THE UNIVERSITY OF AUCKLAND ALUMNI MAGAZINE

Ingenio

AUTUMN 2019

FIGHTING CANCER

OUR RESEARCH REVOLUTION

Essential entrepreneurs
University innovators boosting the economy

Random acts of kindness
Can we keep them up?

Taking Issue
Social media in a democracy

BIG PICTURE

BOLD AS BRASS

Second Line brass band, the Auckland City Scoundrels, shared their energetic musicianship on the City Campus during Graduation Week. Photo: Godfrey Boehnke

this issue

23
Design: Deb Polson

37
Art: Finn McCahon-Jones

14

Shape of things to come

Olaf Diegel's additive manufacturing skills reflect the type of innovation New Zealand needs.

Ingenio
The University of Auckland Alumni and Friends magazine
Autumn 2019
ISSN 1176-211X

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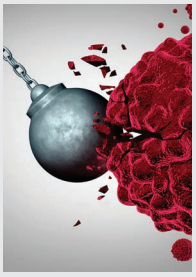


Editorial

TO LIVE AND LEARN

The terrorist attack against Muslim communities in Christchurch on 15 March has had a significant impact on the people of New Zealand, including students, staff and alumni of this University. All of us will recall well our initial shock on learning that people had been attacked as they exercised their right of freedom to worship. Then came the utter horror, as the scale of this tragedy gradually became evident.

The staff and students of the University reacted quickly to this event, keeping all our people well informed, ensuring that those most vulnerable in our community felt as safe and protected as possible, and providing those most deeply affected with appropriate support as they dealt with their bewilderment and grief.

Later came a major organisational effort to support the Jumu'ah prayers the following Friday, supported by a vigil involving more than 1,000 staff and students, the formal He Karakia Whakāwatea (service of remembrance) a week later and a vast array of other responses that sprung up spontaneously across the University.

I think all members of our community, but particularly those most directly affected, have been touched by the warmth, compassion and care for each other demonstrated by many colleagues around our campuses.

That willingness to just get on and do the right thing reminds us that while the University is a large, complex and diverse organisation, it is also, at its heart, an incredible group of decent people, one that we are lucky to be part of and can be proud of.

It is in the nature of these events that we must sooner or later return to our daily lives, but we must also ask how we can prevent such tragedies occurring again. The reality is that we cannot avoid having a small number of people in our society who are, for whatever reason, inclined to evil. But we can deprive them of the opportunity to again create this kind of horror. For that reason, I believe we should all applaud the steps the government has taken to address the inadequacies in our gun laws.

Perhaps more directly, we can all work together to create an environment in which the kinds of behaviours that incubate these tragedies are utterly unacceptable. It is up to all of us, while safeguarding the rights of free speech that are fundamental to a university and to a democracy, to ensure that we also actively protect the freedom and wellbeing of all members of our society.

As an institution that is itself diverse, with thousands of students and staff from more than 120 countries, a great many international relationships and alumni living in 100 countries across the globe, the University of Auckland is particularly well positioned to do just that.

The one good thing that will come out of this tragedy is all of us dedicating ourselves to a much more active engagement with, and support of, our fellow human beings in all their glorious diversity.

STUART McCUTCHEON

Vice-Chancellor

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Cover story

RESEARCH REVOLUTION

By Geraldine Johns

In the past decade, cancer research undertaken at the University of Auckland has changed lives. Our top scientists say it has now entered the next frontier and there's hope that cancer could eventually be brought under control.

On Waterloo Quadrant sits the High Court. Today, as in most weekdays, some trials of great significance are under way. Just across the road, more trials are taking place. Here at the Thomas Building is a research centre focused on immune therapy – one of the most significant cancer treatment developments in the past decade – which Professor Rod Dunbar drives.

Rod is the director of the Maurice Wilkins Centre, a position he's held for almost ten years, co-ordinating research across New Zealand in human therapeutics.

After completing a medical degree and a PhD, Rod spent six years as a post-doctoral research fellow in human immunology at the University of Oxford before returning to New Zealand in 2002. He has specialised in immune therapy since his Oxford days.

Rod spoke to *Ingenio* ten years ago about his work in immune therapy: identifying and purifying the particular T-cells in the blood that have the capacity to recognise and kill cancer cells. Those cells, once stimulated and fed with the right nutrients, can keep dividing to produce an army of identical cells, all with the same capacity to attack and kill cancer cells while leaving normal cells alone.

Back then, Rod described immune therapy as "the next frontier" in cancer treatment. Now, he says, it's the "big revolution" in cancer care. As an example, he cites his work with Dame Margaret Brimble – another Maurice Wilkins Centre principal investigator. Together, they have developed innovative chemical technology to generate cancer vaccines. As reported in *Ingenio* Autumn 2018, this work is being translated for clinical use by the spin-out company SapVax, which is developing a pipeline of products for the treatment of different cancers.

To illustrate the work to date, we tour Rod's research facility. First up, there's a new arrival to view: a machine used to analyse different cells within tissues, including cancer tissues. The significance of its arrival is marked in the fact Rod's colleague, Dr Anna Brooks, who leads the Auckland Cytometry facility, knows the exact date of its arrival: "7 January", she enthuses.

Explains Rod: "What Anna's done with our flow cytometry facility is develop cutting-edge tools that are not only being used in our research, but are also being used by companies from around the world in their clinical trials in Auckland.

"Every single dot you see on the screen is a particular cell … one collection of dots is T-cells that can kill cancer cells, and we can separate these cells out and make them multiply."

Deeper into the lab is a development that takes cell culture a significant step further. It's a clinical-grade cell culture suite that completely isolates the cells inside a machine sealed off from the room outside. Inside that space are filters, such as those seen in operating theatres, that clean the air so there are no infectious particles. This guarantees sterility, and enables cells to be grown safely for use in the clinic, says Rod. The lab is almost ready to produce T-cells for patient treatment, with the first clinical trial planned for 2020.

"We take a sample of a patient's blood and we stimulate it in ways that grow the cancer-killing T-cells. Because they have been confined inside that sterile environment, we will be able to inject them safely back into the patient."

In other words: custom-making cells to target an individual cancer patient's tumour.

That wouldn't be possible in a lab other than one of this type, which uses an internationally recognised quality-control system that ensures therapeutic products are produced consistently and safely.

"Even patients with the most dreadful disease, a modest percentage are now surviving for very long periods after immune therapy. It gives us hope."

– Professor Rod Dunbar

And nor would the unit be functioning were it not for the efforts of one particular philanthropist, who chose anonymity but whose largesse enabled the development of the cell therapy unit's processes and protocols.

"The scale of philanthropy that New Zealanders are now contributing to the University is incredible," says Rod. "As researchers, we are so grateful – these gifts make an enormous difference in lifting our ambitions and enabling us to reach for goals that would simply be unachievable through our public science funding."

So how does the kind of cell therapy Rod's team is developing relate to the ongoing immune therapy "revolution"?

Rod notes that some forms of immune therapy are now first-line therapy for patients with some types of advanced cancer – the classic cases being melanoma and lung cancer patients who had "a terrible prognosis" up until very recently.

"Even in patients with the most dreadful disease, a modest percentage of them are now surviving for very long periods after immune therapy – in fact, they are probably cured.

"That's a really impressive clinical signal – not just a result from a lab dish or an animal model – so it gives us hope that all cancer could eventually be brought under control by

adding in immune therapy to a combination of conventional therapies such as surgery, chemotherapy, and radiotherapy.

"In fact, I can now tell my students with some confidence that cancer will be far less of a problem for their generation than it was for their parents' generation. At the rate things are moving, more and more cancers will be brought under control over the next two decades."

But major challenges remain. Immune therapies can only cure patients if their T-cells can attack and kill every single cancer in the body. So, one of the challenges is to understand exactly which molecules inside the cancer cells make them most vulnerable to T-cell attack – and least able to escape that attack.

Rod likes to draw an analogy with the iconic Cerebos salt cellar, which bears a picture of a boy chasing a bird. "If that kid's eventually going to grab the tail feathers of the chicken, the chicken is going to ditch the feathers and run off."

Cancer cells have the same capability – they can switch off molecules that make them vulnerable to T-cell attack. Working with bioinformatics expert Dr Klaus Lehnert, Rod's team is trying to define molecules within tumours that can be recognised by T-cells, but can't be discarded like tail feathers.

"And then, of course, once we grow T-cells that recognise those molecules, we'll soon be able to infuse them into patients and test whether they can really control their cancer."

Some 20 years ago, he wrote his first paper showing that cancer-killing T-cells could be purified directly from patient blood. "But even when I was in Oxford, I didn't have the capability to test whether they'd be useful in patient care, since Oxford lacked a cell therapy facility. Now we've built one at the University of Auckland, and we can directly test whether our new T-cell culture methods will benefit patients – informed by all the incredible science that's happened since."

***Cutting-edge therapies**: Professor Rod Dunbar tells his students cancer will be far less of a problem for their generation than it was for their parents' generation.*

The immune system is "our frontline defence against cancers". – Professor Bill Denny

Dr Paula Barlow was a student who completed her medical degree in 2008. She has gone on to specialise in medical oncology, and until recently was a research fellow at the Auckland Cancer Trials Centre. When she was at medical school, the mainstays of treatment were chemotherapy, surgery and radiotherapy. There was no talk of immune therapy.

Since then, she has witnessed a rapid change in the approach to cancer treatment.

"One of the most significant changes we've seen is the introduction of more targeted therapies, such as tyrosine-kinase inhibitors and antibody treatments," she says. "These drugs more specifically target cancer cells, often resulting in better treatment outcomes with fewer side effects compared to traditional chemotherapy."

More recently came the addition of immune therapy. "This is where there's been an explosion of information within the past few years. There have been very exciting developments – not only immune therapy, but also combinations

of immune therapy with other traditional treatments such as chemotherapy."

The combinations often seem to be more effective than either agent by itself. "With each step along the way, it's another addition to our arsenal of weapons against cancer," says Paula.

Again, philanthropy has played a key role in enabling more work to be done. Driven by Dr Sanjeev Deva – the centre's medical director – the Auckland Cancer Trials Centre was funded by an anonymous donor. Opened in 2017, it runs as a partnership between the University's Faculty of Medical and Health Sciences and the Auckland District Health Board. In its first year of operation, it saw more than 80 patients with advanced cancer through its doors, all of them involved in early phase trials of novel anti-cancer therapies.

Says Paula: "It's been a really inspiring time in terms of developing that research base at the hospital. Importantly, there has been more clinician-scientist collaboration through this work as well."

She developed an interest in medical oncology during her final year at medical school and says that one of the aspects that drew her to it was that it was such a rapidly changing field.

"I imagine the way we treat patients at the end of my career will be extremely different from the way we treated patients at the start of my career, and I'm already seeing some of that change, which is remarkable."

Some of that change comes from Professor Cristin Print's area of research – genomics and bioinformatics. It's the analysis of gene sequences and how genes are used in health and disease. After his PhD in immunology, he spent four years in Melbourne, then six at Cambridge.

He and his Cambridge colleagues published their first research paper using genomics in 2003 – at that stage their analysis used a second-hand robot to spot microscopic amounts of DNA onto small pieces of nylon paper. While these methods were groundbreaking at the time, today Cristin and his Auckland colleagues Dr Ben Lawrence, Dr Cherie Blenkiron and Dr Annette Lasham use DNA sequencing machines to "read" hundreds of millions of DNA sequences from a patient's cancer. Working with bioinformaticians Peter Tsai, Dr Ben Curran and Dr Nicholas Knowlton, Cristin's group use high-performance computers and Artificial Intelligence to identify personalised therapies and predict individual patient prognoses. PhD student Tamsin Robb used those methods to analyse the genetic evolution of more than 20 metastatic tumours in one patient.

Says Cristin: "Our work has shown that in some tumours, changes in the number of copies of whole chromosomes may be the main driver of tumour development, rather than mutations in individual genes."

Working with PhD student Sandra Fitzgerald, and cancer clinicians Dr Rosalie Stephens and Dr Jon Mathy, he's recently begun to successfully sequence the cancer DNA that leaks out of tumours into the blood of patients. "This allows you to monitor a tumour, its specific mutations and its genetic evolution over time using simple blood tests in the community, rather than patients needing to go through tumour biopsies in hospital. Our vision is for all cancer patients to receive personalised therapy based on genomic testing of their blood samples."

"If Bill Denny was in the Olympics, he would be a serial gold-medal winner and we'd have knighted him years ago."

– Professor Rod Dunbar

The changing shape of cancer treatment is something Distinguished Professor Bill Denny knows all too well.

Bill, a director of the Auckland Cancer Society Research Centre and co-founding scientist of Proacta Therapeutics, has been designing cancer drugs for 42 years. The Auckland- and Oxford-trained medicinal chemist can map the advances – and challenges – since he first stepped into the Auckland

***Lifetime of cancer research**: Professor Bill Denny has been developing cancer drugs for more than 40 years. In 1972, our cancer survival rate was 24 percent. Today it's 57 percent.*

lab after he left a promising pharma offer in London in 1972. Back then, New Zealand's 10-year cancer survival rate after diagnosis was 24 percent. By 2014, the rate had increased to 57 percent, according to Ministry of Health data. That's come through a combination of factors: better lifestyles, better screening and earlier treatment – via surgery, radiotherapy and new drugs.

"But it begs the immediate question of how can we improve things further," says Bill.

He enjoys international recognition: his awards include the Rutherford Medal of the Royal Society of New Zealand, the Adrien Albert Medal of the UK Royal Society of Chemistry, the American Chemical Society Medicinal Chemistry Award and an Officer of the New Zealand Order of Merit for services to cancer research. His colleagues and associates just call him Bill.

Professor Rod Dunbar goes further than that to describe Bill. "He's been peerless in his ability to keep an extremely large team of world-class scientists going for decades. If he was in the Olympics, he would be a serial gold-medal winner and, frankly, we would have knighted him years ago for his level of performance."

To date, the centre Bill heads has taken 15 new drugs to clinical trials in New Zealand and around the world.

When Bill first returned to his homeland from his post-graduate studies, cancer treatment was more of a one-size-fits-all approach. The drugs used targeted DNA and were generally more toxic than they are now. They did not benefit all patients.

Now, therapies are much more focused on individuals, says Bill. "The real difference between then and now is that now we know every cancer is different for each person, and changes over time."

Cancer technology has moved on a great deal since *Ingenio* did its last major feature on the subject, ten years ago. Consequently, Bill and a wide range of collaborators – scientists, clinicians and outside commercial companies – now understand the "staggering" complexity of a human cell and the proteins inside it.

"It's only when we get to the atomic level that we see the unique differences between proteins, and target them," he says.

The centre he heads has three key areas of research: drugs to control cancer cell signalling; drugs targeting hypoxic (oxygen-starved) cancer cells and drugs to boost the body's immune system. The steps they have taken with drugs to control cancer cell signalling have seen them establish an acrylamide "lock" unit, which inhibits signalling pathways in cancer cells. Since its inception in 2000, 12 such drugs have been approved – all of them applying this concept.

Hypoxic tumour cells are difficult to kill

Donor lifeline

The Cancer Society is one of a number of significant players to ensure funding for research reaches this University's experts.

It was an auspicious occasion: the Chancellor's Dinner, held in November 2018. Among the 350 guests was Jonathan Koea, president of the Cancer Society Auckland Northland division. He was there to see the Society honoured by the University for donations totalling more than $50 million towards cancer research – research carried out at the University.

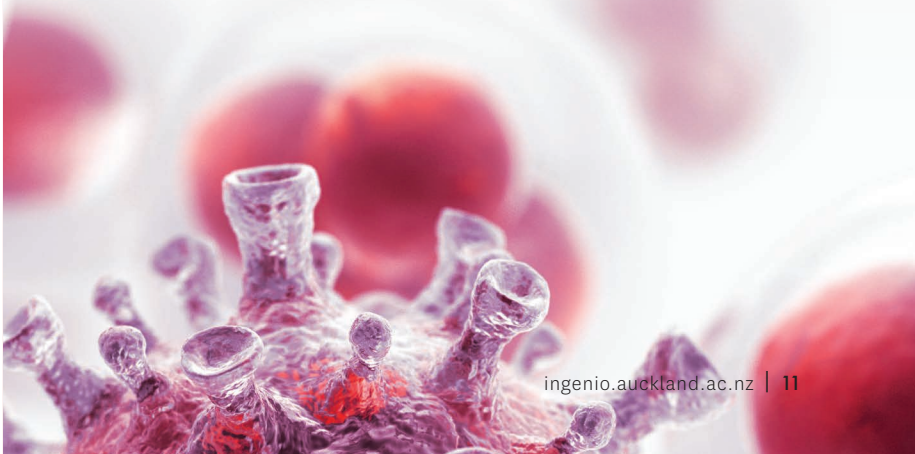
Acknowledging the efforts of staff, volunteers and board members, he said: "This demonstrates our collective commitment towards using research as a powerful tool to reduce the impact of cancer on patients and whānau."

The dinner, he added, was an opportunity "to reconfirm Cancer Society Auckland Northland's commitment to partnering with the University to foster high-quality cancer research for New Zealanders by New Zealanders."

Paul Hayes, marketing and communications manager at the Cancer Society's Auckland Northland division, says it's a remarkable milestone. "It's all through the generosity of donors, bequesters and the people who participate in various fundraising events that we run."

The largest share of the research funding provided goes to the Auckland Cancer Society Research Centre, of which Distinguished Professor Bill Denny is a director. From an annual turnover of $11 million, some $2.5 million is contributed to the Research Centre; a further $250,000 goes to the Auckland Cancer Trials Centre.

Cancer remains New Zealand's number one killer, with 150 cancer-related deaths and 400 new diagnoses a week. The World Health Organisation's International Agency for Research on Cancer released its Globocan 2018 database last year, which identified lung cancer as the deadliest type of cancer in New Zealand, with an estimated 1,758 deaths last year. Non-melanoma skin cancer was the most common cancer, accounting for 31 percent of new cases (10,741) in 2018 and 167 deaths. Of new cancer cases, prostate cancer was the second most common type (3,822), breast cancer third (3,504), melanoma of the skin fourth (2,718), lung fifth (2,416) and colon sixth (2,276).



***Fast-paced change**: Dr Paula Barlow says there are particularly exciting developments in immune therapy being combined with traditional chemotherapy.*

with conventional drugs. These cells can also reoxygenate and repopulate a cancer after treatment. However, Bill and his team have moved to fight them from within by developing hypoxia-activated drugs that contain an oxygen sensor that keeps the drugs non-toxic until they reach the remote oxygen-starved cells.

"They then turn on to become toxic and the toxic form redistributes throughout the cancer," says Bill.

Three drugs have reached clinical trial in this area.

And then there's the immune system, "our frontline defence against cancers," says Bill. He says not so long ago the system was so complicated that "we couldn't even contemplate how we would affect that". That has all changed dramatically in the past decade.

One programme developed by Bill and his team subverts the immune system's response to cancer by using a drug to recruit a patient's own immune cells and then start generating growth factors. These can cause cells to be stimulated and to grow, shutting down the protein secreted by cancers. Immune therapy, increasingly based on each individual patient's genetics, is the next big thing, he says.

All this work costs money. Bill says people are always commenting on the "horrendous" costs of new drugs.

"The dilemma we have is that because of the focus on drugs and new classes of drugs, the cost of them is going up. But at the same time as we subdivide cancers into smaller blocks, the patient population becomes smaller, so the cost of treatment soars."

The government is unable to fund everything, he says, and costs truly have risen. The role of philanthropy in developing drugs to go to trial and beyond is equally huge. While the Cancer Society provides substantial funding to the Auckland Cancer Research Centre, Bill and his colleagues still have to find a considerable amount themselves.

"The Cancer Society contribution is absolutely critical," says Bill. "But beyond that, the Centre still has senior staff at associate professor level who have to write their own grant applications."

The Research Centre wants to see cancer survival rates increased to 75 percent within the next decade. It's a goal they're working towards with many other researchers around the University. For example, Auckland Bioengineering Institute experts have developed computerised models to help detect and track the path of breast cancer – models that are shared with clinicians to improve treatment.

Cristin Print, who also chairs the scientific advisory board of the Auckland Regional Tissue Bank, says there's another important group to acknowledge in the fast-moving realm of cancer research.

"Tissue banks hold patient registers and tumour tissues bravely donated by consenting patients – they're the core of genomic cancer research." ■

People impact

The importance of the work by University of Auckland cancer researchers is profound for those with cancer, such as young Lucca, pictured with her mum, Jordanna. The development of new drugs is key to staying abreast of the latest treatments.

Watch video at **tinyurl.com/CancerResearchUoA**

Guest columnist **Finlay Macdonald**

KINDNESS OF STRANGERS

It feels like an odd thing to write, but since the atrocity of 15 March in Christchurch I've been thinking a lot about kindness. The response of ordinary New Zealanders and of their prime minister to what happened was greeted with something resembling astonishment around the world. People elsewhere, long inured to the morally vacuous "thoughts and prayers" of politicians in the aftermath of awful events, seemed almost grateful for a glimpse of another possible way of reacting.

For Jacinda Ardern it was a terrible opportunity to demonstrate practically what she had previously really only spoken about – empathy and kindness, and her belief that these qualities might define us better than the mean-spiritedness and ideological tribalism that tends to be the face staring back at us in the media mirror.

In her speech to the United Nations last year she put it this way: "We are a self-deprecating people. We're not ones for status. We'll celebrate the local person who volunteers at their sports club as much as we will the successful entrepreneur. Our empathy and strong sense of justice is matched only by our pragmatism."

There is no doubt this was who we were after the Christchurch horror. At the local mosque near my house in Auckland, I witnessed ordinary New Zealanders arrive and linger outside, deliver flowers and heartfelt notes, cry and embrace their Muslim neighbours – who would, I'm certain, have been strangers mere hours earlier.

It was more than a sense of being united in grief, it was about being united in revulsion, too. Revulsion at an act that was the precise opposite of kindness, revulsion that it had been allowed to happen here, revulsion at a twisted pathology that had festered in our midst and perhaps even been nurtured by everyday bigotries that none of us had challenged hard enough.

It was that last bit that gave me pause to wonder whether we could truly change for the better, to genuinely embrace kindness as a guiding social and political principle, or whether we would soon enough slip back into our old ways of not looking, not really caring.

Such were my thoughts, anyway, when I caught a cab to the airport recently. My driver was originally from India, but had been living in Christchurch when the earthquakes struck. Trapped with his wife in the rubble of their home for two days, they were lucky to have been rescued in time and had flown to Auckland without any plan other than to get away from the trauma of it.

Taken in by an ordinary family who had volunteered to help, they were essentially adopted – fed, clothed, found work and given a home for three years until they were back on their feet properly. If they protested and tried to leave, he said, they were told firmly by their 'Kiwi mother' that they were her 'Indian children' and they weren't going anywhere.

This astonishing act of anonymous charity was partly repaid, he told me, when he and his real family hosted his new family on a bespoke tour of his region of India, all food and lodging provided – an experience he said everyone relished.

To my driver, then, the reaction of most New Zealanders to the mosque attacks was not particularly surprising. He had intimate experience, after all, of the very empathy, strong sense of justice and pragmatism that Ardern spoke about in her UN address. To which you might add racial and cultural tolerance.

No, life's not an Oprah show, not all Kiwis are as full of aroha, nor would many of us have the requisite selflessness to do something similar. But I was heartened by his story – we all want to hope the good will ultimately outweigh the bad, after all. We've all witnessed how human beings look after each other in extremis.

At the same time, I'm not under any illusion that kindness alone will be an adequate answer to the problems that now face us – systemic inequality, environmental collapse, climate change. In an inherently unkind, confrontational political system, is kindness even sustainable?

But maybe Jacinda Ardern is really onto something, maybe appealing to our better angels can inform the way in which we confront the real problems. Maybe we could find a way to hold on to that sense of fellow feeling that defined our reaction to Christchurch and let it guide our actions more generally.

And maybe I'm a dreamer, but it's still worth asking ourselves why it can't be like that all the time. ■

About the writer: *Finlay Macdonald has a politics degree from the University of Auckland. He has worked as a journalist, editor, publisher and broadcaster since 1986.*

"We've all witnessed how human beings look after each other in extremis."

Powerful: *Prime Minister Jacinda Ardern's image travelled around the world.*

Feature

SHAPE OF THINGS TO COME

To move beyond an economy founded on agriculture and tourism, New Zealand needs the type of entrepreneurial activity being undertaken by world-class researchers at the University of Auckland.

By Gilbert Wong

Think of New Zealand as a business asking for advice from the accountant. She sits down to review Aotearoa Inc's revenue streams and is unimpressed. The majority of Aotearoa Inc's revenue comes from just two sources, primary industries, mainly dairy and meat exports, and tourism. New Zealand no longer lives off the sheep's back, but the sectors the country has gravitated towards do little to spread economic risk and they don't look like the future in an age of environmental stress.

Professor Olaf Diegel who leads a new University of Auckland initiative, the Creative Design and Additive Manufacturing Laboratory, puts it this way: "There's only so much milk you can produce. Fonterra is doing good and new things with milk. But I think we're not far off reaching a plateau in what we can do here. There are only so many trees we can grow, only so many cows we can milk."

Our two main earners rely on the twin naturals, resources and beauty. As the OECD put it in a 2017 'Review of New Zealand Environmental Performance', our growth model "based largely on exploiting natural resources is starting to show its environmental limits". Peak milk and peak tourism are coming, the only question is when.

The puzzle has more pieces. Every society now faces the unpredictable buffeting of the tornado pace of technological change. As the World Economic Forum noted, "By one popular estimate, 65 percent of children entering primary schools today will ultimately work in new job types and functions that currently don't exist."

If the future is not what it used to be, Wendy Kerr, the director of the Centre for Innovation and Entrepreneurship (CIE), has a ready response.

"We need to diversify where we get our earnings from and the University is key to that. If we want to create a value-added knowledge-based sector and create more jobs that aren't based on primary industries and tourism, then innovation and entrepreneurship is where those jobs will come from."

If the CIE is how the University plants the seeds of innovation and entrepreneurship, Will Charles, the executive director for commercialisation at UniServices, stands at the sharp end of the journey: where research becomes intellectual property in search of market opportunity.

For Will, it is simple. New Zealand plays in a global game it cannot afford to lose.

"Knowledge has no boundaries. If we don't take the opportunities from someone's research, then someone elsewhere will."

Innovation and entrepreneurship are founded on research excellence. Research excellence attracts the brightest students and best post-doctorates. The best post-docs become the brightest professors of the future. Without them, the University slips in world rankings and risks being dragged into a downward spiral, bad news for any university, but a disaster for the prosperity of New Zealand.

Will says: "A smart nation used to be measured by research papers and graduates. Today, a smart nation is determined by how well it converts research into economic or social activity."

Wendy and Will are key players in a national imperative for which the University of Auckland has been a strong advocate. The goal is to transform New Zealand from a country reliant on the export of natural resources, with little added value, to a smart nation in the global knowledge economy.

Wendy and the team at the CIE are the hub for the University's efforts to nurture and

***Innovation in 3D**: Olaf Diegel, opposite page, is head of the Creative Design and Additive Manufacturing Lab. As well as creating custom-made prosthetics, like the one above right, he has made more than 70 3D-printed guitars. Main photo: Dean Carruthers*

"If we don't take the opportunities from someone's research, then someone elsewhere will."

– Will Charles, UniServices

coach the next generation of innovators and entrepreneurs. The Centre's programmes range from a Master of Commercialisation and Entrepreneurship through the School of Business, to a range of experiential programmes designed to ignite new ideas and coach new ways of working.

Most notably, the Velocity programme, launched in 2003, has now helped more than 110 new ventures get started, which in turn have raised more than $220 million in capital and created more than 600 new economy jobs. A mix of design-thinking boot camps and innovation workshops, the programme backs aspirations with cash in an annual $100k Challenge to choose the teams with the best ideas about new ventures, social enterprises and university research.

The big picture is for 10 percent of the University's 40,000-plus students to be engaged in the centre's programmes by 2020. In 2018, 2,557 students took part, with 131 graduates in the Masters of Commercialisation and Entrepreneurship since 2012.

Wendy, looking at the year-on-year trend, reports a 320 percent lift since 2015 and is confident of reaching the 2020 target.

Will has been the commercialisation lead at UniServices since 2005. In the five years to 2018, UniServices has assessed 710 inventions for commercialisation and licensed more than 270 patents. Spin-out companies have raised more than $148 million over the same period.

His latest project, Return on Science, is part connector, part X-Factor for commercialising research and new ideas. Return on Science enables researchers, start-ups, investors and entrepreneurs to tap expertise and networks through nationally convened investment committees with experts in the science and business side of agritech, biotech, life sciences, information and communications technology and physical sciences. A parallel programme,

"To me, it's not fail fast, fail often, but fail extra fast, fail extra often."

– Olaf Diegel

Momentum, does the same for students.

Distinguished Professor Dame Margaret Brimble is in the School of Chemical Sciences and the first New Zealand woman scientist to be elected a Fellow of London's Royal Society. A world-leading researcher, she has seen her work become the foundation for companies in the globally competitive business of drug development.

Neuren Pharmaceuticals, listed on the ASX in 2005, has progressed to Phase 3 clinical trials, the final step before FDA approval, for a new drug, trofinetide, that Dame Margaret discovered to treat Rett syndrome. A neurodevelopmental disorder, it has been described as a combination of autism, cerebral palsy, Parkinson's, epilepsy and anxiety disorders. It only affects females, with a prevalence of one in 12,000, enough for the devastating congenital condition to be the second most common cause of severe intellectual disability after Down syndrome. Trofinetide has also been trialled for patients with Fragile X syndrome and traumatic brain injury.

Dame Margaret says: "There's nothing better than being in front of a class of organic chemistry students and telling them that one day they could make a drug for Rett syndrome."

A further strand of her research is behind a new generation of cancer vaccines, based on her novel peptide platform technology, being developed by an American company, SapVax. Local company Living Cell Technologies has also licensed Dame Margaret's compounds to develop treatments for migraine and obesity.

***Innovative minds**: Professor Dame Margaret Brimble, above, and (facing page) Associate Professor Suranga Nanayakkara, left, with students.*

For Associate Professor Suranga Nanayakkara, the big questions are about how to humanise technology.

In 2014, *Time* magazine's innovation issue singled out his FingerReader, which allows a visually impaired person to scan text at the tip of their finger and read it aloud, as opening a new world of independence for the blind.

Suranga and his team relocated from Singapore to set up the Augmented Human Lab in the Auckland Bioengineering Institute in 2017 under the Entrepreneurial Universities programme funded by the Tertiary Education Commission. The $35 million programme was the idea of the University of Auckland and enables world-leading entrepreneur researchers to relocate to New Zealand.

"There is no way to survive if we don't innovate," says Suranga. "The simple reason is that technology is changing everything. Science fiction is becoming reality today."

Distilled to its essence, innovation is problem solving.

"Nobody can predict the future, but we know there will be challenges, and if the skill we coach is actually problem solving and how to identify opportunities that respond to problems, that's the mindset and culture we need."

Under Suranga's mentorship, students have set up two start-ups, one looking at further development of the FingerReader concept, the other based on a shoe that gives feedback on gait and other data for anyone from a high-performance athlete to a person with a mobility issue.

He sees New Zealand as having the DNA to make the shift to an innovation culture. Here, he says, it is okay to question the accepted wisdom.

"Elsewhere, education tends to be driven by the idea that there is only one answer and whoever gets there fastest wins. The problem is, that leaves no room for innovation."

"Technology is changing everything. Science fiction is becoming reality."

– Associate Professor Suranga Nanayakkara

Olaf Diegel also joined the University under the Entrepreneurial Universities programme. He came from Sweden and is an innovator in Additive Manufacturing (AM) or 3D printing, a disruptive technology already affecting manufacturing and global supply chains

Centre of Innovation and Entrepreneurship	UniServices	Entrepreneurial labs at UoA
110 new ventures	**165** licensing deals	Mark Billinghurst: Empathic Computing Lab
600 new economy jobs	**30** new businesses launched	Suranga Nanayakkara: Augmented Human Lab
$220m in capital raised	More than **$50m** venture and seed capital	Olaf Diegel: Creative Design and Additive Manufacturing Lab
10% of students involved by 2020	*(Since 2005)*	*(Funded from $35 million Entrepreneurial Universities programme, Tertiary Education Commission)*

and creating new markets for the mass customisation of products.

To demonstrate the technology in a mainstream kind of way, he has made more than 70 3D printed guitars that he's had shipped to Auckland and which are on display in his office. But that's just the hobby side of his work. In his lifetime, he predicts the bio printing of human organs from kidneys to livers, using stem cells. "Once we crack the vascular system we will progress to complex organs."

Olaf has begun discussions with local companies about projects from better prosthetic limbs to nutrient-laden printed food in agar gel.

For New Zealand to shift to an innovation mindset, Olaf says we need to reframe how we see failure. Innovation recognises that eight out of ten ideas turn out to be rubbish.

"To me, it's not fail fast, fail often, but fail extra fast, fail extra often."

For New Zealand to prosper, we need to get past the perception that an entrepreneurial academic is a contradiction in terms.

Will defines an entrepreneur as a person who has a vision or a burning question and is adept at putting together the people and money to achieve that vision. "The University is full of highly active researchers," he says.

"They live it, they breathe it, they fizz with it. They might not express what they do in the way society traditionally thinks of as an entrepreneur, but this is very definitely entrepreneurial activity." ■

NEXT GEN **INNOVATORS**

KATE RIEGLE VAN WEST
Founder, SpinPoi

The enterprise: SpinPoi is a social enterprise based on Kate's doctoral thesis in Dance Studies, a scientific study on the impact of poi exercises on elderly people. It found use of the poi improved upper limb strength and range of motion and reduced blood pressure. Kate (pictured) won the prestigious Future Leader Award from the Royal Society Te Apārangi Early Career Research Forum in 2017.

The lesson: "Not being committed to a particular mindset or paradigm allows me to pivot and progress."

Good advice: "Go for it! Approach things playfully, ask lots of questions and follow your heart. It won't be easy, but most things worth pursuing aren't."

NEIL BIRRELL
Director
Hexacycle Ltd

The enterprise: Hexacycle aims to convert organic waste into a source of sustainable protein and oil. Neil hopes to do this by bringing insect protein into our food chain, while reducing organic waste in landfills. Neil and his team won the social innovation category in the 2016 Velocity $100k Challenge.

The lesson: "Being innovative and entrepreneurial is like a super power: it can change the world for the better."

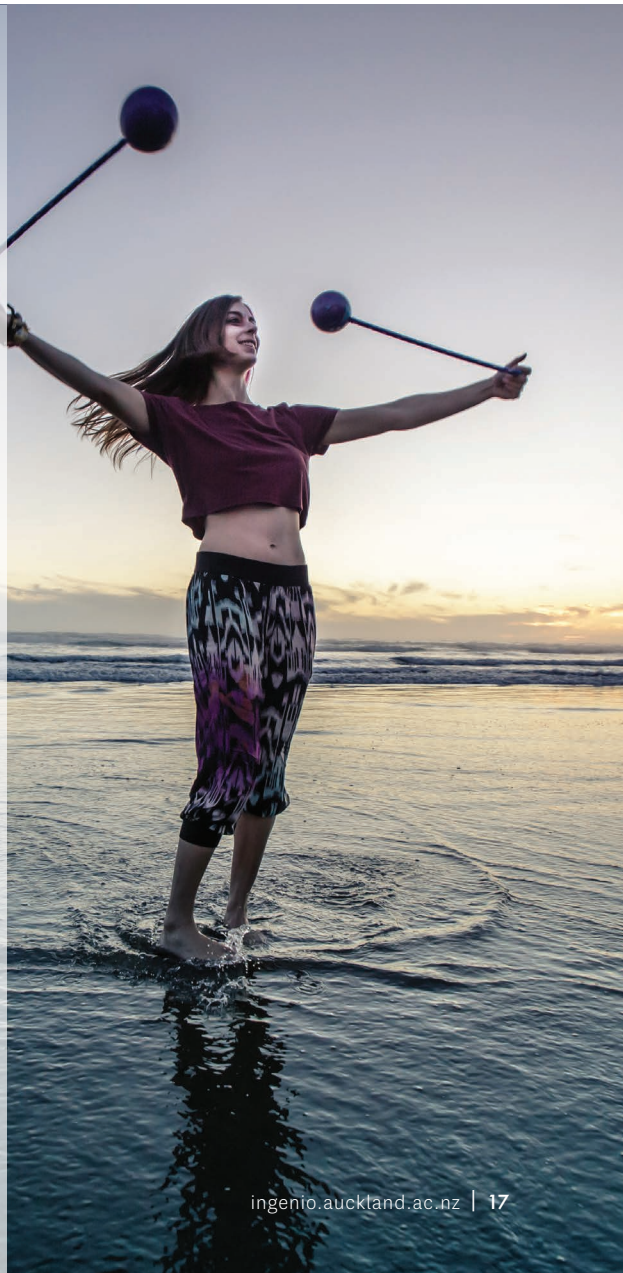
Good advice: "While you're studying is the best time to explore entrepreneurial pathways, as you have the whole university wanting you to succeed and lots of opportunities available to you."

ALLIV SAMSON
Co-founder and COO, Kami

The enterprise: Kami is an app for students and teachers to collaboratively annotate and edit online documents. It has five million users, with a team spread across the United States, New Zealand and the Philippines. The idea for Kami came up when Alliv was completing her Bachelor of Arts.

The lesson: "Execution is important. Ideas have no value until you do something about it. You have to be prepared to either succeed or fail. What is important is to execute fast and learn from the process."

Good advice: One of her investors, Sam Altman, the president of start-up accelerator Y Combinator, told Alliv, "Follow your instincts and take risks."



Taking Issue

SOCIAL MEDIA

GOOD OR BAD FOR DEMOCRACY?

We asked three academics to address the question of whether social media is democratising or eroding democracy.

The writers' views reflect personal opinions and may not be those of the University of Auckland.

Dr Ethan Plaut

IT'S SIMPLY SURVEILLANCE

It's tempting to dodge this question by arguing technologies don't determine our politics, or equivocating with a feeble 'both-sides' answer. To make these disingenuous arguments, one might adapt Kranzberg's first law, "technology is neither good nor bad; nor is it neutral", to say: "social media is neither democratising nor is it eroding democracy; nor is it neutral."

This makes sense because new technologies, especially things as vast and various as social media, have uneven effects in different places and different moments. Social media is used not only by people organising for just causes but also by trolls sabotaging conversation for sport and by tyrants surveilling and propagandising the most vulnerable among us.

Likewise, social media isn't a single, specific tool. They're multiple technologies, industries and cultures that have specific histories and are in ongoing development by flawed humans (especially white men) in peculiar contexts (especially Silicon Valley).

At its best, social media serves our sincere desires to connect with each other – as friends, families, lovers, citizens – but social media corporations are legally bound as publicly traded companies to serve shareholders' needs first and foremost. Their business model is not to support reasoned discourse and other democratic processes. Their business model is surveillance: extract data and use it to develop and sell products like targeted advertising and propaganda as well as new artificial intelligence-based services.

We might use existing social media for democratic purposes, but only in limited and roundabout ways, because these systems were simply designed to do something else. This should not be surprising. Why would we expect corporations to build and maintain expensive infrastructures that we could trust to hold democracy together? It is much easier – and more profitable – to 'disrupt' or sabotage democracy than to nurture it.

One way forward – fraught, but still possible – would be governments and not-for-profit institutions supporting the development and maintenance of new social media designed for social justice.

Social media has great democratic potential but this will likely be corrupted and squandered as long as the platform's raison d'ệtre is to enrich distant shareholders.

Dr Ethan Plaut *is a lecturer in communication in the Faculty of Arts. Specialist subjects include computational media, digital journalism and propaganda and media ethics.*

Associate Professor Lech Janczewski

FLOODING THE WORLD WITH OPINIONS

The topic raises the question of whether social media is influencing the way we, as a country or as a society, are governed. If we agree that "democracy is a system of government where the citizens exercise power by voting", which may be done though formalised elections, referenda or other ways of expressing an individual point of view, the immediate answer to the question is therefore that social media is increasing democracy. However, the meaning of the question is whether social media overall is increasing the quality of governing societies or smaller groups. Unfortunately, I think, social media is decreasing that quality.

In the past, during the pre-digital era, voicing opinions was expensive, in financial terms. If you wanted to spread your point of view, you had to pay for it or find a sponsor. This, in a natural way, limited the number of opinions circulating in the public domain. As a result, it was difficult to spread any individual ideas.

Today, flooding the whole world with ideas is practically free. Anyone may circulate their point of view freely, including those who hold very radical views. By the law of statistics, there will always be some who agree with these ideas, even to the level of springing in to action.

Science fiction writer Stanislaw Lem expressed it this way: "Before using the internet, I was not aware that there are so many idiots around the world."

The world's reaction to the recent attacks in Christchurch supports that. World public opinion condemned the shooter, but in many countries there were voices heard supporting him. Social media is a vehicle for spreading such radical views because the old rule of publishing says: "It is not news when a dog bites a man, but it is news when a man bites a dog."

The management of social media systems assure us that they are working hard to limit the spread of radical ideas. But their financial model is, unfortunately, against them: cutting ideas would reduce the number of subscribers, resulting in fewer advertisers, which are the lifeblood of social media.

Bruce Schneier, in his book *Click Here to Kill Everybody*, suggested replacing the current internet with a limited access (paid?) internet. That might solve the problem, but tell that to shareholders of social media networks.

Dr Lech Janczewski *is an associate professor of information technology at the Business School. He specialises in information security (cyber war, cyber terrorism, cyber crime).*

"It is much easier to disrupt or sabotage democracy than to nurture it."

Watch Online

Ethan Plaut, Lech Janczewski and Maria Armoudian talk about social media's impact on democracy at **tinyurl.com/IngenioMagazine** You can have your say too, email **ingenio@auckland.ac.nz**

Dr Maria Armoudian

MEDIA AS DNA FOR SOCIAL SYSTEMS

When I wrote *Kill the Messenger: The Media's Role in the Fate of the World*, I meant it as a warning about how mediated messages of blame and hate can at times mean life or death. Genocidal frames of Rwanda, the Holocaust and Bosnia were able to turn friends, even family members, into deadly enemies. Hate frames in Chile contributed to societal chaos and justification for a military coup. Now, with the rise of social media and the internet, these messages can spread unmitigated faster and wider than ever before.

But it does not have to be this way. Media messages can also promote deep understanding, reconciliation and peace processes, as they have done at various times in history, including in Northern Ireland and Burundi.

Granted it is not only on journalists and media. These deeper messages that promote greater understanding of our social and natural world require leadership from all sectors – politicians, civil society and media professionals.

It is on all of us to advance deeper truths – on journalists to recognise and disseminate truths that may not emerge from their normal sources, to look beyond attention-grabbing soundbites and headlines that give rise to cheap, fleeting emotions that feel good for a moment but beg for greater intensity. It is on governments to reconsider the political structures and purposes of media and ways in which to usher in a more enlightened age. And for us, as civil society, to reject fake framing of "us versus them," "good guys versus bad guys" and "politics as a game" and instead recognise these as frames that have been imposed on us through fabricated ideas about how the world works. It is also on us to tell our politicians what we want. These are responsibilities that come with democracy and in our information age. Citizens must advise, media must inform, politicians must listen.

Media are like DNA for social systems, offering us the codes, information and ideas by which we organise ourselves. They offer glue for modern societies – common reference points, events, meanings, frames and social laws that guide our thinking and behaviour. When the information is flawed, like a mutant gene in our DNA, the system can malfunction.

Given rapidly changing technologies that can harm masses of people, such as a deadly virus-containing vial intentionally leaked at an airport, we have no choice now but to build a better media and a better society.

Dr Maria Armoudian *is a senior lecturer in politics and international relations in the Faculty of Arts.*

FINANCIAL BOOSTS FOR THE FUTURE

The University's Campaign For All Our Futures, publicly launched in 2016, winds up on 31 October. By the end of 2018, there had been 6,622 donors, helping fund key projects including research into cures for diseases and creating hardship scholarships.

"The campaign has captured the imagination and support of alumni and philanthropists here and around the world," says Mark Bentley, Director of Alumni Relations and Development. "Most gifts are given for a specific purpose, often aligned with donors' interests or because they want the next generation to have the opportunities they had."

He says the median gift for 2018 was $50, but there have been multi-million-dollar gifts from families, individuals, philanthropic trusts and companies.

"We have a large community of supporters who contribute at a level they can afford. When many smaller gifts are pooled together for a specific purpose, they really make a difference. If we can help a student complete their degree by reducing financial stress, they'll go on to contribute."

One such student is Morgan Tupaea. After her BSc, Morgan (pictured) worked for a year to save for her postgraduate psychology studies. Her partner picked up extra shifts at work and they stockpiled as much as possible for themselves and their little boy. Despite their best efforts, they had "eaten through" all of their savings – and their food – by September.

As debts piled up, and the electricity was about to be disconnected, Morgan faced dropping out of her honours degree. A hardship scholarship in October came just in time to pay the bills. "Receiving the scholarship was perfect; it changed our lives a lot," says Morgan. "I can stay at university studying what I love, and it's also made us feel stable and safe."

In 2018, more than 1,800 people made donations for scholarships. "To know donors are aware students are financially struggling, and want to help, is really heartwarming," says Morgan.

"It's made a huge difference to our family. I can't express my gratitude enough." ■

See videos answering the campaign's 'Can We' questions at **tinyurl.com/ForAllOurFutures** where you can also contribute.

CAN WE...

CHIEF JUSTICE FOR ALL

New Zealand's new Chief Justice is drawing attention to diversity issues.

When Dame Helen Winkelmann was sworn in as the 13th Chief Justice of New Zealand on 14 March, she became not only the second woman in the role, but the second alumna from the University of Auckland. Her predecessor, Dame Sian Elias (BA/LLB 1971, LLD 1999), held the position for 20 years until 13 March, retiring at the compulsory age of 70.

Dame Helen (LLB 1987) says Dame Sian had been a mentor and that having women in positions of significance is aspirational for young women. "It's important because it's encouraging to see someone a little like you in the role. When I was going through Law School, women didn't have that encouragement, because at that time judges were all grey-haired men.

"Mentoring, as we know it today, wasn't available at Law School either, certainly not as far as women mentors went. But people who sparked and maintained my interest in the law were Professor Mike Taggart, who died prematurely in 2009, Professor Francis Dawson, who still works at the University of Auckland, and Professor David Williams, just retired."

Dame Helen says some issues of gender equity have been addressed in the judiciary by the efforts of successive attorneys-general, but equally important is the issue of diversity in the profession, which requires urgent discussion.

"The judiciary needs diversity of thought and you achieve that by having people from diverse backgrounds. But the judiciary draws its appointments from the profession and our profession currently lacks diversity in background. I see this as an urgent issue for our profession and our law schools.

"Law schools need to revisit their methods of assessing merit and entry into law – we're not giving young people from disadvantaged backgrounds enough time to show excellence."

Another issue she's committed to improving is fair access to legal representation. Many assume the legal aid system gives everyone access to a lawyer if needed. But the maximum you can earn to be eligible for legal aid, if you are single with no dependants, is just under $24,000. The maximum income varies depending on the number of dependants.

"That leaves many people unable to afford legal representation. Lawyers are expensive. As part of my role, I think it's important to promote discussion regarding how important it is that all have the opportunity to have legal representation if they must go before the courts".

Thought leader: Dame Helen Winkelmann says the legal profession needs to address issues of affordability and diversity.

> **"The judiciary needs diversity of thought and you achieve that by having people from diverse backgrounds."**

The Ministry of Justice has been carrying out a review of the legal aid system, which includes consideration of increasing the legal aid threshold. The answer doesn't lie only with legal aid, however. Dame Helen says the legal profession itself needs to address how it can provide representation at lower cost.

Dame Helen's role as Chief Justice places her at the top of the pyramid of judges in New Zealand. She's also the first "pure" appointment as a Chief Justice because since the last one was appointed, reforms occurred that put the leader of judges in the Supreme Court rather than the High Court.

She says the day of the ceremony was special.

"The ceremonial aspect brings home to the judge the significance of the role and of the oath they take," she says. "It also marks the importance the role has to society."

But the moment disappeared from the headlines quickly because the very next day was the Christchurch terror attacks.

"This is a hard time for New Zealand. At such times, the public institutions, including the courts, must step up and perform their work in an exemplary fashion."

In her role, she is expected to be a thought leader as well as leader of the judiciary.

"I hope to be an inclusive leader and I will work to share a vision of a fair, accessible and humane system of justice." ■

The Auckland Law School is planning to establish a women's mentoring programme for Auckland law students. To find out how you can become involved in the programme, ***email: catherine.davies@auckland.ac.nz***

CHANGING PERCEPTIONS

Housing will be a key challenge as the population ages.

Professor Ngaire Kerse's appointment as the Joyce Cook Chair in Ageing Well allows her to focus on changing our mindset about ageing.

The role was created after Cliff Cook, founder of the Metlifecare retirement villages, donated $5 million to the University's For All Our Futures fundraising campaign. Ngaire is recognised as an international expert in maximising health and reducing falls for older people. She spent many years working as a GP in residential aged care and still practises part-time as a GP at the Auckland City Mission.

"I'm hoping to be able to influence in this role. Whether that's me saying some outrageous things or whatever. Because old people are outrageous – they're fantastic!

"We need to change society's attitudes to expect older people to be a positive influence," says Ngaire. "Maybe develop some innovative ways to influence the way society thinks about older people that don't make them feel so bad."

She's working on developing a virtual Centre for Healthy Ageing in which experts share experiences to build a critical mass of information about ageing in New Zealand. She says nutrition, physical activity, loneliness and housing are key areas to address. As the number of people aged 85-plus grows from 85,000 now to about 385,000 in 2060, these issues will be critical. She says while retirement villages are great for those who can afford them, there are a growing number of renters in the ageing demographic. She's heard of a solution – older people flatting together in privately organised options, such as Abbeyfield in Auckland.

"There's a communal housing thing going up in Grey Lynn, with around 17 households all together. You have a community space you share, and you know each other so you don't get lonely. We should turn all the old motels into these, so you can have all your friends living in the units!"

*Read more at **tinyurl.com/FMHSLiLACSNZ***

HEALTHY FIRST

Sitting at first in the University Impact Rankings is a good place.

The University of Auckland has been rated No. 1 in the world in the inaugural University Impact Rankings by Times Higher Education (THE). The global ranking measures how well academic institutions are delivering on the UN's 17 Sustainable Development Goals (SDGs) established in 2016. This outstanding result recognises the University's commitment to sustainability and making a positive social impact through its research and teaching.

The goals include providing inclusive and equitable quality education, achieving gender equality and fostering innovation. Auckland ranked sixth in gender equality and first in good health and wellbeing. One of those leading the charge in health is Cindy Farquhar, Professor of Obstetrics and Gynaecology at the Faculty of Medical and Health Sciences.

Cindy has researched infertility for around 20 years and says improving the evidence base for clinical decisions on fertility treatments is vital for women and their families. Her research into intrauterine insemination (IUI), an alternative to in-vitro fertilisation (IVF), saw her awarded the Health Research Council's Liley Medal in 2018. "I describe fertility patients as vulnerable. They deserve the best possible information about effective treatments and alternatives to IVF," she says.

*Read about the awards at **thewur.com** and about our rankings at **tinyurl.com/UoATimesHigherSDGs**. Read about Cindy Farquhar's work at **tinyurl.com/FarquharSDG***

DESIGNS ON A NEW REALITY

How do you prepare students for jobs that haven't been invented yet?

Associate Professor Deb Polson is the head of the new Design School that will welcome its first students in Semester One, 2020.

She has her work cut out – a UN World Economic Forum in 2016 predicted 65 percent of children in school today will end up with jobs that don't exist yet. But design is one field that's sure to be prominent.

"Students have no problem with the idea of the future designer," says Deb (pictured). "It's often parents and teachers who struggle a bit. We can't predict exactly what those jobs will be. But the field of design is totally made for that reality – you're learning how to adapt and respond to constantly changing environments, technologies and human behaviour."

Design is naturally collaborative and Deb says that's why she came to Auckland after 25 years working in universities in Australia and China. There are 11 conjoint study options for the design student, so the programme includes collaborations with engineering, health science, law, global studies and arts.

"You can't design anything in this world on your own any more. Design involves teaming up with people and organisations that challenge and complement design practices."We're not really interested in doing the traditional thing. It's about 'what is the ideal graduate in the world and how do we all contribute to that?'

Deb likes to use game technologies to "smuggle in science through play" and that includes augmented reality (AR) and virtual reality (VR). In 2004, she worked with award-winning AR expert, Professor Mark Billinghurst, now at ABI, to create her first mixed-reality game for families to engage with science museums and art galleries in Melbourne.

She says the Design programme will use UN's Sustainable Development Goals as a guide. "It's an important framework to adopt as it ties us to a global initiative. As such, it's a massive deal that we're No. 1 in the inaugural University Impact Rankings by Times Higher Education." (See opposite page.)

Read about the Bachelor of Design at ***tinyurl.com/DesignatAuckland***

Degree at 17, teaching adds up

Tristan Pang has a BSc and is a Kupe Leadership Scholar.

The inaugural Kupe Leadership Scholars were announced in late March and among them was an extraordinary young graduate.

Kupe Leadership Scholarships offer an opportunity for postgraduate students who care deeply about Aotearoa New Zealand and have a strong desire to serve. They are funded by Canadian donor John McCall MacBain and supported by other generous donors here and overseas.

Tristan Pang, aged just 17, recently graduated with a BSc in mathematics and physics with a near-perfect Grade Point Average. After completing honours this year, Tristan will enrol in his PhD in 2020 and hopes to complete that by age 21. He studies pure mathematics, a subject he has been fascinated by since he was a preschooler.

"Maths is an infinite beautiful puzzle waiting to be explored; it is spontaneous and exciting and that is why I love it," he says. "I also admire how maths can be used in other fields such as business, engineering and science. Part of my goal is to discover maths that can benefit the world."

Tristan's schedule involves public speaking, teaching at undergraduate level, mentoring and following a programme as part of his Kupe Leadership Scholarship. He wants a career in academia and can't think of anything he would rather do than research and teaching. "It's the perfect career for me."

The full list of Kupe Leadership Scholars for 2019 is at ***tinyurl.com/KupeScholars***

Feature

Out on a limb

By Briar Hubbard

Top reconstructive surgeon Dr Simon Talbot is redefining what's possible in the world of transplants.

Each time Simon Talbot walks through the doors of his Boston hospital, he is faced with a challenge like no other.

The University of Auckland alumnus was a recent recipient of one of the four 2019 Distinguished Alumni Awards and as a world-leading reconstructive plastic surgeon at Brigham and Women's Hospital (BWH), he performs surgical feats often deemed impossible, or never seen before.

Simon first made headlines across the world after successfully leading teams undertaking ground-breaking double-arm transplants in 2011, 2014 and 2016.

He is the director of the Upper Extremity Transplant Programme at BWH, where he specialises in arm and hand transplants. He has also been involved with seven face transplants. What he's learned along the way has helped in related operations, including one in which a patient's nose and upper lip had to be reattached after being bitten off and swallowed by a pit bull terrier.

It sounds like sci-fi, but finding creative solutions to unprecedented problems is part of the job – even if that requires reattaching part of someone's face after it has been in a dog's stomach.

"When you're neck-deep in the kinds of things we do, it's hard to know what's considered totally left-field," Simon says. "I work in an area where we are confronted with unique situations every day. Successful patient outcomes depend on lateral thinking and creativity."

In the instance of the dog attack, he and his colleagues weren't aware of other cases of swallowed tissue being retrieved from an animal's stomach. Although the situation was unusual, they decided the best option was to get it out.

"A patient's own tissue is unique in terms of contours, structure and function. There is no perfect replacement for facial tissues anywhere else in the body."

The time from the dog attack to surgery took around six hours. Three teams were involved and several operations were required for the desired result.

Simon was also part of a team of 13 surgeons who performed a double-arm transplant at BWH in 2011. The recipient was 65-year-old Richard Mangino, who had lost all four limbs after a severe infection as the result of a kidney stone.

News of the operation was broadcast internationally and its progress was tracked on the BWH YouTube channel. This was followed by another double-arm transplant, in 2014, involving a patient who had lost all limbs to a streptococcal infection. In 2016, a third case caught the attention of the media worldwide, after Simon and his team performed a double-arm transplant on a retired Marine who had become a quadruple amputee after stepping on an explosive device in Afghanistan.

Simon, 42, is an associate professor at Harvard Medical School. As well as taking care of patients and teaching students, Simon also leads a research laboratory with funding from the United States Department of Defence. He collaborates with groups to innovate plastic surgical practices using engineering technology in microsurgery and nerve regeneration.

He says the process of transplanting arms and hands is a huge undertaking for everyone involved. The patient has to pass a number of psychological and physiological assessments, a suitable donor must be found and around 40 people are involved with the surgery itself, which can take up to 24 hours.

That's just the beginning for the patient, who will then commit to a long-term rehabilitation programme and take immunosuppressive medication for the rest of their life. In most cases, the patient is able to perform daily tasks that were once impossible and also feels more confident with their appearance.

"I get the opportunity to take care of patients who are going through a terrible time and I have the privilege of making a huge difference in people's lives.

"I know it sounds cheesy, but that's truly what gets me up each day – and it gives you the meaning and satisfaction to keep going."

Following the 2013 Boston Marathon bombings, Simon and his colleagues were able to dramatically reduce the need for amputations because they were already well practised in attaching and reattaching limbs.

When the first of the two bombs exploded, Simon and other surgeons rushed to help in the emergency room.

"The lesson that came from that is when you put a team of people together, you really can achieve some amazing feats.

"We were able to save a lot of limbs and help a tremendous number of people by working as a team." ▶

"We joined up the blood vessels, let off the clamps and blood flowed into the patient's hand. We saw that hand become a part of the patient."

– Dr Simon Talbot

***Team players**: Simon Talbot with colleagues at Brigham and Women's Hospital in Boston. The expertise of the surgeons helped save many limbs following the Boston Marathon bombings in 2013.*

***Medical pair**: Simon Talbot and his twin sister Sarah, who is a pathologist, at their graduation (top) and growing up.*

Growing up with a cardiologist for a father and a nurse for a mother, Simon says dinnertime conversations could range from beta blockers to blood-pressure control, so he seemed destined for a medical career.

As a child, he was captivated by science and was fascinated with fixing things around the family's Hamilton home. His twin sister, Sarah Wallace, became a pathologist and Simon married Elizabeth Morgan, also a pathologist.

In the early years of his career, Simon was fortunate to be mentored by the late Joseph E. Murray, who worked at the same hospital in which Simon works today. Dr Murray was awarded a Nobel Prize in Physiology in 1990 for his pioneering efforts in the field of transplant surgery.

Dr Murray not only passed on his medical knowledge, but also philosophical views that Simon holds in high regard.

"He used to say 'every challenge is an opportunity', and that's something that I try I live by. It really exemplifies how I think we should handle the seemingly impossible."

The most memorable surgery for Simon was the first time he and his colleagues transplanted a limb at BWH.

"We joined up the blood vessels, let off the clamps and blood flowed into the patient's hand. We saw that hand become part of the patient. That, for me, is the culmination of years and years of training and hard work to create an incredibly memorable and special moment."

Simon says improving his patients' quality of life is extremely fulfilling.

"You should always want to leave the world a better place than when you arrived, and fundamentally that's what I'd like to do with my career."

In the little spare time he has, Simon volunteers at hospitals in developing countries, but also enjoys baking and putting his green thumb to good use.

"Right now, a particular hobby is regenerating and replanting a small native forest in the north-east, so I'm working to get better at forestry."

Simon has always loved getting amongst nature. He says during his university days, he and some friends went adventuring in a forest and were close to never seeing his mum's car again, after nearly losing it on a forestry road.

"We saved the car but it was never the same."

Living amid the hustle and bustle of Boston, he often yearns for New Zealand's outdoors.

"I miss a lot of things about New Zealand. I miss a lot of my friends who live there and I miss the outdoor lifestyle; I think that is unmatched anywhere in the world."

Simon travelled back to Auckland in October 2018 for the Faculty of Medical and Health Sciences' 50th reunion and again in March for the University's 2019 Distinguished Alumni Awards (see opposite for the other three recipients).

"I take any invitation I can get to come back to New Zealand and it was an honour to be recognised as one of the Distinguished Alumni. I wouldn't be anywhere near where I am if it wasn't for the teaching I had at the University and the passion and encouragement I received."

He visits his family in Aotearoa about once a year, and says the lengthy plane journey is always interesting.

"Whenever I'm on a plane and people find out I'm a reconstructive plastic surgeon, they start pulling on their face and asking what I think they should have done ... there really is no good answer to that question." ■

Watch Online

IMPACT ON LIVES

– Watch a video about Simon Talbot's work at **tinyurl.com/IngenioSimonTalbot**
– See Simon speak at the Bright Lights 2019 event: **tinyurl.com/SimonBrightLights**
– Nominations are open for the 2020 Distinguished Alumni Awards. These annual awards honour alumni who have made outstanding contributions through their achievements to their professions, communities and globally. Submit nominations by 30 June at **auckland.ac.nz/daa**.

DISTINGUISHED ALUMNI AWARD WINNERS 2019

(with Simon Talbot)

John Bongard

ONZM,
BCom 1982 (Business)

ADVICE YOU'D GIVE YOUR YOUNGER SELF

Work much harder when you get an opportunity to go to university. My first attempt to achieve a BSc was a failure, which meant I had to return to the University of Auckland to do a BCom through six years of part-time study.

YOUR MOST SIGNIFICANT MENTOR

Without doubt it was my late mum. She was a solo mum in the mid-Sixties, living in a state house with three young kids. As a family, we were severely economically and socially challenged, but Mum's drive and unconditional love kept us a happy family. Her work ethic and high moral compass continue to influence me to this day.

IF YOU HAD TIME TODAY TO RETURN TO UNIVERSITY TO DO ONE PAPER, WHAT SUBJECT WOULD IT BE AND WHY?

A Māori language paper. It remains one of my goals to one day be fluent in te reo.

IF YOU COULD DO ONLY ONE THING A DAY, WHAT WOULD GET YOU OUT OF BED?

I'd work on progressing The Rising Foundation's objectives of helping to unlock the enormous potential of youth in South Auckland.

My wife and I started our Foundation ten years ago, and since then we have had almost 1,500 young people through our programme. The Rising Foundation is a long-term intervention that works with the same kid for up to six years.

Moana Maniapoto

MNZM, LLB 1984 (Law)

ADVICE YOU'D GIVE YOUR YOUNGER SELF

Don't ever stop running; keep asking questions and it will all work out in the end.

YOUR MOST SIGNIFICANT MENTOR

There's not just one. My father, Nepia, was passionate about music, whānau and marae. Rob Cooper and Jane Kelsey answered every question with a question. It made me think.

IF YOU HAD TIME TODAY TO RETURN TO UNIVERSITY TO DO ONE PAPER, WHAT SUBJECT WOULD IT BE AND WHY?

A paper in politics so I could understand some of the terms people throw around nowadays.

IF YOU COULD DO ONLY ONE THING A DAY, WHAT WOULD GET YOU OUT OF BED?

Performing onstage.

William Pike

BEd Tchg 2007, BEd Tchg (Hons) 2008 (Education and Social Work)

ADVICE YOU'D GIVE YOUR YOUNGER SELF

Step further outside your comfort zone, aim higher and have lots of fun.

YOUR MOST SIGNIFICANT MENTOR

My mum and dad. They've always supported and encouraged me to create opportunities and step outside my comfort zone. That's allowed me to have some incredible life experiences and to achieve my personal best. Their positive influence and role modelling during challenging times have shown me how to approach life with a glass half-full. We're a tight-knit family and that's helped us support one another in tough situations.

IF YOU HAD TIME TODAY TO RETURN TO UNIVERSITY TO DO ONE PAPER, WHAT SUBJECT WOULD IT BE AND WHY?

Business papers – because I've had a crash course in business and it would have helped me significantly over the past five years.

IF YOU COULD DO ONLY ONE THING A DAY, WHAT WOULD GET YOU OUT OF BED?

Go on an adventure with family and friends. Anything from a day out spearfishing and exploring the outer Hauraki Gulf, to kayaking around Stewart Island with my dad and brother or simply exploring our local patch of native bush with my wife and two-year-old daughter. It's not always about climbing the highest peak; it's the special time spent with great people, creating lifelong memories.

FEARLESS ENTREPRENEUR

Elizabeth Iorns put her career as a cancer researcher on the backburner to help other scientists.

Two years ago, alumna Elizabeth Iorns was featured in the *Ingenio* '40 Under 40' list, and would still make that list today. In June, she's heading back to Auckland from her home in California for 'Fall Forward: Unfiltered Live', an event in which people can "learn directly from the world's greatest business minds".

"Actually, I don't necessarily think of myself as a 'business mind'," says Elizabeth. "I think one of the most important things is to work on something you really believe in."

Her belief was that there was a need to connect scientists with each other to enable efficient collaboration without the administrative hurdles traditionally associated with that process. She set up Science Exchange, which has grown rapidly in the past few years. It has raised around $US60 million in venture capital funding.

"Science Exchange has continued to scale and is now used widely across the pharma and biotechnology industry," says Elizabeth. "Basically, it's a marketplace for ordering scientific experiments. It allows scientists to work with anyone in the world, instantly accelerating scientific development."

Elizabeth's start-up feat will be recognised on 20 June with a Kea World Class New Zealand Award. The awards acknowledge world-leading Kiwis whose achievements are enhancing New Zealand's image internationally.

Previously, Elizabeth was a breast cancer researcher who knew all too well the hurdles to scientific collaboration.

"As a researcher, I had problems finding qualified providers, deciding who to work with, putting contracts in place and even paying providers. With Science Exchange, I can search a database of qualified providers, place an order instantly and pay through the platform.

"It really streamlines the process of collaborating with external partners."

Her own research is on the backburner, although she says she's still interested in scientific research. "I keep up with the latest breakthroughs in the pharma and biotech industry through Science Exchange's clients. I'm also involved with several biotech start-ups and work as an adviser at Y Combinator [an early stage investor]."

She also publishes as a principal investigator, mostly related to the cancer biology reproducibility project being run through Science Exchange.

Elizabeth, who attended Iona College in Havelock North, says her father sparked her love of science. "We would talk about science and technology around the dinner table – both my parents are computer programmers and love technology."

She completed her biomedical science degree at the University of Auckland in 2003 and her PhD at the Institute of Cancer Research, University of London, in 2007. She fondly remembers her time at Auckland.

"Professor Andrew Shelling [head of medical genetics] was the first person who was a career mentor for me. I worked in his lab as a summer intern and then for my honours thesis."

She doesn't have a business background which makes her company motto 'Be Fearless' particularly apt. "Fearless is one of our five company values … being fearless is very important. Generally, change is hard and when you are running a start-up, most of the time you are pushing against the status quo. You need to be brave enough to challenge the status quo and try to create a better system."

Her co-founder at Science Exchange, Dan Knox, is also a Kiwi and works with her in California. "And our chief architect, David, is my brother. He's a computer programmer and works remotely from Wellington.

"There has never been a more exciting time to start a biotech company – innovation has reached a level of maturity that can be utilised for tackling previously unaddressable targets," says Elizabeth. "There is also significant capital available to fund the commercialisation of these technologies."

The message she's bringing to Unfiltered is one she lives by: "Work on something you care deeply about."

Fall Forward: Unfiltered Live is a full-day event for business leaders and entrepreneurs to learn from some of the best business minds, including several Auckland alumni. It's on 21 June at SkyCity. Each speaker shares their three biggest mistakes made in business and what they learned. Alumni, staff and students can use the code '***UOA20***' when they register for a 20 percent discount. (Limited to first 200 tickets.) See ***unfilteredlive.co.nz***

"You need to be brave enough to change the status quo."

GARDEN **SECRETS**

Excavations reveal sophisticated crop planting by ancient Māori.

An archaeological research project on Ahuahu Great Mercury Island unearthed a significant finding that changes what we know about pre-European Māori gardens.

Previous archaeological evidence identified kumara as the most significant crop from early New Zealand but new research, which explored the history of Māori settlement on the island, shows taro was also an important crop in the early Māori diet, alongside other leafy greens such as pūhā and watercress.

During extensive field work on the private island off the eastern coast of Coromandel, researchers found sediments in swamps that contained taro pollen. Archaeology Professor Simon Holdaway led the team of University colleagues, Professor Thegn Ladefoged and Dr Rebecca Phillipps, as well as archaeologist Dr Louise Furey from Auckland War Memorial Museum and palynologist Dr Matthew Prebble of Australian National University. Their work dated the taro pollen to 600-700 years ago. The discovery reveals the sophistication with which early Māori first used the environment, including developing wetland gardens for taro.

Simon says archaeologists long considered our cooler climate hindered early attempts by Māori to grow traditional Polynesian crops such as taro. "This evidence for early taro production refutes the long-held view that taro was only a minor component of early horticulture," he says. "It indicates tūpuna Māori may have initially focused on taro and created specialised wetland gardens for the purpose; kumara then became the main crop after AD 1500."

It's now thought Ahuahu was used for gardens because of the similarity to the wetland gardens on some Polynesian islands.The project on Ahuahu is a partnership between the University of Auckland and Auckland War Memorial Museum, in conjunction with Ngāti Hei and donors, the Fay and Richwhite families.

***Exploring ancient gardens**: Professor Simon Holdaway.*

TEAM BLUE LIGHT

Bees lead scientists to the light.

We hear a lot of talk about blue light being bad – the light of our phones, TVs and computers in the evenings, but finally someone's in the corner of Team Blue Light.

In ground-breaking research a team, led by Associate Professor Guy Warman and Dr James Cheeseman from the Department of Anaesthesiology, found blue-light therapy during anaesthesia helps patients get over the 'jet lag' effect of the anaesthetic and shortens their stay in hospital after surgery.

When people go under anaesthesia it can significantly distort their biological clocks. They lie unconscious for hours and may wake up thinking time hasn't passed. Trials took place with kidney donors who were in good health before having the operation. The team used clock-shifting blue light on the donors during surgery, while some got a placebo red light. The patients wore goggles that emitted blue light flashes through their eyelids every 30 seconds.

Tests had been done on anaesthetised honey bees before the trials on 40 patients over several years. "We recorded rhythms in core body temperature, melatonin and sleep-wake timing," says Guy. "Those given the red light were jetlagged after surgery, while those receiving the blue light suffered less jet lag and had a shorter stay in hospital. Blue light reduces the biological-clock disruption that occurs after anaesthesia and surgery."

Guy says despite the bad rap blue light gets for night-time exposure, blue light in the morning is also "really good to keep your biological clock adjusted".

***Learning from bees**: Tests on anaesthetised honey bees led to successful trials on people, below left.*

GOOD DEED WITH WINE

Scientist Rebecca Deed will take the stage at this year's Raising the Bar to talk about the chemistry involved in that glass of wine.

Talking about wine. Tasting wine. It's a tough job but someone has to do it. Dr Rebecca Deed, lecturer in the University of Auckland Wine Science programme, is that someone.

The 34-year-old shares her knowledge of viticulture and wine microbiology with students in the lab, at vineyards and even with her family.

As well, Rebecca has been a wine judge in a number of competitions and hopes to judge internationally one day when the time is right.

But it wasn't that long ago that she didn't drink wine or think she was much chop at chemistry.

"I was definitely more of an English and French-type student," she says. "I just did a bit of biology at school."

It was her mother who encouraged the former Green Bay High School student to think about wine science.

"I wasn't confident in my chemistry so I stayed on with plant sciences for my honours. My PhD in wine yeast was mostly molecular biology, so I didn't have to do much chemistry. Richard Gardner, my supervisor, was into wine yeast and that's how I got into wine science.

"Now I'm 80 percent hired by chemistry and 20 percent biology, so have definitely gone the chemistry way. I like the interdisciplinary nature of it – and the fact that you can escape the lab."

She spends time researching winemaking at the University-owned Goldie Estate vineyard on Waiheke Island and has also done some chardonnay testing in the lab for winemakers Michael Brajkovich and Kate Radburnd.

Rebecca works out through the chemistry how winemakers can achieve styles that are in demand.

"With chardonnay, it can be a 'struck match' or a flinty popcorn style, and sauvignon blanc you want to smell nice and tropical.

"You try to work out the chemistry behind making that style … so winemakers know why 'if you do this, you will get more of these characters'."

Rebecca analyses the sulphur compounds that occur during the winemaking process – which are either good or bad, depending on the grape and the micro-organisms present.

Rather than pick trends, though, wine science tends to follow them.

"For a long time, we mainly focused on sauvignon blanc for which we had the big government-funded project, and it's only now that we're starting to work on pinot noir, which has already been quite big for a long time."

Funding long-term in-depth research can be a challenge. Funding decisions are made based on the number of plantings and the volume of exports. Sauvignon blanc is number one and pinot noir is number two.

"For both sauvignon and pinot it's really about finding ways to improve the quality … to get better aromas and flavours … and for winemakers to do that more efficiently."

Ideally, she'd like to explore more about wine "minerality", the definition of which differs between experts.

"Some would say it's like a flintiness or a wet stone, like if you were licking a wet rock – that quality. Other people say it's a kind of neutrality and just acidity, like strong fruit characters. Others say it's that flintiness that chardonnay has, for example. So it's hard to get a grip on what it actually is. That's why it's interesting."

Rebecca believes what she's doing is

"It's really about finding ways to improve the quality … to get better aromas and flavours."

important for the wine industry. "I think about that all the time. You want to help the industry. You want to come up with ways that will help winemakers and New Zealand wine."

She also wants to have fun. One of the things she's done is teach her family how to be "wine judges" at family wine-tasting sessions.

Another bit of fun will be when Rebecca takes part in Raising the Bar on 27 August (see sidebar). She's one of 20 academics and thought leaders giving talks in bars around the city.

Rebecca decided to be one of the speakers after attending a talk last year.

"I went to one with Rochelle Constantine talking about the Hauraki Gulf. Seeing Rochelle do it made me feel less nervous.

"She got up there and she said 'You know I'm quite nervous,' but she was fine."

During her talk, Rebecca plans to explain why sulphur compounds in wine are important.

"I'll talk about the good, the bad and the ugly. I can talk about all of those nice flavours that come from the compounds – such as the passionfruits in sauvignon blanc.

"But you'll also find out about hydrogen sulphide and other nasties and how they can be good or bad depending on the wine style and grape variety. It'll be interesting."

And you can have a wine while you're at it. ■

RAISING THE BAR

On Tuesday 27 August, ten Auckland bars will become a campus for one night. Leading academics and thought leaders will give talks, creating a relaxed environment for discussion.

Raising the Bar has been running worldwide for five years. This year's event will feature 20 talks in ten bars over one night, with talks starting at 6.30pm and 8pm. Speakers include Olaf Diegel, Ethan Plaut, Deb Polson, Benedikt Fischer, Erin Griffey and Damon Salesa.

Last year, Raising the Bar Auckland was a sell-out (tickets are free) with almost 1,500 people pulling up a stool in a bar to hear the speakers all over the city.

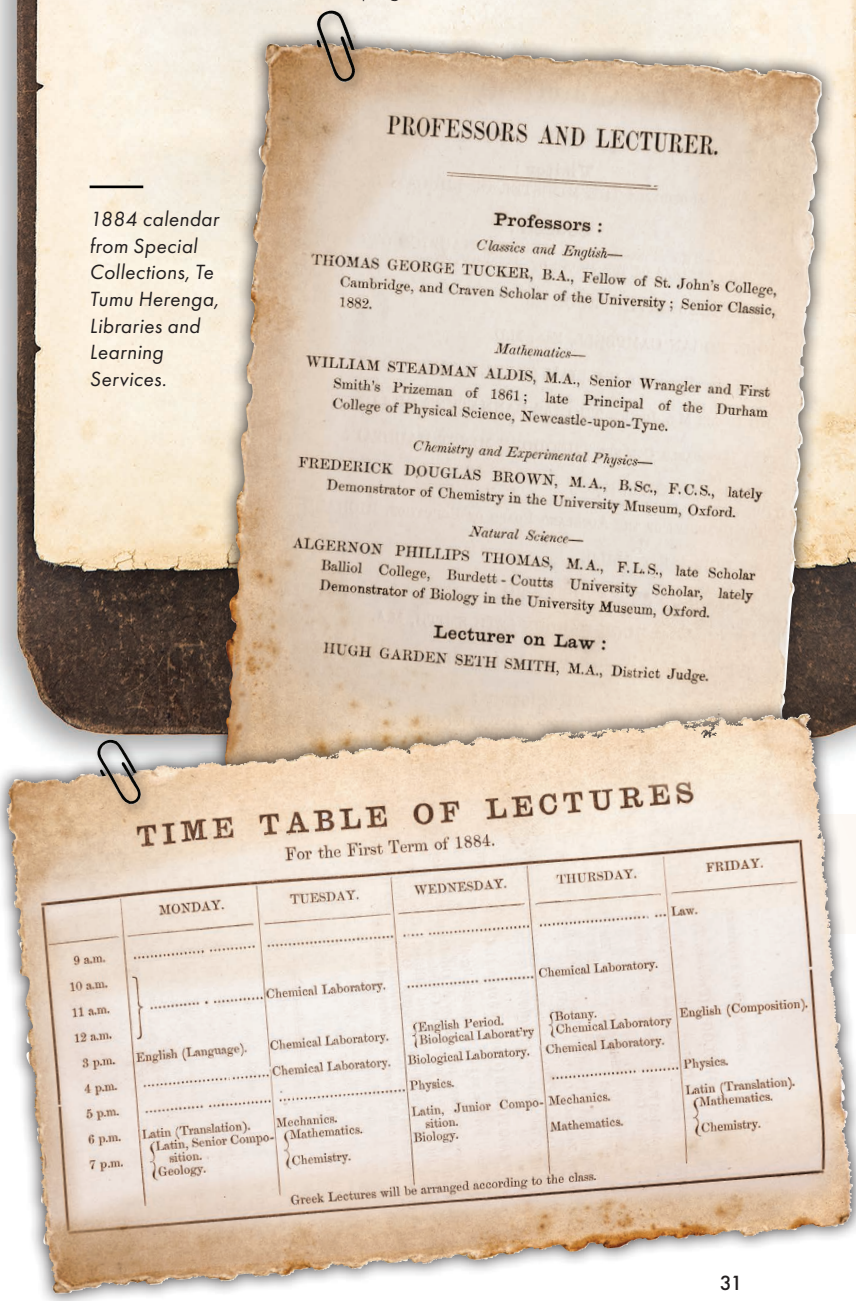
The idea is to share the speakers' unique learning experience with the public and make education part of the city's popular culture. The website featuring all the speakers and venues will go live on 23 July. Sign up to the newsletter at rtbevent.com/auckland

FROM THE ARCHIVES

When an Act of Parliament was passed in 1882 to establish the Auckland University College, it led to the University becoming a constituent college of the University of New Zealand in 1883. Auckland politician Sir Maurice O'Rorke became the College's chairman and later its president. In that year, 95 students enrolled. By 1901, there were 156 and before World War One in 1914, there were 580. Today, the University of Auckland has almost 43,000 full- and part-time students and around 8,850 full- and part-time staff.

Here are how a few of the pages from the 1884 calendar looked:

1884 calendar from Special Collections, Te Tumu Herenga, Libraries and Learning Services.



PROFESSORS AND LECTURER.

Professors :

Classics and English—

THOMAS GEORGE TUCKER, B.A., Fellow of St. John's College, Cambridge, and Craven Scholar of the University; Senior Classic, 1882.

Mathematics—

WILLIAM STEADMAN ALDIS, M.A., Senior Wrangler and First Smith's Prizeman of 1861; late Principal of the Durham College of Physical Science, Newcastle-upon-Tyne.

Chemistry and Experimental Physics—

FREDERICK DOUGLAS BROWN, M.A., B.Sc., F.C.S., lately Demonstrator of Chemistry in the University Museum, Oxford.

Natural Science—

ALGERNON PHILLIPS THOMAS, M.A., F.L.S., late Scholar Balliol College, Burdett-Coutts University Scholar, lately Demonstrator of Biology in the University Museum, Oxford.

Lecturer on Law :

HUGH GARDEN SETH SMITH, M.A., District Judge.

TIME TABLE OF LECTURES

For the First Term of 1884.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
9 a.m.					Law.
10 a.m.		Chemical Laboratory.		Chemical Laboratory.	
11 a.m.					
12 a.m.			{English Period. {Biological Laborat'ry	{Botany. {Chemical Laboratory	English (Composition).
3 p.m.	English (Language).	Chemical Laboratory.	Biological Laboratory.	Chemical Laboratory.	
4 p.m.		Chemical Laboratory.	Physics.		Physics.
5 p.m.			Latin, Junior Composition. Biology.	Mechanics.	Latin (Translation). {Mathematics.
6 p.m.	Latin (Translation). {Latin, Senior Composition. {Geology.	Mechanics. {Mathematics.		Mathematics.	{Chemistry.
7 p.m.		{Chemistry.			

Greek Lectures will be arranged according to the class.

AROUND THE GLOBE

Three alumni living overseas tell us a bit of what they're up to and where.

CYNTHIA LUND

What did you study at the University of Auckland?

I was there 2005-09. I did a BSc and then a PhD in biological sciences. My thesis looked at New Zealand sauvignon blanc to determine whether it is distinctively different from other sauvignon blancs around the world. This was measured sensorily, chemically and having consumers blind taste and select New Zealand sauvignon blanc, based on preference. It also included training a sensory panel to perform to the best of their ability every time, in the same way athletes are expected to perform.

Did your study at Auckland ultimately influence your career path?

Absolutely! It actually influenced being hired into my current position, which is technical sales of enzymes into the North American wine industry. Prior to my getting into technical sales (which I love), my degree led me to be the creative director at one of the world's largest privately owned food companies. I developed a research platform for its flour division, which included collaboration with six countries.

Where do you live and what are you doing?

Portland, Oregon, in the US. I sell ingredients into the wine industry, representing Novozyme enzymes, so I can apply my technical knowledge. Determining what the winemaker's needs and priorities are allows me to recommend the optimum enzyme to use. I'm also planning to volunteer at the local university to help with graduate students' sensory programmes.

Do you get back to New Zealand often?

I try to get back every other year. I keep in touch with several alumni, including Frank Benkwitz, who is director of laboratories at Constellation Brands in the South Island. While visiting Auckland, I also manage to go rowing with another Auckland alumnus, who now lectures there, as we belonged to the same rowing club while we were doing our PhD. We used rowing to clear our minds and to get a good workout while writing our dissertations!

DONNA ROSE ADDIS

What did you study at the University of Auckland?

I did a BA in psychology and history, 1996-98 and then an MA in psychology before doing post-doctoral overseas.

Did your study at Auckland influence your career path?

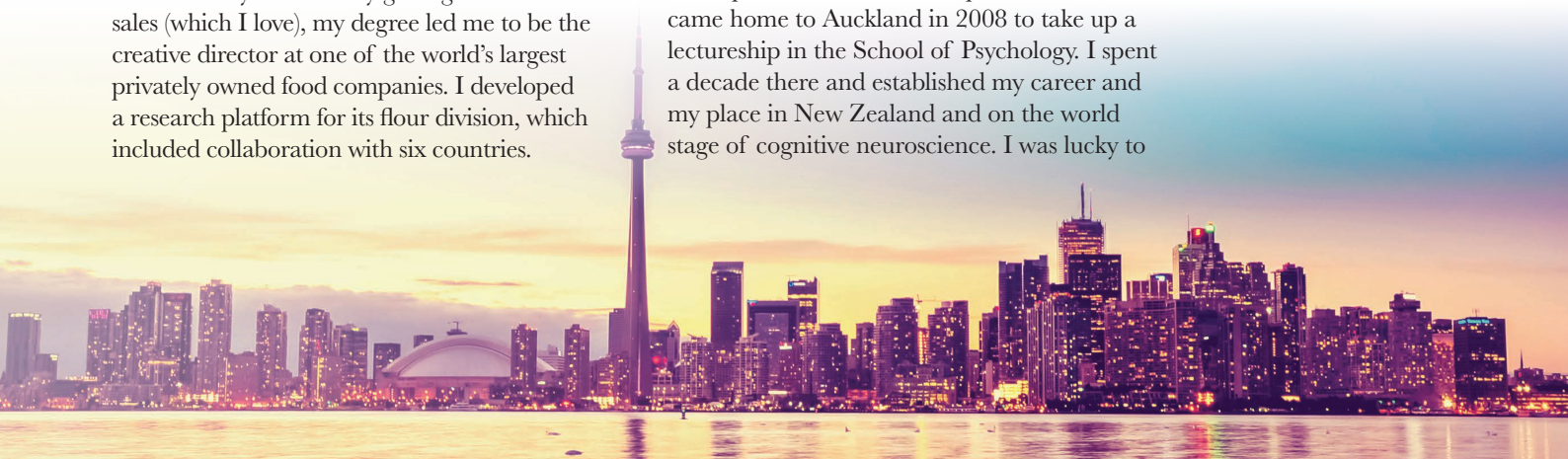
Absolutely. In particular, integrating arts and sciences into my BA was pivotal for developing my unique academic niche. As a history student, I examined identity in medieval and early modern Europe, while in psychology, I was fascinated with memory and amnesia. Bringing these seemingly disparate areas together, my MA research focused on how autobiographical memory – our personal history – provides us with a sense of identity, and how the loss of these memories in Alzheimer's disease has huge ramifications for the sense of self. Associate Professor Lynette Tippett in psychology and Kim Phillips in history inspired me to follow an academic career path.

Was it hard to leave New Zealand?

After my PhD at the University of Toronto and a post-doctoral fellowship at Harvard, I came home to Auckland in 2008 to take up a lectureship in the School of Psychology. I spent a decade there and established my career and my place in New Zealand and on the world stage of cognitive neuroscience. I was lucky to

"I was fascinated with memory and amnesia."

– Donna Rose Addis



have amazing colleagues, talented students and research fellows, in particular Dr Reece Roberts with whom I've collaborated for nine years. So, yes, it was difficult to leave my 'science family' as well as my family and my Pasifika roots.

Where do you live and what are you doing?
In 2018, I moved back to Toronto where I am a senior scientist at the Rotman Research Institute, Baycrest Health Sciences. In 2018, I was awarded a Canada 150 Research Chair, one of 24 positions created to bring the world's top researchers to Canada during the year of the 150th anniversary of Canada's confederation. This has been a huge opportunity for me to launch the next phase of my career – $4 million in funding over seven years and access to imaging technologies not yet in New Zealand, such as magnetoencephalography (MEG). I'm now a scientist in a geriatric hospital – I love it! I'm research-only, although will still supervise graduate students at the University of Toronto.

Do you get back home often?
I try to get to Auckland a few times a year, not only to visit my 102-year-old nana and my baby niece, but also because I have four PhD students and I'm still actively collaborating with Lynette and Reece in psychology. It's great to have reasons to turn up to Psychology morning teas!

What's the most exciting part of your work?
Toronto is an international hub for memory and neuroimaging research, so I have a lot on the go. That includes pinpointing ways in which imagination breaks down in ageing and depression. Eventually, we hope this work will lead us to interventions with the potential to enhance the ability to imagine, thereby improving wellbeing.

KENT ONESEMO

Kent Onesemo is a police officer in Samoa. He recently spent two years in Auckland completing his thesis about cannabis.

Tell us about your thesis.
The idea was to test the potency of cannabis collected from raids in New Zealand and compare it with cannabis grown in Samoa to see if there were differences in potency. We wanted to see whether we could differentiate between the two, based on their elemental profiles. It gave us an insight into the differences in tetrahydrocannabinol (THC) and cannabidiol (CBD) levels and potencies between Samoa and New Zealand.

Why is that useful to know?
The study, with the Institute of Environmental Science and Research, the New Zealand Police and Samoa Police, is useful because we looked at various regions where cannabis was grown. We focused on the elemental profiles to determine the different origins or locations of cultivated cannabis. It will also be useful for the medicinal cannabis industry, as it looks at varying THC and CBD levels in plants from different regions. A lot more study is required, but with the referendum in 2020 into legalising cannabis, this type of research can help the government make an informed decision to ensure safety if there's regulated consumption of cannabis there.

You won a Faculty of Science Student Support Award to study in NZ. How was it?
I really threw myself into it. I take this approach with anything I want in life – opportunities don't always present themselves, so when they do, you must give it everything, no matter how hard. I have a lot of family in New Zealand and during the two years I was there, I couldn't go to see anyone or even attend church. I kept a strict diet and exercised regularly so I didn't fall sick as that would have hindered my studies.

Do you miss Auckland?
The biggest thing I miss about Auckland is the weather. I enjoyed winter, because in Samoa it's hot all year round. I miss the friends I made, too – such a great bunch of friendly people.

What's the best part about life in Samoa?
Life in Samoa is really relaxed. I work from 8am to 5pm and then after that it's mostly staying at home with the wife and three kids. Work takes a lot of my day, and sometimes nights, and also the nature of the job means anything can happen, so the best part is being able to go home to see my family. I missed the birth of my daughter and her first birthday while I was in New Zealand, so I have to make up for that.

What's your motto for life?
Make something out of nothing. I didn't have the best education growing up and my family struggled financially at times. I want the best for my kids, so I take every opportunity to progress in life. In the future, I want to relax and look down from the balcony of my house with a cup of coffee and say, "Well done, mate."

"The research will be useful for the medicinal cannabis industry too."

– Kent Onesemo

MISSION FOR MENTAL HEALTH

A smart technology platform helping to tackle Aotearoa's mental health crisis started with a business plan scribbled on a chip wrapper.

Angela Lim (BSc, MBChB) was at a Swiss artificial intelligence conference when an attendee challenged her to turn her passion for innovative healthcare into a business plan. She called friend Michael Connolly (BEng) to see if he was interested in being her technical co-founder.

"I asked him to meet me at a local takeaway and we got fish and chips," says Angela, a paediatric trainee. "A few hours later, we had our business plan written on the back of the chip wrapper."

With a little convincing, Michael agreed to found the start-up with Angela and the idea became Clearhead, a free online platform that functions as a one-stop-shop for mental wellbeing. The pair secured seed funding from the Swiss investor whom Angela had met.

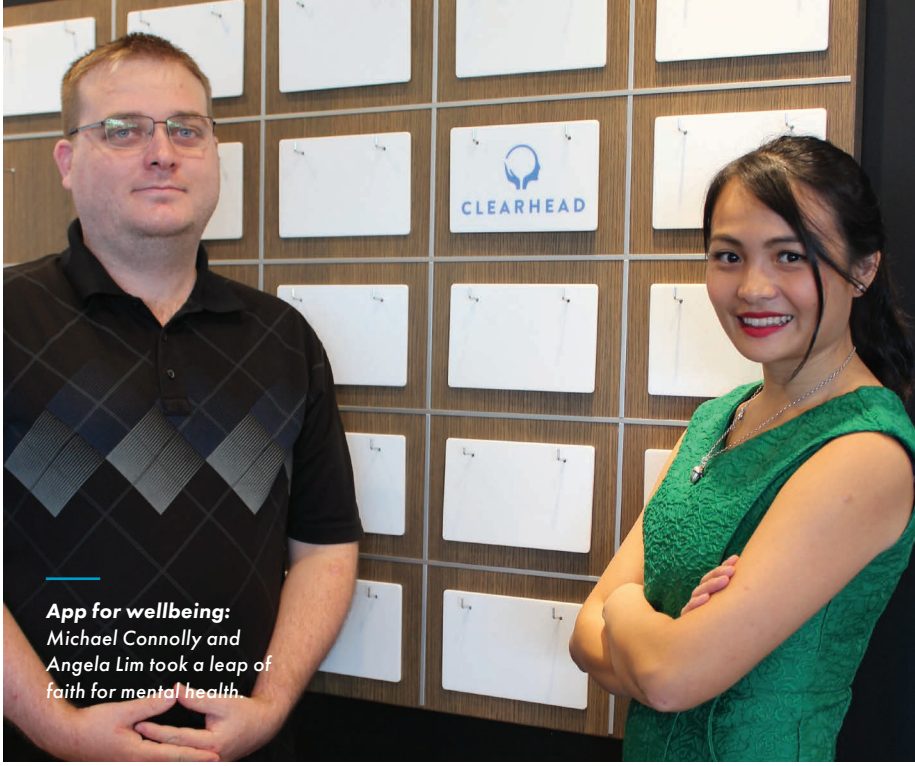
Michael and Angela knew that launching a health technology start-up was a bold move.

"We took a huge leap of faith," says Angela. She says Clearhead aims to empower people through technology. It addresses issues of accessibility and fragmentation in the healthcare system. "Most young people won't even pick up the phone for an unknown number, let alone call a stranger to book an appointment. Clearhead brings healthcare to the people in a way that provides choice, convenience and control."

The platform uses artificial intelligence to help users identify their mental health challenges. It then matches them with personalised resources and allows them to book appointments with mental health professionals online. Angela and Michael say Clearhead's success so far can be credited to volunteers who help out in everything from marketing to sales. "We couldn't have achieved as much as we did without the support of our amazing volunteers."

The pair would love alumni to get involved with Clearhead for Volunteer Impact Week, by spending a few minutes trying out the platform, providing feedback to Angela and Michael, and spreading the word on social media.

Michael and Angela can be reached by email: ***contact@clearhead.org.nz.***



App for wellbeing: *Michael Connolly and Angela Lim took a leap of faith for mental health.*

UPDATE TO FLY AWAY

Enter the draw to win **one of five $1,000 travel vouchers** by updating your details with the Alumni Relations Office before 31 July 2019. You'll receive all the latest news, exclusive invitations to events around the world, special offers and discounts. The $5,000 prize pool is thanks to the University's travel provider, House of Travel Parnell.
Head to **alumni.auckland.ac.nz/update**

UPCOMING EVENTS

San Francisco, Vancouver and Hong Kong are just some of the cities where alumni events will be held in the next few months. There's a full calendar for 2019 of both formal and informal alumni and friends events in New Zealand and around the world. Check out **alumni.auckland.ac.nz/events** to find out about upcoming events and activities in your city.

CONNECT WITH US

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Sharing knowledge: *Janné Mildenhall has volunteered for the Women's Mentoring Programme at the Business School since day one.*

Reaping rewards

The importance of connections was a key driver when accountant Janné Mildenhall first volunteered for the Women's Mentoring Programme at the University of Auckland Business School. That and the fact she'd been a volunteer all her life in various guises. "My friend Cecilia Tarrant [chair of the programme] tapped me on the shoulder nine years ago and asked if I'd be interested in being a mentor."

The pair had met in the halls of residence while studying at the University.

"The timing was right for me. I'd always been a volunteer when my children were growing up – Plunket, schools, sports teams.

"It sounds a bit twee, but I definitely enjoy giving back to the community and it was a chance to reconnect with the Business School."

The Women's Mentoring Programme connects experienced businesswomen with young women who want to pursue business as a career. The students gain insight into the working world and develop skills needed for work. The programme is in its ninth year.

Janné is an associate director at Deloitte, and says her company encourages staff to connect and give back to the communities in which they live and work. "There was nothing like this when I was starting out in my career and it's really beneficial, not just for the mentee but for the mentor as well. I've met a lot of great women through it."

When Janné was studying business, the proportion of women students at the Business School was around 25 percent. Now it's 52 percent. In her introduction to this year's programme, Cecilia explains: "The mentor's relationship with their mentee will hopefully give them valuable insights into how 'millennials' view the world and its issues."

Says Janné, who is the longest-serving mentor: "We explore topics like creating rapport, managing conflict, work-life balance, being resilient and making a great first impression. They're topics we can all do with a refresher on. Every year, I get little nuggets that are beneficial for me as well."

Janné has taken a diverse range of people under her wing through the programme.

"Some will succeed anyway, but shy or less-confident students probably get more benefit. We give them confidence to use what they learn there ... that's a really rewarding thing. You give students context and the confidence to go out and apply for jobs or scholarships and showcase their transferable skills, such as team work or other skills from working in part-time jobs."

The mentoring programme begins in March and events are held through the year. This year, there are 75 mentors from many industries across a range of ages and cultures. "I enjoy the sessions and there are always great speakers," says Janné.

"It's a win-win. I get such a lot out of it." ■

Become a mentor or mentee: business.auckland.ac.nz/wmp

HELPING HANDS

The impact of volunteers at the University is felt widely. From long-running programmes like the Women's Mentoring Programme to helping out for one-off events, there are benefits for volunteers as well as recipients. The University is holding its first Volunteer Impact Week, 16-22 June, for which people can volunteer their time, from an hour upwards. Whether it's tree planting or sharing industry skills, for people who may not be able to help out financially, volunteering is a practical way to connect with the next generation. Volunteer Impact Week involves alumni and friends, as well as staff and students. Read more about it at **alumni.auckland.ac.nz/volunteering**

Volunteer Impact Week

Celebrating the University of Auckland community in action

7 TIPS FOR... BOOSTING *Creativity*

By Peter O'Connor

1 Find the rhythm of your creativity by engaging in things that allow your mind to wander, to make something fresh and new. Sometimes boring, mundane things give you the space to be creative. James K. Baxter, one of New Zealand's most celebrated poets, spent his days delivering mail. How much of that time was spent thinking about and rehearsing the lines from *Beyond the Palisade* or *In Fires of No Return*? It sounds crazy – do boring things to be more creative. Wash dishes. Mow the lawn. Saunter. Let the mind wander.

2 Play with your mates. Do things just for the sake of it, for no other reason than it gives you joy. Laugh a lot. Don't live life like it's some sort of mission, as if there is something to be gained or achieved. My father always said, 'Life is to be enjoyed not endured.' So be playful with words and gestures. Rather than walk somewhere, skip. Play word games, find the absurd in the everyday. Instead of being driven by deadlines and outcomes, be driven by the joy of being alive. Have a life that is full of imagination.

3 Surround yourself with people who say, 'Yes,' rather than 'No, but.' Don't spend time with friends or work colleagues who rubbish something the minute it comes out of your mouth. Find people who, when you offer an idea, reply with 'What about if?' It works the other way, too. When someone gives you an idea, say, 'Yes … and?' It is also a good idea to be generous in taking and receiving feedback. Be generous with your creativity. Being creative with others requires trust, respect and a willingness to give each other the benefit of the doubt, all the time. The only way the world has ever changed for the better is when groups of people imagine that is possible.

4 Don't be afraid to screw up and don't be fixated on the end result. Never painted before? So what? Get the paintbrushes out for no other reason than it feels good. It might lead somewhere, it might not. You'll learn that when you're creative, you're never quite sure where it is going to lead – and that's completely fine. Rather than keeping your eye on the target, watch the arrow. Sometimes it will take you in unexpected directions and land where you least expect it to. Noticing the flight of the arrow might take you to new and unexpected places of discovery.

5 Recognise that every human is creative, including yourself. It's not about talent and genius. We all have different ways of expressing our creativity; it can be discovered through gardening, cooking, poetry, painting, telling stories or fixing cars. Find the thing that gives you joy in the making. Find something that expresses something about you and gives something of you to others. Spend time doing it. Work is something we do, but being creative is who we are. Surround yourself with other people's creativity. Read poetry, a novel, go to a play or an art gallery. Go for a long, slow walk and as your mind wanders, revel in the beauty of nature. That's always been a way to juice up your creativity.

6 Ask questions. Ask why something is what and how it is. Ask questions and when you have early answers, question those answers. Don't limit yourself; spend time on discovery. Ask questions that start with "I wonder …" Look at things and ask, "what if?". Be curious about details, about the ordinary. Never settle, be restless.

7 Never think there is a limited number …

Professor Peter O'Connor is Academic Director of the Creative Thinking Project and an expert in making and researching theatre with marginalised communities.

***Art of creation**: Logan Moffat, Elam honours graduate and 2018 Adam Portraiture Award winner, created the piece below as part of 'The Studio' series. It's one of the works he'll show at the Beijing Art Biennale in August. See more of Logan's work at **elamartists.ac.nz/projects/the-studio**.*

Artist as curator

Art

By Linda Tyler

Finn McCahon-Jones' research into Colin McCahon reveals his artist grandfather's talent as a curator.

***Family research**: Finn McCahon-Jones is sharing what he learned about his grandfather Colin McCahon's days as a curator.*

Returning to study in 2018 after years in the workforce was daunting for artist and curator Finn McCahon-Jones. He hadn't studied at the University of Auckland before, but breezed through the heavy demands of the honours year with straight As. In particular, it was his dissertation – a year-long project resulting in a 10,000 word essay – that he found most fulfilling. Finn chose to research and write about his grandfather, renowned modernist painter Colin McCahon, because it was "a way to look at my whakapapa and the family narrative. I knew Colin in one sense, but I felt I got to know him in a different way by doing this research.

"I heard his voice in the catalogue essays. What was really valuable was how I got a feeling for what it was like for him working at the Auckland Art Gallery in the 1950s and early 1960s when the gallery was just starting to professionalise."

Finn's research is groundbreaking in many ways, most particularly in examining how Colin's training as an artist expressed itself in the way in which he installed exhibitions.

"In most biographical articles or books on Colin, there is usually a line or two devoted to the fact that he worked as a curator at the Auckland Art Gallery. I was interested to find out what evidence there was of Colin's time at the gallery in the institutional records.

"I also wanted to know what impact his work as a visual artist had on his curatorial work. A few writers have dealt with the influence on his own painting of his gallery work, but I was interested in how it worked the other way around."

It was archives held in the E. H. McCormick research library, administered by library managers and Auckland alumnae Caroline McBride and Catherine Hammond, that were to provide the richest resource for unpicking the nature of McCahon's work at the gallery. Finn read through documents, letters and newspaper clipping books from 1953 to 1964, finding mention of exhibitions Colin had curated and of artists he promoted.

"Both Colin and [wife] Anne really rated Frances Hodgkins (1869-1947) and he had a lot in common with her," says Finn. "Colin wrote to [*Landfall* editor] Charles Brasch about how he hung the Hodgkins exhibition. He connected with her paintings."

"He was interested in how art works when you walk up to it, past it, along it."

The centenary of Colin McCahon's birth is this year and an exhibition entitled *Colin McCahon's Auckland: In the Archive* will run at the Auckland Art Gallery, opening on 6 July. Finn's research will run alongside it, helping interpret the ephemera collections and throwing light on Colin's early years in Auckland.

"In one sense, Colin took liberties with his power at the gallery," says Finn. "He curated the exhibitions, he hung them and his own work was in them, but he did do really good shows, especially the Frances Hodgkins. He used to say she had to go away to become an artist and that New Zealand couldn't really claim her."

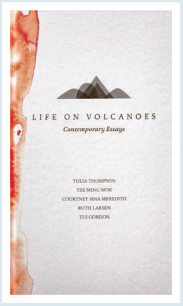
The only time Colin himself had left Australasia was to the US under the auspices of a Carnegie Grant to study gallery and museum display methods, for four months in 1958. Yet Finn's research shows his grandfather was at the forefront of professional museum methodologies of that period, and also that Colin found working at the gallery enormously stimulating.

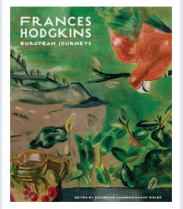
"Colin was all about line, composition, frame, structure. His was a phenomenological approach. Rather than putting up pictures to illustrate a narrative, he was interested in how the body encounters art, and how art works when you walk up to it, past it, along it."

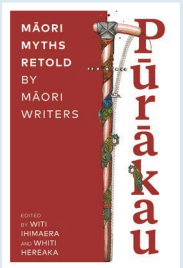
It was a creative way to install exhibitions and one Finn describes as typical of an artist. "He was using his artistic abilities at work. Understanding that, for me, underscored the importance of working with artists in galleries. There are methodologies that you can only develop from artistic practice – spatial considerations. How you look at light and consider materiality. These are the qualities that Colin brought to bear.

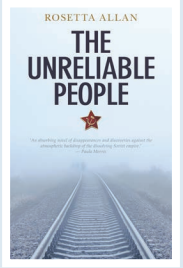
"I am just so glad my research has turned into something. We are making an exhibition that will go out in the world, where other people can appreciate what Colin did." ■

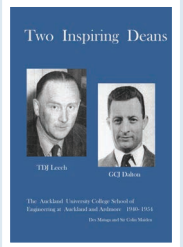
Books











Creative types

LIFE ON VOLCANOES

Life on Volcanoes is edited by alumna Janet McAllister and features essays from five women, all Auckland alumnae. It's dedicated to Janet's mother, Heather McAllister, who worked in Creative Arts and Industries until she died suddenly in 2017. The essayists were given free rein on subject matter and all chose to write on subjects usually discussed in private: sex, money, pain anxiety and trauma.

Life on Volcanoes: Contemporary Essays
Janet McAllister (ed), Beatnik, RRP $25

WIN: Life on Volcanoes
Email your details to: **ingenio@auckland.ac.nz** by 30 June with 'Life on Volcanoes' in the subject.

FRANCES HODGKINS: EUROPEAN JOURNEYS

Edited by alumnae Catherine Hammond and Mary Kisler, this hardback has been published to coincide with an exhibition of modernist painter Frances Hodgkins at Auckland Art Gallery Toi o Tāmaki. (Runs until 1 September then in Dunedin, Christchurch and Wellington in 2020.) The book features more than 100 artworks as well as commentary by international art historians and critics.

Frances Hodgkins: European Journeys
Catherine Hammond and Mary Kisler (eds)
Auckland University Press, RRP $75

WIN: Frances Hodgkins
Email your details to: **ingenio@auckland.ac.nz** by 30 June with 'Hodgkins' in the subject.

PŪRĀKAU: MĀORI MYTHS RETOLD

Pūrākau: Māori Myths Retold is a collection of myths written by distinguished Māori storytellers. They include Auckland alumni, staff or former staff, including Paula Morris, editor Witi Ihimaera and Briar Grace-Smith.

Pūrākau: Māori Myths Retold
Witi Ihimaera and Whiti Hereaka (eds)
Vintage, RRP $38

LOVING SYLVIE

Former NZ poet laureate (2001-2003) Elizabeth Smither was awarded an honorary doctorate of literature by the University of Auckland in 2004. This novel, her sixth, interweaves the story of three women across three generations – Sylvie, her mother Madeleine and grandmother Isabel.

Loving Sylvie by Elizabeth Smither
Allen & Unwin , RRP $36.99

THE UNRELIABLE PEOPLE

Rosetta Allan graduated with her Masters in Creative Writing in 2018. Two years earlier she was the first New Zealand writer-in-residence at the St Petersberg Art Residency in Russia. Paula Morris describes this book as, "an absorbing novel of disappearances and discoveries set against the atmospheric backdrop of the dissolving Soviet Empire".

The Unreliable People by Rosetta Allan
Penguin Random House NZ, RRP $38

TWO INSPIRING DEANS: TDJ LEECH AND GCJ DALTON

Two distinguished alumni, former Vice-Chancellor (1971-94), Sir Colin Maiden, and Des Mataga, explore the impact of engineering deans, professors George Dalton and Thomas Leech who, from 1940 to 1954, transformed the School of Engineering into a thriving faculty.

Two Inspiring Deans: TDJ Leech and GCJ Dalton
Opuzen Press, $55. Email: desmataga@gmail.com

GREGORY KAN: UNDER GLASS

Gregory Kan's second poetry collection is a dialogue between a series of prose poems, following a protagonist through a mysterious landscape, and a series of verse poems, driven by the speaker's compulsion to make sense of things.

Gregory Kan: Under Glass
Auckland University Press, RRP $24.99

WIN: Houses of Aotearoa

Award-winning architect Andrew Patterson (BArch, 1984) recently published *Houses of Aotearoa*. It is a superb coffee-table book featuring 14 houses in stunning landscapes, capturing the essence of a Patterson design.

Patterson: Houses of Aotearoa,
Thames and Hudson, RRP $95

We have two copies to give away. Email your details to: **ingenio@auckland.ac.nz** by 30 June with 'Houses of Aotearoa' in the subject.

BIRTH OF A **BOOK**

We've all heard of second-child syndrome. Parents assiduously document their first-borns, but the enthusiasm for photos and record-keeping can wane with number two.

But when writers Michele Powles and Renee Liang were pregnant with their second children, the opposite happened. The pair knew of each other through writing events but weren't friends. When pregnant Michele heard that Renee was also pregnant, she suggested the Auckland alumnae collaborate on a writing project.

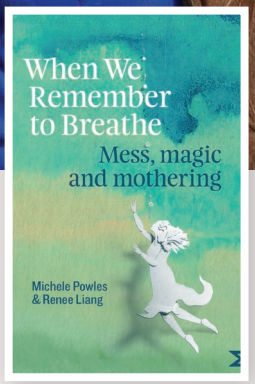
"We'd both said we regretted not writing stuff down during the first pregnancy," says Renee, a writer and paediatrician as well as a researcher and lecturer at the University of Auckland.

They decided to write a short piece every week and to send it to one another, marking their progress as pregnancy progressed to birth and early childhood. "It was both a diary and a correspondence," says Renee. "We found ourselves responding to each other. It wasn't really a book to start off with – more a private conversation and the beginning of a friendship.

"People take photos to record their child's progress, but as writers, it made sense for us to do it in a literary way."

The writing took place over several years and while the subject matter is commonplace, having two talented authors express it the way they do is not. It's part prose, part poetry, sometimes tinged with sadness but always infused with humour. When their eldest child turned five, they stopped writing and printed what they had. "We got a large space and laid it all out on the floor. And then we realised we had most of a book," says Renee.

They sent the collection to Lisette du Plessis who agreed to publish it. Says Renee: "It's the kind of book people can dip into, a page or a thought at a time. When we look back, we realise how much we had forgotten. We're so glad we did it: now we get to share it."



When We Remember to Breathe: Mess, Magic and Mothering
Magpie Pulp,
e-book $7;
paperback $25

BRANCHING **OUT**

If ecologist Robert Vennell, who graduated in 2017 with a MSc in biosecurity and conservation, can't spark your interest in New Zealand's native plants, it's unlikely anyone can.

But Robert wasn't always an expert. The seeds of his book *The Meaning of Trees* were planted after he'd tried to eat his way through native plants of the forest and realised he didn't know much about many of them.

"I was following Andrew Crowe's *A Field Guide to the Native Edible Plants of New Zealand* and thought I'd better find out about the plants if I was going to eat them."

While at the University of Auckland he started writing a blog meaningoftrees.com. Not long after he began work as collections manager for the natural science galleries at Auckland Museum, HarperCollins asked him if he wanted to make his blog into a book.

"I was stoked as I'd had it in the back of my mind. I'm really happy with the design too. The old out-of-copyright artworks from museum collections have given it a real historical feel."

The book considers how our native plants have been used in traditional medicine, as food, and as powerful symbols in Māori culture.

Robert hopes his 256-page hardback has wide appeal. "With all the cute fluffy animals about, we have our jobs cut out to make plants interesting, but that's what I try to do."

The Meaning of Trees by Robert Vennell,
HarperCollins NZ,
RRP $55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