined in what is now seven years of marriage. The Governorship has wrought some changes there too. Their home is now a private apartment above the formal rooms.

Beazley was born in the modest southern Sydney suburb of Hurstville, to parents who missed out on an education due to their Depression-era upbringing. Her father was a milkman and her mother encouraged the five children to value learning, but with no expectation of university. Only Beazley and her brother studied beyond high school.

Admitted to the legal profession in 1975, she has since achieved notable firsts. In 1993, she was the first woman appointed to sit as a judge of the Federal Court,

then in 1996, she was the first woman appointed to the NSW Court of Appeal, becoming its first female president in 2013.

She is only the second woman to be Governor of NSW – the first being Dame Marie Bashir (MBBS '56 MD '02) – and only the third Governor without a military background.

Beazley's career in the law has been described as pioneering, though she bats that idea firmly away. "There were extraordinary pioneering women before me," she says. "It's true I went to the bar very young, when I had young children," she says. "And I kept working, which wasn't too commonplace. I just organised my life to allow for my family."

When asked about the bias she faced as a young lawyer, you can see the sense of outrage re-engage. "I couldn't get briefs; they told me to go and do family law; I was sent to different chambers because they didn't like having women around. That kind of thing was daily fare." She knows things have improved for young female lawyers, but she still hears stories that suggest the battle isn't over.

For his part, Wilson's journey to Government House started in the United States, where he was born. His American soldier father took his Australian war-bride back to the States with him. In 1957, they returned for a new life in the central western NSW town of Dubbo, bringing with them their young son.



Location. Location. Location. Government House is in the city centre of Sydney but Governor Beazley travels to communities statewide.



Margaret Beazley

DEGREE

LLB '74 LLD '08

BEST ADVICE RECEIVED

From my father: "The farmer has to plant the potatoes before they grow."

MOST PRECIOUS POSSESSION

My children

FAVOURITE WORD

"However" followed closely by "Nonetheless". However, my favourite expression is "Just do it". Nonetheless, that was not what I was asked for.



Dennis Wilson

DEGREE

DipCrim '76 LLM '13

FAVOURITE ARTIST

Sculptor, Alberto Giacometti

HIDDEN TALENT

Embryo implant in bovines – but a bit rusty

BIGGEST LIFE INFLUENCE

My wife

Leaving Dubbo High School, Wilson couldn't get any scholarships because of his citizenship. Taking a job as an article clerk at a local firm of solicitors, he became a lawyer by studying at night, so he missed the broader university experience. That came to him later in life.

"At 65, I realised that all the solicitors who sent me work at the bar were either retired or dead," he says. "So, I went back to Sydney and did two master's degrees." It was then that a lecturer told him about the climate change crisis unfolding for the South Pacific nations. This chimed with Wilson's longstanding interest in the environment (at the bar, he was in environmental law and development planning) and he has written passionately about it ever since.

"The sense of impending climate emergency that's there now reflects what's been in the community's mind, and in my mind, for years," he says.

These days Wilson works in alternative dispute resolution, while making room for life at Government House.

The NSW Governor represents the monarch. The first Governors had tremendous power and autonomy, and their names read like features of the Australian landscape – Darling, Hunter, Brisbane and Macquarie. It was the landing of the first Governor, Captain

Arthur Phillip, at Port Jackson on 26 January 1788, that is now celebrated as Australia Day or marked as Invasion Day.

The modern Governorship is more symbolic, and community focused, but with an important constitutional role, including appointing the Premier and the ministry after an election and assenting to bills passed in Parliament as laws.

When the offer of the Governorship came via a phone call from the Premier of NSW, Gladys Berejiklian (BA '92 GradDipIntS '96), a quick decision was needed. The highly respected Governor at the time, David Hurley, had just been called by the Federal Government to serve as Governor General on the national stage. The announcement of a replacement had to be made with minimum delay.

"That's the way it is with judicial appointments as well," she says. "I had been a judge for a long time and president of the court for six years, which I really enjoyed. But to get a new and distinct challenge at this time of life is a rare thing."

A gentle knock on the door signals the Cenotaph event awaits and the Government House machine sees Beazley and Wilson quickly in their car. As it heads down the driveway, the time is seven minutes to eleven. ●

Onboard *HMAS Canberra*, Beazley inspects the Ceremonial Guard in her honorary rank of Commodore.

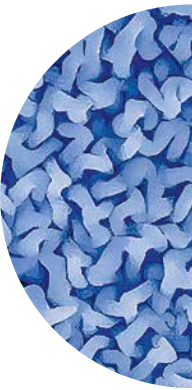




Associate Professor
Chiara Neto in front
of a scanning electron
microscope (SEM)
micrograph of a wrinkled
polymer surface, with a
scratch in the centre

Over billions of years, plants and animals have perfected countless mechanisms and substances that could be useful to humans. Recreating them is the trick, and Chiara Neto goes to the nanoscale to do it.

Scratching the surface



Written by
Jocelyn Prasad

Photography by
Stefanie Zingsheim



Applying crystals of stearic acid produces highly water-repellent surfaces

👉 The carnivorous pitcher plant is named for its built-in pitcher, filled with digestive juices for dissolving any insect that slides into it. The plant's slippery inner coating means even the most sure-footed insect is likely to succumb to the pitcher.

It's an unlikely prompt for a technology that could save the shipping industry billions of dollars a year, but one that presented an opportunity for the University's Neto Research Group. The group has used the pitcher plant as a starting point to create a coating for the submerged surfaces of boats, a coating too slippery for barnacles and other ocean life to attach.

This is a research area called biomimicry: the replication of traits occurring in nature to create new materials and solve engineering problems. The concept of biomimicry isn't new; more than 500 years ago, Leonardo da Vinci famously studied bird flight to draw up plans for flying machines. Elsewhere in the 1950s, Swiss engineer George de Mestral developed Velcro after finding burrs stuck to his socks.

Biomimicry captured the imagination of Associate Professor Chiara Neto more than 15 years ago, when she was doing postdoctoral research in Germany. There, she became interested in superhydrophobic surfaces, those which naturally repel water and are useful, for example, in corrosive environments. This effect is also called the lotus effect because its water repelling properties are like those of a lotus leaf.



"Seeing a droplet roll off a lotus leaf, leaving nothing behind, is an image anybody can appreciate," says Neto. But the structure of that leaf cannot be fully understood and potentially replicated without close examination. To that end, Neto and her team study how liquids and solid surfaces interact to the scale of the nanometre. One nanometre (nm) is a billionth of a metre; a human hair is about 75,000nm wide.

When *SAM* visits Neto, who is an Australian Research Council (ARC) Future Fellow, she shows off her domain – a laboratory in the School of Chemistry on Eastern Avenue – with pride. Sun shines into the laboratory and there is a constant thrum, like a chorus of refrigerators. Researchers work with quiet intent at machines unknown to most – spectrometers, atomic force microscopes, sonicators – that allow them to look at natural materials which have evolved over thousands of years, so their structures might be copied and applied in new ways.



Chiara Neto

OCCUPATIONAL HAZARD
Stress

ADVICE TO YOUR YOUNGER SELF
Take it easy

HAPPY PLACE
Holidaying in Italy

WATER FROM THIN AIR

The Namib desert beetle lives in such an arid environment that it must create water where there is none. It does this through a waxy texture on its back that causes morning fog and moist air to condense into water, which is then channelled to its mouth. Imagine if this texture could be mimicked and painted onto surfaces to be used in arid parts of Australia. Neto and her team have gone past imagining the water-collecting potential of this idea; they're well underway in creating it. As part of a multidisciplinary Sydney Nano Grand Challenge project, the team is developing surface coatings to collect water using no energy and no moving parts. Watch this space.

"A lot of plants are very effective, but they're only effective for a short time because plants don't live long," says Neto. "What we're trying to do is to translate a plant's mechanisms to materials that will last a lot longer."

This is all a long way from Florence, Italy, where Neto grew up and, like her parents, studied chemistry.

"For me, chemistry was a familiar and friendly sort of topic," she says. She is quiet and serious, softly spoken but brimming with enthusiasm. "I didn't feel threatened by it."

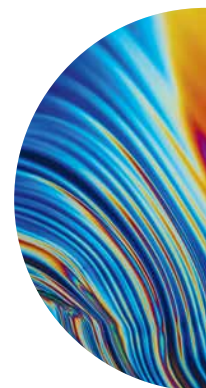
The University of Florence cultivated her interest in intermolecular forces which determine how molecules interact within certain structures. Their close examination requires atomic force microscopes which 'feel' the surface with a microscopic probe. This allows scientists to investigate molecular activity on the nanoscale.



Interference fringes causing colours on a thin polymer film, as often seen on soap bubbles

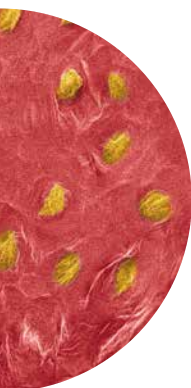
"FOR ME, CHEMISTRY WAS A FAMILIAR AND FRIENDLY SORT OF TOPIC. I DIDN'T FEEL THREATENED BY IT."

— Chiara Neto





A SEM photo of the surface of a jacaranda flower, coloured to look like a strawberry



Neto's first major breakthrough came while completing her PhD at the Australian National University. It challenged what's called the no-slip boundary condition, essentially rewriting accepted knowledge on how moving liquids and solid surfaces behave when in contact with each other. This is important knowledge when considering drag, which affects things like boats travelling through water, with implications for speed and fuel efficiency.

Though hotly contested at the time, Neto's finding eventually gained acceptance and remains one of her most cited pieces of research.

A lectureship brought Neto to the University of Sydney in 2007. Here, she has bedded down her research and created the Neto Research Group, a group of 11 doctoral and postdoctoral researchers who share her research interests.

**“SEEING A DROPLET
ROLL OFF A LOTUS
LEAF, LEAVING
NOTHING BEHIND, IS
AN IMAGE ANYBODY
CAN APPRECIATE.”**

— Chiara Neto



These minute pinholes in a polymer film are the start of 'dewetting', as the film retracts from the substrate

The newly developed surface was put to the test in Sydney Harbour, tied to the shark nets at Watsons Bay for seven weeks.

"We found that very little in terms of algae and larger barnacles and organisms attach to the surface," says Neto. The few that do attach can be easily removed, so the surface is antifouling and foul-releasing."

Neto is now working with a Sydney-based enterprise to translate this research discovery into a commercial product that can be manufactured at scale.

It has been a long haul for Neto to get from her PhD thesis, which established her academic credibility, to the development of technology that can solve pressing engineering problems. But it has allowed her now to split her time between continuing her fundamental experimental research and the more practical applied research.

She's also encouraging her own children to explore science at a fundamental level.

"My six-year-old is obsessed with experiments. He's always getting a jar from under the sink and mixing stuff – powders, liquids, whatever he can find – to see what happens."

"There's not much control in the experiments," she says, breaking into a broad laugh. "But the idea is there." ●

This is the group that was inspired by the pitcher plant to create an anti-fouling surface for ships. The accumulation of unwanted marine life on the undersides of boats increases a boat's drag and can increase fuel costs by up to 40 percent. It's also a biohazard that introduces invasive organisms to marine environments.

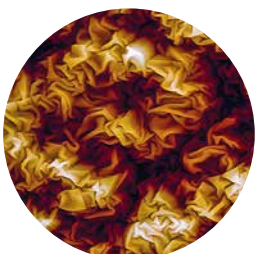
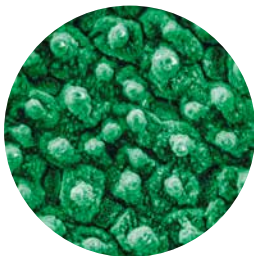
For 40 years, the shipping industry controlled fouling with paint containing the organic compound, tributyltin. But this was banned in 2003 because of its toxicity, which contaminated ocean wildlife and caused the closure of shellfish farms. The shipping industry is now desperate for an alternative.

In searching for solutions, Neto's research group looked to Teflon (used in non-stick cookware and a brand name for polytetrafluoroethylene, or PTFE for short). They used it to make wrinkles which are extremely repellent of water and able to reduce drag. With inspiration from the pitcher plant, the researchers were able to go one better and make the wrinkles resistant to unwanted organisms.



The surface of the carnivorous *Nepenthes* pitcher plant

The microstructure of a lotus leaf, made of a waxy coating and super water-repellent



Polymer films can wrinkle in various ways so they're used to create new and useful surfaces

GET BELOW THE SURFACE

To find out more about Dr Neto's work, or support her research, call Peta Magee on +61 2 8627 8818 or email development.fund@sydney.edu.au

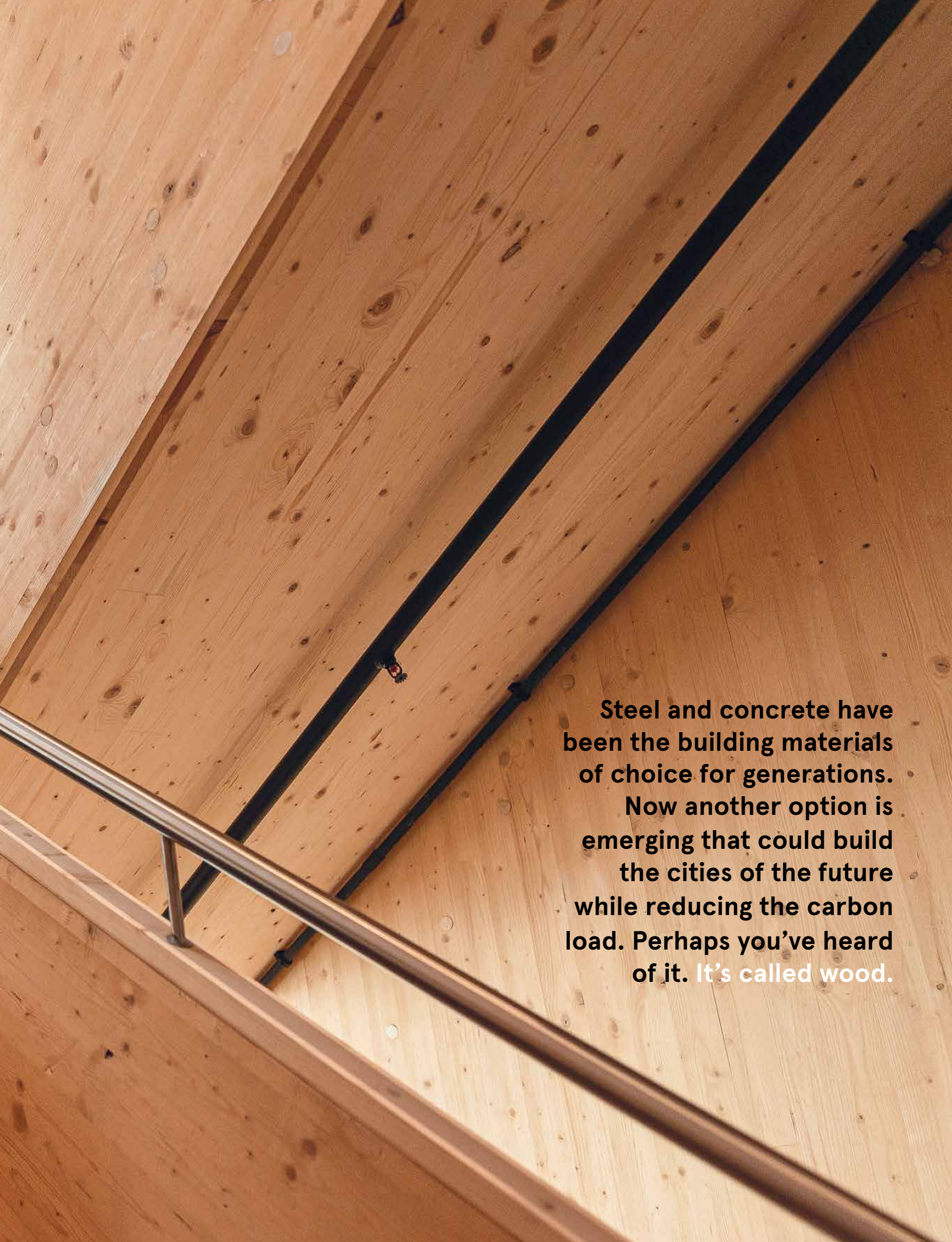
ARCHITECTURE

Tall timbers

Written by
George Dodd

Photography by
Louise M Cooper





**Steel and concrete have
been the building materials
of choice for generations.
Now another option is
emerging that could build
the cities of the future
while reducing the carbon
load. Perhaps you've heard
of it. It's called wood.**

👉 Standing side-by-side in Sydney's Barangaroo precinct are two new office buildings that are part of an international architectural revolution. What makes them unique in Australia and uncommon around the world is that they are commercial buildings made almost entirely out of wood. Walls, floors, ceilings, roof, lift shafts and stairwells, all made of wood.

The architect who has put hundreds of hours of his life into creating these buildings is Jonathan Evans. A gently spoken man, he wants his wooden buildings to be a strong statement about a better way of doing things.

"We were looking for a renewable material that could build our cities, not just our homes," he says. "We want to bring our cities more into a natural cycle with the environment."

Go to a high vantage point and view a modern city and what you see is, in effect, a vast landscape of concrete and steel. In a carbon-aware world, most people know that steel production is energy-hungry, but the lesser known but much bigger villain is cement.

Producing a ton of cement sucks in the energy equivalent of more than 180 kilograms of carbon-heavy coal. A necessary chemical reaction in the process also produces huge amounts of CO₂ so overall nearly a ton of CO₂ enters the atmosphere.

To understand the implications, consider that cement is the second most used substance on Earth after water, and if the cement industry was a country, it would be the world's third largest emitter. This makes cement a problem. Wood could be part of a solution.

"We do require shelter," says Evans, who even as a child roaming the bushland around Newcastle knew he wanted to be an architect. "So why not make our shelters beautiful and generous and connected and harmonious with nature?"

Evans has developed his more human-focused approach to architecture over his 22 years as a director in Sydney's highly regarded, boutique architecture practice, Tzannes (Founding Director Alec Tzannes

(BSc(Arch) '74 BArch '76) is also an alumnus). On turning 40, Evans decided to extend his thinking with a Master of Design Science in Sustainability. "Now I'm taking what I learned in theory and through research to the industry," he says. "But people can be suspicious of architects selling a dream."

Luckily, Lendlease, the property and construction company developing the Barangaroo precinct, weren't suspicious. They welcomed the level of ambition and what the idea of a wooden building offered.

While Evans wants to see the substance of future cities change dramatically, those cities may not look all that different.

Based on physics, there is no reason why a wooden building can't be a skyscraper. In fact, a word exists for it; plyscraper. There is already an 18-storey wooden hotel in Norway, and the Sumitomo Forestry company in Japan plans to celebrate a future anniversary by building a 70 storey all-wood building in Tokyo; a true vote of confidence in the robustness of wood, considering Japan's seismic disposition.

Evans is dubious about some of the other more show-pony projects being announced internationally. "It can be green-spin," he says. But in terms of industry best practice, Evans' Barangaroo buildings, International House Sydney and Daramu House stand as multi-award-winning examples.

The Barangaroo locals probably noticed how different those sites were from their steel and concrete counterparts. With fewer concrete truck deliveries and mixers, they were certainly quieter. The only concrete used is for plinths which are the points of ground contact, preventing termites and damp rising into the wood.

And for those concerned by the fire risk, you're certainly not alone. It's a question Evans has answered often.

"We went through every challenge that timber might present," he says. "The CSIRO and others have tested the burn rate of the timber, and ultimately, the building needs to achieve the same fire performance as any other form of



Jonathan Evans

DEGREE

MDesSc(SustDes) '10

BEST ADVICE RECEIVED

Follow a path that you believe in.

FAVOURITE ARTIST

Is it cheating to say Mother Nature? Inspiring colour, form, structure and perfection down to the finest detail.

MOST PRECIOUS POSSESSION

We are not the sum of our possessions; integrity and character are of greater value.



“We were looking for a renewable material that could build our cities, not just our homes.”

— Jonathan Evans

construction. NSW Fire and Rescue were given all the available testing data and analysis and gave the project their tick of approval.”

Since the wooden elements were delivered precisely pre-cut, there was less noisy on-site drilling and cutting. The sites were also tidier and less hazardous because there were no piles of raw materials sitting around or being worked on, and nearly no waste.

Construction also happened more quickly. Piecing together pre-cut building elements is faster than mixing, forming and reinforcing wet concrete, then waiting for it to dry and achieve strength. Are the elements of a wooden building more expensive than concrete and steel? Yes. Is wood construction more expensive? It’s actually possible to build more cheaply by maximising the benefits of prefabrication.

“You can get off-site three months quicker. That’s a lot of money saved

there,” says Evans. “Not putting in ceilings and wall finishes because wood is an attractive feature ... that’s another cost and material saving.”

At the centre of this work is what’s called engineered wood. It exists in a number of forms, but Evans used two types for the Barangaroo project: cross-laminated timber (CLT) and glue-laminated timber (Glulam).

They were produced in a largely automated factory in Austria, where CLT was invented in the 1980s. The factory uses only farmed softwood from nearby forests and it glues the relatively short and thin pieces of timber into a cross-layered, super-strong product. Evans describes it as ‘infinity long’, like an endless tree trunk that can be cut to any length with virtually no waste.

Provided with an information-dense 3D building plan, the factory produced the exact lengths of CLT specified,

with all ducts and other necessary access points incised, ready for a huge, flat-pack delivery to Sydney. Of course, Evans would have liked it all to happen in Australia, and that is now a possibility, with an engineered wood factory recently opening on the border of NSW and Victoria.

“Plantation softwoods can grow fast in plenty of areas around Australia,” he says. “With so many of our trees becoming low value woodchips, they could instead be redirected into these multi-million-dollar buildings. It’ll attract more investment and more jobs and trigger the planting of new forests to take up more carbon dioxide.

When people in the future go to a high vantage point to view their city, Evans wants them to see a vast landscape of buildings that are like a massive, repurposed forest locking in enormous quantities of carbon. An environment built of carbon, rather than producing it.

“I’ve always thought we’ve left behind what nature could bring to our cities,” Evans says. “Maybe now, we’re finding our way back.” ●



We're unlearning the reef to predict its future

By utilising core drilling technology and innovative 3D mapping approaches, our researchers are examining the history and effects of climate change on the Great Barrier Reef.

Find out how we're unlearning the world's greatest challenges.
sydney.edu.au/our-research



THE UNIVERSITY OF
SYDNEY

Leadership for good starts here

Beyond belief

How can taking a useless sugar tablet have therapeutic benefits? As Ben Colagiuri unravels the mysteries of the placebo effect, he finds himself even more fascinated by the power of the related nocebo effect.

Written by
George Dodd
and Katie Leach

Photography by
Louise M Cooper





➤ When asked for an example of the placebo effect, Associate Professor Ben Colagiuri tells the story of Dr Henry Beecher, a medic in the Second World War confronted with newly wounded soldiers when he had no access to morphine.

Desperate to give the soldiers a sense they were being helped, he administered a plain saline solution, calling it morphine. To his surprise, 40 percent of the soldiers reported that the saline reduced their pain. Beecher went on to study what is now called the placebo effect, where a treatment still has a benefit even when it has been replaced by a lookalike sugar pill or other inactive substitute.

Even more mysteriously, in some circumstances, a placebo will work even when the patient knows they're taking a placebo.

No-one fully understands why any of this happens, but Colagiuri has dedicated his career so far to finding answers. He is now immersed in an evolving field where the clinical possibilities of placebos are being uncovered by a small but determined international network of researchers.

"We're finding that the main way placebos work is to influence the person's expectations, or their mindset, which then affects how their body reacts," says Colagiuri.

This could explain why they can still work when people know they're taking a placebo, referred to in medical circles as an 'open label' placebo. It suggests that an important part of how a patient reacts to a drug or placebo could be to do with the ritual of treatment; talking with the doctor, seeing the drug, taking it.

Some other interesting insights: telling a patient they're about to receive a painkiller like morphine can make it



“PLACEBO EFFECTS ON CONDITIONS LIKE ALLERGIC REACTIONS ARE PRETTY INCREDIBLE. IT’S NOT JUST, ‘I FEEL BETTER’. YOU CAN ACTUALLY SEE A REDUCTION IN THE PERSON’S INFLAMMATION.”

— Ben Colagiuri

Research on placebos has seen mainstream medicine accept the effect as a genuine phenomenon, says Associate Professor Ben Colagiuri.

almost twice as effective than if they’re not told; giving a patient two placebo pills is more effective than a single pill, even though they both only contain sugar; a person raised in a Western medicine environment is more likely to respond to a pill than an Eastern medicine approach like acupuncture, and vice versa.

There are certainly mysteries in play, but one thing Colagiuri is sure of is that the placebo effect is not all in the mind. “Placebo effects on conditions like allergic reactions are pretty incredible,” he says. “It’s not just, ‘oh, I feel better

now’. You can actually see a reduction in the person’s inflammation.”

Placebos have also been shown to offer a very real chance of relieving symptoms in conditions such as psoriasis, hayfever, Parkinson’s disease, irritable bowel syndrome, depression, ADHD, and sleep problems. But only where the body itself can produce the chemicals that have beneficial effects.

In the Second World War morphine example, the human body naturally produces pain-relieving opioids and would have done that for the soldiers being given the saline injection who

expected pain reduction. However, a placebo could not have actually helped heal the wounds, because healing processes are a different mechanism.

Similarly, in asthma, some studies have shown that people taking placebos might report feeling better, but it’s only a perception, because their lung function doesn’t improve. In Parkinson’s disease, on the other hand, taking a placebo can prompt the release of dopamine, which is the neurotransmitter that is lacking in people with Parkinson’s, which explains why they feel an improvement.

This is part of a scenario where every day, our bodies manufacture a complex cocktail of pharmaceuticals to keep things functioning normally: endorphins, antibiotics, neurotransmitters, stimulants. Placebos tap into all this, but there's a lot more to learn about how.

Defining the territory has seen Colagiuri involved in trials for people with sleep difficulties, nausea, and a key area of placebo research: pain. In the latter, healthy volunteers agree to receive small electric shocks in tandem with pain-lessening drugs and/or placebos.

The participants judge their own pain responses but also have assessments of measurable things like the changing conductivity of the skin and relaxation levels. This has shown physiological reactions to placebos in ways that confirm biomechanisms definitely come into play.

All this said, placebos are only part of the picture for Colagiuri. In fact, he thinks there may be more beneficial clinical applications for the lesser known and lesser studied evil twin of the placebo effect: the nocebo effect. Colagiuri devoted a PhD to this subject and remains fascinated by it.

When asked for an example of the nocebo effect, he tells the story of one of his own experiences.

"I was sitting at home after a nice lunch with friends, when the phone rang," he says. "It was someone I'd been out with who told me her husband was feeling really sick. They were worried it was the oysters we'd eaten at the lunch. She asked me if I was alright. Suddenly my stomach was churning. It wasn't the oysters, which were fine. It was just the thought of being sick."

Most people will have experienced something like this to a degree, but in a medical setting, the nocebo effect can cause problems. Obviously, when a doctor explains the possible side effects of a treatment, you don't want a patient to spontaneously develop those symptoms. Yet the nocebo effect means this often does happen.

Essentially, if a patient is worried about a treatment regime, poor results are more likely. If you emphasise negative side effects, you're more likely to get them.

Colagiuri is attempting to reverse this. "It's about framing the patient experience," he says. "So, instead of saying you have a 30 percent chance of getting nausea from this treatment, you say there's a 70 percent chance of not experiencing nausea. In our trials, the second approach results in fewer side effects."

Colagiuri is pulling together all the threads of the placebo and nocebo effects at a research node he recently launched at the University's Charles Perkins Centre, with the multidisciplinary work in medicine, pharmacology, biology and psychotherapy drawing in ideas from all over the University.

So, can placebos and nocebos make treatment approaches more effective or even reduce drug intake?

"The medication people receive obviously plays a critical role in how they feel – but placebo and nocebo effects show us that it's not the only factor. The question is whether we can harness the placebo effect and minimise the nocebo effect to improve treatment outcomes," Colagiuri says. "That's what we need to find out now." ●



Ben Colagiuri

DEGREE

BPsych(Hons) '06
PhD '10

WHAT ELSE YOU MIGHT HAVE BEEN?

I briefly enrolled in a law degree, but my dream job as a kid was to be a wildlife photographer.

HIDDEN TALENT

My 5-year-old niece tells me that I am "very good at relaxing".

PROUDEST MOMENT

The birth of my son on 17 October this year.

MAKING IT BETTER

To find out more about Associate Professor Colagiuri's work, or support his research, call Peta Magee on +61 2 8627 8818 or email development.fund@sydney.edu.au

PERSPECTIVE SHIFT

Teaching philosophy in four New York State correctional facilities exposed Dr Sam Shpall to a new range of human experiences. Now a senior lecturer in the University's Department of Philosophy, he continues to explore how people fit into the world, with one book series in particular giving him important insights.

Photography by Stefanie Zingsheim

Elena Ferrante's *Neapolitan* novels

✎ Few philosophical works have influenced me as profoundly as Elena Ferrante's *Neapolitan Quartet*. I don't yet feel in a position to fully describe why I regard this work as such a vital contribution to intellectual culture. Like its fascinating narrator, Elena Greco, who concludes her story with many questions apparently unresolved, I am still "merely piecing together hypotheses".

The *Quartet* is a four-volume novel that dramatises an intense and important lifelong relationship between the narrator and her friend, Lila Cerullo. Any serious analysis of it must begin with Ferrante's complex valorisation of female friendship. The author's vision engages with the history of feminist thinking, and especially with distinctively Italian debates about the nature of sexual difference and the ambitions of emancipatory politics. In my estimation, a model of female friendship is framed as the essential generative condition for women's freedom – but also, even more strikingly, as a necessary prerequisite for the freedom of all human beings and the flourishing of societies.

There are other reasons why the work should interest the philosophically inclined. It challenges our ideas of love; it provides convincing characterisations of misogyny; it explores the moral psychology of emotions like jealousy with great sensitivity; it may even advance a contentious philosophy of art.

Great literature and philosophy have led to transformations in my self-conception, my intimate relationships, the way I teach, and much more. This evolution – very much a work in progress – convinces me of the shallowness of various ideas concerning what areas of study are 'impractical'.

There are many things to appreciate about the *Neapolitan Quartet*; no short catalogue of these literary merits is possible. So I will close by suggesting only that you read it as soon as you can. ●

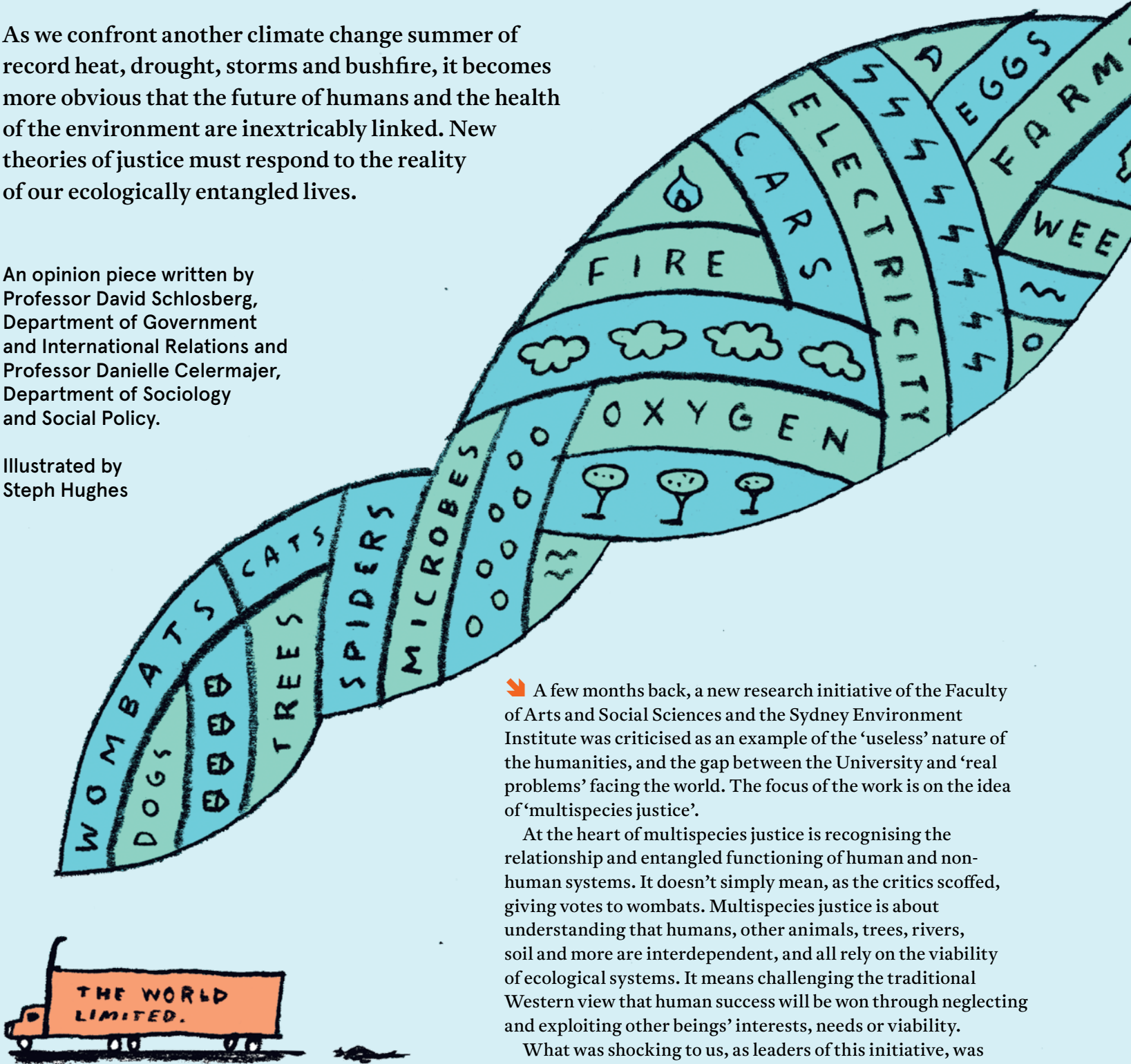


NATURAL JUSTICE

As we confront another climate change summer of record heat, drought, storms and bushfire, it becomes more obvious that the future of humans and the health of the environment are inextricably linked. New theories of justice must respond to the reality of our ecologically entangled lives.

An opinion piece written by Professor David Schlosberg, Department of Government and International Relations and Professor Danielle Celermajor, Department of Sociology and Social Policy.

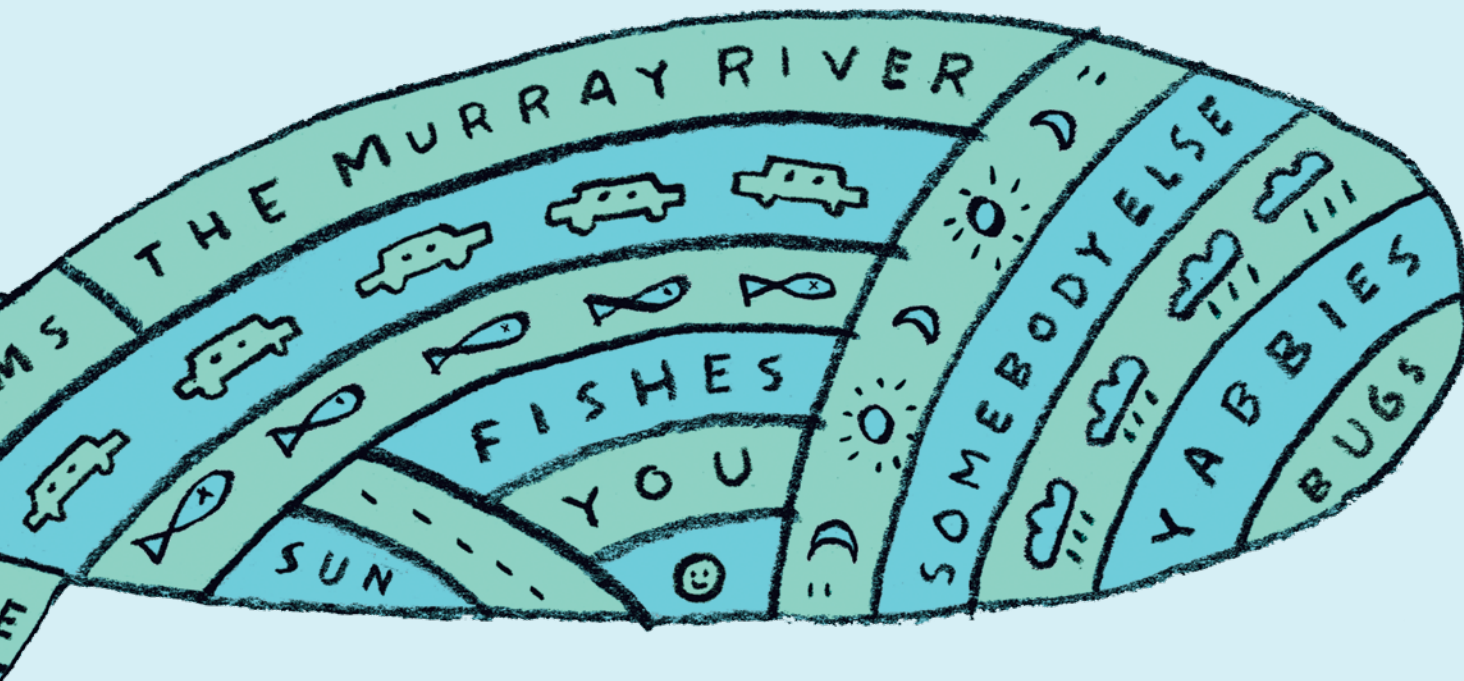
Illustrated by Steph Hughes



➡ A few months back, a new research initiative of the Faculty of Arts and Social Sciences and the Sydney Environment Institute was criticised as an example of the ‘useless’ nature of the humanities, and the gap between the University and ‘real problems’ facing the world. The focus of the work is on the idea of ‘multispecies justice’.

At the heart of multispecies justice is recognising the relationship and entangled functioning of human and non-human systems. It doesn’t simply mean, as the critics scoffed, giving votes to wombats. Multispecies justice is about understanding that humans, other animals, trees, rivers, soil and more are interdependent, and all rely on the viability of ecological systems. It means challenging the traditional Western view that human success will be won through neglecting and exploiting other beings’ interests, needs or viability.

What was shocking to us, as leaders of this initiative, was that such a critique could come in the midst of myriad ecological crises, and in particular, so shortly after a million fish died along the Murray River near Menindee (and even more serious



No singular human can survive isolated from the everyday entanglements with other parts of the ‘natural’ world.

— David Schlosberg and Danielle Celermajer

die-offs are predicted for this summer). Stunned by the scale of that event, farmers and Barkindji Elders alike articulated the spiralling relationship between the death of fish, the mismanagement of the river system, and threats to the viability of their communities.

They asked government ministers to simply come and listen to people who live on the river: to learn that viable and functioning rivers, environments, local economies, and ways of life all rise or fall together. The fish kill makes tragically explicit a range of injustices – most evidently the destruction of human and ecological functioning, but also inequality, lack of recognition, and political exclusion.

Environmental justice movements have been making the point for decades that some human communities, generally those that are already politically and socially disenfranchised, are forced to bear the heaviest burdens of environmental harms. The ongoing decimation of ecological systems, on which all human beings and communities depend, is likewise beginning to be considered a question of justice.

As political theorists, we see that a key part of the problem lies in longstanding theories of justice themselves. Classic liberal notions of justice, on which everyday western

understandings and institutions depend, are based on the idea of the independent, isolated, liberal individual. But this idea of the individual is a fiction, as we are all immersed in a range of ecosystems. Our bodies also host an ecosystem: our gut microbiome.

Recent medical science has taught us that this microbiome impacts our health, actions, behaviour and moods. The viability of this bacterial ecosystem is critical not only for survival, but to our understanding of our own identity.

Even more obviously, no singular human can survive isolated from the everyday entanglements with other parts of the ‘natural’ world – food, water, air, bacteria. We have denied this dependence by calling these parts of the environment ‘resources’; but they, and we, are really just parts of systems in which we are all enmeshed.

So, we have never been individual. And that means that the vast majority of writing on justice, assuming as it does the primacy of the human individual, is based on a world that doesn’t exist, and ignores the world that does. If we are going to take our place in the vibrant multispecies world, and assume our responsibility to it, we must move past this fiction of the liberal individual.

What researchers need to generate today are theories of justice alive to our entangled, ecological, multispecies lives. And for this, we need not look far. Among the many existing ways of knowing about an entangled multispecies world are those that have sustained Indigenous peoples on the Australian continent for tens of thousands of years.

Universities have a responsibility to rethink and redirect the limitations of current and dominant ways of thinking, and to understand and engage with other ways of knowing. There are many concepts and practices of justice to explore to help us live in the real and complex world that we inhabit; that is the task of this crucial and useful area of multispecies justice. ●

Wrist plates can work wonders, but they only come in adult sizes.



Not too many biomedical engineers go to hardware stores looking for inspiration. But Tegan Cheng never knows where she'll find the next idea to help a child move more easily and painlessly through the world.

Whatever it takes

Written by
Rebekah Hayden

Photography by
Stefanie Zingsheim

👉 When parents are told their child has a neuromuscular disease like spastic cerebral palsy, it's a challenging enough fact to deal with without then learning that the treatment options for their child are limited. Happily, solutions are emerging, but first, some background on the condition itself.

For children with cerebral palsy, messages going to the muscles get scrambled as they travel through damaged neurons in the brain and spinal cord. Over time, this scrambling changes the associated muscles, tendons and ligaments, causing stiffening or atrophy. When a child's wrists are affected, it can pull their hand inwards like a hook, making it hard for them to wash or get dressed without pain or discomfort.

An often-used option is to have a wrist

plate implanted to straighten the wrist and improve quality of life, but these implants are only made in adult sizes. Surgeons helping children have to do the best they can with devices that aren't really fit for purpose.

That's where Dr Tegan Cheng comes in. Immediately likeable, with a bright, let-me-help energy, Cheng's specialties are problem-solving and curiosity. That curiosity led her to explore undergraduate degrees in biomedical engineering and medical science, as well as a PhD in bone tissue engineering – basically growing bone out of nothing. As the University's first dual lecturer in both engineering and medicine, Cheng is no academic lightweight and she brings all her skills to bear in helping children across some difficult treatment hurdles.



“Surgeons were getting very frustrated at having to use adult plates on these kids, sometimes bending or manipulating them in surgery. You know the plates are going to be too big and are going to irritate the kid, but there’s no alternative,” says Cheng, who is manager of the Engineering and Prototyping of Implants for Children (EPIC) Laboratory at the Children’s Hospital at Westmead.

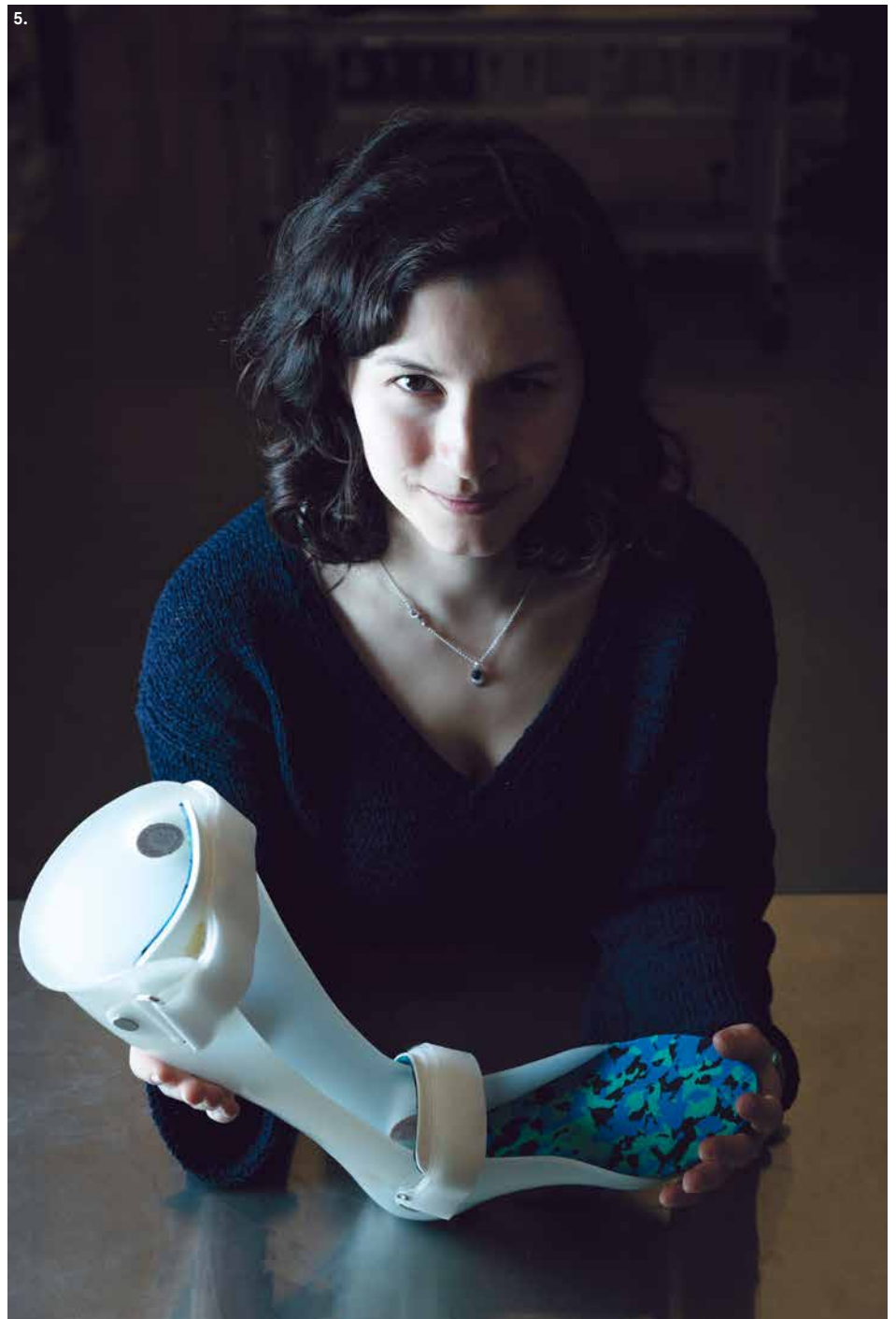
The EPIC lab was set up in 2016 by orthopaedic surgeon Professor David Little (MBBS ’86 PhD (Medicine) ’05) to develop off-the-shelf specialty orthopaedic or musculoskeletal implants for children. Situated on the same floor as the Children’s Hospital at Westmead, and in the building next door to the Westmead adult hospital, the lab is well placed to puzzle out the full range of challenging orthopaedic issues.

For Cheng, solving these puzzles demands input from a range of specialists.

“With our implants, we’ve taken on a user-focused approach, so we talk to different surgeons at different levels, as well as orthotists, physiotherapists, mechanical engineers and computer scientists,” she says.

Working in a lab dotted with 3D printed replicas of everyone on the team, as well as team mascot, Jack Skellington (yes, he’s a skeleton), Cheng and the team came up with the Wrist Fusion Plate System.

The device was one of the first the lab developed in collaboration with US company OrthoPediatrics as part of its range of orthopaedic devices for





1. The marks left behind when 3D models were removed from the 3D printer.
2. A vacuum pump reflects a synthetic bone. The lab is crowded with equipment and works in progress.
3. You can never have too many synthetic bones. Used to understand bone issues in growing young people and to practise surgery.
4. Life in 3D. Tegan Cheng as a 3D printer sees her, and her colleagues behind.
5. Holding a current-style plaster and thermoplastic orthotic, Cheng is working on how to 3D print these devices for much greater speed of production and precision.

children. The plates are low-profile under the skin, which helps reduce irritation of soft tissue. The system also comes in two lengths to allow for patients who've had a procedure called proximal row carpectomy (PRC) for degeneration of the wrist.

"There isn't a huge financial incentive to develop new devices specifically for children's orthopaedic devices as the market is really small. However, it's an important niche," says Cheng. "We had this boring project to make a really small version of the adult device. But the impact it will have on children is huge."

When Cheng says "boring", that just means "easier than some of my other projects". These have included designing devices that help to correct the way bones grow, or brainstorming ways to redesign a device that has a tendency to fail. It's tricky stuff made trickier by the fact that children tend to be more active than adults, with more bumps and falls, and bones that are smaller and still growing.

Getting an implant right the first time can mean less surgery down the track. "We want to make the operations these kids have less invasive and less traumatic by creating minimally invasive devices that work in a low impact way," Cheng says.

To do this, she came up with a research program to improve children's orthopaedic care through 3D printing and design. For children with particular walking difficulties, it incorporates machine learning, where the results of every treatment are used to educate an algorithm that will predict the

most suitable avenues to pursue in future cases.

The ideas for the devices are often driven by Professor Little who returns from surgery talking about the children he is treating, and how the implants available just aren't suitable.

The team will think about a possible solution, draw it up in the computer, and make a 3D print to test it, usually by mechanical testing within the lab using foam bones.

Having the lab so close to the Children's Hospital means that Cheng can run down the hall to the operating theatre, catch Little between operations, show him the design and then run back again, tweaking and reprinting it until it is right.

In the few short years that the lab has been open, the team has developed an impressive swag of new devices now in the process of being commercialised. For children who would otherwise face years of operations, the devices can't come soon enough. For Cheng, it's the job of her dreams.

"I would never have guessed this is where I would end up. It's a far cry from bone tissue engineering," she says. "The goal of every day of our lives is to try and make these kids' lives a little bit better." ●

WHAT YOU CAN DO

To find out more about Dr Cheng's work, or support her research, call Vicki Sloane on +61 2 8627 8818 or email development.fund@sydney.edu.au



Tegan Cheng

DEGREE

BE(BiomedEng)
'12 BMedSc '12 PhD '16

MOST PRECIOUS POSSESSION

My late grandmother's ring. It's big and beautiful, and somehow fits my finger perfectly.

THE THING YOU NEVER WANT TO DO AGAIN

Learn to drive. It was scary and hard enough the first time.

MOST ADMIRER PERSON

US TV host, Stephen Colbert. He talks about difficult subjects with humour, grace and philosophy. It's wonderful.

Call of the wild

From a young age, Benn Bryant felt that humans should be good custodians of the planet. Now, as an intrepid vet, he works to save one of the world's most threatened creatures.

Written by
Jenny Valentish



One of very few left in the world, Sumatran rhinoceros wanders the Way Kambas National Park, in southern Sumatra, Indonesia. (Photo: Getty Images/Mark Cowardine)

👉 The way Dr Benn Bryant describes the Sumatran rhinoceros – “a pelt of shaggy orange hair”, “dagger-like incisors,” “predisposed to wallowing”, with “whistling and squeaking vocalisations” – it sounds more like it romped from the pages of a children’s book than the Indonesian island of Sumatra.

“They’re a very cryptic animal,” the veterinarian says of this most ancient of rhino lineages (more closely related to the ancient woolly rhino than the others living today). “They’re solitary and shy, living in very dense forest habitats.”

One of the world’s five species of rhinoceros, the Sumatran is also the smallest, though it can still weigh up to 800 kg (African rhinos go up to 2500 kg). It used to range across Southeast Asia and all the way up to China, but the few that are left now take advantage of the remaining habitat in Borneo, Indonesia, and yes, Sumatra.

When he speaks to SAM, Bryant (BEcSocSc(Hons) ’11 PhD ’16), has just returned from the Sumatran Rhino Sanctuary, a 100 hectare complex in Way Kambas National Park. The sanctuary is supported by the International Rhino Foundation, of which Taronga Western Plains Zoo is a founding member. As Taronga’s Senior Veterinarian, Bryant is on standby for emergencies.

He deals with all creatures great and small, particularly with Taronga Western Plains Zoo being home to many species of large African hoofstock, but it’s the Sumatran rhino – thought to be the most endangered large mammal in the world – that Bryant is most aligned with. Having had a strong conservationist streak since his days as a veterinary science student, he believes that “conservation of species is an ethical obligation for humanity.”

It’s thought there now could be as few as 70 or 80 Sumatran rhinos left, as a result of poaching and habitat loss. Seven of those are in the sanctuary in a breeding program, because wild population density is so low that the animals will rarely cross paths naturally.



“Back in the ’80s, contingency captive populations were established in zoos. But that strategy failed abysmally. The feeding ecology and nutritional requirements were poorly understood, and attempts to introduce the Sumatran rhinos were quite disastrous, as they are very aggressive toward each other, except when they’re in breeding condition.”

— Benn Bryant



1. The dentist will see you now. Bryant helps out as Lazarus the lion has root canal therapy at Taronga Western Plains Zoo. (Photo by Toby Zerna/Newspix)
2. A black rhino stands ready to be tested for mating readiness. Bryant just visible second from right.
3. Bryant conducts a transrectal reproductive ultrasound on the black rhino.



Critics of captive populations argue that genetic diversity and behavioural patterns can be lost, and certainly decades-past attempts to create breeding programs have not been as successful.

“Back in the ’80s, contingency captive populations were established in zoos,” Bryant says. “But that strategy failed abysmally. The feeding ecology and nutritional requirements were poorly understood, and attempts to introduce the Sumatran rhinos were quite disastrous, as they are very aggressive toward each other, except when they’re in breeding condition.”

In the mid-’90s, the surviving animals were repatriated to Indonesia, with most of them ending up in the Sumatran Rhino Sanctuary. The difference here is that they aren’t fed by keepers. Instead they’re free to browse native trees and shrubs to get their nutritional requirements. Hard-learned lessons

around their reproductive physiology have also been taken on board.

Unlike other rhino species and indeed most mammals, Sumatran rhinos are what’s called induced ovulators. The females don’t actually ovulate until after they’ve mated. Scientists were stumped by this in the past, as they would normally look for an ovulated egg to signal the time for mating.

So how do you know whether an animal is ready for mating if it doesn’t ovulate first? The modern answer for Sumatran rhinos is monitoring by ultrasound, or more specifically,

transrectal ultrasonography, which uses soundwaves to produce a picture of the key organs. To date, this method has seen five calves born in human care, to two different females, though it is, in its way, a gamble.

“Of course, it’s extraordinarily risky to capture a large vertebrate in a remote jungle environment, move it perhaps hundreds of kilometres, unload it into a semi-artificial environment, and impose a human care system on it,” Bryant admits. “But risk-benefit assessments are made, and Sumatran rhinos are on an extinction trajectory.”

“Many of our animal patients are dangerous and aggressive. They are inherently wild and so have a vigorous fight or flight response. Different animals have different behavioural responses and different weapons.”

— Benn Bryant

Another challenge that Bryant has faced is getting a lion onto an operating table for root canal therapy. In these situations, proper sedation is a priority.

“Many of our animal patients are dangerous and aggressive,” says Bryant. “They are inherently wild and so have a vigorous fight or flight response. Different animals have different behavioural responses and different weapons. Controlling them might mean a brief period of physical restraint of a small mammal or bird and administering anaesthesia in oxygen by facemask. With larger animals like lions, it might be by a dart. Or the animal might happily submit to standing by a fence.”

For the record, one of the trickiest animals to fit effectively onto an operating table, Bryant says, is an ostrich.

Benn Bryant grew up in suburban Sydney in the '70s, exploring creeks and wild spots of local bush. His backyard shared a fence with a couple of hectares that were home to dairy cows. “We had family friends who had a dairy farm and

we would go and milk their cows and run their operations for them when they went on holiday,” he says. “All those experiences consolidated into a conviction that veterinary medicine was the path for me.”

Like many kids, he enjoyed the books of vet James Herriot, best known for the *All Creatures Great and Small* series.

After working in private practice for nine years, dealing with rather less exotic species than he does now, Bryant applied for a wildlife medicine residency at Taronga Zoo in Sydney, and concurrently enrolled in a Master of Veterinary Studies in Wildlife Medicine and Husbandry through the University of Sydney.

Taronga now offers a program as an extramural training partner of the University of Sydney School of Veterinary Science, so he comes into regular contact with young students. “I think young people are much more aware now of the challenges the natural world faces,” he says.

It might be expected that the veterinarian field is one of high burnout from stress, but Bryant is a walking testimony to the benefits of doing a job you love. You wouldn't expect someone on the frontline of extinction intervention to be so, well, eternally cheerful.

“I'm ever the optimist,” he says with a laugh. “I'm hoping that we might retrieve the Sumatran rhino from the brink of extinction by the application of ingenuity and science and our human genius for cooperation. I'm sitting here out on the grass on a beautiful day and catastrophe seems very remote in this instance.” ●



Starting out as a vet for domestic animals, Bryant shaped his career to work almost exclusively with wildlife of all sizes.

One of the University's most innovative young researchers, Dr Angela Crean could only continue her groundbreaking work thanks to a bequest made to the University's School of Veterinary Science. Though she never met her benefactor, Mabs Melville, who sadly passed away, Dr Crean has expressed her gratitude with a letter.

A POWERFUL GIFT

Written by
Dr Angela Crean

Dear Mabs,

I wish I could have met you. I've heard so often that you were an intelligent, intriguing, and inspirational woman. We could have talked about so much, but if we had met, my first words would have been 'thank you'. Your amazing gift came at a time when I had almost given up, and it changed my life.

Your donation to the University of Sydney School of Veterinary Science came from your wholehearted love of animals. I really think you'd be thrilled by how it's advancing research into animal health and welfare.

Luckily, the vet school also decided to use some of your gift for early career researchers, like me. I can't fully express how powerful that support has been for those of us who received it.

There is no shortage of bright young minds eager to explore new ideas. My idea was about how animals born through assisted reproduction could be made stronger and healthier and how, one day, my research could help people trying to be parents.

I knew there was something new and important in my idea. But like many other young researchers, I didn't have the opportunity to take it forward. All my research funding options were used up and I felt that I really had no choice but to leave science.

Then just three days before I was about to start that heartbreaking process, I saw an ad.

It talked about bequest-supported fellowships. I had to give it one last chance. When the news came that my application was successful, I burst into tears. Then and there, I decided that I would always be worthy of your wonderful gift.

You gave me the freedom to test my ideas, which really are changing how we view fertility and inheritance. And I've now been awarded another research fellowship, so my work can continue.

It saddens me that I can never talk to you about my work, yet we are connected. By a love of animals. By a belief in the power of knowledge. By a gift from you that changed everything for me. Whatever I achieve, you will be part of it, and I'll always wish I could have met you to say two, simple words: thank you. ●

Now an internationally recognised researcher, Dr Angela Crean, seen here with her son, Parker, was inspired by her own problems conceiving.



MAKE MORE POSSIBLE

A gift in your will can support research you are passionate about. To find out more, contact Alex Miller from our bequest team on +61 2 8019 7964.

Dedicated to bringing
people out of poverty,
Associate Professor,
Shyamal Chowdhury.



**Not all famines are caused by droughts, floods or wars.
In Bangladesh, famines are driven by unemployment.
Shyamal Chowdhury grew up seeing the devastating
consequences. Now he might have a solution.**

Work in progress

Written by
Monica Crouch
(BA(Hons) '95)

Photography by
Louise M Cooper

👉 For many of the poorest people in Bangladesh, the only work available is seasonal, agricultural labour. They have work planting crops and harvesting crops, but nothing in between.

Even in the best of times, such people live on very little: rice, vegetables, perhaps some fish. But when income from agricultural work slows, entire communities fall into famine. People may get just a small bowl of rice on a good day. The government and aid agencies typically respond with handouts, but this doesn't break the vicious cycle. Nor does it always save lives: a newspaper image from 2008 showed a woman who died of starvation while waiting in a food queue.

Known as 'mongas', these famines affect some 5 million people in north-western Bangladesh and they happen twice a year: March to April is the mini monga; September to November is the major monga. There are many consequences, including the effects on the physical and cognitive development of children, particularly girls (their brothers will be fed first).



On field trips, Chowdhury works to understand the economic activities of local people. Here in north-eastern Bangladesh, he's in a traditional boat, the area's main transport option.

This intractable problem has become the subject of intense research by Associate Professor Shyamal Chowdhury, who was born in Bangladesh and is now a developmental economist at the University of Sydney. While he wasn't directly affected by the mongas, people in the village where he grew up were. Their response to the situation planted the seed of his solution.

"We were not far from India," says Chowdhury, whose manner is calm and self-possessed. "At the border, people would go and collect stones which floods would bring in from India."

There is huge demand for the stones from the construction sector in Bangladesh. "The stones provided employment when there was no work in the village," Chowdhury says. "So that was an insight I had. I could see that if my neighbours were able to travel, they could make money for their families."

This thought led to a remarkable intervention created by a collaboration between Chowdhury and colleagues from the London School of Economics and Yale University.

Through AusAID funding and working with an NGO called Evidence Action, the researchers offered cash or credit of \$US8.50 per landless household, on the condition that recipients migrate temporarily to find work.

Migration involved travelling about 300 kilometres to another region or the nearest city for four to eight weeks to find work in agriculture, construction, or as rickshaw pullers. The cash or credit provided enough money for a return bus ticket and a few days' food.

The program had some remarkable impacts, seen across a total of three trials: most migrants earned \$US110 on average during the lean season and saved about half of that – a very high rate of return. As well, about 80 percent of the money loaned out was paid back (it takes about two days' work to repay \$US8.50). No one was left worse off. Those who failed to find work during the monga were not required to repay.

Perhaps most significantly, family members of migrants averaged one extra meal per person per day. All up, calorie intake increased by 30 percent.



Shyamal Chowdhury

EARLIEST MEMORY

A flood that inundated our house in the mid-1970s, and playing on the boat in our front yard.

PROUDEST MOMENT

After a visit to a research project in Kenya, when my 8-year-old son asked if my research had made the banana growers in Kenya better off.

QUALITY YOU MOST VALUE IN OTHERS

Egalitarianism

“It was far more cost-effective than subsidising food,” Chowdhury says. He noticed another surprising result: “Once people were successful in migrating and getting a high return, they would then go back on their own and be successful again. They just needed to learn it for themselves.”

There were also indirect spillover benefits for the people who didn’t travel. With fewer people in the village during the lean season, there was less competition for what few jobs there were.

Talking to Chowdhury is an exercise in hope. His methods are intensely practical and his personal story is impressive. After attending university in Dhaka, he came to Sydney via postdoctoral work at the International Food Policy Research Institute in Washington, D.C. then a stint at the World Bank.

“I studied developmental economics, so poverty was always a big issue – how to make life better, how to bring people out of poverty,” he says. He has found that migration benefits both the hungry and those who need short-term employees.

Following the program’s success in Bangladesh, the Jakarta office of the Department of Foreign Affairs and Trade, together with the Indonesian National Development Planning Agency, approached Chowdhury’s team about trying the program in eastern Indonesia. The main crops here are rice and maize, and seasonal famines are severe.

The team implemented a pilot with two key changes aimed at making the program more inclusive, by offering it to those who are less poor but reluctant to risk what money they have on an uncertain outcome. The grant was doubled to about \$US20 per household. “We wanted to see the minimum amount of money necessary to induce poor households to migrate,” Chowdhury says. “With varying amounts, we could find out the minimum needed.”

The second difference was the conditions applied to receiving the grant. “Some economists believe we shouldn’t apply any conditions because households know what is best for them,” Chowdhury says. “But we thought conditionality was important, because if people use

the money for buying food, they don’t become aware of other opportunities.”

So, most recipients were required to migrate, while a control group received an unconditional grant.

“The result was similar to Bangladesh: people migrated, and they still earned quite a bit of money,” Chowdhury says. “However, we found that giving a larger sum of money didn’t create much further benefit.”

Requiring people to migrate and pay back the money turned out to be crucial. “We found that unconditional cash is not very effective,” Chowdhury says. “It wasn’t generating a lot of revenue.” As predicted, when people spent their grant on food, they didn’t learn anything new – the famine cycle would repeat.

While the program now has the vital ingredient of a viable government policy, funding for the essential scaled-up trials is uncertain. Indefatigable in his work, however, Chowdhury has now run a trial in Tamil Nadu, India, encouraging rural workers to migrate to cities for factory work.

And now for something completely different: Chowdhury also has an experiment underway in Bangladesh where 10,000 primary school children across 140 schools are taught social and emotional skills. “There used to be a lot of emphasis on education to help people earn more,” he says. “But for a good society, we also need people who are kind, who trust each other, who help each other.” ●

“At the border, people would go and collect stones which floods would bring in from India. The stones provided employment when there was no work in the village.”

— Shyamal Chowdhury

ADVANCING THE WORK

To find out more about Associate Professor Chowdhury’s work, or support his research, call Guy Houghton on +61 2 8627 8818 or email development.fund@sydney.edu.au

All too familiar to many women in labour, the standard cardiotocography monitor limits movement and can easily deliver inaccurate information.



When a seriously flawed but almost universal piece of medical equipment nearly brought tragedy to the birth of her second child, Sarah McDonald decided to build something better. She just had to get a PhD in medicine to do it.

BEFORE

Written by
Lauren Sams
(BA(Hons) '07)

AND

Photography by
Stefanie Zingsheim

AFTER

Smaller, more reliable
and able to collect
a wider range of
information, Sarah
McDonald's invention
could transform the
childbirth experience.

✋ Not every woman would stop in the throes of labour and think, “There’s got to be a better way.” And certainly, not every woman would think, “I will find a better way.”

But that’s exactly what Sarah McDonald did.

McDonald was 32 weeks pregnant with her second child, Oliver, when she was rushed to hospital with premature contractions. For the next week, those contractions continued. Anyone who’s endured a day of labour pains will know that sticking it out for an entire week is close to torture.

Making things worse was the cardiotocography monitor (known as a CTG) that she had to wear continually, like countless expectant mothers before her. Its two thick fabric bands were stretched across her stomach and she was told not to move because it would affect the readings.

Again, anyone who’s ever been in labour will know the relief that comes with changing position, taking a short walk and having a shower. With the monitor on, McDonald couldn’t do any of these things.

The discomfort was one thing. But when McDonald, who studied mechatronic engineering and describes herself as a “problem-solver”, began questioning what the bands were actually doing, her frustration grew.

“Foetal heart rate and contraction frequency are open to highly subjective interpretation,” she says. “In my case, the doctors were not getting a quantifiable indication of my condition or the baby’s. The monitoring was a box-ticking exercise.”

It is a mandated part of procedures that medical staff use the CTG or something similar in specific circumstances, whether or not the data is useful – or even reliable. Certainly, CTG is associated with a higher rate of caesarean sections and instrument births, with their attendant risks.

While Oliver is a thriving little boy now, he was born with just a 20 percent chance of survival. The inability of the CTG data to usefully quantify what was happening, led to the decision to conduct a caesarean section delivery at just 33 weeks. This meant Oliver’s lungs were not fully developed when he was born. “It was a horrific experience,” says McDonald.

If the clinicians had more accurate information to help them determine what was happening, McDonald attests, Oliver might have been born later and had a greater chance to develop vital organs. “People in the community might think

“BIRTH IS AN INTENSE EXPERIENCE FOR THE BABY AS WELL, SO EVEN IN A PERFECT BIRTH, AT PARTICULAR STAGES THE BABY’S HEART RATE WILL BE ALL OVER THE PLACE.”

– Sarah McDonald

everything is known about childbirth and what we do now is best practice,” says McDonald. “But my experience, and that of many other mothers, shows that we have a long way to go.”

Speaking energetically and packing in a lot of information, McDonald pauses for breath. “So, the way forward was to make sure no mother ever again goes through what I went through.”

For McDonald, that meant inventing the Oli™ (named, of course, for her son), as an entirely new monitoring system for women in labour. To do this, she added a PhD in medicine to her existing engineering and commerce degrees, doing the PhD under her former engineering supervisor and clinicians from Royal Prince Alfred Hospital. It was a mighty leap from stay-at-home parent to PhD student, and it happened during baby Oliver’s first year. McDonald hasn’t looked back.

Labour of love. Sarah McDonald devoted herself to creating transformative technology. Now her focus has widened to getting it produced and used.





Sarah McDonald

DEGREE

BE(MechatronicEng) '12
BCom '12 PhD '19

FAVOURITE

CHILDHOOD TV SHOW

Teenage Mutant Ninja Turtles

HIDDEN TALENT

A single mum for most of
the lives of my children.

I also learned Chinese from
preschool (very, very rusty now).

MOST ADMIRED PERSONS

My children

HAPPY PLACE

Running – ideally bush
and long distances

The cross-disciplinary approach was essential because the device couldn't be, in McDonald's words, "this crazy engineer's idea". She had to be able to convince the medical establishment that this device was more than needed; it would work with them and for them to reduce unnecessary interventions, identify complications early and improve outcomes.

In other words, the Oli™ would reduce the kind of guesswork that led to Oliver's pre-term delivery.

Developing the device, McDonald spent time on the obstetrics ward, learning from midwives and obstetrician-gynecologists about what was needed for women in both pregnancy and labour. That cross-collaboration proved key, she said, in designing a device that would deliver the best results for all users.

It's been half a century since any true advance in obstetric monitoring; even the CTG was only designed to automate what doctors used to do manually – check foetal heart rate and number of contractions. It's in no way capable of measuring what we now know is an array of signs needed to accurately understand what is happening during pregnancy and childbirth to make truly informed decisions.

"For example, knowing foetal heart rate isn't nearly enough information to have, and cannot be read in isolation," says McDonald. "Birth is an intense experience for the baby as well, so even in a perfect birth, at particular stages the baby's heart rate will be all over the place."

The Oli™, couldn't be more different from the cumbersome and unreliable CTG. A small, lightweight device, it sticks to the belly, monitoring not just contractions and foetal heart rate, but uterine activity, maternal and foetal wellbeing, level of exertion of the mother, and movement. It does all this wirelessly, allowing the mother to move around freely.

Though the Oli™ isn't on the market yet, McDonald thinks that might happen after the clinical trials, scheduled for the end of 2021. It promises to be a gamechanger for obstetrics.

Building a medical device is one thing but selling that product to potential investors is another new skill set for engineer McDonald. Though she's raised close to \$5 million in funding, from government grants, prizes and her own investment, she admits that it hasn't been easy. "I've had to learn to trust my gut. You can't compromise your vision because an investor wants to change your product."

Not surprisingly, investors want to get the product to the market quickly, to the largest possible number of buyers and with minimal risk. "All this is difficult when you're dealing with medical devices," says McDonald.

Certainly, she sees the Oli™ as something to be used by doctors and hospitals, rather than making it publicly available. This is important so expectant mothers aren't falsely reassured or made unnecessarily anxious.

"It puts extra pressure on those mothers, not to mention on the health system. It's basically the opposite of what we're trying to do," says McDonald.

The whole process has brought some realities home to McDonald about what it can take for vital advances to be made.

"No-one has been looking at this problem in this way," she says. "The only reason I'm looking at it is because I happened to be a mechatronic engineer who had a normal birth followed by a very difficult birth which allowed me to see the differences between the two and ask practical questions about them." ●

It led me to improve lives through technology.

James Flynn
Master of Management

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Being the director of one of the world's most powerful, private art organisations isn't a job that many people could do well. For Tim Potts, it's as if he was meant for it.

Down to a fine art

Written by
Andrew Stafford

Collage by
Fábio Dias

👉 Tim Potts (BA '81) still has the archaeology books he was given for his 11th birthday. They are the earliest evidence of an obsession that has taken him all the way to the top of the art and antiquities world: since September 2012, Potts has been the director of the J. Paul Getty Museum in Los Angeles.

Known simply as the Getty, it's one of the world's wealthiest and most powerful art institutions.

Potts says he can't remember much else about his childhood self. But he was captivated by the same things that have enthralled young minds for generations: ancient civilisations that built giant pyramids, invented writing, and buried their royalty in gold sarcophagi. "I wouldn't have put it in these words then, but I couldn't understand how anyone could not be fascinated by all of that," he says.

When Potts came to the Getty (the second Australian in a row to head the organisation), he had a formidable resume. Among numerous achievements and postings, he had won University of Sydney medals in both archaeology and philosophy, lectured in Near Eastern art and archaeology at the

University of Oxford, and was the director of the National Gallery of Victoria (NGV) from 1994–98.

But amid all this, he was progressively lured sideways into the world of museums; after the NGV, he served long stints as director of the Kimbell Art Museum in Fort Worth, Texas, and the Fitzwilliam Museum in Cambridge.

For Potts, the Getty's appeal was obvious. The main Getty Centre is perched on a plateau with expansive views over Los Angeles and houses its extensive galleries. The organisation also researches art history and the related humanities while conducting research and training aimed at conserving the world's art, architecture and archaeological sites.

The Getty organisation itself was initiated by J. Paul Getty, once America's biggest oil baron who quipped, "the meek shall inherit the Earth, but not its mineral rights". He had collected art since his teens and established the J. Paul Getty Trust in 1953, which received his full bequest in 1982, six years after his death.



With an estimated endowment of close to US\$7 billion in 2017, it has enormous collecting clout. “We have the resources to buy many of the most important works that come on the market today,” as Potts says drily.

With such buying power comes great responsibility, and like many galleries and museums, the Getty is no stranger to controversy.

There is a long history of antiquities and artworks being stolen from one country to adorn another, with most modern-day plundering being done in war zones by criminals and extremist organisations, who then on-sell what they take to fund other activities.

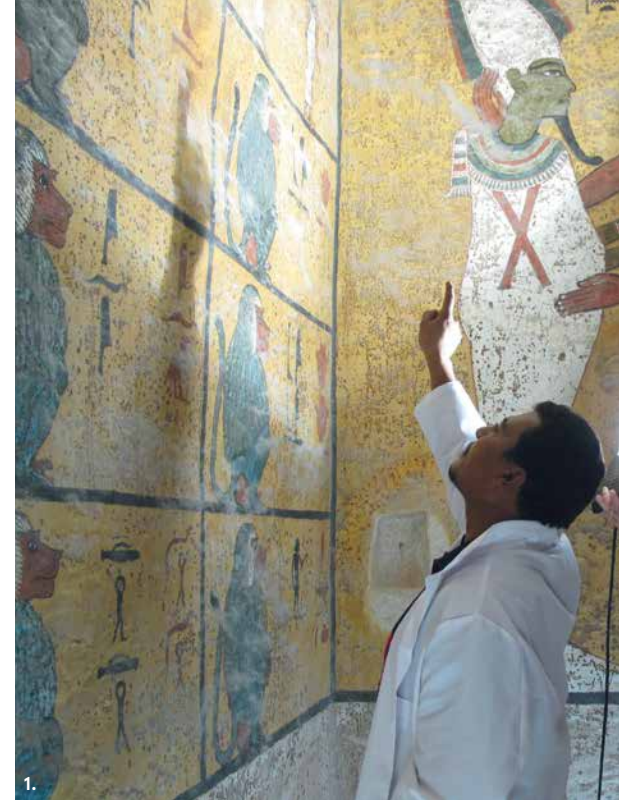
Understandably, ownership of ill-gotten artefacts is hotly contested in the world of art collecting. “It’s a world in which you have to be careful, because provenance issues are very real and very sensitive,” Potts says.

As a result, there has been a convergence of views on the issue of stolen and looted works. “I think 20 or 30 years ago, many museums had different policies and different approaches, but there’s been a realisation that provenances have to be scrutinised very diligently,” he says. “Just saying ‘we don’t know where it came from, but it’s important and we’d like to have it’ is no longer enough.”

Many Getty works have been repatriated to their countries of origin, both before and after Potts’ arrival. In 2014, the museum returned a 12th century Byzantine New Testament, originally purchased as part of a collection in 1983, to Greece. “I feel that we’ve been very responsible players,” he says. “When other parties have come forward with evidence that something in the Getty’s collection was illegally exported or removed from the country, we’ve given it back. And when we’ve come upon evidence that something should be returned, we have offered it back.”

This more collaborative approach has now resulted in joint exhibitions

1. As part of a five-year collaboration, the Getty Conservation Institute is helping conserve the tomb of Tutankhamen. © J. Paul Getty Trust
2. Examining *Vertumnus and Pomona* by Boucher, held in the de Young Museum. Image courtesy of the Fine Arts Museum of San Francisco
3. Potts in 1983, excavating the Lion Box, a small but luxurious item found in Pella, Jordan. Used to hold jewellery, it is rare to find these objects outside Egypt.





and conservation projects between the Getty and Italian and Greek institutions. Potts says the Getty has also been designing pedestals and bases for the Archaeological Museum in Athens which will help protect their ancient sculptures from seismic damage: “We know about earthquakes in California, and how to mitigate their effects,” he says. “Again, we’re in a totally different world than we were 20 or so years ago.”

Increasingly, though, the Getty’s competition in the art market isn’t other museums and galleries but the wealthiest

private collectors. Recently, Leonardo da Vinci’s painting *Salvator Mundi* was sold by Christie’s for \$450 million to Saudi crown prince Mohammed bin Salman. The painting is reputedly kept on the prince’s yacht, *Serene*. (Whether it was da Vinci or one of his assistants who painted the work is in dispute.)

“Things like that Leonardo do end up in private hands from time to time, that’s a fact,” Potts says. “To a degree that’s always been the case, but the particular dynamics do change from generation to generation. I think the world is more interested in iconic works of art and culture these days, so a Leonardo being in the Emirates or Saudi Arabia gets a headline, when it probably wouldn’t have previously.”

A possible Leonardo on the yacht of a Saudi prince begs the question of how many other Leonardos, or works of similar stature, might be hidden from public view in private collections around the world. “I wouldn’t have a clue!” Potts says. “But I hope it’s very unusual for a painting of that importance to be sitting on someone’s yacht, and I suspect it is. I think that’s the exception to the rule.”

Ultimately, though, Potts says the biggest challenge for the Getty is a nice one to have: where to allocate its vast resources. “We can do extraordinary things, but we can’t do everything,” he says. “It’s making judgements about the legacy we’re going to leave through the programs we support ... We’d rather do fewer things and do them really well, because we want the impact to be felt 50 and 100 years from now.”

And inside, Potts himself is still that 11-year-old boy. “I’ve been lucky in that I have always been in positions that have allowed me to indulge my greatest interests,” he says. “That’s the joy of being in a world of museums and intellectual activity. As long as you have really strong, keen interests, there’s nothing more enjoyable than pursuing them, and to be paid for it is an extraordinary luxury.” ●

“It’s a world in which you have to be careful, because provenance issues are very real and very sensitive.”

— Tim Potts



CLASSNOTES



CARLO RITCHIE
BA '11 BA(Hons) '13

Wymysorys is a critically endangered minority language of Poland, currently with fewer than 20 native speakers. It was the subject of Ritchie's honours, and in 2013, he wrote the first children's book in that language. While at the University, he and fellow alumnus, Steen Raskopoulos (BA '10), formed an improvised comedy duo, *The Bear Pack*, later performing to sold-out shows at the Melbourne and Sydney Comedy Festivals, the Edinburgh Fringe and Kilkenny Cat Laughs Festival, and most recently, the Soho Theatre in London. In 2014, Ritchie co-founded Improv Theatre Sydney (ITS), becoming its Artistic Director in 2019. ITS is now Sydney's largest dedicated school of improvised theatre.



DIEGO SCHOTT
MIntBus '10

Returning to Brazil after graduation, Schott entered his family's pneumatic components business, WDS, which has been going for more than 30 years. As the manager of the sales and marketing department, he confronted growing competition that was threatening the business by changing its focus to pneumatic automation in the truck and trailer industry. Sixty percent of Brazilian cargo is transported by road, so by helping the transportation sector improve logistics, boost efficiency, lower costs, and increase safety in loading and unloading in the cargo process, the company has become Brazil's leading manufacturer of pneumatic automation for the road implements industry.



MARGARET HENNESSY
BEc(SocSc) '94

Now the CEO and owner of Australian boutique dog care and fashion brand, DOGUE, Hennessy started there in 2005 when it was a single retail outlet with declining revenue. While founder, Simone Kingston, concentrated on design, Hennessy took over the retail side. Now the brand is at the forefront of canine fashion, accessories, grooming, playtime and boarding in Australia, with multiple DOGUE boutiques and a dog luxury hotel: DOGUE Country Retreat. In 2014, DOGUE launched a franchising arm and is investigating online and international opportunities. Hennessy came to DOGUE after a career as a business and change management consultant working throughout the Asia-Pacific, the United States and the United Kingdom on more than 20 projects for corporate clients and public sector organisations.



MIN-JUNG KIM
GradDipMuseumStud '97
MA '05

As the curator of Asian Arts and Design for the last 12 years at the Museum of Applied Arts and Sciences (known as the Powerhouse Museum), Kim is also the museum's first Asian-born curator. She has published and lectured widely on Korean textiles, ceramics and metalworks, Japanese fashion, Chinese belt toggles and curatorial studies. Selective exhibitions she has curated include *Rapt in Colour* (1998), *Earth, Spirit and Fire* (2000), *Spirit of Jang-in* (2010), *Japanese Folds* (2015), and *Reflections of Asia* (2018). Recently, Kim was invited to speak on 'Asian art museums in the world' at a plenary session of the International Council of Museums, Kyoto. She is now working on an exhibition for the University's soon-to-open Chau Chak Wing Museum.

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PAUL HOCKINGS

BA '57

For 28 years, Hockings has been Editor-in-Chief of *Visual Anthropology*, an influential publication advancing photography and movie-making in anthropology. His own film, *The Village*, a study of a small Irish community, has been in distribution for 50 years, and his textbook, *Principles of Visual Anthropology*, has sold constantly since 1975. He taught at UCLA and the University of Illinois for 36 years, then in 2005 became the first Dean of United International College near Macau. Currently he is Emeritus Professor at the University of Illinois, is co-editing an encyclopaedia of South Asian religions, and updating the 1000-page dictionary of the Badaga language of India, among other editing and writing projects. He enjoys hiking around the hills of Silicon Valley.



PIETER UPESSY

GradDipTEFL '89 MA '90

Teaching linguistics for more than 10 years at Cenderawasih University (UNCEN) in Papua, Upossy moved to the University of Papua New Guinea to teach the Indonesian language to Papua New Guineans. Returning to Papua, he took up his current roles as Head of both the UNCEN Department of Language and Arts and the Collaboration Unit of the Faculty of Education. Developing overseas programs for UNCEN has seen him work with the University of the Sunshine Coast of Australia, and the University of Gottingen-Germany, among others, to promote development in eastern Indonesia. Upossy is now designing English language programs for Papuan locals and for tourism in Papua's Yapen island, while he works with the University of Rhode Island to establish a Faculty of Fisheries and Aqua Marine Science.



SALLY PARADIS

BA '83

For her 25 years in New York, Paradis has had a largely environmental focus. After building a US base for the Australian Wildlife Conservancy, she established the Advance Green Network, creating networking opportunities between Australia's first Department of Climate Change and environmental professionals like Policy Adviser, James Cameron, Ethical Investor, Ken Newcombe, and Thirst Founder, Mina Guli. This led to an advisory group for then Minister for Climate Change and Water, Penny Wong. Next, Paradis studied product life cycle analysis at Columbia University before founding a sustainability consultancy, CoClear, to give clients like Nike a realistic picture of their environmental impact. CoClear recently created the data-visualisation tool, Carbon Catalogue, the first global database of product carbon footprints.



VIVIAN BI

PhD '01

Earlier this year, Bi's memoir, *Bright Swallow: Making Choices in Mao's China*, was published by Hybrid Publishers, and her first novel in English, *Dragon's Gate*, is now finding its English audience. Bi started by writing in her first language, Chinese, successfully publishing novels, novellas and short stories. She now writes in English, having received four grants from the Australia Council for the Arts, including a residency in Paris' Keesing Studio in 2017, where she began a novel with a French setting. Bi taught at the University of Sydney, winning an award for Excellence in Teaching in 1998, then earned a PhD in classical Chinese poetry. Her writing continues as she teaches at Sydney's Ascham School.

JUST THE FACTS

ON UNDERSTANDING POLICIES IN POLITICS

The fight between reinforcing power and disrupting power is called politics. What usually tips the balance either way are political penalties. I examine what makes political penalties stick and how politicians and political systems navigate penalties to hold onto or reproduce power. An example is policy responses to shark bites. I've talked about 'policy as therapy' where policy responses are about calming the public rather than addressing the problem. It's a way of keeping power, and the more we look, the more we see it. This is a disturbing trend that I am committed to understanding.



Dr Christopher Pepin-Neff

With a particular interest in political policymaking around emotionally charged issues like LGBTQI politics and mass shootings, Dr Pepin-Neff is also a Senior Lecturer in Public Policy in the Department of Government and International Relations, researching all areas of policymaking.



Emma Spencer

As a PhD student working with the University's Global Ecology Lab, Spencer can often be found in the Simpson Desert working to advance wildlife conservation and management by understanding how feral predators interact with their prey.

YOU AND SAM

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sam@sydney.edu.au



Andrew McLachlan (BPharm '88 PhD '92) and Samantha Fletcher (BPharm '87 DipHospPharm '89)
Visiting the Monastery at Petra, Jordan, Andrew and Samantha met at Sydney, married, and have 17-year-old twin boys.



Jaqueline Bosen (BSW '06)
Here visiting Washington, Jaqueline works for the Western Australian Council of Social Service (WACOSS) in Perth.



Salette Figueiredo (PhD '11)
Reading SAM in Rio Grande, Brazil, Salette is a postdoctoral research fellow at the Federal University of Rio Grande where she models climate change impacts on areas of Southern Brazil.



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