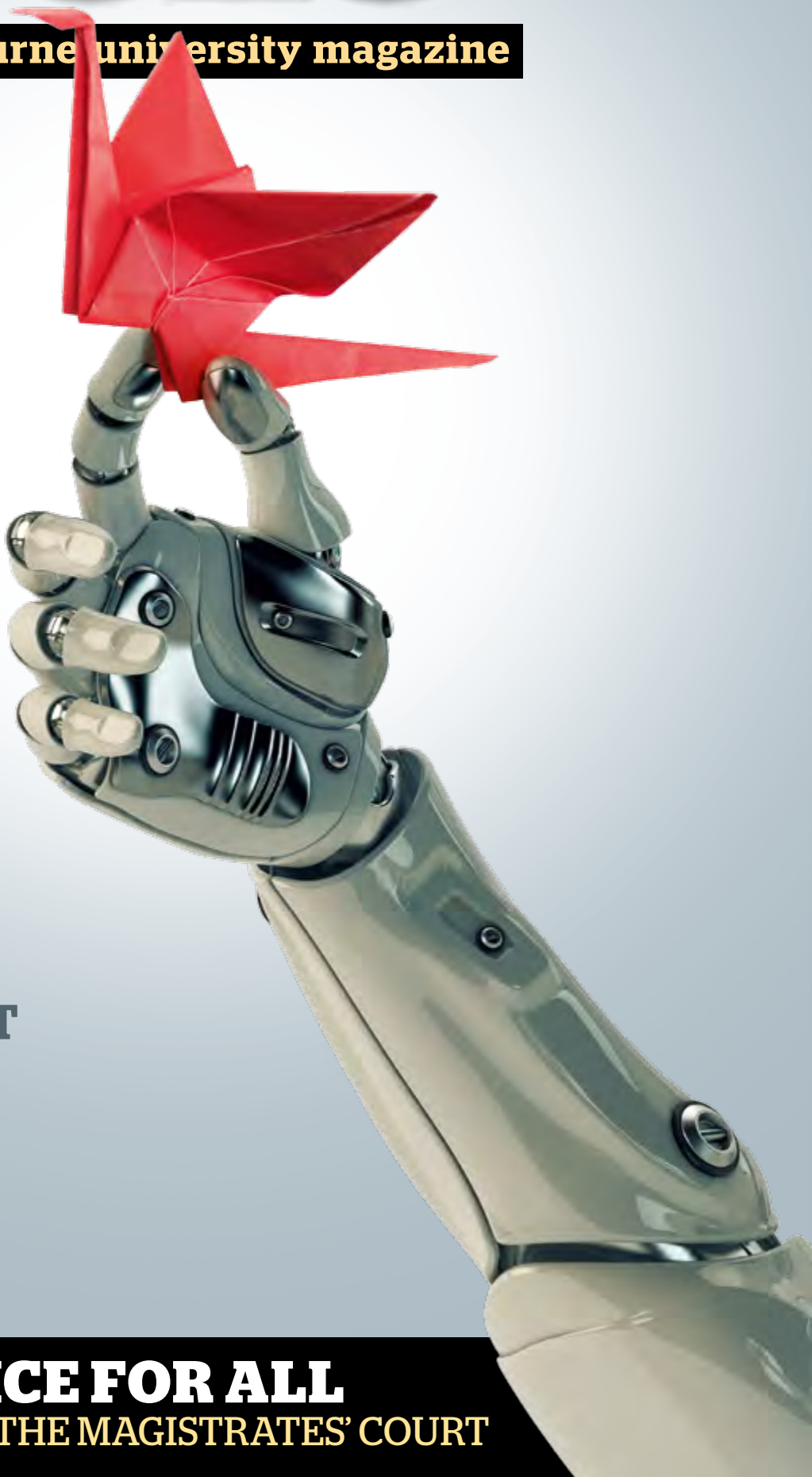
3010

melbourne university magazine



How great ideas take flight

INNOVATION
AN EIGHT-PAGE SPECIAL REPORT

ISSUE 1, 2017

THE UNIVERSITY OF MELBOURNE

JUSTICE FOR ALL
A DAY IN THE MAGISTRATES' COURT

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LA story

A group of driven, young graduates come together in a Hollywood house to pursue their movie dreams. **PAGE 28**

PICTURE: DAN TUFFS

COVER STORY

Beyond the big idea

It's a catchword of our times, but what is innovation? And how do you create a culture in which it thrives?

PAGE 17

CLOSE ENCOUNTER

Reluctant playwright

Joanna Murray-Smith strives to ensure beautiful writing doesn't sabotage her work.

PAGE 10

Bones of contention

Inside the University's intriguing Anatomy Museum, where mysteries abound.

PAGE 14

STAY IN TOUCH

We hope you enjoy your exclusive alumni magazine, *3010*, packed with news, features and all that's happening at the University of Melbourne.

We have an extensive range of events and benefits available to alumni both locally and internationally.

Go to **unimelb.edu.au/3010** and stay in touch.

THE ALUMNI RELATIONS TEAM

WANT MORE? GO ONLINE

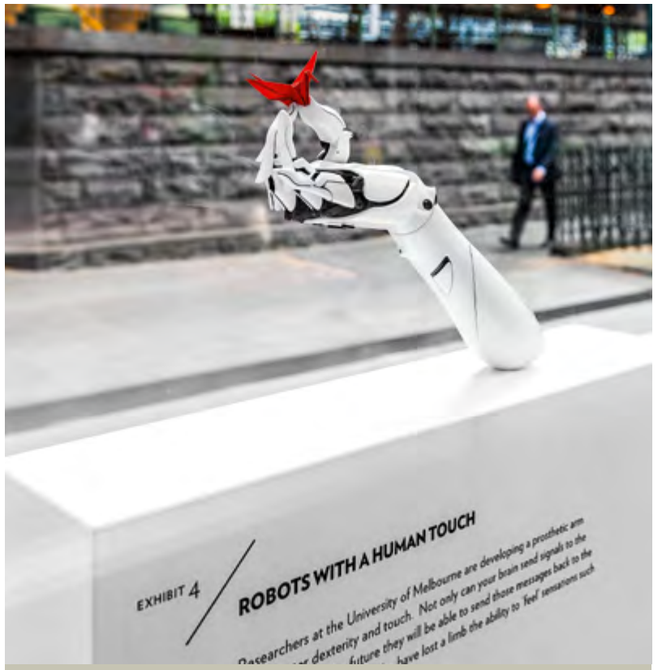
Social media can connect you to many of the University's 300,000-strong alumni community. Our alumni are represented on all the major channels.
Go to **alumni.unimelb.edu.au/alumni/connect**

With more University of Melbourne alumni on Facebook than any other social network, it is the place to go for the latest alumni news, events and benefits.
facebook.com/melbourneunialumni

Go to Twitter to follow famous alumni, or to enjoy live tweets from selected alumni events.
twitter.com/uomalumni

Keen to move up the career ladder or help others who are? Go to LinkedIn to get – or give – career advice and discover new opportunities.
linkedin.com/groups/3693333

CORRECTION
A report in our last edition, *A Night in Emergency*, incorrectly stated that the Australasian College for Emergency Medicine was formed in 1993.
The correct year was 1983.



MADE POSSIBLE BY MELBOURNE

A world of possibility

World-changing research was at the centre of an innovative University promotion that came to life in Melbourne's city centre in November. Fourteen projects were highlighted by the Made Possible by Melbourne campaign during a month-long exhibition. Dedicated installations provided prototypes, audio and visual demonstrations of research breakthroughs as diverse as robotic arms and organs grown outside the human body. **pursuit.unimelb.edu.au/madepossible/**

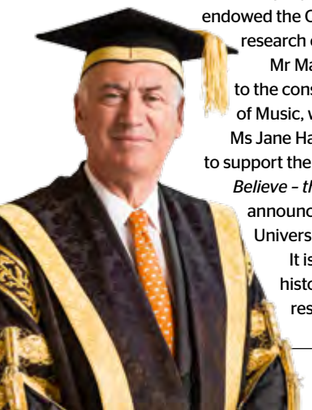
APPOINTMENTS

Allan Myers new Chancellor

One of Australia's pre-eminent legal and business figures, Allan Myers AC QC, has been appointed as the University's 22nd Chancellor. He began his term on January 1.

Mr Myers (BA 1969, LLB(Hons) 1970, LLD 2012) replaced Ms Elizabeth Alexander AM (BCom 1964), who stepped down after six years in the position.

Qantas Ltd Chairman Mr Leigh Clifford AO (BE 1968, MEngSc 1971) has replaced Mr Myers as Chair of *Believe – the Campaign for the University of Melbourne*. Mr Clifford had served as Deputy Chair since 2013 and together with his family endowed the Clifford Chair in Neural Engineering, a major research collaboration investigating neurological disorders.



Mr Martyn Myer AO, whose generosity has contributed to the construction of the new Melbourne Conservatorium of Music, will continue as Deputy Chair. He will be joined by Ms Jane Hansen, who in 2015 established The Hansen Trust to support the history discipline.

Believe – the Campaign for the University of Melbourne announced in February it had raised $628 million for the University and engaged almost 63,000 alumni.

It is the largest philanthropic initiative in Australian history and supports the University's teaching, research and engagement goals.

Join the club

NUMBER OF CLUBS AFFILIATED WITH THE UNIVERSITY OF MELBOURNE STUDENT UNION:

216

NUMBER OF CLUB MEMBERS (APPROX):

18,000

MOST UNUSUAL CLUB:

FRIENDS OF UNNATURAL LLAMAS (FOUL), A BAND OF MONTY PYTHON LOVERS.

IN BRIEF

AUSTRALIAN STUDIES BOOST IN LONDON

A new fellowship hosted by King's College London and the University of Melbourne has bolstered Australia's presence in international academia. The Joint Distinguished Fellow in Australian Studies will expand analysis of Australian politics, culture and society in the United Kingdom. Anti-tobacco advocate Dr Bronwyn King (MB BS 1999), is the inaugural appointee to the role.

GIFT TO ADDRESS INEQUALITY

Social inequality will be addressed as part of the largest philanthropic gift in the University's history. The Atlantic Fellows for Social Equity program is a multi-partnered initiative that will address the broad issues underpinning inequality in Pacific-region indigenous societies. The program is a US$50 million investment from Atlantic Philanthropies, the US-based philanthropic organisation founded by entrepreneur Chuck Feeney. Starting this year, up to 25 fellowships will be awarded each year, with the University one of several partners committed to developing 500 social change agents, influential leaders and innovative thinkers.

BUILDING NAMED AFTER PROFESSOR

The late Professor Peter Hall was honoured in December by having his name attached to the School of Mathematics and Statistics Building. Professor Hall – a leading authority in non-parametric statistics – was world-renowned for his contribution to statistics and probability theory.

CLIMATE CHANGE

Ambitious plan to cut emissions

NUMBER OF SOLAR PANELS AT PARKVILLE	
2006	0
2016	2500
2017	7500 PLANNED

The University has announced an ambitious four-year strategy committing it to action on climate change and its impacts.

Under the Sustainability Plan 2017–2020, released in January, the University will become carbon neutral by 2030, achieve zero net emissions from electricity by 2021, and report annually on its sustainability impact and performance.

Vice-Chancellor Professor Glyn Davis says the plan positions the University as a leader in sustainable practice and innovation.

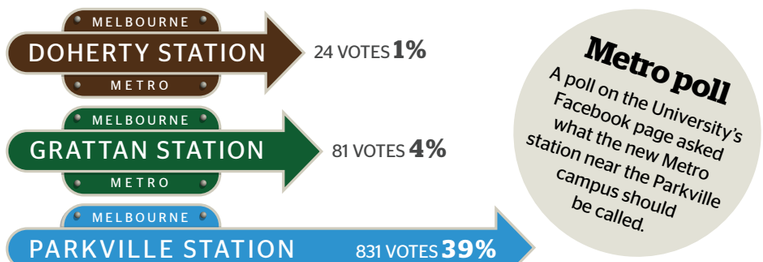
"The Sustainability Plan reflects the consolidated efforts and collective will of the University community, responding to public expectations of the role we should play as a university in helping meet a grand challenge of our age," he says.

The plan also pushes for aspects of sustainability to be embedded in all undergraduate curricula, as well as outlining the University's response to calls to divest from fossil fuel-intensive companies.

Developed in consultation with students, staff, alumni and community partners, the plan reflects a commitment to embed sustainability at all levels of University operations.

The Spot Building (home to the Faculty of Business and Economics) and the Nona Lee Sports Centre are among six sites on the Parkville campus recently fitted with solar panels. These are expected to reduce the University's carbon footprint by about 850 tonnes per year.

The Sustainability Plan can be viewed at **ourcampus.unimelb.edu.au/sustainability-plan**



ARCHITECTURE

Station returns to traditional hues

Forensic analysts from the University have worked to uncover the original colours used on Flinders Street Station's iconic façade. The current building – which dates back to 1910 – will return to its original colour scheme as part of a $100 million upgrade.

ARTS

Small works for a big anniversary

ART 150

An exhibition to celebrate 150 years of art at the Victorian College of the Arts and its antecedent institutions will enable recent graduates to enjoy a measure of financial support during the early years of their careers. The *9 x 5 NOW* exhibition, part of the ART150 celebration, will feature more than 150 works by prominent alumni at the VCA, including 2016 Sulman Prize Winner Esther Stewart (BFA(Hons) 2011, MACM 2014), pictured above. Proceeds from the sale of the works will fund the Art150 Alumni Fellowship.

The exhibition title is derived from the size of the works on show. All will be nine-by-five inches, recalling the cigar-box lids used as canvases in the 1889 *9 by 5 Impressionism Exhibition* featuring National Gallery of Victoria Art School alumni.

9 x 5 NOW will be held in the Margaret Lawrence Gallery in June. **art150.unimelb.edu.au**

A day in court

It's the 'engine room' of the judicial system. Thousands of people – victims, defendants, witnesses and lawyers – pass through Victoria's Magistrates' Courts every day, all seeking justice. Gary Tippet takes a seat in the public gallery.

Back in his day, the defendant had a familiarity with tribunals of a different sort. In five seasons in the old VFL, the big footballer had thrown a punch or three and missed 30 games through suspension. He wasn't fond of rule-keepers either, missing four of those matches for abusing the umpire.

Now 78, and a self-funded retiree, he finds himself in Court 11 of the Melbourne Magistrates' Court, in furious disagreement with a traffic policeman over a penalty for using his mobile phone while driving.

In the officer's version, he was spotted talking on the phone while in heavy traffic. Pulled over, he allegedly admitted: "You got me. I was talking to my wife, she's in hospital."

Nonsense, the big bloke tells Chief Magistrate Peter Lauritsen. His version is very different, a lot longer and much more complicated.

Greatly condensed, it goes like this: While on his way to visit his gravely ill wife in hospital, his phone rang. He was wearing a Bluetooth earpiece, but its battery was dying and he could barely hear. So he pulled over at the first opportunity, switched off the radio and engine, removed the earpiece, took his phone from its pouch, took the call and quickly disconnected. It all took 46 seconds and he has the records to prove it. Only then did he notice the sergeant tapping on his window.

The matter has already been heard by a judicial registrar (a court member with delegated judicial functions), who found him guilty and ordered a $200 payment into the Court Fund. But the defendant was entitled to seek a review of the decision by submitting an affidavit – which is why he's in the witness box before Victoria's most senior magistrate.

However apparently minor, it is significant to the accused and demands proper consideration. Today the Chief Magistrate is sitting in Court 11 and like all magistrates hears whatever pops up. The increasing administrative duties of his position mean he does not sit in court as often as he'd like. He makes time to ensure he does sit.

Peter Lauritsen (BA 1973, LLB 1974) presides over Victoria's 11 metropolitan and 42 regional Magistrates' Courts. Appointed Chief Magistrate in November 2012, he is in charge of 105 sitting and 17 reserve magistrates, four deputy chief magistrates, more than 20 assorted co-ordinating magistrates, judicial registrars and Drug Court magistrates – and, by far, the state's busiest court.

Justice for all: An artist's impression of proceedings in the Melbourne Magistrates' Court (below). About 90 per cent of cases that go to court in Victoria are heard by a magistrate.

The Magistrates' Court is "the engine room" of our court system, according to Lesley Fleming (BA 1981, LLB 1985), a magistrate in the Children's Court. "We deal with over 90 per cent of the cases that come before Victorian courts," she says, estimating that more than a million people – offenders, prosecutors, witnesses and students – pass through its doors every year.

As a consequence, she says, the court has "an opportunity and an obligation to make that experience for court users one that is just, efficient and without undue delay".

Volume is an issue, with huge pressure on magistrates to move through the daily lists in a timely way, Fleming adds.

Lauritsen points out that for most matters the Magistrates' Court is the first point of entry into the court system. "If you consider the system as a pyramid, the County and Supreme courts are at the apex, and the bulk of the rest of the structure is the Magistrates' Court."

After beginning his secondary education in schools in England and Germany, where his father was posted

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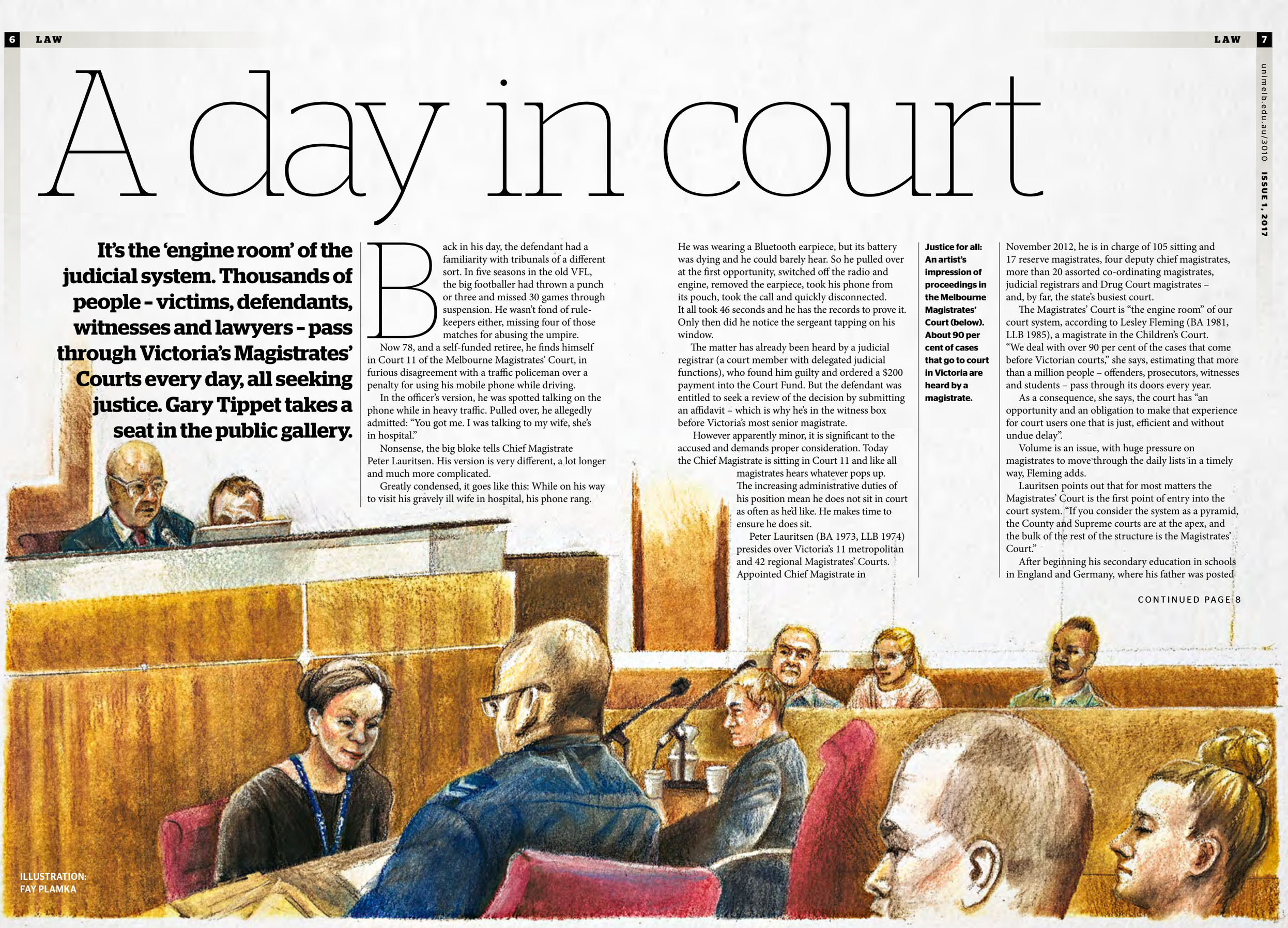

ILLUSTRATION: FAY PLAMKA

FROM PAGE 7

as an Army electrical engineer, Lauritsen completed his matriculation in Melbourne. He entered Melbourne Law School in 1969, though geology had been a consideration.

"I took the view that I'd do better doing law than I would in geology, which is pretty much an up-and-down career, depending on the fortunes of the mining industry," he admits. "But as I got into law I found I quite enjoyed it – the development of principle, preparing cases."

In 1975, he joined the "robust people's practice" of John Cain (LLB 1953), who became Premier of Victoria in 1982. In 1987, Lauritsen became a magistrate in the Northern Territory, returning to Melbourne two years later. He found the magistracy suited him.

"A magistrate has to be first and foremost impartial," he says. "A magistrate in our court has to be decisive. You don't have the luxury of putting it off to another day to think about it. You need a good judicial demeanour. You have to be patient with people. You've got to be hard working. And, I suppose, you have to be reasonably energetic to keep coming back at it all the time."

This day in court, a couple of those qualities are being tested. The old ruckman is a talker, offering a long, meandering version of events, constantly digressing, and adding sound effects by tapping on the witness box. Even the soft-spoken magistrate's renowned patience is tried and three times he gently steers the witness back to the point.

Eventually, after carefully weighing both versions of the story, Lauritsen finds him guilty of the original charge but dismisses it under a provision in the Sentencing Act.

Downstairs in Court 9, a procession of defendants passes before the bench, almost all seeking adjournments. It's all fast, efficient and business-like.

None of it makes much impression on the skinny girl in black in the back row of seats. She keeps nodding off, slumping drowsily to the side. She's still clearly under the influence of what brought her here.

"Wake up," says her lawyer from the seat in front. "You're up next."

The Magistrates' Court has never wanted for custom, but since 2013, after the murder of Jill Meagher and public reverberations over bail and parole, there has been "a truly massive increase" in the number of people on remand, says Lauritsen. The proportion of people on remand – in custody awaiting trial – has doubled from 18 per cent to 36 per cent, and the number is growing. Magistrates now hear 27,000 bail applications each year.

"No system can realistically cope with such a huge increase over such a short time," he says, and one result was that the authorities were increasingly failing to present people from prison to court when required. The court has responded with a number of measures, including Saturday and Sunday sittings and more audio-visual links.

MAIN PICTURE: CHRIS HOPKINS, INSET: STEVE McKENZIE

A magistrate has to be impartial, decisive, hard working and energetic, says Chief Magistrate Peter Lauritsen.

Now, a large flat screen flickers to life. A heavy-set, crew-cut, crooked-nosed man in a white T-shirt is appearing from prison for sentencing. Two weeks ago, he pleaded guilty on six counts of burglary, dealing with the proceeds of crime, and breaching a Community Corrections Order.

He gets a short lecture on the distress of victims and an aggregate sentence of five months' jail, topped with another 12-month CCO. With 114 days already served, that means he has another 41 days to serve in prison. "Thank you, Your Honour," he says.

In Court 5, a red-faced woman in her late 30s is less content, fidgeting unhappily under the withering gaze of Magistrate John Doherty (LLB 1986). She is appearing in court on six matters, including shoplifting and theft. She has "an extensive history" of dishonesty, but her life has been "a tale of woe" of abuse and drug issues, pleads her barrister. But he knows he's swimming against the tide.

Doherty, with a salt-and-pepper buzz cut, neat beard and call-it-a-shovel manner, peers over his glasses and pithily opines: "Until she gets over her drug issues she's going to keep knocking off other people's stuff and she's going to keep going to jail. The head sentence is two-and-a-half years on the top, 12 months on the bottom." It's a long parole term, but she won't get it unless she does all the programs attached, he adds.

"The uninformed look in on the system and criticise judges and magistrates, but don't credit them when they get it right."

— Lawyer Bernie Balmer (left).

The woman wears a look of outrage. "That's massive," she tells her lawyer. "That's just bloody massive." But she cops it.

Defence lawyer Bernie Balmer (LLB 1982) – nicknamed Bernie the Attorney – has watched legions of defendants troop through these environs in the 46 years since he began as a Clerk of Courts at the old Melbourne Magistrates' Court.

While studying at the University he also won an Australian university heavyweight boxing title, and in 1983 set up his own practice, specialising in criminal law and traffic matters.

Abolition of suspended sentences, increasing drug-related crimes and the rise in people on remand have built pressure on the Magistrates' Courts, he says. "It's become more of a factory now. We've got to a stage where I believe there's an obscene haste with which justice is now being dispensed, which then creates enormous pressure on judges and magistrates.

"The system gets criticised unnecessarily. The uninformed look in on the system and criticise judges and magistrates, but don't credit them when they get it right."

It takes two: Judge Wendy Wilmoth on mentoring - page 26

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LAW SCHOOL CELEBRATES 160TH

Verdict of history

In its 160 years, Melbourne Law School has made a rich and lasting contribution to Australian life, politics and law. Its distinguished alumni include four prime ministers (Deakin, Menzies, Holt and Gillard), two governors-general, a Victorian premier, four chief justices, including arguably the nation's greatest jurist, Sir Owen Dixon, and the first woman to practise as a lawyer in Australia, Grata Flos Greig, pictured above.

Offering Australia's first law course, MLS was established in 1857 by the University of Melbourne's founding chancellor, Sir Redmond Barry. It began in what was then the University's main building, later known as the Old Quadrangle, and initially had no lecture rooms of its own, using instead the Mathematical and Natural Sciences rooms.

With the school's creation, Victoria became one of the first places in the common law world where lawyers were required to complete part of their training at university. In 1873, a reorganisation created the Faculty of Law, the University's first faculty, to oversee the school's academic activities.

Initially offering the degree of Doctor of Laws (LLD), the University from 1881 awarded a Master of Laws (LLM) to honours graduates. Between 1883 and 1895, a two-year Bachelor of Laws (LLB) course was made available to students who had completed a Bachelor of Arts.

In 1884, as links with the practising profession and courts grew, classes and lectures in several subjects shifted to what is now the Supreme Court in William Street.

Federation in 1901 transformed Australian constitutional law and MLS led the way. The then dean, Professor William Harrison Moore, became one of the country's leading constitutional authorities, advising governments and governors-general.

The years after the Second World War saw great expansion of MLS, establishing, in the words of former dean and alumnus Sir Zelman Cowen, "new horizons for Australian law schools".

Housed since 2002 in purpose-built premises in Pelham Street, MLS is ranked No.1 in the Asia Pacific in the Quacquarelli Symonds (QS) World University Rankings by Subject (2017).

Top: The University's main building in the 1860s, where MLS was established (University of Melbourne Archives, 1993.0036.00001) and Grata Flos Greig (UMA/I/5131); and right, alumna and former Prime Minister Julia Gillard (LLB 1986, BA 1989).

In 2017, the University is celebrating 160 years of legal education. Melbourne Law School will mark this milestone with a series of flagship events. More information: law.unimelb.edu.au/160

In search of the not-so-beautiful line

She has 21 works to her name, and her words ring out in theatres across the world. Yet Joanna Murray-Smith describes herself as a reluctant playwright. She speaks to Jonathan Green.

PICTURE: JACKY GHOSSEIN

It was a modest grant of $3000 from the University of Melbourne in the 1980s that took Arts Honours student Joanna Murray-Smith to New York. And, once there, to the theatre: "Every night, I saw a different play."

It was a formative experience, a worldly experience, a time that reinforced for Murray-Smith the simple truth that, even now, budding writers in theatre need to take their eyes and ears overseas to experience the full possibilities of their craft.

"It's probably the most important thing you can do."

New York would prove to be doubly formative for Murray-Smith, perhaps the country's leading contemporary playwright, a woman with 21 plays to her name, and a constant presence on Australian and world stages.

Broadway brought her career breakthrough with the 1998 staging of *Honour*, a play that drew Tony nominations in New York, then did even better in the West End.

Honour had found its feet in the New York summer of 1996 through readings that featured Meryl Streep, Sam Waterston and Kyra Sedgwick. Back then, Murray-Smith (BA(Hons) 1985) attended Columbia University on a Rotary scholarship, juggling a three-month-old child with the teachings of novelist AM Homes, screenwriter Loren-Paul Caplin, short story writer and poet Alan Ziegler, and playwright Eduardo Machado.

For the writer this was a moment of vocational confirmation, a transformative period in which she mixed young motherhood with the most brilliant of professional opportunities.

Joanna Murray-Smith is a woman of family. A woman of tough-minded professional dedication. And the writing? Well that was never an option.

"If it comes down to a conscious choice," she says, "you're probably not a writer.

"My entire professional life has been an absence of conscious choice. I was interested in writing, but I was also very interested in acting."

And then: "Once I started writing, I had no desire to be a playwright, and I still have no desire to be a playwright. I'd rather be a great novelist." There have been three novels, but the plays, by weight of number and reputation, have taken the upper hand.

She describes the drive to write as a compulsion. But that compulsion can be formed and nurtured in a family home that in Murray-Smith's case was filled with books, conversation and ideas. Her father was the academic and editor Stephen Murray-Smith (BA(Hons) 1947, GDipEd 1947, BEd 1961, PhD 1967).

Being a writer of close human interiors, she's not shy of exploring her own.

"I've been interested in the psychological elements that have driven me into certain preoccupations. It really happened when I googled myself – which one should never do – and saw that some PhD student had written a thesis on my work and they had written, something along the lines of, '… as is customary in Joanna Murray-Smith's plays …' something which made me, for the first time, contemplate the idea of repetition, of recurring preoccupation.

"It made me stop and think: if other people can see those preoccupations, then perhaps I should be able to see them, too."

And so with typical application, she set about holding her plays to the light.

"Memory came up again and again. Mothers and daughters came up again and again. Ideological conviction clashing with emotional compulsion, the way in which the head and the heart collide.

"The failure of hard-line ideologies came up again and again."

It all made a certain sense. "I grew up in a household with parents who, when I was born, were not yet a decade out of their life in the Communist Party, and still wearing the effects of that disillusionment." It left an "atmosphere of scepticism of hard-line ideology".

"Anything that makes you less in control as a human being makes the writing more vivacious . . ."

This had a consequence not only in the preoccupations of her dramatic characters, but also in the very gristle of her writing: it must not slip into blunt polemic.

"I grew up with a real sense that in your creative work you cannot push a political barrow. If you do you are in some way denying the humanity and the energy of what it is to be human in what you write. You are oversimplifying, and people don't work that way."

It is that fine human complexity, the intricate shadings in all of us, that has informed so much of Murray-Smith's work.

"Mostly, for me, writing plays begins with the question 'what if?'

"There is in that swirling mass of ideas and sensitivities and anxieties that we all have; in all of that, certain things will just find a moment in which they are in a spotlight." For most of us, this is the stuff of internal dialogue, of quiet reflection, but then most of us don't write plays.

"If you are a writer, then you are sensitive to those moments of clarity or illumination. Your mind will flick over them and then backtrack, and say, 'hang on, that's a play.'"

From there the writing takes on a life of its own. That first setting down, a quick fusing of thought, feeling or stolen observation, with words and character, that is a process that for Murray-Smith is an almost otherworldly thing. It is not a meditated space.

"The working writer, or at least this one, is in a state of suspension between the real world, between consciousness and the world of the imagination.

"Of course you are drawing from your intellect, of course you are drawing from real life, but you have to let go of control or you're not going to end up with anything that has got any kind of theatricality to it, or any kind of human interest.

"As a practised writer now, I know, as I sit down at the desk, that if I'm feeling too conscious of what I'm doing I might as well just stop, because I'm not going to be writing anything worthwhile.

"Which is why sometimes I find it great to write when I'm tired, or after a glass of wine. Anything that makes you less in control as a human being makes the writing more vivacious, and the ideas more interesting and complex."

This is, though, writing for the theatre, writing which will eventually blend with actors, movement, direction, lighting and design. After the first inspired authorial flourish, technicality intrudes.

"They are really two different processes. The process of writing is accidental, chaotic, uncontrolled, unconscious and without the input of any critical faculties.

"So when I sit down and write that first draft I never look back over the previous piece of dialogue and think, 'is that any good?'. When I finish it I look at the first draft and try and work out – and it's usually not hard – where is the energy in that draft, where is the vibrancy and theatricality, and I preserve that."

And on it goes. Draft after draft. Sometimes with an easy pouring out of words, sometimes with tough, page-scrunching graft. "And then each draft – and for this STC play I'm working on now I'm probably up to my 20th draft – each draft is a bit more knowing."

The Sydney Theatre Company play is a slow work in progress, but her latest for the Melbourne Theatre Company, *Three Little Words* was a quick process, writing that seemed eager to fill the page. The result, as you settle into the stalls, is just the same.

"The most important thing is that when the words come out of the mouth of the human being on the stage is that those words sound authentic and you're not breaking the magic of luring the audience into a creative universe.

"The audience might sit there and think, 'oh that's a beautiful line', but as soon as they think that, they're out of the world you've created. Early on I found that really difficult, because I wanted to write as beautifully as I could, and then I realised that beautiful writing was sabotaging a really good night on the stage."

ANOTHER OPENING, ANOTHER SHOW

Melbourne Theatre Company's production of Joanna Murray-Smith's latest play, *Three Little Words*, will run at the Southbank Theatre until May 27.

Jonathan Green is the editor of *Meanjin*. 3010

In a league of their own

Australian football, part of Melbourne's fabric, has long been dominated by men – until this year, when the sport was gripped by a revolution.

BY **PETER HANLON**

As a world championship winner in the relatively obscure pursuit of ultimate frisbee, and an accomplished athlete who as a student excelled at netball while trying her hand at everything from cross-country running to surf lifesaving and water polo to soccer, Cat Phillips is a handy barometer of the sudden, up-in-lights appeal of women's Australian Rules football.

Like Phillips with ball in hand, the game has latterly been cutting a mesmerising dash.

"I think I might have left it a bit late – I'm loving my engineering career and don't want to give that up," the 25-year-old says of the prospect that women could soon make a living out of a sport that for more than 120 years has been almost exclusively the domain of men.

"But I'm definitely seeing the girls who are 17, 18 and coming through now, they're putting everything into it and thinking they can make it into a career. And I think that's a really valid and viable option, which is amazing."

When Phillips (BSc 2013, DipMathSc 2013, ME 2015) joined pre-season training with the Melbourne University Women's Football Club two years ago, ostensibly to boost her running for ultimate frisbee, her footy experience amounted to half-time kick-to-kick in the MCG carpark while attending Collingwood games with her family.

She dipped her toe in a little deeper last February at an AFL women's talent day, and in July finally played her first official game. Many wouldn't have persevered beyond her first "unofficial" game.

"My first practice game I went to tackle a girl and she put her hand right in my chest," Phillips says with a laugh. "My Mum didn't love it when I came home and said, 'I've got a fractured sternum but I'm going to keep playing'."

If this was supporting evidence of the primitive wisdom that football is no game for women, Phillips was having none of it. She shrugged it off, recovered, and in October was drafted to Melbourne, one of the four Victorian clubs granted an AFLW licence in the inaugural eight-team national women's competition.

On the first Sunday in February, she played against the Brisbane Lions, and the sight of her haring down Casey Field and kicking long into the Demons' forward line almost reduced Laura Kane to tears.

A different game: AFL chief Gillon McLachlan (top) and (main) Cat Phillips under pressure during her opening game against Brisbane in the AFLW.

A knee injury ended Kane's playing days at 20, but six years later she exemplifies the doors that are opening to women in football, not just in a playing sense.

President of the University's six-team women's club, Kane last year became head of women's football at AFL club North Melbourne. Then, in the week of AFLW round one, she quietly ascended to the role of football operations manager for the entire club.

She celebrated by joining the masses that flocked to Princes Park for the historic first game between Carlton and Collingwood, walking down Royal Parade among men and women, boys and girls clad in club colours "like it was a normal thing to do".

The AFL had anticipated a crowd of up to 15,000; officials were forced to lock the gates when it topped 25,000.

When Phillips arrived at an outer suburban venue almost three hours before Melbourne's first game two days later, she couldn't believe fans were already queueing to get in. "Playing at Cranbourne with a thunderstorm forecast I didn't think anyone would turn up … it was amazing," she says of a crowd of 6500 that, buttressed by staggering television audiences, kept women's football where it had been all weekend but scarcely ever before – on the back page of Melbourne's newspapers.

No one is better placed to mark this progress than AFL chief executive Gillon McLachlan (LLB(Hons) 1996), who was playing for University Blues in the Victorian amateur competition when the women's arm of the club began in 1996.

"It was very much separated from the men's club," McLachlan recalls. "They played on Sundays, there was no relationship or connection with the men's clubs. In fact, there was a level of antipathy I guess. It was just seen as a women's team."

Since last October, the women's club has sat alongside men's teams Blues and Blacks in a governance structure that oversees the University's three football arms, which continue to operate autonomously. McLachlan says the structural change that's occurred mirrors the rapid linking of arms in footy clubs throughout Australia, which last year saw 250 women's teams play in greater Melbourne.

PICTURE: GETTY IMAGES

Perhaps the greatest revolution has been the conversion of fans who cared only for men's football. "Go back 10 years and look at how women's football was viewed, there's been incredible change and momentum," McLachlan says.

"That attitude, the embracing of it by the hardened football supporter … there's very little scepticism anymore." McLachlan takes an old boy's pride in the University having 17 players drafted onto AFLW lists, the most of any club in the country.

"All I know is it's a really important thing for our game, a really significant moment in Australian Rules football."

GILLON McLACHLAN

Kane doubts this could have happened if the Uni women hadn't been preparing and training out of North Melbourne's Arden St headquarters for the past six years, accessing the same facilities and expertise – gym, theatrette, nutrition and medical staff – that North's male players have at their disposal. This was pioneering, but has quickly become the norm.

She has no doubt the talent pool will grow, and the women who made the transition from club football into the AFLW will improve markedly.

McLachlan, meanwhile, wavers at the notion that AFLW could be the great legacy of his time in football's top job, saying his task is to manage expectation and help bridge the talent gap between the best players and those filling out club lists. "All I know is it's a really important thing for our game, a really significant moment in Australian Rules football generally."

His eldest daughter plays netball, her sister plays football and basketball, and both love their footy. "They'll get older, they'll make decisions, but they now know it's a real option for them," he says of a future that female footballers can look to with great optimism.

■ The Adelaide Crows beat the Brisbane Lions by six points in the AFLW Grand Final.

3010

UMPIRE KICKS PERSONAL GOAL

Annie Mirabile has never been a footballer, not in a "proper team" anyway. "There was the occasional thing at school … but in the few times I played I wasn't much of a talent."

Hers is not an uncommon story, of the footy lover who yearns to be more than a fan but knows the most intimate vantage point – that of a player – is one they'll never comfortably occupy. The umpiring ranks have long been filled with such devotees. Mirabile's emergence merely reflects that it's not just in player numbers that female participation is climbing.

"I found a way to be really up-close to the action," the 23-year-old University of Melbourne physiotherapy student (pictured below) says of a pursuit that began with the Moorabbin Saints juniors in her early teens, progressed through the local senior competition, and in the historic opening game of the AFL Women's season saw her toss the ball into the air to start the action as one of the game's three field umpires.

"I first started to get the sense of it when we went out and an hour-and-a-half before the game, the seats were already filling up," Mirabile (BSc 2014) says of a Princes Park crowd that surged past all expectations and forced a "house full" sign.

"I thought, 'Gee, this is going to be big.' I got chills during the national anthem, then the crowd cheered at the end of it. It was amazing."

As more women follow her and the AFL-listed Eleni Glouftsis into on-field officiating, more will know the perverse accomplishment she felt in reflecting on her performance. "I think we did everything we could to make sure we went as unnoticed as possible, which is always an umpire's goal."

Bones of contention

"It's a very vibrant environment to study in. Anatomy is a language."

ASSOCIATE PROFESSOR JENNY HAYES
PICTURE: CHRIS HOPKINS

At first blush they may seem a little macabre, but the exhibits in the University's Anatomy Museum provide a great teaching resource – and the odd mystery.

Left: Four plaster models showing thoracic and abdominal dissection, circa 1900. Right: A dermatone model. Each colour represents an area of skin primarily supplied by a single spinal nerve. Below: The skeleton of a French beggar with 'mermaid syndrome'.

BY **MURIEL REDDY**

In death, he has the kind of star presence he might have craved in life. A beggar who played the recorder on the steps of Notre Dame in Paris, he has beguiled thousands of people, young and old, since his move to Melbourne in 1862.

But it has been his medical rather than his musical story that has made him one of the big drawcards at the Harry Brookes Allen Museum of Anatomy and Pathology at the University of Melbourne. He suffered from a severe malformation of his lower limbs, a rare medical condition known as sirenomelia, or "mermaid syndrome".

It has made him a lodestar for tens of thousands of students – in medicine, biomedicine and physiotherapy – who have been fascinated by the single, symmetrical lower leg that makes him such a phenomenon. Unusually for someone with this condition, he lived to the age of at least 18.

It has been more than three decades since Jenny Hayes was a medical student at the University, but she still recalls how captivated she was by the skeleton and the mystery surrounding the beggar of Notre Dame.

Arguments have raged over the years about whether or not it was a fake. Sirenomelia is rare, occurring at a rate of 0.98 per 100,000 births; more than half are stillborn.

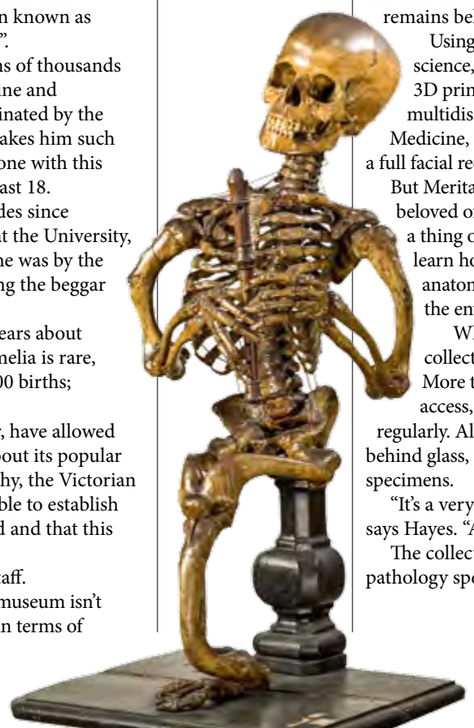
Advances in technology, however, have allowed the museum to discover the truth about its popular skeleton. Using computed tomography, the Victorian Institute of Forensic Medicine was able to establish that the bones were naturally formed and that this was indeed a genuine pathology.

The result has thrilled museum staff.

"It's exciting because it shows the museum isn't a static collection but ever-changing in terms of what we know about the particular objects," says Dr Hayes (MB BS 1982), now Associate Professor of Topographic Anatomy at the University, and Chair of the museum management committee.

It has been this sort of collision of the old with the new world that makes a tour of this museum so stimulating. It houses one of the largest collections of real human tissue specimens and historical anatomical models in the country.

In all, about 1200 specimens are on display, 10 per cent of the museum's collection. The oldest material is a small collection of Egyptian mummified remains believed to be more than 2000 years old.



Using the latest technology – forensic science, computerised tomographic scanning, 3D printing, Egyptology and art – a multidisciplinary team from the Faculty of Medicine, Dentistry and Health Sciences produced a full facial reconstruction of a woman.

But Meritamun, as she has been named (it means beloved of the god Amun), is so much more than a thing of beauty. Through her, students will learn how to diagnose pathology marked on our anatomy. They will also be able to explore how the environment can affect population groups.

What is remarkable about the museum's collection is that it is also a teaching resource. More than 2000 students have swipe-card access, and classes and tutorials are held on-site regularly. Although many of the older specimens are behind glass, students do get to handle the plastinated specimens.

"It's a very vibrant environment to study in," says Hayes. "Anatomy is a language."

The collection includes dissected anatomy and pathology specimens, moulages and death masks,

CONTINUED PAGE 16

A FACE STRAIGHT OUT OF HISTORY

The face is serene and enigmatic – just as any romantic would wish of a visage straight out of the ancient world.

It is reconstructed from a mummified head dating back 2000 years that is a mysterious part of the Anatomy Museum collection.

A team of specialists, including some from the Faculty of Medicine, Dentistry and Health Sciences, combined their knowledge with modern technology to reconstruct the face of the Egyptian woman, aged 18 to 25, they named Meritamun.

Removing the head from its original bandages was never an option. A CT scan was taken so that a 3D printer could produce a facsimile of the skull (below).

Sculptor Jennifer Mann then used her forensic and artistic skills to reconstruct the face.

Although the head has been part of the collection for about 100 years, how it arrived at the University remains unclear. It's just another mystery at the museum.

PICTURES: PAUL BURSTON/UNIVERSITY OF MELBOURNE

A wax model from about 1890 demonstrates the cardiovascular system.

IN ADDITION TO THE ANATOMY MUSEUM, THE UNIVERSITY OF MELBOURNE HAS TWO OTHER MEDICAL MUSEUMS:

MEDICAL HISTORY MUSEUM

Located on level 2 of the Brownless Biomedical Library (Building 182) on the Parkville campus. Reopening this month. *medicalhistorymuseum.mdhs.unimelb.edu.au*

HENRY FORMAN ATKINSON DENTAL MUSEUM

Located at the Royal Dental Hospital of Melbourne, Swanston Street, Carlton. Open Monday to Friday, 9am–5pm. *museum.dent.unimelb.edu.au*

FROM PAGE 15

including one of the notorious Ned Kelly. It also has a prized selection of the Steger/His gypsum-based anatomical models. Many of the European collections of these models were destroyed during the Second World War.

The museum is home to a small collection of perfectly preserved skeletons of babies from foetal stage to newborn. These are rare because under the Human Tissue Act of 1982, the museum can no longer accept material from anyone under the age of 18.

"At the time, however, it was within the moral and legal framework," explains Dr Ryan Jefferies, the museum's curator. "They're of great teaching importance to our students."

In an apparently seamless journey down the ages, the specimens of bygone eras are being given new life with today's advanced technology. A set of human lungs from the historical collection, for example, has been recreated in exquisite detail on an advanced 3D printer, allowing students to handle and study them.

The same technology and techniques that were used to reconstruct the head of Meritamun are being deployed to give relevance to the collection. "The technology means that students can use 3D virtual reality and printouts to understand tissue, bones and organs," explains Jefferies.

"Surgeons can even use them to practise on representations of the actual structures in a patient they will be operating on. Everything we are doing with Meritamun has an application in modern practice."

The museum's collection, not open to the public, can be viewed at: **harrybrookesallenmuseum.mdhs.unimelb.edu.au/collections**

THE INNOVATORS Everyone talks about it, but what does innovation really mean? And how do you create a culture in which innovators flourish? The University of Melbourne believes it has some answers.

Coming to the University: an artist's impression of Science Gallery Melbourne, part of Carlton Connect. The new innovation precinct will highlight talent and ideas.

BEYOND THE BIG IDEA

BY **TANYA HA** (BSC 1994, MENV 2013)

It is 200 years since the English surgeon James Parkinson wrote his influential *An Essay on the Shaking Palsy*, the first systematic description of the progressive degenerative disease of the nervous system we now know by his name, Parkinson's disease.

Even now, it's a disorder that has no cure. Researchers are still striving to unlock its causes.

But previously house-bound sufferers of the disease are gaining some relief thanks to a wristwatch carrying smart science, an innovation that emerged from the Florey Institute of Neuroscience and Mental Health, part of the famed Parkville medical research precinct.

Innovation has seldom been a hotter topic. It's a buzzword in newspaper headlines, political manifestos and hype-filled marketing pitches. It's being applied to every advance, big or small, from self-driving cars to new flavours of ice-cream.

Amid all this frenzied talk of transformation and disruption, the University of Melbourne is reinvigorating the role of a university in innovation, making the changes, building the infrastructure and doing the hard yards needed to turn the talk into action. It starts with an understanding of what innovation is and how it works.

CONTINUED PAGE 18

19 Australia's world ranking on innovation according to the Global Innovation Index – below the **US**, **South Korea**, **New Zealand** and **Singapore**, but above **Norway**, **Israel** and **China**.

50 Percentage of economic growth in developed nations that can be attributed to innovation. The Australian government invests **$10 billion** a year in research and development for science and innovation (**2.1 per cent of** GDP). SOURCE: GLOBAL INNOVATION INDEX

FROM PAGE 17

"Innovation is a much-misused word," says Doron Ben-Meir, the University's Vice-Principal for Enterprise. "Invention is not innovation. An idea by itself is useless. Worthless. Innovation is invention plus adoption."

The CEO of BioMelbourne Network, Dr Krystal Evans (PhD 2005), describes innovation as a process creating a product or service that provides a solution to a significant problem, with vastly improved outcomes.

"There's several pieces to that: it's got to be a finished product or service, and there's got to be a significant improvement; it's not a 'me, too' product. When you tease that out, you find there are a lot of players in an 'innovation ecosystem'."

That medical wristwatch is Evans' textbook example of what innovation looks like. The problem facing the doctors treating those with Parkinson's disease is relying on a patient's recollection of their tremors to determine their medication dosage.

"Invention is not innovation. An idea by itself is useless. Worthless. Innovation is invention plus adoption."

Florey researcher Professor Malcolm Horne had developed an algorithm that measures the movements of Parkinson's patients. Global Kinetics Corporation was established to commercialise his invention and take it from "bench to business to bedside".

The finished product, called the PKG (Parkinson's KinetiGraph) watch, looks more like a conventional watch than a medical device. It's a vehicle for Horne's algorithm to collect accurate information about a patient's movements. Doctors can download this data, then analyse and use it to identify the optimum dose of medication.

The device also alerts patients when it's time to take their medication. Today, thousands of people in 17 countries benefit from this innovation.

"People who were completely house-bound are now able to go out and play tennis because they've got the dosage of their meds right," says Evans. "That's a significantly improved outcome."

Anthony Goldbloom (BCom(Hons) 2006) created the competitive data science platform Kaggle, which was recently sold to the technology giant Google in a multi-million dollar deal, to solve a different problem. There were organisations with large data sets but without access to top data scientists. There were data scientists itching to play with more real-world data.

Kaggle hosts competitions, with clients providing the data and a predictive problem to solve; the data scientists compete to develop the best predictive model

PICTURE: CHRIS HOPKINS

"I strongly believe innovation is a team sport," says Dr Charlie Day, former director of Carlton Connect and now the inaugural CEO of the Office of Innovation and Science Australia.

(See *Research harnesses power of the crowd* – page 30).

Kaggle helped NASA crowd-source better ways to map invisible dark matter in the cosmos using images of distorted galaxies.

Kaggle has gone on to work with supermarket chains, healthcare organisations, and several major US insurers. It has also developed a new line of business, hosting competitions to help companies such as the American business giants Walmart and Facebook find and recruit the best data scientists.

Why did Melbourne boy Goldbloom relocate to San Francisco? Because Google, Apple, Stanford and Berkeley universities, and a host of startups are there.

"You can go to a dinner party and most of the people there will work in tech, so the chance you'll meet a useful connection or learn something that's useful to your business is very high without even trying," he says.

The University of Melbourne is striving to replicate that culture near its front door. The Carlton Connect Initiative is the University's new innovation precinct, aiming to bring to the site of the old Royal Women's Hospital the kind of talent and activity density that Goldbloom enjoys in the United States.

Carlton Connect will foster innovation by co-locating University teaching and research with startups, small and medium enterprises, student accommodation, and even artists' spaces. It's already home to the University's start-up accelerator, the Melbourne Accelerator Program, and is the site of the future Science Gallery.

"Carlton Connect was premised on the vision of a university as a place where innovators could meet," says Dr Charlie Day (BE(ChemEng)(Hons) 1992, BA 1993), the initiative's former director and now the inaugural CEO of the Office of Innovation and Science Australia.

"I strongly believe innovation is a team sport," he says. "To be successful you need to assemble the best players to be part of that team. In successful innovation, those players are going to come not only from the University, but also from the private sector and broader civil society."

Similarly, the Bio21 Institute brings together university and industry researchers under one roof in the heart of Melbourne's biomedical precinct, with the Royal Melbourne Hospital, the Victorian Comprehensive Cancer Centre, and other medical research institutes in the neighbourhood.

"Ten years later, with my hand on my heart, I can say that that vision has been realised. We've attracted great scientists and had great results."

CSL Limited, Australia's largest multinational biopharmaceutical company, chose to build its research facility at the Bio21 Institute to help attract the best talent, foster collaboration and improve outcomes.

"If you can show scientists great labs in a great medical research precinct, they're more likely to come and work for you than if you're showing them labs away from where all the action is," says Dr Andrew Nash (BSc(Hons) 1983, PhD 1988), senior vice-president for research at CSL

"Ten years later, with my hand on my heart, I can say that that vision has been realised. We've attracted great scientists and had great results," says Nash, naming a long-acting treatment for haemophilia that has received US Food and Drug Administration approval as one result he's particularly proud of.

CSL will double its tenancy at Bio21 over the next three years to about 150 researchers.

Such ambition is music to the ears of Doron Ben-Meir. "When you've got that activity, diversity and density, you have the preconditions for invention and innovation," he says. "We might call it the startup or innovation ecosystem, but really, 'it's the eonomy, stupid'."

The PKG 'watch' (above) has helped thousands of Parkinson's sufferers monitor their movements. Dr Krystal Evans (below) describes the device as a textbook example of what innovation looks like.

PICTURE: DARREN JAMES

Charlie Day says the process of developing an idea through to a product creates jobs along the way and contributes to economic growth.

"You bring in clinical nurses and the healthcare system as you take new therapies through clinical trials, for instance. The jobs aren't created only when it hits the market; there's quite a lot of work that happens between invention and delivery."

Associate Professor Rufus Black says modest innovations are just as important as the spectacular ones for our future economy.

"Germany's enormous manufacturing economy is built on countless acts of industrial innovation that have built the leading producers of a whole range of sophisticated products that are exported around the world. None of these is an Uber or an Apple, but they power a huge economy."

Black says that, in Australia, we need to make sure our innovation agenda is broad, and that we must remain committed and excited about the continuing incremental innovation that maintains our competitive advantage in areas such as agriculture and biotechnology.

"We need to resist getting lured off chasing unicorns! They're exciting, but they don't build a whole economy."

Black (BA 1990, LLB(Hons) 1991) is Master of Ormond College and has held leadership roles in both academia and the corporate sector. He's sharing his insights and developing the skills of the next generation of innovators through the University's new Master of Entrepreneurship degree, taught at the Wade Institute of Entrepreneurship.

"Converting ideas into products and services needs a particular skill set; it's a discipline," Black explains. "Failure rates for startups in Australia are high because this skill set is inherently difficult and not widely distributed. The Master of Entrepreneurship has been established to develop these capabilities in a very practical, hands-on way."

Krystal Evans, meanwhile, hopes the Parkinson's wristwatch, made in Melbourne, is a sign of things to come."I see Melbourne in 2050 as a city that's known for medical manufacturing with a thriving local industry, exporting cures and therapeutics to the rest of the world."

For Anthony Goldbloom, innovation isn't just an intellectual process, but a pursuit with a visceral dimension. "If you do something that's really novel, and you're the first there, it's scarier and it's riskier, and you're going to have lots of missteps. But it's exhilarating when it works."

The University boasts many famous and enduring examples of innovation

1923 VEGEMITE

Australia's legendary spread was invented by food scientist Cyril Callister, who received a scholarship to study science at the University in 1914. He went on to work for a food processing company, where he transformed yeast cells from brewery waste into a salty black paste. Callister used his research to earn a doctorate from the University in 1931.

1978 THE COCHLEAR IMPLANT

Professor Graeme Clark led a team of scientists and engineers to invent the Bionic Ear cochlear implant. Inspired by the struggles of his hearing-impaired father, Clark researched ways for sound to bypass the damaged part of the human ear using electrodes to stimulate the auditory nerve. More than 300,000 people have now received implants, including Grayson Clamp (left), seen at the moment his implant was switched on in 2013.

Innovation is about more than good ideas. It's about converting those ideas into products and services. Melbourne alumni have achieved this across an impressive spectrum of fields. Here are some of their stories.

#01 SPORT

MEASURING ATHLETE PERFORMANCE

Shaun Holthouse loves sport, though he has more aptitude for maths and science than any natural talent on the field.

"I was much more likely to be captain of the chess club than the football team," he says of his school days in Melbourne's southeast.

Despite his early lack of athleticism, Holthouse (BE(Hons) 1996) grew up to co-found Catapult, the world's leading sports analytics company and designer of cutting-edge sports technology.

Athletes from more than 900 elite sports teams now use Catapult's wearable monitoring devices to measure and track their performance. And Holthouse, pictured below holding one of the devices, gets an insider's look at sporting culture around the world, from the AFL to the NBA.

"It's like 'Revenge of the Nerds'," he says with a laugh. "I get to be involved with all these amazing elite teams."

Holthouse didn't jump into sport science when he graduated from the University of Melbourne in 1996. He worked first as an engineer, developing technologies for small but forward-thinking companies. In 2002, he became a development manager for the government's Cooperative Research Centres microtechnology program and saw potential in a project from the Australian Institute of Sport – a wearable GPS device that used sensors to measure athlete speed, force and other metrics during play.

When the device failed to attract funding through the program, Holthouse and a colleague, Igor van de Griendt, bought it themselves and founded Catapult in 2006. They started selling the OptimEye tracking monitor along with software to interpret the data it provided.

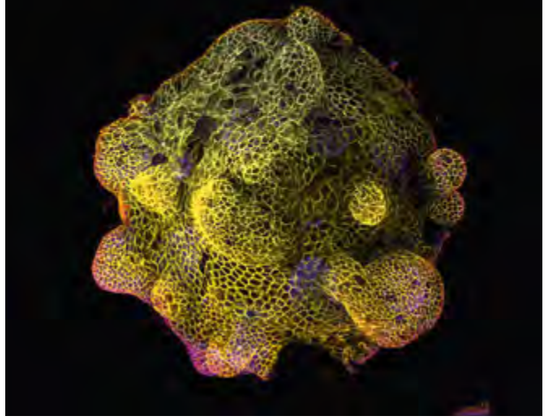
Catapult grew slowly and organically, says Holthouse, with occasional help from government grants. Hawthorn Football Club became the first AFL team to use the technology in 2007. The Hawks were using it when they won the premiership the following year. "They had such an appetite for the things that were going to create an edge for them," Holthouse says. "They were true early adopters."

Catapult expanded to other football teams and, eventually, began exporting to the English Premier League. They finally entered the lucrative US market in 2012, becoming the main sports analytics company selling to the NFL and the NBA. "Now we are completely dominant in our space."

Catapult's customer base includes the world's biggest sports teams, from Real Madrid to the Dallas Cowboys. The company listed on the Australian Stock Exchange in 2015, and last year acquired US-based video analytics firm XOS.

#02 MEDICINE

ORGANOID CULTIVATION



Cancer researchers are usually in the business of shrinking tumours. Dr Elizabeth Vincan wants to grow them. She collects and cultivates organoids – miniature versions of tumours removed from cancer patients – in a lab at the Peter Doherty Institute for Infection and Immunity.

Vincan (BSc(Hons) 1981, PhD 1995), pictured below, says these tiny cell clusters, the size of a grain of sand, lie at the core of a scientific breakthrough set to revolutionise cancer treatment.

"They are a real game-changer," she says.

Vincan, head of the Doherty's Molecular Oncology Laboratory, is part of a group of clinicians and researchers establishing Australia's first "organoid bank", a collection of tumour organoids used to test the effectiveness of different anti-cancer drugs.

Alarmingly, many patients don't respond to a given therapy, but doctors will soon be able to order drug testing on organoids derived from their patients' own cancer cells. They will then be able to use drugs on patients they already know will work. This makes personalised cancer therapy a reality today.

"A drug pre-screen means that no time is wasted and the patient is treated with the correct drug and dose from the outset," says Vincan. "This is just the sort of information a clinician needs — how best to treat their patients." The organoid bank will also serve as a repository for large-scale testing of potential drug therapies, avoiding the financial and logistical difficulties of clinical trials. "Instead of having to sign up a number of patients to do a trial, we can simply thaw out stored tumour organoids and test it," she says.

The Australian Living Organoid Alliance includes Vincan's group and doctors and researchers from Royal Melbourne Hospital, the Walter and Eliza Hall Institute and the Victorian Comprehensive Cancer Centre as the Melbourne node. The team has banked about 50 cancers so far. They will spend this year evaluating procedures for their drug screening tests.

#03 DESIGN

COLOUR ANALYSIS

Picture a top interior designer on holidays sitting by a forest stream. Suddenly she spies a moss-covered rock with exactly the shade of green she's been looking for.

Thanks to the ingenuity of three alumni, she can easily overcome what would otherwise be an insurmountable problem. She could take a photo with her mobile, but due to light variance it wouldn't capture the exact colour. Memorising the precise shade is unlikely, but by holding a small device called Cube directly onto the moss and pressing a button, she can capture its exact CMYK and RGB values and Cube will later wirelessly transfer them into her Photoshop library.

Even better, Cube not only matches the colour of the moss to paint products and common systems like Pantone, it will link to many lesser-known databases, such as Britain's Royal Horticultural Society, which provides a standard for plant colours.

Cube was created by electrical and electronic engineering graduates Paul Peng (BE 2012, BCom 2012), Djordje Dikic (BE 2011, BA 2011), pictured below, and Rocky Liang (BE 2015, MPhil 2016), who were part of the Melbourne Accelerator Program intake in 2013.

Their company, Palette, now has two products on the market – Cube, and a similar consumer device called Spot, which is being sold in partnership with Dulux paint outlets around Australia for about $150 under the brand name Dulux Snapshot. Each product can easily slip into a pocket.

"The methodology was the subject of a research paper we did about four years ago, looking at the challenges of developing the algorithms required to accurately analyse colour and how to perform matches at very low cost," says Peng.

"Our eyes have red, green and blue sensors and we mimic that in electronic form. We essentially do the same thing the brain does in processing information from the eyes."

PICTURE: NEWS LTD

1981 RECALDENT

In 1981, researchers from the University's Dental School discovered a protein derived from cow's milk that could be used to repair weakened tooth enamel. Today it is sold under the trademark Recaldent and used as an ingredient in chewing gum and toothpaste.

2002 ASICS SHOE

University physiotherapists partnered with the international shoe brand ASICS to develop a running shoe that combats painful osteoarthritis in the knee joint. They created the ASICS Gel Melbourne OA, a modified shoe that reduces the load on the knee, providing pain relief without drugs or surgery.

#04 SOFTWARE

FROM ULTRASOUND TO 3D

It's a big jump from the tiny bronzed booties parents once kept as a memento of their new-born child to a three-dimensional model of their baby's face in the womb, transformed from ultrasound images into an amazing 3D-printed relief sculpture.

The idea, boosted by a $10,000 CMB Capital "Best Startup Pitch" award, will soon hit the market in partnership with radiology clinics, but Bindi Raja (MEntr 2016) is determined it will lead to something much more important than money.

Her company – originally called Teenyco, but now changed to Sonotec – is developing new software to help sonographers around the world identify foetal abnormalities often missed in routine 20-week ultrasound examinations.

Raja's motivation was strengthened recently with the publication of a major European study of more than 200,000 women, which found that 39 per cent of malformed foetuses were not detected by routine ultrasounds.

Meanwhile, Sonotec's baby models are in the final stages of development. Raja came up with the idea last year while studying and working part-time as a qualified sonographer doing routine ultrasounds of 20-week-old babies in the womb.

"Converting the ultrasound images to 3D required a specialised program, which we got from Singapore," she says. "But even after conversion the files needed a refined smoothing process, and that's what we're currently focusing on. We are also trialling a range of different 3D printers to create the models, and envisage that parents will be able to choose the type of material and packaging they want."

Sonotec doesn't print a model of the entire baby, just the contours of its face, hands or feet, 3D on one side and flat on the other. Raja plans to market the models worldwide after piloting them through Australia's biggest radiology network.

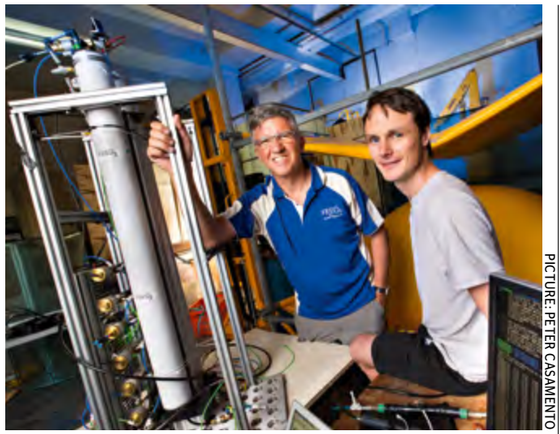
39 per cent of malformed foetuses were not detected by routine ultrasounds.

"Developing the models will also give me the capacity to start building the software needed to improve foetal abnormality detection," she says.

"We only started the company about six months ago, but while testing the 3D models we'll be able to collate the data needed for the diagnostic product. It's been a fast and exciting journey, and it definitely had its challenges along the way.

"Without the Master of Entrepreneurship, I wouldn't have been able to build the right foundations to build my startup. All this has been possible because of the support of my networks, including my lecturers and classmates from the Wade Institute."

PICTURE: CHRIS HOPKINS



PICTURE: PETER CASAMENTO

#05 DESIGN

GENERATING PURE OXYGEN

Countless children in low-income countries die each year because they have no access to medical-grade oxygen, a cruel fact that led a determined group of University of Melbourne students and academics to develop an ingenious solution.

The FREO2 group has conquered the seemingly impossible task of generating and storing pure oxygen without electrical power by using a simple device known to ancient Greeks and Egyptians – the siphon.

"The problem we're dealing with is the biggest killer of kids in the world, and that's pneumonia," says Associate Professor in Physics and FREO2 co-founder, Dr Roger Rassool (BSc(Hons) 1982, PhD 1996). "That fact surprises many people because they think it's AIDS or malaria," he says.

"If you can provide them with concentrated oxygen for 48 hours it improves their chances of recovery by 30 or 40 per cent."

"To treat a child with pneumonia you need antibiotics of course, but many will die anyway. If you can provide them with concentrated oxygen for 48 hours it improves their chances of recovery by 30 or 40 per cent."

FREO2 began in 2011 with Rassool and physics post-doctoral fellows Dr Bryn Sobott (BSc(Hons) 2004, PhD 2010), pictured above right with Dr Rassool, and Dr David Peake (BSc(Hons) 2006, PhD 2012), who partnered with Associate Professor Jim Black from the Nossal Institute for Global Health. It has grown into a larger foundation of academics and volunteers.

The team spent years looking at options like steam engines, until Sobott flipped the problem and realised mechanical power wasn't needed. The vacuum created in a siphon generates enough power to separate nitrogen from air and leave enriched oxygen. All that is needed is a small stream nearby.

#06 EDUCATION

A TESTING REVOLUTION

When three of the world's biggest high-tech companies expressed alarm in 2008 that university graduates lacked the 21st century skills needed in the digital age, it triggered a revolution now affecting higher education and schools across the globe. Cisco, Intel and Microsoft backed their concerns with support for a multi-million-dollar global project led by Melbourne academics to develop ways of identifying and then teaching and assessing those skills.

Almost a decade on, Professor Patrick Griffin (BSc 1968, MEd 1976) and Professor Esther Care (BA 1973, BEd 1976, PhD 1987, GCertUniTeach 2005) head an international team that has shown how the skills of critical thinking, problem-solving, decision-making and collaboration can be combined into a single complex set under the title Collaborative Problem Solving.

"In 2015, the PISA program run by the OECD tested collaborative problem solving among students in 53 countries – a direct result of the work we've done," Griffin says. "We're also talking to UNESCO about leading the charge towards identifying the competencies that will be required in the future but that will require massive shifts in the school curriculum."

Last year, Eltham High School teachers took part in a trial with their year 7 students (pictured below). The trial is being repeated this year at Eltham and other schools. It involves pairs of students working online with laptops to solve a problem, but each partner sees different information on the screens so they need to collaborate using online chat to share information.

The students' actions and communications are captured by the computer whose program has been designed to assess their collaborative behaviour and cognitive skills. Teachers receive instant reports that identify the students' ability to solve problems collaboratively, as well as other activities that may build their skills. These programs are being used in Australia, Costa Rica, Finland, the Netherlands, Singapore and the United States.

2005 INTELFUSE

University software engineers partnered with data analytics company Intelfuse to create an interactive computer platform that monitors power lines and vegetation using laser light technology. This allows utility companies to identify anything that might disrupt power transmission.

Museum on the edge

BY **KATE STANTON** (MJourn 2016)

Imagine a museum where you can trace your heartbeat, test your blood or learn to pick locks. Museums don't have to be stuffy collections of artefacts, says Rose Hiscock. They can be engaging, edgy – even transformative. "What I'm interested in is impact," she says. "I'm interested in changing people's lives."

That's Hiscock's dynamic vision for Science Gallery, an unusual blend of science museum, art gallery and events space coming to the University in 2020.

Hiscock (BCom 1991), a lifelong arts administrator, had been director of Sydney's impressive Powerhouse Museum for two-and-a-half years when she was tapped to spearhead the ambitious new project in Melbourne.

Science Gallery Melbourne is part of an international network that explores connections between art and science.

The first gallery opened at Trinity College Dublin in 2008. Seven more are planned for cities around the world, all embedded within educational institutions, and all tasked with attracting young people to think creatively about science and innovation.

Hiscock says she was inspired by a 2015 visit to the Dublin gallery's SECRET exhibition, where she was asked to hand over her credit card, only to find later that the museum had displayed her personal information as part of the artwork.

"It kind of taps into the zeitgeist," she says of Science Gallery. "We can be really playful and really experimental. I think about what we're going to do in our exhibitions as a laboratory, as an experiment, rather than as a really highly polished contemporary art experience."

Hiscock wants Science Gallery Melbourne to help dispel the notion that arts and science are separate and competing disciplines. True innovation, she says, comes from combining the two. "Arts and science both are endeavours in the pursuit of the unknown," she says. "They're both about exploration."

The Science Galleries are particularly aimed at those aged 15 to 25, in the hope of inspiring more students to take an interest in the skills of the future – science, technology, engineering and maths (STEM).

Hiscock is thinking big; she wants young people to be ready to solve the world's biggest challenges, from climate change to the refugee crisis. "If we're going to solve wicked problems as a society we have to use our whole brain. We have to use both the curious and creative minds."

PICTURE: CHRIS HOPKINS

SCIENCE GALLERY

Rose Hiscock at the entrance of her temporary University home, the historic Grattan Street Gatehouse. She will soon move to the new gallery, artist's impression at right.

Innovation case studies by: Geoff Maslen, Iain Gillespie and Kate Stanton (MJourn 2016)

Hiscock's first exhibition at Science Gallery Melbourne, *Blood*, will run in collaboration with Science Gallery London starting in June. Potential contributors were encouraged to submit works addressing blood as it relates to menstruation, doping, HIV testing, biological identity and other topics.

It will run as pop-up exhibitions around the city until the building that will house Science Gallery Melbourne is completed.

EXCLUSIVE 3010 OFFER FOR ALUMNI
Join Rose Hiscock for a Director's private viewing – an insight into the stories behind the *Blood* exhibition. Fifteen double passes are available for readers.
For details: **mag.alumni.unimelb.edu.au/science-gallery**

PICTURE: CHRIS HOPKINS

Students get a taste for brewing

BY **JENI PORT**

Brewer Paul Holgate is quite emphatic. The new subject he helps teach at the University, *An Introduction to Beer Styles*, does require students to swallow, not spit.

"It's the only way," he says. "The only way! This is what we do in beer judging to understand style and a beer's characteristics. To get the full hop or bitter sensation on the back of the tongue, you need to swallow the beer."

The higher the percentage of hops the more bitter the beer, but students need to keep in mind that bitterness can be off-set by the sweetness of malt, which helps determine a beer's flavour and style. Tasting the beer will tell a drinker all about that.

An Introduction to Beer Styles and *Sensory Analysis and Principles of Brewing* – two breadth subjects introduced this year by the Faculty of Veterinary and Agricultural Sciences – cover a fair bit of beer-making and drinking territory, with help from Paul and Natasha Holgate, of Holgate Brewhouse in Woodend, 70 kilometres north-west of Melbourne.

Paul is a guest lecturer in the highly popular *Beer: Theory and Craft* subjects, which teach a range of skills to would-be beer-makers. It's a chance for students to learn about a fast growing industry from real-world professionals.

For the Holgates, the subjects mark a return to their old stomping ground. The couple met in the University's chemistry library in 1987. Both were chemistry majors (BSc(Hons) 1989), who went on to work in the chemical industry before Paul decided to take his enthusiasm for home brewing and turn it into a business.

"To get the full hop or bitter sensation on the back of the tongue, you need to swallow the beer."

The couple moved to Woodend and began selling beer they made in a backyard shed. Eventually, they left their corporate careers to concentrate on their passion. The timing was perfect.

By 2002, when the Holgates bought an old hotel (circa 1896) in Woodend's main street, interest in the craft-brewing movement, which had begun in the US and Britain, was taking off in Australia.

It has been portrayed as a kind of grass-roots rebellion against the dominance of big, multinational brewers. Paul says "craft brewing", a term that has been bastardised by big breweries, requires time, attention to detail and quality ingredients.

It has proved to be a winning formula for Holgate Brewhouse, which has since expanded to a restaurant and hotel, with a showroom and beer discovery centre in the works. The Holgate brews sell in bars, pubs and outlets across Australia.

Subject coordinator Dr Charles Pagel, a lecturer in veterinary and agricultural sciences and an avid home brewer himself, says the study of craft brewing fits well with other University subjects in wine-making and viticulture.

"Breadth subjects allow students to learn about something they're interested in from outside the core disciplines of their degree," he says. "Many of the students I have talked to are interested in the recent rise of the craft-brewing movement, and are keen to learn more about brewing and even to get their hands dirty and have a go themselves."

Dr Pagel says enrolments in the subject have been high, prompting him to move classes to a bigger lecture theatre and to add more practical sessions. Students will learn the skills to brew good-quality beer, with additional lectures in biochemistry, agriculture, sustainability and marketing.

Meanwhile, Paul and Natasha's daughter, Emily, is now at the University studying a Bachelor of Arts. She has yet to say whether she will follow in her parent's beer-brewing footsteps.

"I think she would know a lot more about beer than regular kids her age," says Paul. "We'll wait and see. Let her enjoy uni first." 3010

EXCLUSIVE 3010 OFFER FOR ALUMNI
Holgate Brewery is offering an exclusive tour and tasting for 15 readers. For details:
mag.alumni.unimelb.edu.au/holgate

Matters of judgement

Judge Wendy Wilmoth (BA 1972, LLB 1973, LLM 1979) is one of Victoria's most experienced and esteemed judges, having served on the County Court since 2003. **Pinar Tat** (BA 2015) is a third-year law student at the University of Melbourne. She met Judge Wilmoth through the University mentorship program. They speak to **Kate Stanton** (MJourn 2016).

JUDGE WILMOTH

When I was a young solicitor, there were no women magistrates. But in 1986 the first women were appointed. I knew a couple of the women who were appointed and I thought, 'well, now it's a possibility.' I worked as a solicitor for five years, moved on to lecturing and, eventually, worked on the Social Security Appeals Tribunal. From there I was appointed to the Magistrates' Court and in 2003, I was appointed to the County Court.

I really enjoy my job. Even though I could have retired last year, I don't intend to for some time. I like the exercise of applying the law in different ways. The challenge of applying it to different human circumstances can be testing, but it's also professionally rewarding.

I've done ad hoc mentoring over the years and I still do that for young people, or students, who could spend a few days shadowing me. I also started working with the University's mentorship program about seven years ago and I've since had one student a year. When I heard that Pinar was my mentee last year I asked her to come and meet me at my chambers. She came into court with me on the first day and, eventually, she sat through a whole trial – I think it was about 10 days – so she was able to see the whole process from start to finish.

That's a huge advantage. When you're a law student you may not get any real sense of what a whole trial might be like. You might sit in court for a day and see a bit of cross-examination, for example. But you might not see where that fits into a whole trial. Students always tell me that watching a trial is a great experience because they can understand how it all fits together, how it works.

Pinar was very receptive to it. She realised straight away how beneficial it was to be able to do that and she committed to it. I think perhaps she was inspired by the whole process.

Sometimes I didn't have time to talk to Pinar during court proceedings, but we could sit down later and talk about what happened. I gave her all the court documents to read so she knew what was going on.

She'd ask what things meant and why they happened. In that sense, mentorship is not just the experience; it's instructive as well.

It would be most rewarding if Pinar were to become a judge one day. I think it's excellent that she can get exposure to the work of a judge through programs like these, which weren't available in the past.

I do like the opportunity that it presents to discuss different ways of being a lawyer and different ways of using a law degree.

PICTURE: STEVE McKENZIE

"Her presence is definitely felt in a courtroom. Her knowledge of the law is absolutely incredible."

PINAR

I always knew I wanted to study law. I wanted to do something where I was engaging with people directly and helping them. I think the law can be used to empower people – that's the driving force for my career.

As soon as I finished my undergraduate degree, I started law school. I'm now in the final year of my JD, which is my sixth year of university. It's been a really enriching experience so far but I'm looking forward to finishing. It's been a long six years of study and I'm eager to start my career in the law.

I completed a mentorship program in my first year and decided to do it again. By my second year, I had a much better idea of the direction I wanted my career to take.

I was very nervous and excited the first time I met Judge Wilmoth. I think that stems from the fact that law students can be quite fascinated by judges because we spend so much of our time studying their legal opinions. Judge Wilmoth was absolutely wonderful and made me feel very welcome. I felt like I could ask all of the questions that I wanted to ask about the law and what life as a judge is like.

It was a really interesting experience to talk to a judge directly about how they practise law. And I was lucky enough to be able to sit through the entirety of one of her trials, which is something I had never done before. The study of law can be quite theoretical, so seeing the law in practice was invaluable.

I think I would like to become a judge one day. Being able to see what they do – and their role in court – was absolutely fascinating. Judge Wilmoth was calm and approachable but also firm and assertive. Her presence is definitely felt in a courtroom. Her knowledge of the law is absolutely incredible. It was difficult not to be in awe of her.

When I expressed my interest in criminal law, Judge Wilmoth put me in touch with one of the partners of a criminal defence firm. I was lucky enough to be able to spend three weeks there through her recommendation and this further solidified my interest in criminal law. Although our formal mentor-mentee relationship has concluded, Judge Wilmoth is someone I have a lot of respect for and hope to continue to keep in touch with. I'm looking forward to consulting her in the future when it comes to making career decisions. 3010

ARE YOU INTERESTED IN MENTORING A STUDENT?
For further information or to register your interest visit **mentoring.unimelb.edu.au**

Looking for a break in La La Land

The synopsis: Four driven, young graduates come together in a Hollywood house to pursue their movie dreams. **Andrew Murfett** takes up their story.

They share an address, an accent and an ambition to make it big in the world epicentre of entertainment – while also ensuring the pantry is well stocked with Milo and Vegemite.

These four housemates in Los Angeles – Joe Brukner, Charles Hopkins, Brigitte Wise and Robert Chislett – have something else in common: they are University of Melbourne alumni.

Through happenstance and connections forged through University social and career networks, these ambitious twentysomethings find themselves living together in a Spanish-style, two-level abode on a leafy street in Beverly Grove, bisecting West Hollywood and Beverly Hills, in the heart of the American film industry.

Of course, there is nothing unusual about Australians relocating overseas. According to the Australian Bureau of Statistics, more than 92,000 did so last year. And sun-soaked Los Angeles has long held an allure for Australians, particularly those enticed by its film and television production studios. Yet the strike rate for success here is predictably low.

"I simply hoped someone would employ me and I wouldn't be homeless," says Wise (BA 2011, JD 2014), who worked as an associate producer on Robert De Niro's recent release, *The Comedian*. "I didn't know what to expect."

Wise and her alumni housemates have been able to carve out their own slice of home in LA and make headway in the entertainment industry. They share the spacious house with Tilly, a chocolate Labrador mix. It's where they can commiserate with each other on bad days, or toast their successes on good ones. It's a sanctuary in which to speak one's mind, collaborate, solicit ideas, trade gossip and unwind.

PICTURE: DAN TUFFS

Wise's time there is dictated by her work. She can often be found shooting a film on location. So far, she has travelled to Canada, Morocco and Manhattan, as well as film markets and festivals. When a film is in post-production, she may be holed up for days in an editing suite, or in a recording studio working on audio replacement with actors.

"Often I'm engaged in all of those stages at once on multiple projects," she says. "Being out on set is generally my favourite time as we get to meet a multitude of talented people, from actors to costume designers to sound mixers and the countless army it takes to make a movie."

She learns from them by osmosis, she says, simply by being around them and observing their work.

"I like having people at home whose opinions I trust and who I can bounce ideas off," she says. "We have intellectual discussions – and sometimes respectful arguments – about industry issues, and the guys are informed and working in the thick of it, so it's an invaluable resource for each other. It helps keep me motivated."

Charles Hopkins (BA(Media&Comm) 2010, JD 2013) moved to LA to pursue screenwriting and was the first to snare a spot in Beverly Grove, in mid-2014. "People here think it's hilarious that we've rustled up four Melburnians to fill out a share house," he says.

His screenwriting ambitions are on hold as he works as a junior executive at Shoreline Entertainment, a film sales, production and management company.

"I review script submissions, collaborate with clients and producers on projects in development and negotiate deals," he says. "It's really a practical education in independent film production. I chose to stay here for my professional aspirations and I've learned to love the city, the lifestyle and the people."

Joe Brukner (BA 2012) is a prolific writer and producer, having written and produced music videos for pop artists such as The Fratellis and Jack Ü. He played key roles in supporting the production of blockbuster films such as Sony's *Ghostbusters* (2016) reboot.

"Charles keeps us all on track," says Brukner. "He makes sure the house is running, unstacks the dishwasher a lot. We all work long hours or travel but it always feels like coming home. It's interesting hearing how other parts of the industry work. It's especially helpful if our roles ever overlap or we need guidance: an accomplished producer is literally down the hall."

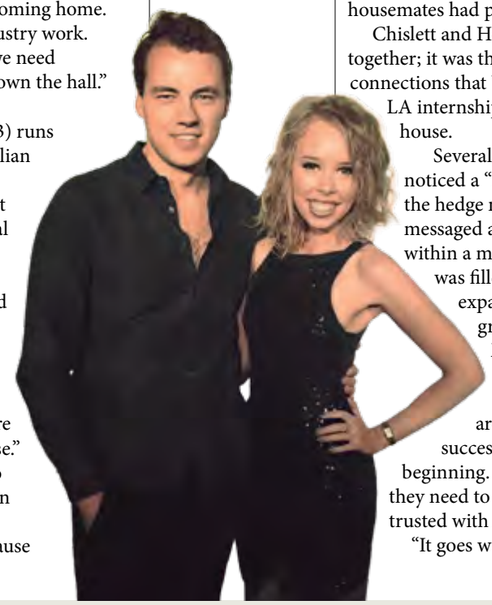
Robert Chislett (BA 2010, JD 2013) runs several restaurants for an Australian restaurateur, including the well-known West Hollywood hangout Goldies, while developing several comedies, including one with Hopkins.

"Charles and I lived together in Melbourne and Joe and myself were neighbours in New York, so I love coming home and feeling like I'm with family," Chislett says. "My friends think it's weird we only have Australians living there, but that's just the way it's evolved. This is a space where we're all comfortable being ourselves, for better or worse."

The diversity of their work has ensured that no one in the house has been in the awkward position of angling for the same jobs.

"I don't think there's jealousy in the house because our aspirations don't overlap in a significant way," Hopkins says. "We're not cannibalising each other's opportunities. Especially as the business is so big here."

"People here think it's hilarious that we've rustled up four Melburnians to fill out a share house."



Housemates: (left) Joe Brukner, Charles Hopkins and Robert Chislett on the Hollywood Walk of Fame. Below: Charles Hopkins with Brigitte Wise at a film festival launch.

Wise is similarly pragmatic.

"We don't really seem to get jealous of what the others are doing," she says. "If there is any jealousy or competitiveness, I've somehow remained fairly oblivious to it. I like to see them succeed because I love and care about them." Although Brukner was the last to arrive at Beverly Grove, the 27-year-old was in fact the first to move to the United States, leaving Melbourne in 2012.

"You have to start by saying, 'I'm starting everything from scratch and am willing to take a full zero on this'," he says. "We all gave up a lot to get here, but we have also seen what one another has done and that makes us feel more secure."

A screenwriter by trade, Brukner went on to complete a Masters of Fine Arts at New York University after he left Melbourne. After NYU, he landed an internship on the long-running TV series, *Blue Bloods*. "There is a culture of apprenticeship in the writing world here," he says. "Working in that writing room for two months, I shadowed one episode from inception to final edit, an amazing opportunity."

Brukner had known Hopkins in Melbourne for many years: they attended kindergarten together. Their paths first crossed again via the Melbourne University Law Revue, a seminal incubator of talent, in which all four of the LA housemates had participated.

Chislett and Hopkins write comedy together; it was through the latter's connections that Wise landed her first LA internship – and her place in the house.

Several months ago, Brukner noticed a "For Rent" sign fixed to the hedge next door. He quickly messaged a friend from Melbourne; within a month the house was filled with Melbourne expats. "We're now slowly growing a compound of Melburnians in Beverly Grove," he says.

The housemates are optimistic their success thus far is merely the beginning. Still, there is one thing they need to work on. "We can't be trusted with Milo," Hopkins says. "It goes way too quick."

3010

Research harnesses power of the crowd

FIVE QUESTIONS FOR NEURO-ENGINEERING EXPERT LEVIN KUHLMANN

BY GARRY BARKER

When Dr Levin Kuhlmann (BSc(Hons) 2000) set about probing the mysteries of how and why epileptic seizures occur, he took a novel approach to advancing the cause.

He organised an international crowdsourcing project. He and his Melbourne colleagues sought engineering talent rather than investors' money with the goal of writing computer algorithms capable of predicting epileptic seizures based on the electrical signals and activity recorded from patients' brains.

The project, with prize money of $US20,000, was sponsored by the University of Melbourne, the US National Institutes of Health, the American Epilepsy Society and MathWorks. It attracted 10,082 entries.

Melbourne is a world leader in the fight against the cruel and unpredictable disease of epilepsy. Much of that research owes its origins to the Bionics Institute and research there into the retrieval and interpretation of brain signals and the development of the cochlear implant – the bionic ear.

Members of that same team, centred on the University of Melbourne and the Royal Melbourne Hospital, went on to invent the bionic spine and then took up the challenge of epilepsy in collaboration with the University of Melbourne and St Vincent's Hospital, Melbourne.

Dr Kuhlmann is Research Fellow at the University's Neuro-Engineering Laboratory in the Department of Electrical and Electronic Engineering.

1 What was the goal of the competition?

For the competition we worked with data recorded at the University of Melbourne between 2010 and 2013 during a clinical trial of a brain implant device. We are trying to understand how seizures emerge in the brain while trying to develop algorithms that can predict seizures from changes in brain activity signals. That's assuming we can find a pattern or marker that is a reasonably reliable predictor of seizure. As we understand more about how seizures are generated we hope to improve the prediction of them and make the randomness more deterministic; more definable mathematically. The hope is to make seizures less like earthquakes, which can strike without warning, and more like hurricanes, where you have enough advance warning to seek safety. Basically, that's the goal.

2 But that's only part of the problem, isn't it?

Yes. Epilepsy is highly different among individuals, very patient-specific. The types of epilepsy that people have can vary between groups and even within groups. Collection of data from patients, either by external sensors on the patient's scalp, or by placing electrodes directly on the brain or deeply into it, has been done for some time, but accurate prediction of a seizure remains elusive.

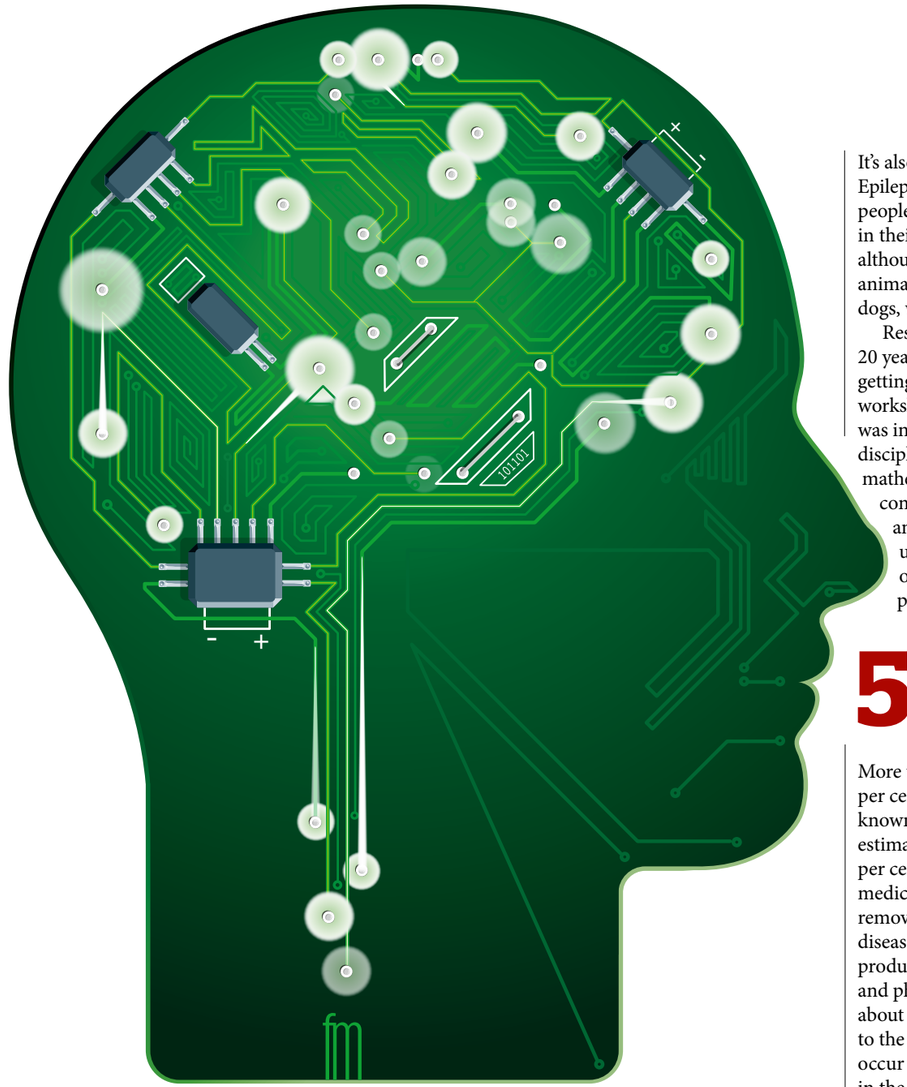
Seizures seem to be random and come without warning, although a very few patients experience warning signs, called prodromes, of an imminent seizure. We think that to achieve successful prediction the algorithms will have to be trained for individual patients through machine-learning techniques, as has been done for years with speech-to-text, image recognition and other computer-based functions. Deep learning with neural networks is now a hot topic among researchers working on seizure prediction.

You need to collect data for a few months and then, with the patient, train the algorithm on that period of time. Once it is trained you let it run to see if it can predict seizures after that period.

3 What happens now?

The three prize-winning teams will publish their algorithms online on Kaggle (See *Beyond the Big Idea* – page 17) for free access by anyone. Next, a post-contest assessment of the top 10 teams' algorithms will be held, using data from at least 100 pre-seizure periods per patient. That's important because it assesses the ability of the algorithms to work on large amounts of data they have not "seen" before. It helps us to ask, if we use the algorithms and train them on a patient for six months, will they continue to work years ahead?

If the post-contest assessment shows we can predict seizures on large amounts of "unseen" data for patients whose seizures have previously been difficult to predict, it will likely lead to new, larger long-term clinical trials of the algorithms and hopefully devices that can reliably give warnings of impending seizures or activate a brain implant that can control or avert seizures using electrical stimulation or drug delivery.



4 How did you come to be involved in the competition and how far has research gone in finding an answer?

I am interested in how the brain works and finding a way to predict epileptic seizures is one of my areas of research. About 10 years ago, I worked at the Bionic Institute when researchers were beginning to think of branching out into other areas of medical bionics. In the meantime I went to Boston to do my PhD in computational modelling of vision and when I came back to the Institute the epilepsy project was under way.

Epilepsy is interesting because you get to study the whole brain dynamics and how the brain can change over time. It's also a good way to study humans. Epilepsy is such a severe condition that people are willing to let you put electrodes in their brains to study the condition, although researchers also work with animals. Research has been done using dogs, which are vulnerable to epilepsy.

Research has been going on for about 20 years but around the late '90s it started getting serious with a lot of international workshops held. The seventh of these was in Melbourne in 2015, a huge inter-disciplinary effort with people from mathematics, physics, engineering, computer science, medicine, neurology and biology all aimed at trying to understand how and why seizures occur and to understand the neuro-physiology underlying it all.

5 How common is epilepsy?

More than 50 million people – about one per cent of the world's population – are known to suffer from epilepsy, but some estimates put the figure as high as three per cent. Treatments currently range from medication to intracranial operations to remove parts of the brain affected by the disease. In both cases, side effects can produce problems such as loss of memory and physical and cognitive abilities. Also, about 30 per cent of patients are resistant to the current range of drugs. Seizures occur with abnormal, storm-like activity in the brain but vary widely.

Causes range from brain injuries in accidents and in wars to brain tumours and autism. Rwanda, for example, has one of the world's highest rates of epilepsy, particularly among the thousands of child casualties of the war there. Brain damage to infants before or during birth can be a cause, also, in older children and adults, strokes, and infectious diseases such as AIDS, meningitis and viral encephalitis. It can even be genetic.

Dr Kuhlmann acknowledges the expertise contributed to the project by Professor David Grayden (BE(Hons) 1990, BSc 1991, PhD 1999), deputy head of Electrical and Electronic Engineering and leader of the Bionics Laboratory at the Centre for Neural Engineering at the University, and by Professor Mark Cook (MB BS 1983), director of Neurology at St Vincent's Hospital, Melbourne, an expert in epilepsy.

A DELIGHT IN THE MUSEUM ANGELITA TEO

MArtCur 2012

DIRECTOR OF THE NATIONAL MUSEUM OF SINGAPORE

Angelita Teo has a vivid memory of racing through the Louvre as a child, eager to see Leonardo da Vinci's *Mona Lisa* first-hand.

"I was quite disappointed, to be honest," she says with a laugh. "It was really, really crowded, I was young and had to tiptoe to see over all the heads, and then I realised how tiny it was."

Undeterred by that disappointment, Teo went on to study anthropology at the University of British Columbia in Vancouver, and in her early 20s worked as an assistant curator in Singapore's Asian Civilisations Museum before dabbling in the IT industry.

She found herself drawn back to museums, however, when an ex-colleague asked her to work at the National Museum of Singapore. In 2010, she was awarded a scholarship by Singapore's Ministry of Culture, and decided to complete a Masters in Art Curatorship in Melbourne, citing the city's culture and networking opportunities.

"During my two years in Melbourne I got to meet really important people in the industry, and I continue some of those wonderful relationships today."

In 2013, 11 years after first being hired by the National Museum, Teo was appointed its director. "I never expected to be the director of a national museum," she says. "I've been doing this for slightly more than three years now and it's been extremely invigorating."

Over a period of 18 months in 2014-15, Teo oversaw a complete revamp of the museum's galleries. In her first year as director, more than a million people visited the museum, a record for any museum in the country.

"During my two years in Melbourne I got to meet really important people in the industry, and I continue some of those relationships today."

Teo credits her success in part to timing – she was appointed director shortly before Singapore celebrated the 50th anniversary of its independence, an occasion that resulted in extra funding for the museum – and partly to her experience as festival director for the National Heritage Board.

"When I came back to the museum I brought those portfolios with me, and because of that we had a lot of opportunities to create exciting events that were either held at the museum or within the museum grounds," she explains.

Singaporeans don't traditionally go to museums, but that's changing. By installing activity corners and workshops in the museum, Teo has encouraged the young to develop a passion for history and culture.

"The number of children coming to the museum has increased quite dramatically, and I'm hoping that we'll be able to have a new children's wing at some point," she says.

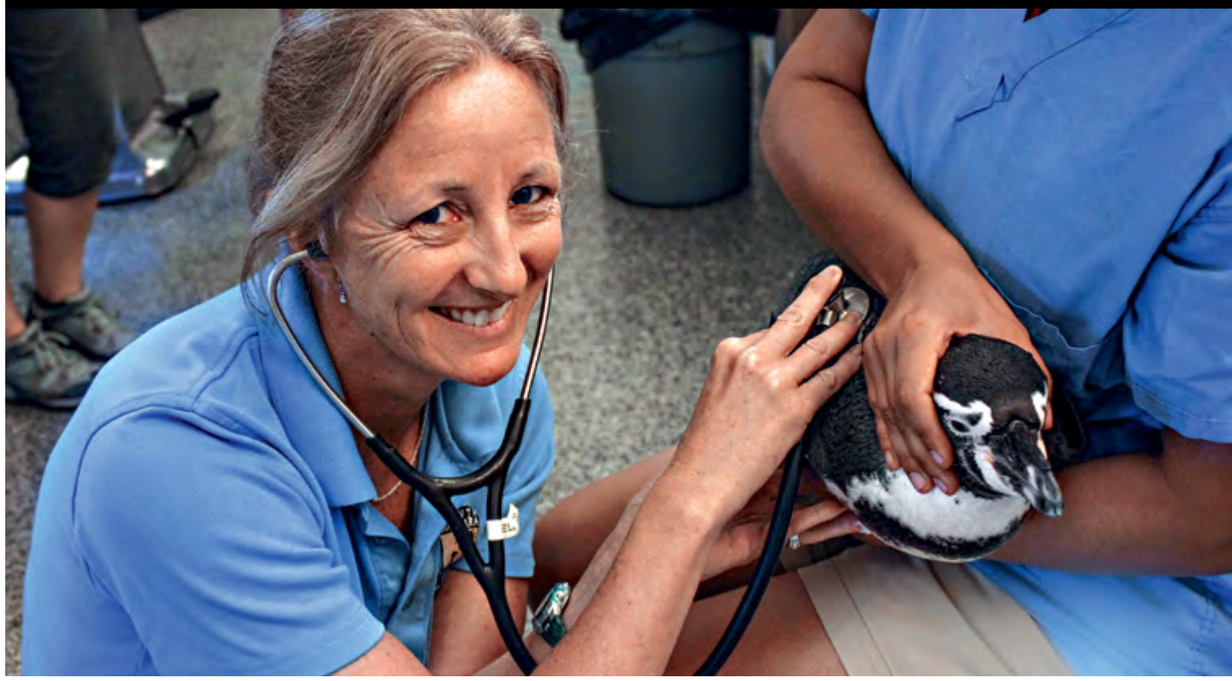
"I've always felt very strongly that the first experience for kids coming to museums should be with family."

PICTURE: © SINGAPORE PRESS HOLDINGS LIMITED

CALL OF THE WILD JULIE BARNES

BVSc(Hons) 1989

DIRECTOR OF ANIMAL CARE AND HEALTH AT SANTA BARBARA ZOO



PICTURE: SANTA BARBARA ZOO

Dr Julie Barnes always liked working with Australian animals, but these days, as the Director of Animal Care and Health at California's Santa Barbara Zoo, she's concentrating on conserving endangered North American species.

"Our zoo, along with many other partners, has made a significant contribution to the recovery of the endangered California condor. The pay-off is really starting to happen with that now – there are over 400 condors back in the wild," she explains.

The zoo also contributes to recovery programs for the Channel Island fox, which lives only on six of the eight Channel Islands off southern California, and the California red-legged frog. It has been asked to partner on other recovery programs for endangered species, such as the unarmored threespine stickleback, a small fish native to a watershed 100 kilometres from Santa Barbara.

"I think the capacity of zoos to educate people about the importance of conservation is really where they can have the most impact."

A lifelong lover of animals, Barnes' journey to a career with them began late in secondary school, when she decided to study veterinary medicine. It wasn't until university that she discovered her deeper interest lay in wildlife care – an area in which it is notoriously difficult to find veterinary jobs.

"When you go through vet school you're constantly told that there are not many openings in zoo and wildlife medicine, so you know it's going to be challenging," she says.

After 12 months at a private mixed practice in Shepparton, Barnes travelled to England to locum for a year and ended up staying for seven, achieving her Master's degree in wild animal health at London Zoo. From there, she has worked at Taronga Zoo in Sydney, at Ocean Park in Hong Kong, and spent time on scientific research vessels in Antarctica, performing anaesthesia on seals.

That career highlight wound up being a personal one, too. While on the remote continent, Barnes met her American husband, who was scuba diving on a krill research project. Their marriage set her life in a new direction, to a career in the United States.

She started working at Los Angeles Zoo and is now six years into her position at Santa Barbara Zoo, which recently expanded to include animal care in addition to animal health. Barnes' experience has led her to believe that zoos can play a crucial role in conservation.

"Zoos can provide valuable expertise and support to recovery programs for threatened and endangered species around the world, but I think the capacity of zoos to educate people about the importance of conservation is really where they can have the most impact."

THE POWER OF SPEECH
NATHANIEL SWAIN

BA 2010, MSpeechPath 2012, GCALL 2016

WINNER OF THE UNIVERSITY OF MELBOURNE'S THREE MINUTE THESIS IN 2016

Nathaniel Swain credits studying Japanese with kick-starting his passion for speech and language.

"I soon discovered it wasn't actually Japanese that I was interested in; it was the phenomenon of language and communication altogether," he says.

Quickly changing his major to Linguistics, Swain thought about how to apply his passion to a profession, and came across speech pathology towards the end of his degree. After graduating, he immediately enrolled in the Master of Speech Pathology.

"As soon as I went into it I really loved it, and could see enormous benefits of having experts in communication and language address these sorts of problems," he says.

The problems Swain refers to are developmental language disorders, hidden disabilities that impair an individual's ability to comprehend language or to express themselves through speech. This affects 10 to 15 per cent of the population.

In 2014, after working as a speech pathologist for a year, Swain became a PhD candidate and a National Health and Medical Research Council (NHMRC) postgraduate scholar. His thesis centres on language disorders in young offenders, whose disabilities can contribute to their disengagement from society, and also prevent them benefiting from rehabilitation interventions such as counselling and cognitive behavioural therapy.

"There are only a handful of speech pathologists working in youth justice at the moment," Swain explains.

"My research was looking at a way that a speech pathologist could go in and directly try to make a difference in the communication skills of some of the boys that were in there."

"I could see enormous benefits of having experts in communication and language address these sorts of problems."

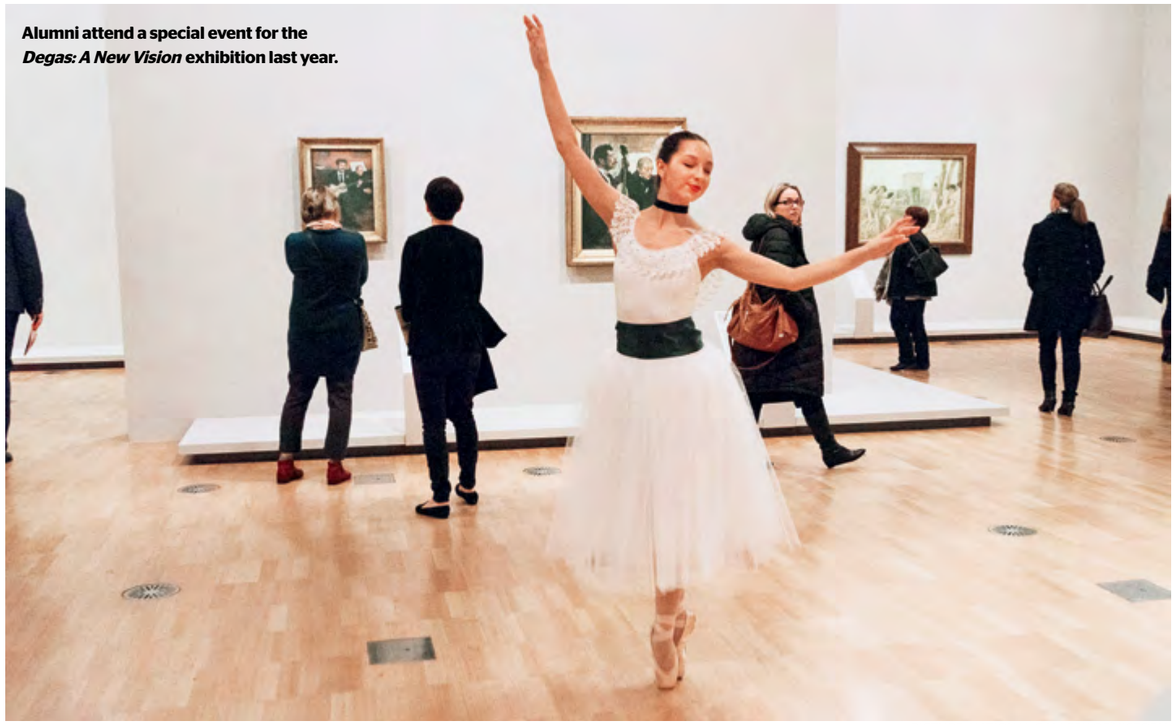
Ultimately, Swain's results showed he could make a meaningful difference in some young offenders' communication skills. The boys, and their teachers, responded positively. Swain hopes policy-makers and youth justice professionals take notice.

Last September, Swain stepped up his efforts to share his findings by entering the University's Three Minute Thesis (3MT) competition. He won, and subsequently flew to Brisbane for the Asia-Pacific contest, where he placed runner-up.

"3MT tends to work well for projects where researchers demonstrate how it will affect the public, like medical researchers saving lives, or engineers producing efficient solar cells," Swain explains. "I felt very proud to win. I saw it as a sign that my research resonated with people and that its impact was understood."

PROFILES BY ERIN MUNRO (BA 2006)

PICTURE: CHRIS HOPKINS



Alumni attend a special event for the *Degas: A New Vision* exhibition last year.

PICTURE: NATIONAL GALLERY OF VICTORIA

Bringing Melbourne's cultural life closer

The University's cultural partnerships bring the world of arts and learning closer to our alumni community through a range of exclusive offers and exhibitions.

It has long been so. Many of Melbourne's cultural institutions trace their origins to the University.

The National Gallery Art School, now the Victorian College of the Arts, was founded at Australia's first public art museum, the National Gallery of Victoria.

The National Museum – as Museums Victoria was once known – used to be housed on the Parkville campus.

The University itself is home to a diverse and vast array of cultural collections – from veterinary anatomy to rare manuscripts.

Partnerships with the National Gallery of Victoria and the Melbourne Recital Centre present a wonderful extension of that rich resource.

Here's how you can benefit:

National Gallery of Victoria

The oldest and most visited gallery in Australia has more than 70,000 works in its collection, which spans thousands of years and a wealth of ideas, disciplines and styles.

Since 2014 the Learning Partnership between the University and the Gallery has given alumni access to exhibitions such as *Degas: A New Vision* (2016).

This year's Melbourne Winter Masterpieces exhibition is *Van Gogh and the Seasons*.

To complement these exhibitions, experts from the Faculty of Arts and NGV curators have presented The Faculty of Arts Melbourne Masterclass series, allowing alumni and students the chance to enter the intricate world behind the art.

Alumni offer: Discounted one-year membership of the NGV at the concession price of $73. alumni.unimelb.edu.au/special-offers

Melbourne Recital Centre

Combining architectural innovation and acoustic perfection, the Melbourne Recital Centre houses two of the finest performance spaces in the southern hemisphere. Each year the Centre presents more then 450 concerts and events across a variety of musical genres, from classical and jazz, to popular and cabaret.

Last year the Centre forged a Learning Partnership with the University of Melbourne. This partnership will enhance the University's research into the impact of the arts, opening up a world of opportunities for our young musicians through commissions, masterclasses, internships, interaction with visiting artists, and shadowing and mentoring opportunities.

Alumni offer: Two-year membership of the Melbourne Recital Centre for the price of one ($50). alumni.unimelb.edu.au/special-offers

AUSTRALIA DAY HONOURS

Five alumni received the nation's highest civilian award – the Companion of the Order of Australia (AC) – in the 2017 Australia Day Honours. Honoured were former prime minister **Julia Gillard** (LLB 1986, BA 1989), current Governor of Victoria **Linda Dessau** (LLB(Hons) 1973), pictured, former federal minister **Dr David Kemp** (BA(Hons) 1965, LLB 1966), chemist **Emeritus Professor Andrew Holmes** (BSc 1965, MSc 1967) and ophthalmologist **Professor Keryn Williams** (BSc(Hons) 1970, PhD 1975). In all, more than 75 Melbourne alumni and staff received awards in the first of two honours lists released in 2017.

More details: alumni.unimelb.edu.au/honours

APPOINTMENTS

Eminent constitutional lawyer **Dr Stephen Donaghue QC** (BA 1995, LLB(Hons) 1995) has been appointed Australia's 12th Solicitor-General. His appointment is for a tenure of five years. Prior to joining the bar, Dr Donaghue served as an associate to High Court judge Kenneth Hayne AC QC for a year.

Ross Williamson (BSc(Hons) 1983) took over as director of Healesville Sanctuary in January 2017. He was previously Zoos Victoria's General Manager of Threatened Species. The appointment caps a 30-year career in wildlife conservation.

Jewish Community Council of Victoria president **Jennifer Huppert** (MUP 1993) was appointed to the board of the Victorian Equal Opportunity and Human Rights Commission in 2016. She was previously a Member of the Legislative Council (2009-10) and director of the Emergency Services and State Superannuation Board (2006-09).

Richard Larkins (MB BS 1966, MD 1972, LLD 2004) replaced Professor Adrienne Clarke as Chancellor of La Trobe University in February 2017. It is the latest in a long series of senior university appointments for Professor Larkins, who was previously the Dean of the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne and Vice-Chancellor of Monash University (2003-09).

Luci Ellis (BCom(Hons) 1990) became the first woman appointed Assistant Governor (Economic) at the Reserve Bank of Australia. Her November 2016 appointment is a good omen – she holds a position previously held by the last three Reserve Bank Governors. Ellis (right), a housing expert, has been with the RBA since 2008. She regularly represents Australia's central bank at parliamentary inquiries.

The University of New South Wales appointed **Professor Emma Johnston** (BSc(Hons) 1997, PhD 2001) Dean of Science in November 2016. Johnston, previously the University's Pro Vice-Chancellor made headlines earlier in 2016 after she discovered a species of flatworm that had both male and female reproductive properties.

Jay Savage (BA(Media&Comm) 2005) has been appointed Australia editor for BBC.com. Previously a journalist with the *Herald Sun*, Savage is responsible for shaping editorial direction on the BBC's dedicated Australian news service.

Jennifer Gidley (BA 1972) will step down this year as President of World Futures Studies Federation, a UNESCO and UN-ECOSOC partner organisation, charged with bringing together academics, researchers, practitioners and students to examine innovation and ideas that will help resolve future problems.

AWARDS

Bede Jones (BA(Hons) 2015) became the first Indigenous Tasmanian and second Indigenous Australian to be awarded a Rhodes Scholarship. Jones received the 2017 Tasmanian award, while fellow Melbourne graduate **Rebecca Duke** (BA(Hons) 2016, DipL 2016) received the Victorian award. The scholarship covers postgraduate study costs at Oxford University.

Jenny McGregor (BA(Hons) 1974, GDipEd 1981) was selected as a BOSS True Leader 2016 by *The Australian Financial Review*. The Asialink founder was honoured for her institution's role in furthering Asian-Australian relations over the past 25 years. Other University representatives in the BOSS True Leader awards were former federal minister Andrew Robb AO (DipAgrSc 1971), Professor Ian Frazer AC (MD 1988), Professor Brendan Crabb AC (BSc(Hons) 1988, PhD 1992), Professor Douglas Hilton AO (BSc(Hons) 1986, PhD 1990) and Vice-Chancellor Professor Glyn Davis AC.

A modern take on *Romeo and Juliet* resulted in **Randa Abdel-Fattah** (BA 2001, LLB(Hons) 2001) receiving the Victorian Premier's Literary Award for Young Adult Fiction. *When Michael Met Mina* is the story of the son of anti-immigration campaigners who falls in love with an Afghan refugee. Abdel-Fattah is a former litigation lawyer who ran for Federal Parliament in 1998, aged 19.

Tony Birch (BA(Hons) 1991, MA(CrWrtg) 2000, PhD 2003) took out the 2016 Victorian Premier's Literary Award for Indigenous writing for his novel, *Ghost River*, a coming-of-age story set in Fitzroy in the summer of 1968.

Dr Eva de Jong-Duldig (GDipPhysical Ed 1957, BA 1971) won the Historical Interpretation Award as part of the 2016 Victorian Community History Awards. Dr de Jong-Duldig created with **Dr David Smith** (BSc 1971, PhD 1976) a documentary about her father titled *Duldig Studio Documentaries: Volume 1*. Her father, Karl Duldig, was a renowned Jewish sculptor who fled to Australia following the annexation of Austria by Nazi Germany in 1938.

Urban planner **Professor Alan March** (PhD 2004) received the Planner of the Year Award at the 2016 Planning Institute of Australia – Victoria Awards. Dr March worked with many industry partners to better recognise bushfire vulnerability, disaster risks and resilience in regional Victoria.

ARTS, BOOKS & ENTERTAINMENT

The maiden feature film by Melbourne writer-director **Ruth Borgobello** (BCom(Hons) 1999, GDipFTV 2002), *The Space Between*, opened the 2016 Lavazza Italian Film Festival. Borgobello's semi-autobiographical movie traced the opening days of her relationship with her future husband. It is the first film to be officially co-produced under an Australian-Italian cultural treaty signed in 1996.

For the first time, an all-Australian cast performed on New York City's famed Broadway in January 2017. Cate Blanchett and **Christopher Ryan** (BMusPerf 2001, BDramArt 2005) starred in Andrew Upton's adaptation of Anton Chekhov's *Platonov*, which was produced under the stage name of *The Present*.

A novel by **Cher Chidzey** (MSc 1985, GDipEd 1987), *Ken's Quest*, published in November 2016, tells the story of a Chinese migrant's turbulent journey to Australia.

In a research breakthrough, music therapist **Professor Felicity Baker** (BMus(Hons) 1992, MMus(MusThrpy) 1999) was able to demonstrate that dementia sufferers can still be capable of learning. Professor Baker, whose University-led pilot program centred on the role of song writing, helped patients at the Caladenia Dementia Care Centre in Mooroolbark write, record and remember lyrics from new compositions.

It's been a startling rise for novelist **Anna Snoekstra** (BA 2009), whose debut novel *Only Daughter* is being turned into a Hollywood screenplay by Universal Pictures/ Working Title. The psychological thriller centres on an imposter who claims to be a missing teenager. The film adaptation will be called *The New Winter*.

VCA graduate **Hannah Fredericksen** (BMusThtr 2012) played 1950s teen idol Sandra Dee in *Dream Lover – The Bobby Darin Musical*, which premiered at Sydney's Lyric Theatre in 2016. Fredericksen (pictured right with David Campbell) had previously played singer Olivia Newton-John in Channel 7's miniseries *Molly*.

Famed fashion designer Alexander McQueen found a kindred spirit in **Sarah Harmarnee** (BFineArt 1992), who worked with the iconic British designer for several years until 2001. Harmarnee's designs are now featured in *Alexander McQueen: Unseen* (Yale University Press). The book's release coincides with Harmarnee's shift to photography, with her portfolio focusing on horses, specifically in the Tuscan countryside.

In a surprising career shift, physicist **Justin Matthys** (BSc 2008, MSc 2010, PGDipTeach 2012) went from helping to discover the fabled Higgs boson particle to founding a teaching model tipped to revolutionise maths in schools. Maths Pathways is the venture Matthys founded with Teach for Australia recruit Richard Wilson. It is an online maths problem-solving program used in more than 110 schools across Australia.

Former AFL premiership player **Peter Bell** (LLB 2002) embraced a career change in October 2016, when he began as a breakfast radio presenter on ABC Perth. Bell previously worked as a lawyer.

Sister Joan Healy (GDipArts 1972, BA(Hons) 1974) tells the story of six families who fled the aftermath of the Cambodian killing fields in *Writing for Raksmey*. They were held in a crowded refugee camp at the border of their country and then sent back to a nation still at war.

Patrick Brammall (BDramArt 2001) has become one of Australia's most sought-after actors. Recent credits include *No Activity*, *Offspring* and *Upper Middle Bogan*. The latter won Best Television Comedy at the 2017 Australia Film Institute Awards. Brammall has also appeared in the US spin-off of *Upper Middle Bogan*, titled *Furst Born*.

Dena Kahan (BA(Hons) 1982, BFineArt 1992), a former art conservation expert at the Centre for Cultural Materials Conservation, worked on a series of paintings based on the botanical models in the University of Melbourne Herbarium. Her exhibition took place in March 2017.

Cynthia Lee (BCom 2009, BIS 2009) was selected as the Young ICT Professional of the Year (Female under 30) at the Australian Computer Society's Digital Disruptors Awards 2016. Financial services and accountancy firm Deloitte gave Lee her breakthrough in 2010, when she was invited to join the graduate program.

Nadia Tass (GDipTeach(Sec) 1975, BEd(Sec) 1980) directed an adaptation of Anton Chekhov's *Uncle Vanya* at St Kilda's Red Stitch Theatre in 2016. Tass is best renowned for her work in Australian cinema, with directing credits including *Malcolm* (1986) and *The Big Steal* (1990).

Garden designer **Michael McCoy** (BSc 1984) has worked for many high-profile clients. Now the Woodend-based botanist has made his mark on TV, hosting an eight-program series on the ABC. *Dream Gardens*, which went to air in February, looked at striking garden designs across Australia.

A TASTE FOR SPORTING GOLD

Dylan Alcott (BCom 2016) won two gold medals in tennis at the Rio Paralympic Games, then followed up by winning his third successive quad wheelchair Australian Open tennis title. Alcott previously represented Australia in wheelchair basketball – a sport in which he also won Paralympic Gold.

Mamma Mia, here we go again – the music that refuses to die

Michael Ingvarson (BEd(Sec) 1993) has played the role of Benny in an ABBA tribute band, BABBA, for the past 22 years. He recalls how his musical journey began.

BABBA's long musical journey began with a crush. It really was that simple. Singer Kathy Mikkelsen had the hots for the owner of the Royal Derby Hotel and thought he might be impressed if he heard her sing with her friend, Gabriella Favretto, in his hotel's 'Battle of the Bands'.

The hotel manager then thought it would be a good idea to try an ABBA-style band at the Fitzroy pub on a Thursday night. Always up for a challenge, the girls sang *Fernando* in harmony for him, and so began the story of BABBA.

This was in the early '90s and though the legendary ABBA had not performed since 1982, their music refused to die. Who could ever really forget classics like *Waterloo*, *Dancing Queen*, *Mamma Mia* and *One of Us*?

I had met Kathy while we were both studying music at Melbourne University, but was still a bit surprised when she invited me to play Benny. I went to the pub for an audition and had my own crush experience when I met the gorgeous Gabriella, who played Frida.

BABBA today (from left): James Macdonald, Susannah Gidley (BA 2013, BMus 2013), Jacqueline Hamilton and Michael Ingvarson.

James Macdonald, who had also been performing in the Battle of the Bands, was recruited as Bjorn. Our robust rhythm section was filled with Kim May and Paul Edsall (BMusPerf 1993).

We had our first gig on December 2, 1994, when we played for an audience of 450. We were terrified and thrilled at the same time. Within a couple of years, we were performing 180 shows a year. Now, 22 years on, we have crossed the 3000-gig mark.

I loved music but never really imagined making a career out of it. I had studied Music and Drama at the University of Melbourne and in 1994, I began teaching the subjects at a western suburbs school.

It was my first teaching job and, to put it mildly, it wasn't exactly a resounding success. After one semester, I began to look for other ways to make a living from music. BABBA was the passport to my new life.

"People often ask if we ever tire of playing the same music. We don't, and the reason is that these are well-crafted songs with lovely melodies . . ."

The group members have changed over the years, but we have now played together for twice as long as ABBA. There are many highlights, such as performing to 45,000 at Etihad Stadium for the closing of the Masters Games, touring Asia on seven occasions, and playing at the Melbourne Zoo Twilight concerts.

These days we play on cruise ships several times a year, and we are now preparing for a massive gig with the Canberra Symphony Orchestra, performing our whole show with them in front of 20,000 people. Indeed, we've also loved our University of Melbourne courtyard gigs. Always such an appreciative audience!

People often ask if we ever tire of playing the same music. We don't, and the reason is that these are well-crafted songs with lovely melodies and song structures. They're hugely satisfying to play.

The arrangements, vocally and instrumentally, are complicated and unique – so we are always musically refining our performances. The audiences, too, play their part. It's fun and joyful to watch the faces of people as the music flicks a switch and triggers happy memories.

My other great passion in life has been composing, recording and producing music. I found the joy in music as a boy of 14 when I began improvising on the piano. Soon I was doing MIDI sequencing with early Macs and samplers, composing music for a film and producing and co-writing music for singers and songwriters. My University course gave me the basics for all that followed it.

Since 2003, I have owned a professional music production studio in Canterbury called Big Hand Productions. Music is very much a family affair. Gabriella and I have been together since pretty soon after my BABBA audition. We now have three children, all involved in music.

Music has been good to us because, as ABBA sang long before we did, 'Without a song and a dance what are we?' 3010

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