SYDNEY ALUMNI MAGAZINE

2019 EDITION

SAM HERITAGE

THE UNIVERSITY OF SYDNEY

AN ANCIENT BOOK OF MYSTERY

ADVANCES IN YOUTH MENTAL HEALTH

PILOTS OF WORLD WAR II

SCIENCE FICTION CAMPUS FEATURE

Bringing galaxies closer

Top left:
Princess Anne visits the Women's Union, Manning House, 1971 (Archives G3_224_0485_2)

Top right:
Living Statues, physical education display, Sydney Teachers' College, 1958 (Archives G3_224_2194_5)

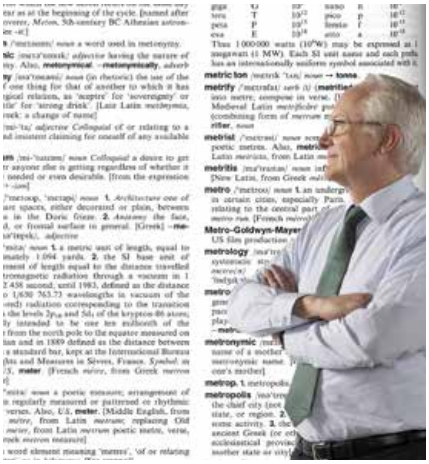
Middle left:
Victorious inter-varsity fencing team, 1985 (Archives G77_2_0292)

Middle right:
SUPRA printery in the Manning basement, 1979 (Archives G77_1_0667)

Bottom left:
University switchboard operators, 1975 (Archives G77_1_2380)

Bottom right:
A warm welcome, Orientation Week, 1981 (Archives G77_1_2210)

CONTENTS



The word on the Word of the Year 5

The sense of touch goes digital 20

Have dalek, will travel 22

TELL US WHAT YOU THINK

SAM Heritage celebrates alumni speaking their minds. We would love to hear your feedback about this publication and your ideas for future editions via sam@sydney.edu.au

Published by:
Alumni and Development
Level 2, Administration Building (F23)
The University of Sydney NSW 2006
+61 2 9036 9222
sam@sydney.edu.au

ISSN: 2205-4669

Managing editor: Vanessa Marks
Publishing editor: George Dodd
Produced by Marketing and Communications
The University of Sydney
Printing managed by Publish Partner
Design by Martine Jones

19/7979

Cover: Astronomer, Professor Julia Bryant
Photo: Stefanie Zingsheim

Thanks to Pan Macmillan for permission to use Macquarie Dictionary pages.

All uncredited photos in SAM Heritage supplied by participants.

CHANCELLOR'S MESSAGE

It may take years of hard work to finally get your degree, but once you cross that finish line, you realise it isn't an end at all. It is another beginning, and I am constantly amazed and impressed by what our alumni go on to do.

Once again, I was full of admiration when I heard the stories told at a recent event for the Faculty of Engineering and Information Technologies. The theme of the evening was 'Engineering for Developing Communities', one that I found truly inspirational.

We are all familiar with massive engineering projects in areas like transport and construction, but engineering can be just as transformative when it is implemented on a more human scale. This is what our students learn in the multidisciplinary major of Humanitarian Engineering.

Consider this engineering challenge: how can isolated communities be supplied with large quantities of clean, drinkable water if they don't have access to pumps, energy or chemicals? It sounds like an impossible ask. Yet alumni Rhett Butler (BE(Mech) '79 ME '83) found an answer. He developed a handheld, gravity-driven membrane filter capable of decontaminating 10,000 litres of water a day.

When you consider that two billion people around the world have to drink contaminated water, this is a powerful innovation on its own. But Rhett and his team came up with an added benefit: they developed a scheme of autonomous safe water kiosks to encourage women, in particular, to start their own businesses selling water as a source of income.

This innovation not only makes clean water more easily available in communities where it is sorely needed; it also brings to families resources that can be used on better nutrition, health and education.

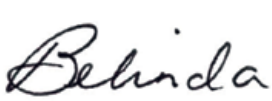
Another engineer with a strong sense of purpose is Emelia Milliner (BCom '19 BE(Hons) '19). The proportion of women studying engineering and computing at our University is double the national average, and Emelia's story helps to explain why. She is a strong advocate for gender diversity in engineering and serves as a mentor with our University's Network of Women and in the Indigenous Australian Engineering School.

Now, as a young graduate who has been awarded the Convocation Medal for undergraduate leadership, Emelia is continuing her commitment to Engineers Without Borders (EWB), an organisation that featured heavily in her studies.

EWB started in Australia in 2003 and conducts work internationally, channelling the energies and ideas of engineers like Emelia into projects that bring water, sanitation, clean energy, housing and digital access to some of the most disadvantaged people in the world.

When we talk about instilling leadership in our graduates, this is what we mean. Emelia and Rhett, like so many of our alumni, use their imagination and courage to drive fundamental change. We see it in our engineers certainly, but the achievements of all our graduates, across every discipline, through the years and around the world, have been extraordinary.

You are members of a truly inspirational community.



Belinda Hutchinson AM
Chancellor
BEc *Sydney*, FCA

Lost and found

Written by George Dodd
Photography by Louise Cooper

An ancient book. A curious philosopher. Clues for solving a mystery. The day a research project turned into a world-spanning adventure.

When a small piece of old, dry plant matter fell out of the book she was browsing, Laura Kotevska (BA(Adv) '08 BA(Hons) '09 PhD '17) couldn't have known the hold it would take over her. Since it happened, she has spoken with botanists, librarians, historians, artists and scientists, and become familiar with carbon dating, spectroscopy and the history of ink.

What captured Kotevska's imagination wasn't just the plant, it was the book it fell from: a classic text of early botany called *Gerard's Herball*, published in 1597 and revised in 1636. Kotevska was looking at the revised edition, though both are held in the Fisher Library Rare Books section.

"It takes a particular person to see a bunch of dead plants and think, wow that's really interesting," Kotevska says, not as a botanist, but as the philosophy historian she is. "I immediately thought: who put the plant sample in there and why? And how long ago? Were more plant specimens in there? The book has 1600 pages and it took me two days to turn every one."

There were indeed more plants to find. Some within the pages, with the best preserved of them wedged into the binding. Was someone matching their collected plant samples to the plant references in the book? And could this person actually be of the 17th century? A Nancy Drew switch had been thrown in Kotevska's head and she needed to know more.

None of this had anything to do with why she was looking at the book in the first place. As part of her PhD and postdoctoral research, Kotevska had spent time in France, Britain and the United States doing archival work on 17th century French philosophy and how it was influenced by the works of Euclid, a Greek mathematician known as the father of geometry.

"One of the principles enshrined in Euclid's work is the importance of sound reasoning. It's what drew 17th century people back to it," she explains. "They believed that clarity of mind could bring moral strength."

Looking at so many classical texts, Kotevska was struck by how much information was conveyed through illustrations. It gave her the idea for an exhibition (which was held in the Fisher Library earlier this year) with examples not just from mathematical sources, but also natural history texts, of which *Gerard's Herball* was an early example. Hence her looking through the Fisher Library's copies.

John Gerard himself was a pioneering botanist at a time when scientific principles and language were coming into being. Previously, a plant might be described through its appearance in poems, paintings and folk tales, but now people were hungry for facts. That's what the *Herball* delivered, crammed as it was with informative – though sometimes inaccurate – text and plentiful woodcut illustrations. The book was a publishing sensation of its time.

For Kotevska, another teasing element was handwritten annotations on slips of paper inserted like bookmarks. The language, and indeed spellings, suggested 17th century origins, but finding out how the ink was made, through a process called spectroscopy, could also have brought insights. Unhelpfully, the spectroscopy established that the annotations were written with iron gall ink (created in the 4th century but used through to the 20th century). It also revealed that the book was covered in arsenic.

▲ Top: Gerard's *Herball*, where the first English language reference to potatoes was made.

▲ Left: Found in the pages of the book, could this plant fragment be from the 17th century?

▲ Right: Dr Laura Kotevska studies how scientific thinking evolved from a more fantastical world view.

"Arsenic was used to preserve books from insect pests," says Kotevska. "Now I've been told I have to use gloves when I touch it."

Who collected the plant samples and wrote the annotations is still an open question that Kotevska is determined to answer (she has some suspicions). Soon she will resume discussions with the Australian Nuclear Science and Technology Organisation about carbon dating the plants, and an overseas trip is on the cards because a mark in the book suggests it was once part of a particular library in Scotland.

One question that might have been answered though, is why Kotevska has been so consumed by her discovery. "Just recently, my mother told me that when I was a little girl, if I went to a place I really liked, I'd collect a plant and tape it down. So, maybe I have something in common with that other collector." ●

WORD ON THE STREET

Written by Katie Leach
Photography by Louise Cooper

The word ‘fashionable’ was invented by William Shakespeare. New words are still constantly created and some become the Macquarie Dictionary Word of the Year, with a little help from your University.

What do *mansplain*, *milkshake duck* and *Me Too* have in common with *fake news* and *captain’s call*?

Answer: they are all winners of the Macquarie Dictionary’s Word of the Year. Of course, they’re not all single words, so maybe think of them as single concepts – encapsulating the moment when a cultural phenomenon took root in the language.

The Australian focus isn’t all that makes the Macquarie Dictionary special to us – it also has a University of Sydney connection. The dictionary team relocated to the Camperdown Campus in 2007 and commenced a close working relationship with the University’s library and linguistics department.

▲ A member of the Macquarie Dictionary Word of the Year committee for 15 years, Professor Stephen Garton

Word of the Year was initiated soon after Macquarie’s move. Professor Stephen Garton (BA ’78), an Australian social and cultural historian and the University’s Provost, has been on the committee from the beginning. Over the years he has debated *pod slurping*, *fracking*, *burquinis* and *toxic debt* with many other wordsmiths, including the late poet Les Murray, journalist Annabelle Crabb and crossword setter David Astle (Fairfax’s infamous ‘DA’).

“The process is mainly a table discussion, but in the end, we do vote,” says Garton. “We have a good chinwag about why this particular word. Is it absolutely ‘of the moment’, encapsulating contemporary public discourse? Is it an obscure word uncovering something in Australian culture? Is it because we like the way it rolls off the tongue? All of those issues are in play.”

Macquarie Dictionary is relatively new to the Word of the Year scene. Its first pick, *muffin top*, was announced in 2006. By comparison, Germany’s government-sponsored language society, *Gesellschaft für deutsche Sprache* has been selecting a *Wort des Jahres* since 1972.

Being an official dictionary of Australian English, it’s apt that several of Macquarie’s Words of the Year originated or were at least popularised in Australia. *Milkshake duck* was coined by an Australian cartoonist. *Captain’s call* will long be associated with Tony Abbott. Even choices like *fake news* – well-known across the Western world – are firmly embedded in the Australian psyche.

In recent years, Garton has found it “fascinating, the number of social media words on the shortlist”, as an insight not just into popular culture but the way the internet is influencing language.

Asked if he has any concern about the way the English language is evolving in the hands of Millennials and the iGeneration, Garton is adamantly on the side of change. “It’s a living language that changes and reflects culture,” he points out. “As a historian, it’s a source for understanding how the world works.”

Across the universe

Written by George Dodd
Photography by Stefanie Zingsheim

For nearly six decades, this astronomer has looked for answers in the heavens, and for better ways of doing things on Earth.

When the main fragment of the comet Shoemaker Levy crashed into Jupiter in 1994, it caused a media frenzy on Earth, while on Jupiter it caused a fireball that leapt hundreds of kilometres above the planet's surface and ripped a hole in its atmosphere bigger than Earth itself.

The world was gripped by the event, but the only radio astronomer at the University of Sydney who was interested in observing it was Professor Richard Hunstead (BSc '64 PhD '73).

"The others thought it was boring solar system stuff," he says from his office in the Physics Building, where he has worked for more than 50 years. "Once upon a time, I would have said the same thing, since a lot of my work has been looking at far distant objects."

To give a sense of the distances, Hunstead mentions in passing: megaparsecs. One parsec is 31 trillion kilometres. A megaparsec is one million of those.

The question for Hunstead in 1994 was whether the collision would affect Jupiter's radio emission. As influential as Hunstead has been in optical astronomy, he is also internationally recognised for his work in radio astronomy.

Radio waves can travel further than light because they are less affected by absorption from space dust and our atmosphere. Where an optical telescope sees a patch of space as empty, a radio telescope might reveal a far-distant galaxy.

It's a young branch of astronomy (it only emerged in the early 1930s), and Hunstead has contributed some important insights. When the mainstream believed that radio sources observed at low radio frequencies were constant in brightness, Hunstead went out on a professional limb to say some were strongly variable; in effect they twinkled.

Likewise, colleagues didn't believe that a fragment of Shoemaker Levy could affect an object as massive as Jupiter, whereas Hunstead had a strong sense that it had to be tested.

In both instances he was correct, and in the case of the low frequency radio sources twinkling, he changed the accepted wisdom of that whole area of research.

Hunstead's willingness to take a stand expressed itself early. Remembering himself as shy and quiet when he started at the University on a scholarship in 1960, he nonetheless found himself leading a push to update the University's whole approach to the teaching of experimental physics.

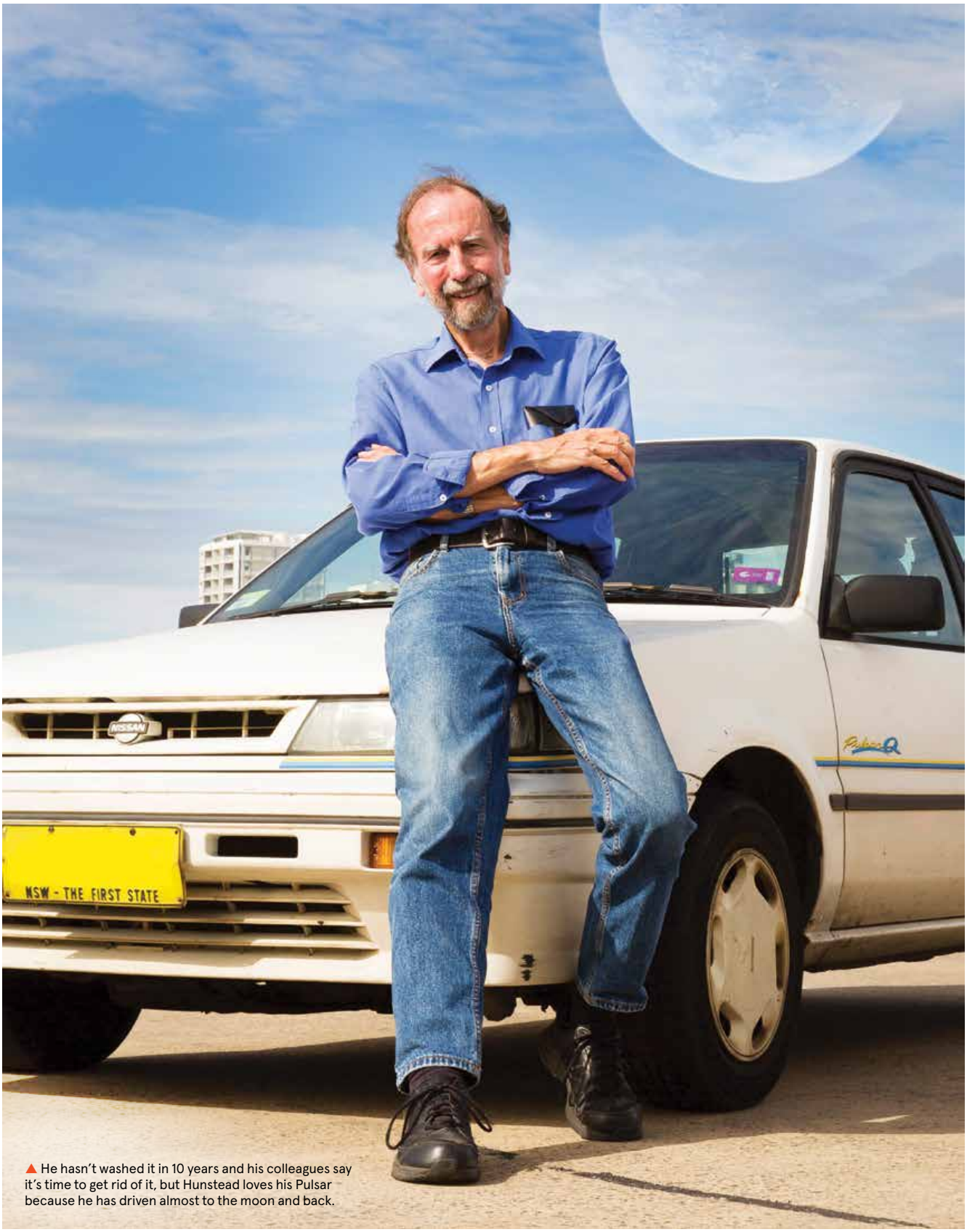
"Lots of exciting things were emerging around electronics that the University wasn't incorporating," Hunstead says. "So, when I became a tutor, I wasn't only writing lab notes, I was building equipment."

Having achieved so much, Hunstead still works at the University and is the astronomy department's resident "proofreader from hell". He and his wife, Penny, who is a botanist, have also made a gift to the University that they hope will promote collaboration in astronomy and enrich the student experience.

And still Hunstead searches the skies for new insights. "It's all knowledge," he says gently. "And I admit, I could learn a lot more."

HELP CREATE MORE STARS

The Hunsteads are helping create the next generation of astronomers. For information about how you can advance your passion with a gift or bequest, call +61 2 8627 8818, or email development.fund@sydney.edu.au



▲ He hasn't washed it in 10 years and his colleagues say it's time to get rid of it, but Hunstead loves his Pulsar because he has driven almost to the moon and back.

Making light work

Written by George Dodd
Photography by Stefanie Zingsheim

The first telescope that viewed the heavens changed how we humans perceive ourselves. It made us feel smaller. Less the centre. It also made us hungry to see more. Modern telescopes are delivering.

Modern optical telescopes are highly technical, vanishingly precise and sensitive enough to look from New York to Tokyo and clearly see a fly. Even though they are extraordinary machines, Dr Julia Bryant (BSc '94 PhD '01) has good reason to want them to be even more powerful.

"My work is trying to understand how galaxies are born and what makes them look the way they do," she says. "Many years ago, I realised no existing equipment could give me the type of data that I needed. I've been working to change that."

This journey started for Bryant with the last passing of Halley's Comet. "It was 1986, and I was in high school," she says. "I had a teacher who was just passionate about it, and a teacher like that can change your whole life."

Now following her own passion to see ever deeper into the universe, she is using optical telescopes, which create images from the visible part of the electromagnetic spectrum, or more simply, light.

Some telescope technologies use invisible parts of the spectrum: radio waves, infrared, x-rays and others, and show us things that light can't. Yet it's the images from optical telescopes that let us gaze at lush, light-generated images of the Ant Nebula, the Helix Nebula and the Pillars of Creation.

Still, the benefits of optical telescopes go beyond aesthetics. Their high resolution means they can much more easily distinguish between two close objects that other telescopes might blur together, like stars. Visible light also has a wavelength that's about a million times shorter than radio waves, which means a 4m optical telescope can have a resolution that a radio telescope would need a 4000km diameter to achieve.

So how do you make the latest optical telescopes even better? For Bryant, the answer is astrophotonics which is based on the same fibre technology used in telecommunications. By incorporating fibre optics, Bryant hopes to collect every skerrick of light that comes our way and squeeze more information out of it.

The downside with optical fibres, and what Bryant and her research team have been working to correct, is light loss. This isn't an issue for transmitting information generated on Earth, but what Bryant wants to capture are the very faintest traces of light that have travelled vast distances to reach us.

She has already had significant success doing this through her involvement in the Sydney Australian Astronomical Observatory Multi-Object Integral Field Spectrograph, more conveniently called SAMI, where she was the lead scientist. Previously, galaxies were viewed through single optic fibres, but Bryant had the idea of deploying 60 fibres in what are called hexabundles.

"After years of developing the hexabundles, it was such a wow moment when that first image was on screen and it looked exactly as I'd hoped," she says. "Every single image was loaded with information. We could even do high order motions of the stars and gas in the galaxies."

▲ The Pillars of Creation, as seen by the Hubble Space telescope. Photo courtesy NASA.
◀ Dr Julia Bryant creates technologies so other astronomers can look further.

SAMI began its work in 2013 and is already yesterday's technology as Bryant is now part of a team building what she calls "SAMI on steroids". The device is called Hector which isn't an acronym, but it is a massive leap even further forward.

The work on Hector has to fit in around Bryant's academic responsibilities which include managing the postdoctoral students and interns who work in her lab. She is also the director of the newly formed, Sydney-based node of the Optical Astronomy and Instrumentation Consortium. But as with SAMI, Bryant is keen to see Hector begin its work.

"When it does, we'll start a survey of 15000 galaxies: the largest survey ever done in the field," Bryant says with obvious excitement. "Not only will this help me answer the questions I have around galaxy evolution, but building this instrument means I can enable the work of hundreds of other astronomers at the same time."

This idea has always been a strong motivator for Bryant. "A catchphrase for me has always been that I want to enable more science than I can do myself, and I believe photonics can help me do that. It's the way of the future."

THE UNFORGETTABLES

They're the charismatic University staff members with rock star status. Usually loved, sometimes feared but never forgotten. Three have been gathered here, while there are many more.

Herbert Ian Priestly Hogbin, Professor of Anthropology
Remembered by Jeffrey Mellefont (BA '73 DipEd '76)

My first year of undergraduate anthropology, 1969, was Professor Hogbin's last before retiring. Lucky for me. His tales were mind-blowingly different to my suburban Sydney upbringing and propelled both my major and a lifetime of travel, research and writing. Unforgettable, for the Anthrop. 1 freshers in the Wallace Theatre, was Professor Hogbin acting out a Trobriand Island mother pretending to bewail her unmarried daughter's lost virginity, when really a Trobriand mum didn't much care. This was useful cross-cultural contextualising for us late-sixties kids dealing with our own society's recently inaugurated sexual revolution. Hogbin was a living link to that glorious but politically most incorrect heyday of anthropology when young ethnographers could insert themselves into just about any unprotesting village in their respective cultures' colonial empires.

Honorary Associate Professor Winsome Evans (BMus '63)
Remembered by Dawn Nettheim OAM (BMus '89 GradDipMusComp '90)

Winsome was a shining light of the music department. In addition to a heavy teaching load, she also ran 'The Renaissance Players' who gave concerts and produced recordings. A generous person, she would come into uni early in the morning to coach me and others in subjects we found difficult and offered me free accommodation when I was making costumes for a music department opera. With a marvellous sense of humour, she "played" music in the sense of "having fun". Winsome was strict about presentation though. Manuscript exercises had to be done in ink, with beautiful calligraphy for reading in dark orchestra pits. This training meant I was could get work as a copyist and arranger immediately after finishing my degree in 1987.

Photos: Hogbin (G3_224_2883_6_) and Evans (G77_1_0211), from the University Archives. Dulhunty, National Library of Australia

Dr John Dulhunty
Remembered by Murray Aitkin (BSc '61 PhD '66 DSc '97)

Years after my studies, I was visiting the University when I saw Dr John Dulhunty. I called out to him and he stopped. When I began science in 1957, he opened my eyes to the geological world around (and under) us and developed my lifelong interest in this subject. Meeting him again, I said, "I was a geology student and I've always wanted to tell you how your teaching opened my eyes to the geological world and inspired me to go further." Of course, he was delighted. Though my interests changed, and I went into a different field, I've always remembered and enjoyed the benefits of his course.

WHO WAS YOUR UNFORGETTABLE?

We'd love to hear about your unforgettable University staff member. Send their name, how you had contact with them and why they were unforgettable to: **sam@sydney.edu.au**

DRAWING ON EXPERIENCE

Written by Ian Simmons

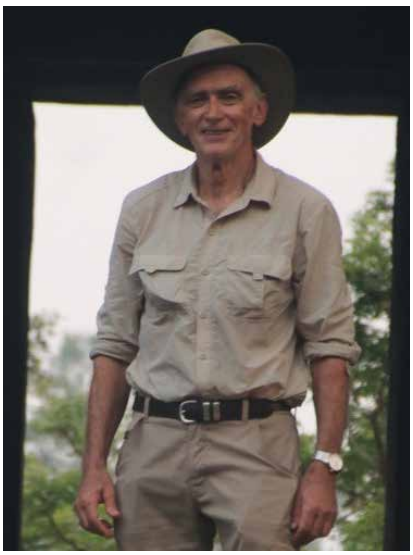
He started out using his medical training to repair heart problems in kids. Later, his concern for children saw him champion the repair of their emotions.

When he began working at Boston Children's Hospital in the mid-1970s, Dr David Watson (MD '67) brought his medical skills and another very valuable talent: he could draw.

"Trying to explain the anatomy of a child's heart was much easier if you had diagrams, because paediatric cardiology involves a lot of three-dimensional thinking," he explains. "I was able to put the concepts down on paper. And I'm told those were used at the hospital long after I left."

Watson was still at primary school when the famous detective, Sherlock Holmes, helped him decide on his future career. "Everyone used to call me Dr Watson," he says. "So I thought I'd better do medicine."

Watson remembers university as a lot of hard, challenging work but also as an opportunity to meet new people, travel, get involved in student politics and sport; he even started a scuba diving club. He also realised that his medical skills could take him anywhere.



▲ A focus on helping children, Dr David Watson

"I eventually practised in both the United Kingdom and the United States," Watson says. "And I found that my education was as good as anyone's."

After completing residencies in London and Sydney, Watson decided to focus on paediatric cardiology, which led to a fellowship in Boston at the top children's hospital in America. He was the first Australian on staff. Initially he felt out of his depth, though that soon passed.

When the fellowship ended, Watson decided to stay in the United States and go into general paediatrics. So, nine years after graduating, he had to pass a new set of exams to become accredited, and then build his practice.

"I was driven, and I wasn't afraid of failure," Watson says. "I mean, I was afraid of failure, but I never thought it would happen. Looking back on it, I should have been a lot more afraid than I was."

Over the next three decades Watson grew the practice, bringing in partners and expanding into four offices employing 150 people. But there was one area where young patients were not getting the help they needed.

"There were very few competent paediatric psychiatric practitioners," he recalls. "I had employed a lot of practitioners and decided that I would convert some of them to mental health, so we could have the expertise in-house. We manufactured our own."

Watson also saw a broken medical system where psychiatrists could only make money by prescribing drugs for children, an approach he always believed was wrong. "You needed contact with professionals, people who could de-escalate situations and steer kids into less aggressive modes.

"What I wanted was to try and build up a big practice with a lot of therapists, so kids in trouble had someone to talk to on a regular basis. That was the most difficult thing I've done in my life."

Watson sold the practice in 2012 and retired. He now lives with his wife in New York, where they're restoring a 200-year-old, historic register house on the Hudson River. He still has friends in Australia from his days at university, and he still loves scuba diving.

Professor Ian Hickie

Dr Frank Iorfino

Connecting the dots

Written by Ian Simmons
Photography by Stefanie Zingsheim

The statistic is distressing but it suggests an effective place to start treatment: 75% of mental health problems begin before age 25, and 50% before age 15. Now, a common point of contact for this group is transforming service delivery.

It's 3 o'clock in the morning and a young person is having a mental health crisis. What can he or she do? Currently, the only option is the emergency department of a local hospital. If that young person lives in rural Australia, even that option might not be available.

This is one of the scenarios that mental health professionals at the University's Brain and Mind Centre (BMC), have wrestled with, looking for solutions, and the signs are good that they've found one. It's called the Innowell Platform and it harnesses the online environment to provide a 24-hour option for people seeking to improve their mental health.

"People can get online and do something immediately," says postdoctoral research fellow Dr Frank Iorfino (PhD '18 MBMSc '14). With an obvious enthusiasm for his work, Iorfino believes there's real value in online engagement. "People can fill out questionnaires about their current mental health, which in itself can be quite therapeutic. They can also find out what they can do right now – maybe using an app or fact sheet, or even having a 'video visit' with a counsellor."

A worldwide consensus is emerging among mental health researchers that online interactions can be positive and can even be used to provide clinical care. An online portal is also less confronting for someone who has avoided seeing their GP or psychologist because of the stigma around mental illness.

As the co-director of health and policy at the BMC, Professor Ian Hickie is a tireless advocate for improving access for people with mental illness. As he points out, fewer than one in three girls and one in six boys with a major mental health problem ever gets an assessment or intervention.

"There's a total disconnect between the need for health care in that period of adolescent and early adulthood and what our health system currently does," he says.

The Innowell Platform, created in collaboration with professional services network, PwC is designed to fill that gap. Developed by a multidisciplinary design team including psychiatrists, software engineers and people who will actually use it, the platform so impressed the federal government that it agreed to contribute $30 million dollars to a related program called Project Synergy that could revolutionise mental health service provision.

After four trials were completed with promising results, the Innowell Platform is now being trialled with headspace, a youth mental health service; Open Arms, a military veterans' counselling service; and the Butterfly Foundation for Eating Disorders. But creating and refining the technology is not the only hurdle.

"Getting people to change their behaviour and understand how this platform can help is a major barrier," says Iorfino. "There's a big need to run education and training, not just for those using it but the clinicians as well."

Perfecting the Innowell Platform is just one facet of what happens at the BMC, a multi-faculty initiative encompassing research, social policies, engineering, IT and economics. BMC was established in 2015 to build on a decade of work carried out by the Brain and Mind Research Institute (BMRI). Hickie was appointed the BMRI Executive Director in 2003 – he stayed on at BMC because he believes the centre's investment in mental health research has put it at the cutting edge.

"In childhood, there are things like autism and anxiety. For teenagers, there is depression, substance abuse and the onset of disorders like schizophrenia," he says. "Then in ageing, it's about dementia, Alzheimer's and Parkinson's disease. The social costs of mental health are seen as the big health and medical research challenges of the 21st century."

With the Project Synergy trials set to finish next year, Hickie is looking to a future where similar innovations are an integral part of Australia's mental health system.

"In five years, any teenager will be able to connect immediately with effective and highly personalised health care," says Hickie. "And the services will put the person and their family at the centre of that care."

For all the current inadequacies in service provision, Hickie estimates that Australia is still a decade ahead of most other countries. "What we haven't had is the confidence that, if you invest in this area, we'll see breakthroughs."

Hickie uses a favourite quote to illustrate the point. "President Obama said that we have ventured much further into outer space than we have inside our own heads. The thing now is to turn the awareness into investment."

For more information about the Brain and Mind Centre:
sydney.edu.au/brain-mind

Animal magnetism

Written by George Dodd

His mother said he was the child she had to pray for, but Dr Jean-Paul Ly turned his risk-taking childhood impulses into a business empire and a dedication to being a vet who challenges the orthodoxies of animal treatment.

The idea that some of his professional colleagues in Singapore might see him as a renegade doesn't faze Dr Jean-Paul Ly (BVSc '75) in the least. "I don't always follow the accepted paths because they don't always work," he says in his precise but relaxed way.

Part of his fringe status comes from his, at times, controversial approach to treating his animal patients. Ly understands the negative reaction to a certain extent but says it's important to look at the context.

"People bring their pets to me when they're really desperate and they've tried everything else," he says. "Unfortunately, a lot of this is end-stage cancer."

"People bring their pets to me when they're really desperate and they've tried everything else."

This situation means Ly is willing to play with the accepted wisdom and go with his instincts. "We vets keep swapping the medication but not challenging the way we think," he says. "The first things I do are change the diet and look at the environment."

By his estimation, Ly has given longer lives to 40% of his hopeless cases and learned a lot. Much of this work happened at the Animal Recovery Centre (ARC) which he opened in Singapore in 1999. It is now one of the most advanced vet facilities in Asia, offering six vet teams along with computer radiography, ultrasound and magnetic resonance imaging.

Though he recently sold the ARC, Ly flies in every month from his home on the Gold Coast to spend a week at the clinic so he can continue to embrace the biggest challenges. "Right now, we are the only facility doing open heart surgery and stem cell transplants in the whole of Southeast Asia."

How Ly came to study veterinary science at the University of Sydney is a family story wrapped in a South East Asian history lesson.

His parents were Chinese, but as his father was educated in France, the then Chinese Nationalist Government sent his family to French-occupied Vietnam, where Jean-Paul was born. The family spent the next years staying one step ahead of various geopolitical crises. Finally, in British Singapore, the rise

of anti-colonial forces meant Ly and his siblings were sent to Sydney for safety. His father stayed in Singapore as a journalist and was later jailed in a media crackdown.

Ly was 15 when he found himself at a Sydney boarding school. "I could be first in the class in one test and in the next, I could be last," he says. "No one recognised it, but I had attention deficit disorder."

He remembers his time at the University as Friday nights at the pub in the nearby suburb of Forest Lodge and the constant frustrations of getting access to texts in the days before the internet. He was also asking himself whether he wanted to be a vet at all.

"Then I was drawn into the anti-Vietnam War movement," he says. "Suddenly, I identified with the student body, and to remain part of the student body, you had to be a student."

On graduation, he found himself armed with a useful springboard into work as a vet. After a conversation with his father about animal acupuncture, Ly learned the skill and realised there was a big demand from the owners of dogs and horses.

"That's because it works," he says directly. "As well, [United States President] Nixon had just gone to China and the bamboo curtain came down. People were interested in anything mystical and Chinese."

A look at Ly's long career shows that he has indeed followed his own path, mixing a vigorous clinical dedication with an audacious mind for business. Many of his wider endeavours link directly to efforts to save those last-chance animals. His commercial interests have included, but are not limited to, pet nutrition, immunotherapy, animal cloning and cancer stem cell research – for which he also created a spin-off marketing company to make sales.

Then there's his fish-farming enterprises and the holistic pet food company, Addiction, that manufactures in New Zealand and exports successfully to Asia, Canada and the United States.

It's hard to imagine one person being able to keep so many fingers in so many pies, including running four companies. "I'm a multitasker and I have focus," he says with some understatement, then smiling adds, "When I die, if I find it too boring on the other side, I'll come back."

◀ As a youngster, Dr Jean-Paul Ly cried all through the dog movie, *Old Yeller,* and knew then, he had to be a vet.

IN TWO MINDS

For their studies in veterinary science and engineering, siblings Jessica and Nicholas Divall both received University medals for exceptional academic achievement; a rare outcome for a family. Here, they talk about their motivations and goals.

◀ Nicholas and Jessica Divall on the day Nicholas graduated

Jessica Divall (BSc(Vet) (Hons) '16)

"I enjoy learning, as corny as that sounds. I think the more you learn, the more you realise you don't know. I worked hard at school to get into this degree, because I wanted to be the best vet I could possibly be and maximise the opportunity I had at university.

"Right now, I'm working in a small animal practice getting some clinical experience. I'm trying to decide whether to specialise, continue working in general practice or look more into the research world.

"The wellbeing of animals is very important to me, as it is to most animal lovers. I am passionate about increasing their quality of life and advocating for their needs. I believe it's essential to maintain the health of our domestic animals and achieve the best possible outcomes for farm animals.

"I think animals play such an important part in people's lives. As levels of anxiety and stress increase, their role is even more important. By looking after animals, I want to make the human/animal bond even stronger, so improving not only the lives of companion animals but of the families who love them."

Nicholas Divall (BE(Hons) BSc '19)

"I grew up in Canberra and had an awesome IT teacher who supported and inspired my passion for technology. At university I worked with smart and motivated peers to solve challenging problems. You build friendships like no other after spending almost every waking hour together to finish a project! I find it very rewarding to solve problems that initially seem impossible.

"I am driven to make a difference, to improve society, which I believe has come from the passionate ambition of the supervisors who guided me. Their immense drive to better humanity through technology is contagious. My goals include improving health outcomes and the environment.

"I passionately believe that climate change is having an impact on the natural world and that nature will be changed forever and for the worse. Still, I am optimistic that humanity is capable of dealing with this change.

"As engineers, we are obliged to do everything in our power to develop modern technologies to best reduce humanity's impact on the environment. Engineering itself allows for the development of technologies to help solve some of the problems of humanity. It allows an individual or a team to achieve so much more."

Cleared for take off

Written by Rebekah Hayden

Blacking out at the controls of a Second World War fighter was an occupational hazard for pilots. One wartime researcher pioneered a solution and provided a framework for all who followed.

▲ Historian Dr Peter Hobbins in a Macleay museum storage area with artefacts from the anti-g force research.

The story of the Frankie Cotton anti-blackout suit is perfect for a boys' own annual, with its Second World War Hurricanes and Spitfires, remnants of a centrifuge buried and forgotten, Japanese bombers and an unsolved mystery.

In the early part of the Second World War, air forces were desperate to stop pilots blacking out when making sharp turns in their fighter planes. The problem was caused by excessive 'g-force', which is measured in multiples of the standard force of gravity on Earth (g). Standing still at sea level, the g-force acting on you is 1g. Take-off on a commercial flight might exert 1.5g. Fighter pilots in a tight turn can experience 5g or more.

The rapid movement can cause a pilot's blood to pool in their stomach and legs, leading to a greying of vision, loss of sight and unconsciousness – not an ideal thing to experience mid-combat.

Enter Professor Frank 'Frankie' Cotton. A specialist in the human cardiovascular system, Cotton had an idea to solve the problem; a special suit that would inflate and put pressure on the pilot's legs and feet, pushing blood back up the body. It was called the aerodynamic anti-gravity suit, and in 1941, Cotton and his team built a centrifuge in the University's Anderson Stuart Building to test its effectiveness.

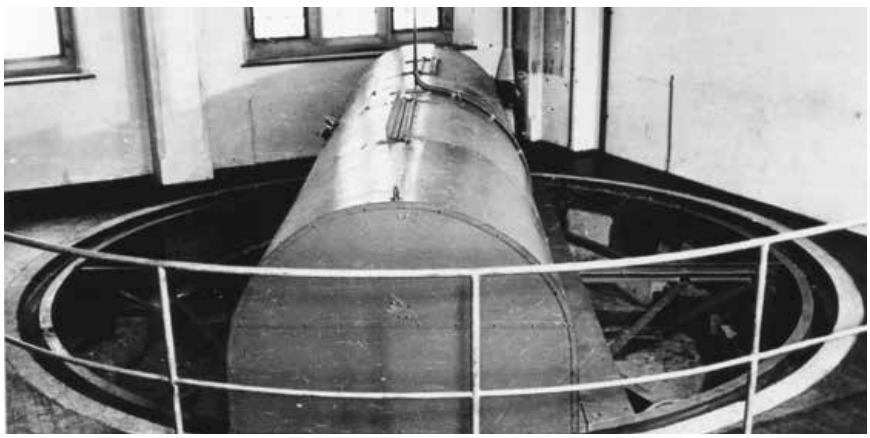
The suit looked not unlike a pair of fishing overalls, albeit far more slim-fitting, with inflatable bladders inside that responded to changes in 'g'. Peter Hobbins (MMedHum '09 PhD '14) happened upon the Cotton suit in 2014 when he was asked to find information about a test subject of the program. As a historian of science, technology and medicine, and an awarded author of history, Hobbins had a unique perspective.

"It was basically an early cyborg technology," he says. "Humans were connected directly to machines to make sure the pilot was able to withstand as much stress or as much 'g' as the airplane."

Despite the brilliance of the idea, which inspired international anti-g research and had echoes in the spacesuits worn on the Apollo missions, the suit was stymied from the beginning. Zippers had to come from Canada at a time before easy international delivery, and the rubber bladders kept bursting. The suit also added an extra 30 kilograms of weight to lightweight fighter planes, plus there was the sheer discomfort of wearing one.

"The air force defence was in Darwin. Imagine wearing a 10-kilogram wetsuit for several hours where it's often 30 degrees and getting towards 100% humidity. The word 'intolerable' comes up a lot," Hobbins says.

In 1943, an entire frontline squadron of Supermarine Spitfires in Darwin was equipped with the Cotton suits, and a chocolate company donated an airconditioned van in which the pilots could wait for Japanese planes. But few planes arrived, as the Japanese soon moved operations away from Northern Australia. The suit was only worn in combat once.



Today, the University has a suit and several pieces in careful storage. Heavily patched and badly perished, most of these remnants were found in 1995, buried beneath a floor in the Anderson Stuart building with what was left of Cotton's centrifuge after it had been dismantled and abandoned at the end of the war.

So, what of Hobbins' original task of finding one of the people who took part in the Cotton program? Several articles, 20,000 pages of documentation and five years later, there's still no sign. "I have looked at so many published materials as well as archival documents," he says. "It's a hazard of being a plane spotter."

◀ Bottom left: the Cotton centrifuge in the Anderson Stuart building in 1940 – last used in 1947, it was later found buried in the floor (Archives G3_224_2397_2)

◀ Top left: fitting an experimental anti-g force suit in 1940 (Archives G3_224_2397_1)

▲ This page top: Best known for tyres, Dunlop rubber was used to make the suits (photo by Stefanie Zingsheim)

▲ This page, bottom: Years of oxidation has caused the rubber in the suits to seriously degrade – they now require special storage and handling (photo by Stefanie Zingsheim)

REMEMBRANCE OF THE SECOND WORLD WAR

We're looking for University staff members, students or alumni who served in the Second World War.

The information will be used to produce an online *Book of Remembrance* for people who served in Australia or overseas. The University is keen to collect names, service records, photographs and biographical information of the University men and women who served in the Second World War.

A large number of University people served, but the University's existing *Book of Remembrance* is a print publication, and space limitations mean it only commemorates those who died. The online version will allow the inclusion of all who served.

This new project is building on the success of our existing website: *Beyond 1914 – The University of Sydney and the Great War* (Beyond1914.sydney.edu.au).

The new information collected will be added to the Beyond 1914 database to create a unique digital record of the University's people and their contribution to both world wars.

If you have any information or items that could be part of the *Second World War Book of Remembrance*, or if you'd like to find out more, please email Senior Archivist, Nyree Morrison at: **nyree.morrison@sydney.edu.au**

WRITTEN ON THE BODY

Written by Rebekah Hayden
Photos by Louise Cooper

The skin is our interface to the world. Now, technology is being developed that will give our skin its own interface that can deliver more and different information with a touch.

You might not know what they're called, but you probably use them quite a lot. Virtual buttons, also called soft keys, are on smartphones, ATMs and computer monitors, doing the work of buttons though they are just an image.

Virtual buttons are handy and efficient, unless you are vision impaired, because you can't actually feel them.

Dr Anusha Withana is looking for solutions in what is one of the fastest growing areas of scientific research: electronic skin. "My research is about creating blended interfaces," he says in the University's School of Computer Science, where he works. "Meaning technology that can be worn without being noticed."

Working with colleagues, Withana is developing a super-thin, hyper-flexible sticky tape that can have electronic circuits printed onto it. Once applied, people could use it to control devices, receive

information and importantly, register sensations through mobile phone-like vibrations. This could have benefits in robotics, education and game-playing; and for people with disabilities.

An added advantage of tactile information is that it doesn't distract people in the same way that visual or auditory information might. As Withana points out, "Some vision-impaired people prefer not to have information come to them through sound, because that's their connection with the world. If information can come to them in a tactile way, that's better."

To that end, Withana worked with a team in Germany to develop what is effectively a printable electronic fake tattoo called the Tacttoo, that can be personalised to specific needs. A fake tattoo it might be, but there are no gaudy dragons or unicorns here. Instead, the Tacttoo is screen-printed with a circuit made from polymer-based conductive inks which can stretch and move with the skin, while all connections between the skin and the electronics are printed in skin-safe silver ink.

The 'feel through interface', as in the sticky tape element, is only half the thickness of a human hair, making it the thinnest wearable tactile device to date, and so thin that it doesn't interfere with the normal sense of touch. Tacttoos are also inexpensive: mass produced, the material content would cost less than 1c each.

"We want people to be able to wear it today and remove it tomorrow – and we want people to be able to create it themselves," Withana says. "A broader user goal is to allow people with vision impairment to explore graphical information and more fully comprehend objects in museums and parks. This is something we're looking at with a team from Monash University."

Growing up in Sri Lanka, Withana went to Japan to pursue further studies. There he saw how technology could help people improve their quality of life. He also saw that only a fraction of tech advances is accessible to all people. "Everybody is unique, and if you are challenged in some way, those challenges are also unique. So, I began looking at how technology can be personalised," Withana says.

A move to Germany and the Saarland University saw him join its world-leading Max Planck Institute for Informatics. Working with Daniel Groeger and Professor Jürgen Steimle, he explored new ways of evolving the technology. Now Withana is pursuing ideas at the University of Sydney that could be used in any number of ways.

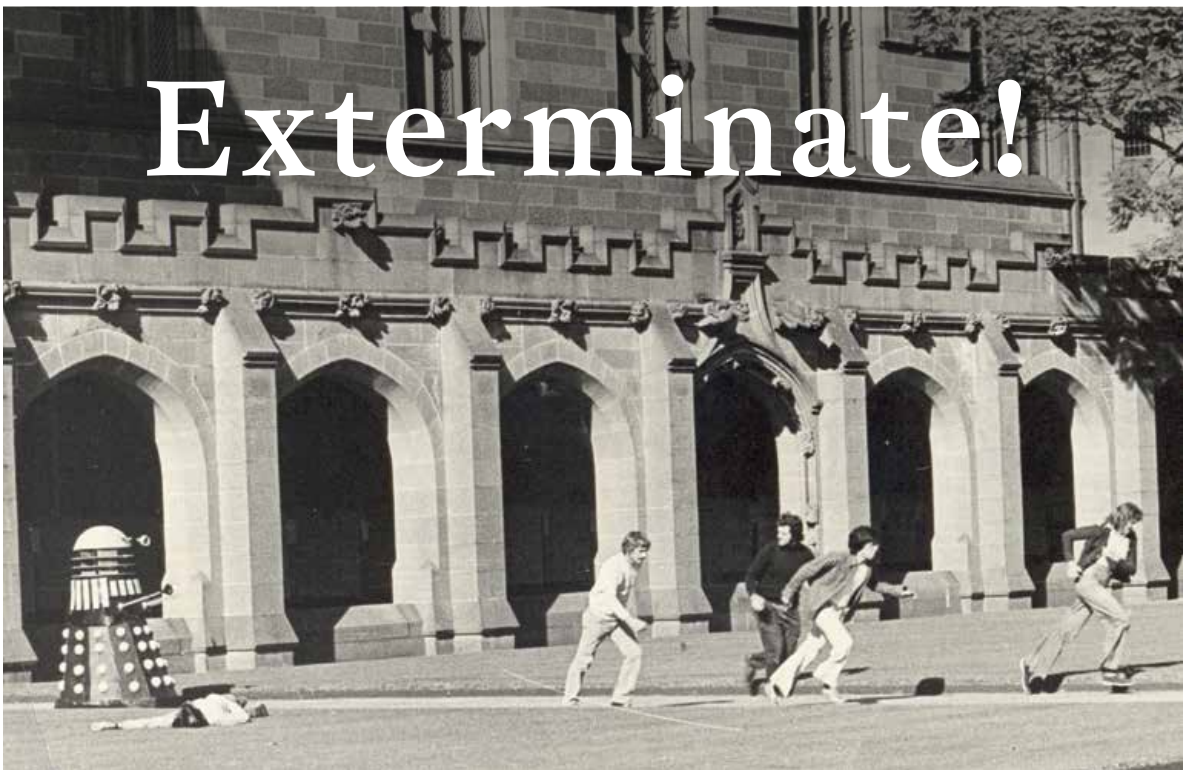
In a not-too-distant future, someone with a robotic hand will be able to sense heat from a cup, or gauge how much pressure to apply to an object. A stroke patient might have a personalised interface with sensors that measure their progress and give them feedback. A surgeon doing remote surgery could get the same sense of pressure or dexterity as if they were there in person.

As well, these wearable technologies will be connected to smart watches to control music or take calls. In 20 years from now, an entire smart device – including energy harvesting batteries – may be printable and worn on the skin.

The capabilities of these devices were once science fiction. Now they're science in action.

▲ Dr Anusha Withana, advancing 'electronic skin' technologies

Exterminate!



Written by Katie Leach

Time-travel back 50 years from 2019, and you'll find yourself at the beginning of SUSFA: the Sydney University Science Fiction Association. And yes, that sinister metal creature hunting down students in the Quadrangle is a Dalek.

Never an actual cast member of Doctor Who, the Dalek was built by student members of SUSFA to compete in possibly the world's first Dalek race, when Sydney took on models from Melbourne and Adelaide universities in 1976.

SUSFA's heyday was a heady era for science fiction fandom. The 80s would see a huge change to popular culture, bringing cosplay, fanfic, board games, roleplaying and electronic games to a much wider audience. But in the 70s, before online speculative fiction communities were even possible, fans who wanted to discuss their favourite film, television show or book, had to meet in person to do it. What a concept.

SUSFA arose from an original idea by Philip Connor (BE(Elec) '73), and was also motivated by the excitement of the 1969 moon landing and the movie *2001: A Space Odyssey*.

Later, SUSFA's meetings were held in the Holme Building, in a space Dr Antony Howe (BA '83 MA '89 PhD '04) refers to fondly as "seedy, dimly lit, with crumbling, dark red leather armchairs". Howe became president of SUSFA in 1976 after stumbling into a lunchtime gathering which turned out to be the club's annual general meeting.

The club's activities were staged by a dedicated and changing team and went well beyond constructing Daleks. It promoted club events like the first Sydney Science Fiction and Fantasy Film Festival (1977). This was a runaway success, making a $2700 profit and scoring a major coup when it secured the rights

to première a now cult classic: the post-apocalyptic animated film *Wizards*, by Ralph Bakshi.

SUSFA also amassed a library of more than 1200 science fiction books and magazines and published a magazine of its own: *Enigma*, first edited by Richard Faulder (BScAgr '75 DipEd '76 MAgr '95), then Van Ikin (BA '74 PhD '80), who is now himself a science fiction writer and editor. Covers were illustrated by emerging talents like Nick Stathopolous and Ikin's brother Dane.

Enigma was first printed on a Fordigraph spirit printer with its characteristic smell of a school office. Then came a temperamental 'Rex Rotary' offset duplicator – Howe is pained to recall its "endless devouring of money in repairs." Over the years, SUSFA churned out thousands of fanzines, newsletters, posters, flyers and stickers. Some of those stickers found their way onto hand dryers in toilets across campus prior to SUSFA's campus author events.

Still, it's the Dalek that fascinates. Called Valek by its fans, after a misprint in the now closed student publication, *The Daily Bull*, Howe was among the crew that drove it south for the race in Melbourne, its base strapped without dignity to the roof of a car.

That the SUSFA crew and Valek returned to Sydney victorious was largely due to an internal tricycle element which made Valek easily manoeuvrable, allowing it to take the lead in the obstacle course section. It also helped that Adelaide's Dalek was made at the last minute. "It fell to bits as the race progressed," says Howe.

For many years later, Valek was a star of Orientation Week, Open Days and became a mobile billboard promoting club events. Between appearances, it lived in the garage of club member Kerrie Dougherty (BA '81) before retiring to a storeroom in the Holme Building, from which it rarely ventured out – stairs, of course, being an eternal problem for Daleks.

The ultimate fate of Valek is lost in time. When the room in the Holme Building became unavailable in the mid-80s, Valek was taken on by person or persons unknown and is probably sitting, forgotten, in a garage or storage area, waiting patiently for the next Dalek invasion.

While Valek was a celebrity impersonator, SUSFA brought some actual celebrities to campus. Authors Larry Niven and Brian Aldiss both gave talks. Jon Pertwee (the suave third Doctor), and Peter Davison (the youthful, cricket-loving fifth), attended fan events on campus, with Pertwee and his wife joining event volunteers for dinner at Howe's home. Actress Katy Manning, who played Pertwee's companion Jo Grant, later moved to Sydney and became patron of the local Doctor Who club.

On the subject of companions, if Howe was offered a key to the Blue Box, would he accept it?

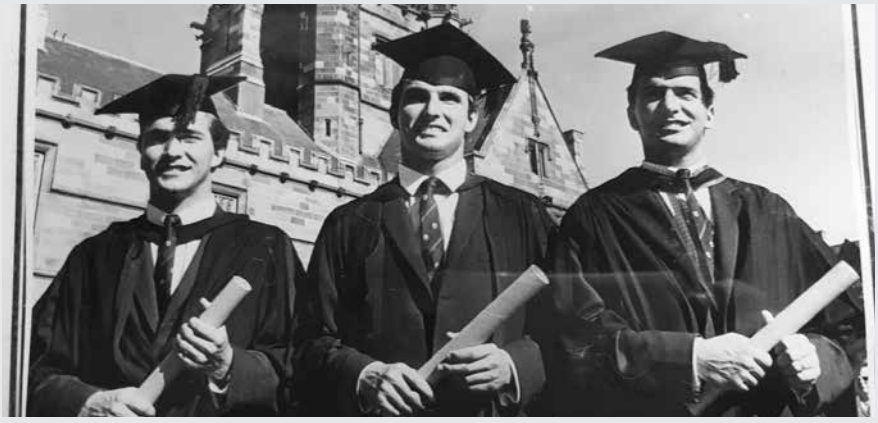
"No." Then he relents. "I would want a personal force field, guaranteed painkillers and dental care. I don't want to go back to Elizabethan times and have a toothache, thanks." ●

◀ Left: then-student, Anthony Howe, with the race-winning Dalek, Valek
▼ Below: The third Doctor reimagined by Dane Ikin
▼ Further below: three *Enigma* covers by Nick Stathopolous

HAVE YOU SEEN THE MISSING DALEK?

If you have any information on Valek's whereabouts, or if you'd like to know more about SUSFA, go to Facebook and search: SUSFA

CLASSNOTES



▲ L to R both photos, John, Peter and Paul Caska. Top, on graduation in 1969, above at their 50 year reunion.

John, Paul and Peter Caska (MBBS '69)

For first time in the history of the University and possibly the world, three brothers (two of them twins) graduated in the same year in the same faculty (Medicine), on 22 January 1969.

The unlikeliness of the event, which only happened because older brother, John, repeated second year, was enough to see the brothers on the front page of the *Sydney Morning Herald* and featured in the *Women's Weekly*.

During their studies, the brothers shared a flat and a car, with some hitchhiking thrown in, and they taught themselves bachelor-style cooking. They also found that some senior consultant doctors remembered teaching their father, Dr Zdenko Caska (MBBS '74).

After passing their exams, the twins, Peter and Paul, went to St Vincent's hospital and John went to Royal Prince Alfred. Later all three returned to work in their home territory of the NSW Central Coast.

In 1971, John joined his father's general practice and now runs a skin cancer clinic in Woy Woy. Also in Woy Woy is Paul, who trained as a general surgeon and now specialises in laparoscopic obesity surgery. Peter is an obstetrician and gynaecologist in Gosford.

The three Caska brothers, with their father, were instrumental in the building of the 100-bed Brisbane Waters Private Hospital at Woy Woy in 1976. At the time, it was the "most modern private hospital in Australia", later having the first cardiac surgical unit outside a major city.

On 9 March 2019, the University hosted a celebratory luncheon for the 50th postgraduate year of the Medical Class of 1969. There was a record attendance, including the three Caska brothers.

Shamistha de Soysa (MBBS '87)

Music has been a constant driving force for de Soysa. With a doctor-father and a music teacher mother, combining the two was inevitable. Studying piano and violin, de Soysa more recently realised her passion for music through choral singing. An Associate in Music, Australia (AMusA) in voice, she has been a member of Sydney Philharmonia Choirs' Symphony Chorus for 13 years. This and other choral activities have seen her sing at the Proms at the Royal Albert Hall, Bach's churches in Leipzig and San Marco in Venice. Recognising the links between music, medicine and wellbeing, de Soysa formed DocsVox, the NSW Doctors Choir, which gave its inaugural concert to a full house at the Sydney Conservatorium last February. After volunteering at Fine Music radio for five years, she established her own classical music website: SoundsLikeSydney.

Ann Sutherland (BA '79)

Gaining her degree through the University's then Department of Fine Arts (now the Power Institute), Sutherland's career was mainly in public program development and marketing. With the recent death of Prime Minister Bob Hawke, she recalled a career highlight. The small marketing firm that lured her away from academia handled the public communication program for the launch of Medicare in 1984. This was the first nationwide, voluntary sign-up program of the Commonwealth and its first online community access program. So, Medicare was a technical and system design miracle as well as an important and enduring aspect of Australian life. Sutherland is still hooked on contributing to the public interface in Australia and is drafting a research thesis on Australian cultural diplomacy between the wars.

Andrew Spearritt (LLB '83 BA '84)

While studying his arts degree, Spearritt also ran a business selling second-hand Australiana and history books to academic institutions and private collectors. As a history buff, he feels fortunate to have been taught by distinguished historian, Professor JM Ward. Initially working for a boutique litigation firm, Spearritt acted for the Save Seal Rocks (NSW) Action environment group, before specialising in insurance and reinsurance, particularly passive smoking and asbestos cases; later presenting papers in London on asbestos litigation. Previously a team leader in large firms including Dunhill Madden Butler and PWC Legal, Spearritt is currently a director of YPOL lawyers. Downtime means offshore sailing, travel, music, art and wine. He and his wife are also Ambassadors at the Museum of Contemporary Art in Sydney.

Ray Harrisson (BSc '52 MSc '53 PhD '58)

Harrisson's lifelong mantra has been "don't get a job, create a job". Always interested in the natural sciences, a family friend gave him *The Treasury of Knowledge* and *The Treasury of Science* which he devoured. At university, that interest became chemistry, geology and physics. Experimental science became a focus - medicine was way too personal. After three years of government-funded study, the University supported Harrisson with work and scholarships. His need to create a job led to management consulting with the prospect of much higher returns! Then followed manufacturing and wholesaling of promotional clothing, marketing of agricultural products at Flemington, exotic beef breeding using embryo transplants (that did not pay off!), property development and acquisition, long voluntary roles with disadvantage schools and a well-established private school. All fun.

Maggie Shapley (MA '81 BA '78)

Shapley, the archivist and poet, is obsessed with evidence. Studying early English manuscripts led to a Postgraduate Diploma in Archives Administration at UNSW. Moving to Canberra, she worked at the National Archives, including as Assistant Director-General, Public and Reader Services, with a consultancy at the World Bank Archives in Washington DC. In 2005, she became the University Archivist at the Australian National University, co-authoring *Prime Ministers at the Australian National University* (ANU Press, 2011). Her first poetry collection, *Proof* (Recent Work Press, 2017), was published after her work appeared in journals, anthologies and on Canberra buses. Now retired, Shapley is working with the UNESCO Australian Memory of the World Committee, the Australian Women's Archives Project and preparing a second poetry collection.

What will your legacy do?

Advance medicine
Educate communities
Protect animals
Improve cities
Promote humanity

The University is tackling all these challenges and many more every day.
By leaving a bequest, you can make your passion your legacy.

Call our bequest team on +61 2 8019 7979
or email Alexandra Miller at
planned.giving@sydney.edu.au

THE UNIVERSITY OF SYDNEY