UNIVERSITY OF OTAGO | NOVEMBER 2020

MAGAZNE ISSUE

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Otago experts rise to the COVID-19 challenge Multidisciplinary approach to food waste problems Big dreams for New Zealand youth



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Distinguished career with a global focus

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A magazine for alumni and friends of the University

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VICE-CHANCELLOR'S COMMENT

As you will all be aware, this year has been a year like no other. Although 2020 began as usual, by March here at Otago we were living and working under circumstances that we had never experienced before.

IN MY NINE years as Vice-Chancellor, I have never been more proud of this University. Our staff and our students have demonstrated unprecedented levels of resilience, kindness and success through the COVID-19 crisis.

One hallmark of New Zealand's response to COVID-19 is that it has been evidence-based; much of that evidence has been provided by experts at the University of Otago. Our experts provided advice to Government on the diagnosis, containment and contact tracing of COVID-19; others are currently working on a vaccine. In addition, our experts have provided advice and commentary on the impact of the pandemic on the disability sector, the economy, mental health, tourism, Māori and politics. When the country was running short on hand sanitiser and swabs, experts at Otago even set up manufacturing operations here on campus.

The contribution of Otago staff has been acknowledged by the Prime Minister, the Director-General of Health, the Ministries of Health and Education, and District Health Boards. Since early February their work has also been covered in over 300 TV slots, over 900 radio interviews, over 2,900 newspaper articles, over 9,500 pieces of online news, over 7,000 international media hits, and over 1 million social media interactions. This news has reached five continents with an aggregate readership of potentially 24 billion people!

While all of this was going on, other staff rapidly moved our complex teaching programmes online. At the height of lockdown, we were teaching more than 1,000 different classes online. We couriered almost 500 computers within New Zealand and overseas to people who lacked the devices they needed to work or study at a distance.

Although many of our students returned home during lockdown, we provided pastoral care to more than 1,500 who chose to remain in our residential colleges or in our Uniflats in North Dunedin. We also kept a caring eye on the thousands of other students who remained in residence in flats around the campus as well as maintaining contact with our international students who were stranded offshore.

In consultation with OUSA, we agreed to give students a five-mark grade bump at the end of Semester 1. Although our commitment to the grade bump was undoubtedly reassuring to students when they were preparing for their exams, their grades were higher prior to the bump than they were in Semester 1 last year. Furthermore, despite the disruption in their learning environment and our

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VICE-CHANCELLOR'S COMMENT

extension of the withdrawal deadline, student attrition was no different from last year and our residential colleges have remained over 98 per cent full.

On a personal level, COVID-19 has wreaked havoc on the livelihoods of many of our students' families. In some instances both parents (and sometimes both grandparents) have been made redundant. In response to this high level of need, we established a student support fund, Pūtea Tautoko. This fund comprises both Government support, University support, and generous donations from staff and alumni. To date, we have given out more than \$3 million in support to hundreds of students. We suspect that this level of need will continue in 2021.

One uniquely-Otago approach to decision-making this year was the inclusion

We have also learned to trust ourselves. Many of the extremely difficult decisions that we have made over the last five years paid off in response to COVID-19. Our new professional staff structure allowed us to work as a single co-ordinated organisation during lockdown and beyond. By way of example, between 26 March and 15 May 2020, AskOtago handled almost 49,000 contacts by phone or email. They provided the single source of truth – a truth that was updated multiple times each day.

Additionally, the fact that we had already cut our cloth to fit our income meant that we entered the pandemic in a strong financial position. Finally, the fact that we have long resisted Government pressure to remove or increase our cap on international student numbers has meant

"Our experience this year has underscored the valuable contribution that this University can make to the world in which we live. Going forward, we will continue to be guided by our motto: Sapere Aude, Dare to be Wise."

of our student president, Mr Jack Manning, on our senior leadership team. Beginning in March, Jack joined the Emergency Management Team during our daily Zoom huddles. His input and the input of his OUSA Executive was extremely valuable, allowing us to keep students at the centre of our thinking at all times.

We have learned many important lessons this year. For example, we have learned that our students are firmly committed to an on-campus, in-person learning environment. Some of our first-year students arrived on the doorstep of their colleges at midnight as soon as they were able to return after lockdown. that we are not nearly as exposed to the international market as our counterparts in this part of the world.

Taken together, all of these decisions mean that while the pandemic has placed us under some pressure, we are not contemplating the kind of COVID-related redundancies that many universities in New Zealand and around the world are announcing now.

Finally, our experience this year has underscored the valuable contribution that this University can make to the world in which we live. Going forward, we will continue to be guided by our motto: Sapere Aude, Dare to be Wise. We will



continue to assist where we can in the fight against COVID-19 and we look forward to contributing to New Zealand's recovery. We will also continue to conduct world-class research across the University, using the outcome of that research to solve other big challenges facing our communities, our country, and the rest of the world. Most importantly, we will continue to inspire the young minds who join us every year in our unique living and learning environment.

Some of you will be aware that my second term as Vice-Chancellor comes to an end next year. As one door closes, another one opens. In April, I will take up the role of Vice-Chancellor at Curtin University in Perth, Australia. This decision is obviously bittersweet. I look forward to reflecting on my time at Otago in my final message in the *Otago Magazine* in March.

Noho ora mai

Harlene Harpe

Vice-Chancellor Professor Harlene Hayne

Experies informs action

The COVID-19 global pandemic has dominated 2020, its impact defined by the strengths – and weaknesses – of individual national responses. Here at Otago, we are proud of our experts' responses to this rapidly-changing situation. They have risen to the challenge and have had a fundamental influence on the New Zealand government's decision-making – and continue to do so.

Some of their work is summarised over the following pages. However, it is just a small cross-section of the University's contribution to the crisis. To read more please visit the University's *He Kitenga* website, *otago.ac.nz/hekitenga*, which canvasses these stories and many more in greater depth.

A rapid response

WHEN REPORTS of a new coronavirus emerged from Wuhan in China, epidemiologists at the University of Otago and internationally feared that this was the pandemic they had long been predicting.

As the crisis unfolded, governments around the world were placed under severe pressure to mount an effective response. Here in New Zealand, dozens of experienced public health and infectious diseases researchers from the University of Otago - together with others from across the country - were able to provide expertise to inform our national public health policy, from early warnings to first responses, and to building capacity to contain the epidemic. Their influence extended across television, radio, print media and online forums, with many featuring internationally. Otago's Professor

Philip Hill, inaugural holder of the McAuley Chair in International Health, co-director of Otago's Centre for International Health and chair of Otago's Infectious Disease Emergency Planning Group, says New Zealand was not ph well prepared for COVID-19. Da

"The country was not ready and the pandemic challenged the part of our health system that had become our weakest. The only pandemic plan we had was mainly based around the influenza virus – but the new virus was not an influenza virus."

Hill – who has been appointed to the advisory committee to oversee the implementation of the New Zealand COVID-19 Surveillance Plan and Testing Strategy – was just one of many Otago researchers who saw problems early and tried to contribute to solutions.

"Rather than just listen to what the Chinese were saying, it was important to take note of what they were actually doing. For example, setting out to build a huge hospital in 15 days in Wuhan meant that they were in serious trouble. But by late February it became clear that China was actually gaining control over the virus," he says. "Their public health approach had been huge, sophisticated, tailored and integrated."

It also became clear that some other Asian countries were succeeding in controlling even large outbreaks, including those that featured community transmission. Hill, Wellington-based infectious diseases physician Dr Ayesha Verrall and others realised that those countries had one intervention in common – rapid case contact management.

Verrall began lobbying for a rapid scaling-up of testing and contact tracing, and was commissioned to audit the government's existing contact tracing methods and to recommend ways to improve systems and scale them up. Within six weeks her recommendations were in place.

Internationally-recognised epidemiologist and public health

physician Emeritus Professor Sir David Skegg "entered the fray at just the right time", says Hill. He warned the government's Epidemic Response Committee that failing to improve New Zealand's contact tracing system would be like playing Russian roulette with the health of the population. Skegg also repeatedly highlighted the urgency of widespread testing – within the community and at the border: "There is no such thing as overtesting and every day counts".

Scientific advice changed as more was learned about the virus. From

FEATURE

early February, the University of Otago Wellington's (UOW) Professor Michael Baker and Professor Nick Wilson urged the government to ramp up its response by preparing the population for a massive upgrade in protective practices, strengthening border controls and improving quarantine procedures. They were the first to alert the government to how many New Zealanders might die if officials made the wrong calls.

"In early February we warned that the pandemic could get very bad. But it became much easier to convince officials of the urgency to act because of what was happening in Italy, which was struggling with the pandemic despite having better hospital capacity and more ICUs per population than New Zealand," says Wilson. "If our government had delayed by just another week we could have lost control."

In March their Health, Environment and Infection Research Unit (HEIRU)

team estimated 8,600 to 14,400 deaths as being plausible if there were inadequate controls. The worst-case scenario – letting the virus run its course through the population without intervention – had suggested a death toll of 28,000.

Initial lockdown followed the influenza pandemic plan and aimed

at mitigation – trying to slow down the spread of the virus to avoid overloading the unprepared health system with patients. But modelling by Wilson and Baker soon showed that lockdown provided a real chance to eliminate (not eradicate) community transmission of the virus in New Zealand. With their UOW colleagues they wrote the world's first COVID-19 elimination strategy and published it in the *New Zealand Medical Journal* on 3 April 2020, an approach ultimately adopted by the New Zealand government. They also published an article on the New Zealand response and initial success with COVID-19 elimination in the *New England Journal of Medicine*, regarded as the world's highest impact medical journal:

(nejm.org/doi/full/10.1056/NEJMc2025203)

Throughout the crisis – including after COVID-19 was successfully eliminated and later reappearing in an outbreak in Auckland the researchers have continued to advocate for the wearing of face masks in appropriate settings, for improved contact tracing with digital tools, for a cautious sciencebased approach to border management (including quarantine) and for the need to plan for the introduction of a vaccine.

They have also recommended major changes to the way public health services are organised – such as a new national public health agency for disease prevention and control – and have urged the government to launch an inquiry into its response to the pandemic to identify ways it can be improved. "We need to learn from

the COVID-19 response as there are other threats on the horizon that are far more destructive for all of us," says Baker.

Professor Michael Baker

(left) and Professor

Nick Wilson

COVID captured

AS OTAGO'S epidemiologists informed the government's public health response, the University's infectious diseases scientists were also hard at work. Professor Miguel Quiñones-Mateu and

> Associate Professor James Ussher (Microbiology and Immunology) developed a diagnostic test for COVID-19 in their Dunedin laboratories just as the first case was detected in the southern region. Once the test

was up and running, their priority shifted to providing samples of the virus for culture and genetic sequencing. Quiñones-Mateu, who

holds the Webster family Chair of Viral Pathogenesis, says it took just 36 hours to sequence the full genome of the viruses collected from the first two patients.

"Having the virus opens the door to doing so many different things. We now have more than 30 different projects people want to do with us because we have the virus here. I'm talking about diagnostics methods, disinfection of PPE, vaccine development and antivirals."

Although there have been no major mutations in the virus, there are several distinct clusters circulating in

different parts of the world. "It is important for us to know which virus is circulating here in New Zealand," says Quiñones-Mateu. "Some came from Europe, some came from China, others from the US. So we need to keep an eye on any virus we have here."

Associate Professor James Ussher

Professor Miguel

Quiñones-Mateu

Evolutionary virologist Dr Jemma Geoghegan (Microbiology and Immunology) is heading a nationwide group involving ESR (Institute of Environmental Science and Research) and

other universities using genomic sequencing to track how the virus came into New Zealand and how it worked its way through the country. Geoghegan says genomes can provide insights that

epidemiological data cannot – and in real time. "We can help link a case to a cluster to which there is no apparent epidemiological link: by using the genome we can link that sample to a known cluster or exclude it from a cluster."

Dr Jemma

Geoghegan

This sort of information has proven invaluable in the resurgence of the virus in South Auckland, enabling policy-makers to link cases to a known cluster, to measure the effectiveness of lockdown measures and, by looking for any genomic diversity, seeing whether or not there is undetected community transmission.

Vaccine development

THE UNIVERSITY OF OTAGO is

part of a nationwide alliance to secure a vaccine for New Zealand – Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo (VAANZ)– working with a number of research groups, institutions and companies around the country, including the Malaghan Institute of Medical Research, Victoria University of Wellington, AgResearch, Avalia Immunotherapies, ESR and South Pacific Sera.

Three main candidates are being

At a glance

From early February to late September 2020 dozens of academics from across Otago's campuses made a substantial contribution to the COVID-19 debate, here in New Zealand and around the world.

New Zealand

Over 300 TV appearances Over 900 radio interviews Over 2,900 newspaper articles Over 9,500 pieces of online news

Global

Nearly 7,000 international media hits

Over 1 million social media interactions

Aggregate readership of potentially **24 billion** across **five** continents

FEATURE

"So the question is – will there be a magic bullet come out of existing compounds or do we need to develop specific targeted compounds? I suspect it is both."

pursued, with Quiñones-Mateu's team leading work on an inactivated viral vaccine candidate. Another is a recombinant spike protein vaccine being developed at Victoria University of Wellington, and the third is a pan-coronavirus vaccine being explored by Avalia Immunotherapies with international collaborators.

Ussher, who is VAANZ's science director, says Otago is also a key partner in developing a pipeline for evaluating vaccines. The SARS-CoV-2 strains isolated in the University's PC3 lab will be used in a preclinical challenge model and to measure antibody responses following vaccination, to see if they are capable of blocking infection. A strategy is also being developed for second generation vaccines in case the virus mutates and for any future

coronaviruses that may emerge. "We're trying to stay one step ahead of the virus by having vaccine candidates that are ready to go and could just be taken off the shelf and

slotted straight into a vaccine development programme," he says.

Doing the detail

TEAMS LED BY virologist Professor Vernon Ward (Microbiology and Immunology) and structural biologist Professor Kurt Krause (Biochemistry) are also drawing on their extensive experience and expertise to find ways to beat SARS-CoV2, the virus that causes COVID-19.

Ward's laboratory is working with renowned medicinal chemist Professor Dame

Professor

Vernon Ward

Margaret Brimble (University of Auckland) to identify potential antiviral drug targets for which her lab can create compounds to form the basis of new drugs.

But, he warns, it is likely multiple drugs will be needed for efficacy and because it is often easy for resistance to develop to

a single drug.

"So the question is – will there be a magic bullet come out of existing compounds or do we need to develop specific targeted compounds? I suspect it is both. We will find drugs that help and new drugs will be needed in combination as they become available."

Ward is already leading the MBIE-funded New Frontiers in Antiviral Development project (see *Otago Magazine* issue 50) and has started a project looking at 3CLpro protease of SARS-CoV2.

"We're taking the approach that sooner or later there is a reasonable chance we

Professor Kurt Krause will need to have something specifically designed for this virus, rather than repurposed from something else." They will also undertake a longerterm project focusing on the polymerase looking at different approaches to targeting how the virus replicates its genome.

Once they have a likely target and compound to use on it, they turn it over to Krause and his lab to evaluate, using X-ray crystallography.

This technique allows them to examine these viral proteins at an atomic level to see how well the antiviral compounds bind to them. They can then understand how to improve them so they can do an even better job of blocking the virus from functioning.

"Margaret Brimble has an international reputation for her creative synthetic chemistry and her ability to synthesise proteins and peptides, so Vernon's and my lab will be testing them and feeding back into her work with any suggestions that we have," says Krause.

Bubble concept goes viral

Dr Tristram Ingham (Department of Medicine, Wellington) came up with the bubble concept while advising the Ministry of Health about communications on COVID-19 for the disabled community.



While considering how best to describe self-isolation and quarantine in simple terms, it occurred to him that everyone knew about bubbles. The idea had the advantages of being easily understood and of helping at-risk communities like the elderly and the disabled feel empowered.

His bubble idea quickly went viral and helped frame life under Alert Levels 4 and 3 more positively for all New Zealanders.

Better prepared

Professor Michael Baker has become one of the most public faces of New Zealand's pandemic response and is now leading a new research project to help ensure the country is better prepared for the next major public health emergency.

The programme of work, called Co-Search, involves more than 20 collaborating researchers, three universities, a Crown research institute, community organisations and an international advisory group, and is funded by the Health Research Council (HRC), the Ministry of Health and donations. It is based at the Department of Public Health, UOW, with Baker as director and principal investigator and Dr Amanda Kvalsvig as lead researcher.

Co-Search's main research goals are to describe the pandemic and its impact on population health in New Zealand and the Pacific; evaluate the elimination response to help improve its effectiveness; improve the country's ability to manage major threats; and identify health, equity and sustainability benefits arising from a well-designed recovery.

Wastewater detection

Researchers internationally have shown that wastewater detection of coronavirus can identify hidden clusters and the emergence of the disease days ahead of other approaches. Otago geneticist Professor Neil Gemmell is at the forefront of this work and is part of a national group led by ESR exploring the value of wastewater testing for the coronavirus in New Zealand.

Gemmell says that detecting the presence and, potentially, the abundance of the COVID-19 virus in sewage could become an important tool to monitor its spread and help uncover pockets of infection.

"Depending on what we find we could then make some predictions about which communities might need to go back into – and out of – lockdown. It could be particularly useful for monitoring likely hot spots for new COVID-19 entry and dispersion such as airports, ports and quarantine facilities."



With the reappearance of COVID-19 the ability to test sewage at facility, local and regional scales could well be an important part of New Zealand's surveillance safety net, he says.

Antibody answers

Antibodies are the body's first line of defence against a virus such as COVID-19. Their presence is also evidence the body has encountered the virus – and is the focus of a new governmentfunded study by University of Otago, Christchurch scientists.

Lead researcher Associate Professor Chris Pemberton says one of the best ways New Zealand can understand the real impact and future threat from COVID-19 is to know how much of the population has been exposed – or developed antibodies against it.

He and his team are developing a specialised test that will identify whether someone has contracted COVID-19 and how their body dealt with it. They will recruit and test 14,000 New Zealanders from ages 10 to 70 from across the country who will be followed over three years to gauge how they have responded to the virus infection.

Pemberton says the study will provide answers to the crucial questions needed in order to effectively plan for and treat COVID-19. "One of these is how much of the New Zealand population has been exposed to COVID? We suspect it will be far greater than the current number of confirmed RNA-based tests."

Sensing COVID

While a cough and a high temperature are the most common symptoms of COVID-19, Dr Mei Peng (Food Science) reports that loss of smell and taste are also key early warning signs that shouldn't be ignored.

An international team of 550 researchers from 35 countries has revealed that sudden loss of smell and taste can often be the first symptoms of the virus. Peng, who specialises in olfactory senses, joined the consortium in early March. The group is gathering standardised observational data about how and when the sensory changes happen, and the patterns in different places.



"Within one month we received over 40,000 patient responses, and more than 45,000 in three months," she says. "The findings so far show consistent reductions in smell ability, but at different proportions in different populations."

Diagnostics support

Otago scientists responded to a call to action from the Ministry of Health to boost supplies of COVID-19 testing systems should global supplies run short.

The Diagnostics Development Working Group (C-19-DDWG) has been working since late March across New Zealand universities and government agencies, and is chaired by Otago's Deputy ViceChancellor (Research and Enterprise), Professor Richard Blaikie.

"Our aim is to gain self-sufficiency on COVID-19 testing as insurance against global shortages, to save money for the Ministry of Health, and to stimulate new export business opportunities."



All aspects of testing are being investigated. "We have swabs in late-stage prototype form, and have identified home-grown sources for all the chemicals and reagents needed in molecular testing."

"Some of the work has already led to the production of control materials for use in diagnostic labs and new ways of extracting RNA from samples as part of the testing process. A full test is being validated by teams at MPI and ESR, and could be in wide use when approvals are gained and production is scaled up.

"Similarly, home-grown antibody tests are showing promise, with results comparable to the best labs around the world."

Ready results

Associate Professor Jo Stanton (Anatomy) has already helped develop a portable device to detect a virus that was crippling cassava production and the livelihood of subsistence farmers in



sub-Saharan Africa. Now she is developing that technology to detect COVID-19 in the field.

"The aim is to develop a device in which a sample can be safely put in at one end and, within a short time, get a screening diagnosis out the other without having to doublehandle the sample.

"Our aspiration is to do that in under 30 minutes. Even an hour would be a huge achievement. The lab's mission is to take these complex molecular tests and put them in the hands of people who are not molecular biologists, but absolutely require the answer that molecular biology can deliver."

Life in lockdown

A number of research teams across the University's campuses are looking at how New Zealanders have been coping with life during the COVID-19 pandemic.

Ms Lesley Gray (Primary Health Care and General Practice, Wellington) has received Ministry of Health and HRC funding to investigate the experiences of New Zealanders in lockdown, continuing to follow them as alert levels change.

"We often hear people say disasters are great levellers. Well, of course, that's not true because we don't have a level playing field or equal resources to start with," says Gray. "People's available resources and social situations make a massive, massive difference to people's ability to sustain their own health and well-being."

Gray says the information gathered by the research team will be linked to anonymised demographic information from the Ministry of Health's New Zealand Health Survey, so the results can be broken down by ethnicity, age, gender, occupation and health status.

The research is a collaborative project between the UOW, the Joint Centre for Disaster Research and the School of Psychology at Massey University, and is supported by science communicator Dr Siouxsie Wiles (University of Auckland).

The impact of lockdown on mental health has been surveyed by academic staff from the University's three campuses, led by Dr Susanna Every-Palmer and Dr Matthew Jenkins (Psychological Medicine, Wellington).

An online survey of adult New Zealanders between 15 and 18 April asked participants about their levels of stress, anxiety and depression, the state of their family relationships and whether there were any positive outcomes from lockdown. Every-Palmer says one of the surprises was how well older people responded to the lockdown, with those over 65 the least distressed, while younger adults between the ages of 18 and 34 reporting being most distressed. Most of those surveyed enjoyed having more time to spend with their families.

The researchers will use the same survey to continue to track people's well-being over the next year.

A few weeks into Alert Level 4 lockdown Associate Professor Elaine Hargreaves (School of Physical Education, Sport and Exercise Sciences) and colleagues noticed people changing their physical activity behaviour.

The team subsequently conducted online questionnaires to find out how physical activity changed during Alert Level 4 and whether those changes continued as restrictions lifted.

The surveys – which attracted hundreds of responses – included questions around physical activity levels, types of activity and motivation levels. Early results have shown that physical activity predicted psychological well-being during lockdown; those who were highly active pre-lockdown tended to be less active while those who were less active pre-lockdown reported higher physical activity levels; and the more "daily hassles" people experienced as a result of lockdown the less likely they were to be physically active.

The team plans to re-survey participants next year.

A group of researchers led by Dr Damian Scarf (Psychology) have undertaken in-depth surveys to gauge changes in beliefs and behaviours.

"We wanted to find out whether crises like COVID-19 change people's political beliefs and whether these changes are maintained as we go down the lockdown levels and the risk of COVID-19 decreases," says Scarf.

During Alert Level 4 (full lockdown) researchers received around 3,500 responses to the anonymous survey, which also asks a range of moral and ethical questions.

The group received another 2,000 responses at Alert Level 3 (part lockdown) and 1,000 at Level 2. Now they plan to follow up all 6,500 participants to see how opinions have changed as the threat of coronavirus decreases.

"At this stage, we've found that New Zealanders across the political spectrum are in support of more authoritarian rules. This is not surprising: the survey revealed people are quite fearful of COVID-19 and this is associated with support for a strong government and strict penalties for young people breaking the strict lockdown restrictions."

He says the insights from the study would be useful when assessing economic recovery for instance, given fearful behaviour would lead to a more cautious approach to spending habits and potentially impact views on immigration and international tourists.

Distinguished career with a global focus

The University's highest honour, the Distinguished Research Medal, has been awarded to Professor David Murdoch whose career-long commitment to fighting infectious diseases was cemented during his time as a newly-trained doctor working in Nepal. **AS A BOY,** David Murdoch would spend hours poring over his father's old *Bartholomew Atlas*. Mountains – the Himalaya in particular – held a fascination.

As it happened, the Himalaya would play a pivotal role in the career of this year's Distinguished Research Medal recipient. Stints volunteering at remote Nepalese hospitals influenced him to become an infectious disease specialist and researcher.

Today Murdoch is a professor and recognised world leader in the study, prevention and treatment of infectious diseases. Among his many achievements is a leading role in a global childhood pneumonia study that altered the course of this disease – the world's single biggest killer of young children. He is currently one of three independent advisors consulting the Oxford University team developing a vaccine for COVID-19.

Murdoch first experienced global health issues on his medical school elective at a hospital in Kathmandu, Nepal, with his now-wife, Lynley Cook. They subsequently travelled the country and fell in love with the place and its people.

"I found myself totally immersed in the mountains and the mix of different religions. It was exhilarating and challenging. Totally magic."

As a newly-trained doctor, he and

Lynley worked at a high-altitude aid post in the Mount Everest region, followed by two years with Cook at nearby Kunde Hospital, for Sir Edmund Hillary's Himalayan Trust.

"As we left New Zealand for Nepal we felt incredible happiness knowing we were going for two years to this amazing place. Many times during our stay I stood outside the hospital with the most magnificent mountain vista in front of us and thought 'this is probably the best job I will ever have and we're not even being paid!"

In Nepal, Murdoch developed invaluable and lasting connections with local health professionals, and an understanding of medical problems facing the country and other developing nations. It also exposed him to the devastating effects of infectious diseases and cemented his decision to specialise in the area.

"Since I was quite young, I had always been concerned about global and social injustices. Infectious diseases had been brewing as an option as I studied medicine, but going to Nepal and having to deal with so much preventable disease sealed it for me.

"There was a massive measles outbreak while we were in Kunde and kids were dying. It was horrific. We saw cases of tuberculosis, typhoid, leprosy and iodine deficiency. We were part of national treatment programmes and witnessed

"All those years ago in Nepal I saw how devastating infectious diseases can be. They don't respect international borders and... a pandemic was always going to be inevitable, as is another one in the future. My hope is this experience will open our eyes and we can work better together as a global community in future."

PROFESSOR DAVID MURDOCH: "Since I was quite young, I had always been concerned about global and social injustices." Photo: Neil Macbeth

PROFILE

the transformative nature of public health programmes.

"We hid and treated Tibetan refugees fleeing over the mountains, which led to meeting the Dalai Lama. Looking back, it's quite extraordinary some of the things we were involved in during that short period of time, and it's no exaggeration that it shaped our lives and our careers."

Murdoch followed his undergraduate medical training with a diploma at the Liverpool School of Tropical Medicine and later completed a fellowship at Duke University in North Carolina and a master's degree in epidemiology at the London School of Hygiene and Tropical Medicine. It was in the United States that his love of Nepal and his interest in global infectious disease research would merge.

"My boss at Duke, Barth Reller, was interested in international work. He knew about my relationship with Nepal and encouraged me to explore research opportunities there. Barth said if I came up with a worthwhile project, he would sort the funding," Murdoch recounts.

The result was a simple, but muchneeded, study done with staff at Kathmandu's Patan Hospital to identify which infections were hospitalising patients.

"I spoke to a physician friend at Patan Hospital. At the time there was a huge burden of infectious disease in Nepal, but not a lot of information about which infections were causing most harm. It was one of many studies that cemented my view that the best research outcomes come about through friendship, respect and true collaboration."

After finishing his fellowship at Duke University in 2000, Murdoch returned home and shortly afterwards became head of the Pathology Department at the University of Otago, Christchurch, where he began a number of studies on pneumonia and Legionnaires' disease with fellow clinician and veteran researcher Professor Steve Chambers and colleagues at Canterbury Health Laboratories.

Their work on Legionnaires' disease would reveal the often overlooked but deadly disease was four times more prevalent in Canterbury than expected. This ground-breaking work led to the establishment of the world's first national surveillance study of Legionnaires' disease showing that New Zealand had the highest



David Murdoch and Lynley Cook, outside Kunde Hospital with hospital staff (from left) Kami Temba, Mingma Temba and Tsumji.



reported incidence globally.

At the same time, Murdoch's reputation as a notable international researcher was growing. He was asked by colleagues at Patan Hospital to help establish a research programme on serious infections affecting Nepalese children, particularly vaccinepreventable ones.

He enlisted the help of an old friend, British paediatrician Professor Andy Pollard. The pair met while planning a Mount Everest expedition in the 1990s while Murdoch was in Liverpool and "rapidly became close friends, with a shared world view and work ethic and love of mountains and Nepal". They co-wrote *The High Altitude Medicine Handbook*, a practical guidebook that went to three editions plus a pirated version, and is still considered one of the best clinical reference books of its kind.

"Andy and I still hear stories about how this book has saved lives in the mountains." Pollard is now one of the world's leading vaccine experts and is the lead researcher on the Oxford University programme to develop a COVID-19 vaccine.

"The programme of work we established in Nepal identified the important causes of pneumonia and meningitis in children and the suitability of vaccine schedules. It directly led to major policy decisions in the country, including the introduction by the Nepalese government of *Haemophilus influenzae* type b and pneumococcal vaccines into their national immunisation programme in 2009 and 2015, respectively. This work is an absolute career highlight for me and a source of immense pride. It has had a substantial impact on child health in Nepal and helped establish a new generation of young Nepali researchers."

Through this programme, Murdoch and his collaborators developed strong relationships with the Ministry of Health in Nepal, the World Health Organization's local office and Global Alliance of Vaccine and Immunisation (GAVI), which provides a mechanism for the funding of vaccines in poor countries.

His expertise in pneumonia research, and ability to develop close working relationships with international collaborators, led to an invitation to join the largest ever study of childhood pneumonia funded by the Bill and Melinda Gates foundation.

One of Murdoch's tasks was to set up laboratories for the Pneumonia Etiology Research for Child Health (PERCH) study in seven countries in Asia and Africa. Over a two-year study period the laboratories ran tests on children hospitalised with severe pneumonia to pinpoint the specific viruses and bacteria involved. In 2019 the PERCH team published a significant paper summarising its work. It identified a major viral contributor to the hospitalisation and death of millions of children that could be vaccinated against. Murdoch says the PERCH study gave countries, the World Health Organization and major funders direction on where to put limited resources for pneumonia prevention such as vaccination programmes.

While working on the PERCH initiative, Murdoch established an important New Zealand group. He and veterinarian Professor Nigel French, of Massey University, co-founded One Health Aotearoa. It began as a partnership between the medical school, veterinary school and the Institute of

Environmental Science and Research (ESR). At its core is the philosophy that human health and infection is impacted by animal health and changes in our environment.

Murdoch says the COVID-19 pandemic is proof of this crucial interplay. He believes New Zealand needs to adopt the One Health approach to strengthen its defences against COVID-19 and inevitable future infectious disease threats.

"Like many countries, we are not always well 'joined up' – which is vital for a co-ordinated and timely response. We allow scientists to work in silos, despite obvious overlapping interests and skill-sets," he says.

"We need to strengthen capability in areas such as epidemiology, modelling and outbreak management, and build generic pandemic plans that are flexible enough to

"Looking back, it's quite extraordinary some of the things we were involved in during that short period of time [in Nepal], and it's no exaggeration that it shaped our lives and our careers."



And with Sir Edmund Hillary and his wife, June.

respond to all eventualities."

A lack of investment in infectious diseases research also needs to be addressed, he argues.

"New Zealand has a Centre of Research Excellence in plant biosecurity, but not in animal biosecurity or infectious diseases. We need to better integrate science and research into the health system. This requires a culture change and investment so research is regarded as business-as-usual for district health boards, providing the science needed to inform policy, preparedness and best practice."

Murdoch says the pandemic has brought the importance of scientific collaboration and global health into focus.

"All those years ago in Nepal I saw how devastating infectious diseases can be. They don't respect international borders and, in this age of regular global travel and humans' impact on the environment, a pandemic was always going to be inevitable, as is another one in the future. My hope is this experience will open our eyes and we can work better together as a global community in future."

KIM THOMAS

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Otago scientists are taking prominent roles in an important Antarctic Science Platform programme to investigate how a warming world will impact ecosystems in the Ross Sea. Will two degrees be too much?

Photo: Alan Di

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PROFESSOR MILES LAMARE: "We want to be able to predict how the range of species and biodiversity are going to change..."



THE UNIVERSITY OF OTAGO is

drawing on its extensive research experience in Antarctica as it takes the lead in one of four multi-million dollar projects to understand more about how climate change could impact the frozen continent.

Marine Science head of department Professor Miles Lamare says the six-year research programme, under the umbrella of the Antarctic Science Platform, will investigate how changes in climate could affect Ross Sea ecosystems.

"It's all about how the Ross Sea will respond to two-degree warming. The Paris Agreement aims to restrict warming to below that, so this study will look at what that will mean for Antarctica."

Otago researchers are involved in all four projects that make up the programme.

One is Antarctic Ice Dynamics, looking at ice sheets and previous ice sheet movements.

A second project, Antarctic Ocean Mechanics, involves another leading Otago researcher Dr Christina Riesselman who is co-principal investigator for a team looking at oceanography and how the Ross Sea and Southern Ocean are likely to change under different climate scenarios.

Lamare heads up a third project dealing with the impact of warming on Ross Sea ecosystems, while a fourth project examines Sea Ice and Carbon Cycle Feedbacks.

Understanding the region's ecosystems will cover a lot of territory – quite literally – from sea ice to Antarctica's famed dry valleys, to understand how they are likely to respond to meltwater and how it could drive changes in terrestrial biota.

Other research will focus on how coastal ecosystems could respond to changes such as reductions in sea ice, as well as examining what Antarctic fauna feed on and where they get their energy.

"There's a range of research tools we can use to see how energy is cycling through the systems. What is the contribution from seaice communities compared to energy from the water column, and how energy is getting brought in from animals coming in from off the ice shelf, such as penguins and seals?

"It's all around those nutrient dynamics, energy dynamics and carbon cycling through the system."

Lamare says sea ice is a key driver of so much.

"It's two metres thick and it's not solid, it's porous – so you get a whole community that lives inside that ice. That community includes diatoms and other primary producers that basically provide food for the whole ecosystem underneath it, such as the krill and fish which graze on the bottom of the sea ice."

The sea ice extends about 2,000km off the continent and, when it melts, it produces a huge phytoplankton bloom to drive those nutrient dynamics.

Another component of their project focuses on the pelagic food webs that exist offshore, away from coastal influences. Lamare says this ranges from plankton to the silverfish and tooth fish – key pelagic fish species that are an important food source for animals like seals and penguins.

The project will involve wide-ranging interdisciplinary collaboration, as well as co-operation between institutions including NIWA, Landcare Manaaki Whenua, and other universities (Canterbury, Auckland and Waikato).

This allows them to draw on the expertise of marine chemists, biological oceanographers, food web and meltwater production modellers.

"But the real crossdisciplinary collaborations come across the platform itself. We are basically biological, but the other project – number two – is physical oceanography. We are working with them to tell us how the oceans and currents are going to change, and how the water structure may change.

"We've got people working on modelling the sea ice changes and incorporating this into our models of how the biology will respond. We also have people working on how glacial melting is putting freshwater into the coastal systems."

The modelling component of the

FEATURE

programme will be particularly valuable because the research projects will provide a massive amount of data about how the ecosystem is functioning and how the environment drives processes such as primary production and species distribution.

"What we need to do is take that information and model it so we can start predicting how those ecosystems may respond and function if the region starts warming up and sea ice reduces."

The Antarctic Science Platform has a modelling hub in Wellington with expertise in areas covering climate, biogeochemical cycles, sea ice and glaciology. There is also a big data modeller.

"We want to be able to predict how the range of species and biodiversity are going to change regionally, and we also want to identify vulnerable parts of the ecosystem in the Ross Sea region that are going to be particularly sensitive to change.

"One of the key things the project has to do is set up what we call sentinels of change. If the modelling says the most sensitive part of the ecosystem is penguins, then you can then monitor those as a sentinel of what's happening to the rest of the food web. Similarly, if we identify a particular region is sensitive to warming, we can use that site as a sentinel of change."

They will be setting up permanent monitoring sites – four or five key places which the modelling suggests could be "One of the key things the project has to do is set up what we call sentinels of change. If the modelling says the most sensitive part of the ecosystem is penguins, then you can then monitor those as a sentinel of what's happening to the rest of the food web."

sensitive to change. These areas would track temperature and productivity changes over time.

Lamare's own hands-on research will involve working around Ross Island and along the coast amongst the sea ice.

"We'll be fishing and diving to collect samples for population genetics and isotope analyses – using an ROV [remote operated vehicle] for mapping, looking at biodiversity and gathering water samples."

Unfortunately, COVID-19 has disrupted the usual research season, forcing a lot of work to be postponed. The RV *Tangaroa*, NIWA's research vessel, is going down to the Ross Sea in January so they will have a team onboard as they work to make up for lost time.

Lamare says they are developing funding to charter an ice-strengthened research vessel in the coming two to three years to carry out some of the marine work down the Victoria land coast.

The programme involves extensive international collaboration, working with Italian and Korean research programmes, as well as support from the US and the British Antarctic Survey.



Past informs future

DRILLING HUNDREDS of metres into the seabed below the Southern Ocean is allowing scientists to reconstruct past climate in Antarctica using fossil material going back more than three million years. Paleoceanographer Dr Christina Riesselman (Geology) is co-principal investigator in the Antarctic Ocean Mechanics project along with lead investigator Craig Stephens, an observational physical oceanographer from NIWA.

Her own research takes the record created when phytoplankton and various geological materials eroded off the continent settle to the sea floor and uses it to reconstruct climate in the past.

"I'm trying to understand how dynamics of the Southern Ocean might be different under a future warmer climate scenario, by examining paleoclimate and paleoceanographic records. Essentially it's a logbook of how the ocean has changed through time."

Riesselman says the work has benefited from New Zealand's involvement in the long running International Ocean Discovery Programme. Three recent expeditions to the Southern Ocean produced more than five kilometres of sediment cores.

"We now have cores from really sensitive locations that were selected, by design, to improve our understanding of how the ocean behaved during these past warm climate intervals."

The team includes people with expertise in how sediment particles collect under different ocean current regimes, while others use their expertise in microscopic fossils or geochemistry to identify transitions in the geological record, including times when phytoplankton that live in the sea ice gave way to those that are more tolerant of open ocean conditions and sub-Antarctic temperatures.

"You can use that information to work out where oceanographic fronts were migrating through time or where the overall ocean was a lot warmer."

Riesselman's project particularly focuses on geologic periods where global temperatures were two degrees warmer than present.

"In the last 500,000 years there have been three previous interglacial periods that were just a little bit warmer than the one we're in now, where the sea level was about five to nine metres higher than it is today," she says.

"We're also looking in detail at the last time atmospheric carbon dioxide was elevated above 400 parts per million [ppm] – that was about three million years ago. We passed that level again for the first time in 2013. Today we're right around 412 ppm." The information gathered will be fed into the programme's computer modelling hub.

"We can take the data and generate a time horizon by reconstructing some particular slice of Antarctica's past at multiple locations," says Riesselman.

"It's quite exciting. This [the Antarctic Science Platform] is the only programme I know of in the world where a nation has prioritised building something this integrated."

For Riesselman there is a sense of urgency, particularly considering the way recent drilling programmes have completely revolutionised scientists' understanding of just how climate sensitive the ice sheets are.

"The more we learn from these reconstructions, the clearer it becomes that two degrees of warming is too much. At two degrees, ocean warming has the potential to destabilise sections of West Antarctica – that's already underway.

"But we also have the potential to destabilise key regions of East Antarctica, an ice sheet that was long thought to be pretty insensitive to warming."

MARK WRIGHT

DR CHRISTINA RIESSELMAN:

"I'm trying to understand how dynamics of the Southern Ocean might be different under a future warmer climate scenario, by examining paleoclimate and paleoceanographic records."

PROFILE

Scott Gilmour with young Mt Roskill Dreamers at the *I have a Dream* launch in 2003.

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Otago alumnus Scott Gilmour is an inspiring man. He has forged a successful career and is now committed to helping New Zealand's less fortunate young people on their own paths to success. His *I have a Dream* project works to find long-term solutions to create generational change.

MANY SCHOOL STUDENTS know

their teachers, parents and peers expect that post-secondary studies will be part of their education. Many less privileged pupils are not so lucky.

Some don't even expect to finish schooling before heading off ill-equipped for the world they are about to enter. Without a good education, learned skills or even hope, their future could be bleak.

Scott Gilmour is working on changing that, promoting the dream of a better future to disadvantaged youth.

The project he founded in New Zealand, *I Have a Dream*, works with Kiwi kids from ages five to 20, supporting them to find a path to success – not just academically, but for life.

From small localised beginnings 17 years ago, it has grown into a promising project that inspires and empowers kids to dream and to achieve. It is rapidly

"If you can inspire and support kids during schooling through to employment or further study, you have a good chance of providing positive outcomes for them, their whānau and the communities they live in."

accumulating success stories that highlight its effectiveness.

For Invercargill-raised Gilmour, whose own road to success included an Otago BCom in Management and Marketing, *I Have a Dream* has high aims.

"We're looking at long-term solutions to create generational change. If you can inspire and support kids during schooling through to employment or further study, you have a good chance of providing positive outcomes for them, their whānau and the communities they live in."

I Have a Dream is currently a privatelyfunded charity. Gilmour wants to prove its long-term worth to government. "We've had contact with MPs from all parties. We really need cross-party support as there's not enough philanthropy to roll out what we're doing nationwide.

"Restructuring government social service delivery could do this at no extra cost to them. Our results show a 20 to 1 return on investment when you consider such things as lifetime earnings and taxes paid. But governments are naturally risk-averse and tend to think in the short term. Whereas social change is generational change.

"Our next steps are putting together a national business plan, looking for more partners such as iwi, and we might need another five years to get sufficient data to convince government of the effectiveness of our proposals."

Gilmour is ideally placed to pitch the idea to politicians, bureaucrats, businesses and communities. His career has seen him in sales and start-ups, and he is still an angel investor, funding and supporting innovative start-up companies.

He never had a long-term life plan, believing that if you don't plan ahead it frees you to take new directions when doors open. While he appreciates his upbringing was comfortable, since then he has made his own way and has certainly made the best of opportunities.

Choosing a degree was not so much a passion for business as eliminating subjects he didn't like. But he found inspiration in his second year when he started using computers for analysis, agreeing with his father's advice that they could well be the future.

Graduating with a double major, Gilmour landed a sales position with Burroughs in Christchurch, where he discovered how businesses actually worked and how computers could be used effectively.

Life took an unexpected turn when he met an American girl tramping in New Zealand. "We knew almost instantly that we were going to get married." A year later, when Gilmour was ready for a traditional OE, the couple passed on Europe and headed to the States instead. In six months



they toured 20,000 miles together in a small car. "If you can survive that, you can survive anything."

They settled in Portland, Oregon, with the idea of starting a family and heading back to New Zealand after a few years. Gilmour joined NCR in sales, but soon felt he needed to move on from selling. With few options available at the time, he decided to advance his education with an Executive MBA.

"NCR were very good and funded my first year, where I was able to work and study side by side, but I couldn't see a future with them so left and self-funded my second year."

Gilmour took to mature study with a passion, working with real-life situations. "I had to do a full-year business plan using activity-based costing theories. At last accounting made sense." So did business. Gilmour and a fellow student used the study to start their own software company from scratch.

"We raised money to start it, but as I also had a mortgage and two kids and debt from study, I needed an income too so I joined Intel, which was a fantastic place to work, rather like doing an ongoing MBA."

For eight years Gilmour ran parallel careers, working for Intel by day and working on the start-up on some nights and at weekends.

When the opportunity came to head Intel's operation in New Zealand, it was perfect. "We now had four kids and our five years in the States had expanded to 15. It was time."

During Gilmour's four years as general

manager of Intel in Auckland, he had high visibility, with a broad experience in management, marketing, development and investment.

That visibility led to him teaming up with Andy Hamilton, of Icehouse, and others to co-found Ice Angels, a business network that invests in and supports promising teams exploring global opportunities.

"New Zealand desperately needs to figure out how to develop more businesses where we add value to what we do. We can't keep relying on industries such as forestry, agriculture and high-risk tourism."

In 2019 Gilmour received the annual Arch Angel Award from his investment peers for his contributions over the years and, possibly, his sense of humour. "My first reaction was shock and then amusement. I reckon I got it just because of longevity as I'd been doing it for so long."

Throughout his years in the States and in New Zealand, Gilmour remained involved in his own software company, which he had helped to nurture all the way from the first business plan and capital raising through hiring staff, strategic planning, expansion and, finally, to a successful sale of the company. It was another life-changing event.

"We'd made every classic mistake startups make but, in the end, after 13 years, we'd become an overnight success. I now had the resources to do something else."

One of the first things he did after selling the company was to dig out an old newspaper clipping he had filed after it fired his imagination in the US.

The item reported the success of the *I Have a Dream* project supporting disadvantaged kids through school. It had started in East Harlem in New York City in 1981 and had been running for about a decade when it came to Gilmour's notice.

Gilmour felt the model could be a perfect fit for New Zealand. He approached the American organisation for permission to set up the first similar project outside the US.

"I didn't know much about education or social work, but it looked like a great business plan to me. Then I found out there were more than 20,000 different charities in New Zealand. Did we really need another one?

"After six months of investigations and talking to lots of people doing great things for kids I found there was really nothing like *I Have a Dream*."

Gilmour emphasises two standout differences. "The first is inclusivity. Most aid programmes target the top 10 per cent of kids on the bell curve or the bottom 10 per cent. We target the whole cohort, including the largely overlooked 80 per cent in the middle. We aim to move the whole bell curve up. Working with kids from years one to 15 and beyond, we have shown that the whole group has potential for greater outcomes than they would have otherwise.

"The second difference is timeframe. Most programmes run for a few months or for one or two years and involve one activity. We run for 10 to 15 years and include everything: literacy, numeracy, soft "University can be powerfully formative. Otago woke me up intellectually, socially and emotionally."

social skills and all you need to get a job or go on to further study."

Breaking out of generational issues and challenges such as the cycle of poverty involves youth getting support from a fourlegged stool, says Gilmour.

"The legs are family, friends, culture and community, and education and employment. Take away any one of those four and it becomes harder. Take two away and it's harder still. Lose three and you are likely to get lost. This is where the gangs step in and provide alternative social structures."

Gilmour has seen many participants in *I Have a Dream* respond and blossom. Some have fallen by the wayside, but supporters are still standing by them and they still have opportunities to turn their lives around.

"The key to *I Have a Dream* is the people who keep it going. I funded the first round and promote and support it, but the people who do the day-to-day work deserve all the credit for its success. We are also blessed with many generous donors to fund this expansion. Now can we find more people who can help us set it up around the country?"

Gilmour appreciates education – and Otago. "Lessons you pick up at Otago are foundational. You leave home and learn how to live independently and get on with others. You learn time management and meet different people from different places doing different things. You get to evaluate life and look at your choices."

Campus life in Dunedin gives graduates an edge, says Gilmour. "I and other business people I meet find Otago graduates typically shine out among job seekers coming from university.

"University can be powerfully formative. Otago woke me up intellectually, socially and emotionally."

Otago has also inspired participants in *I Have a Dream*. After an exploratory 2019 visit to campus, half of one group decided they wanted to study at Otago. And when one of the programme's early protégées crossed the stage to be capped in neuroscience, Gilmour felt as proud for her as he had for his own children who had graduated not long before.

I Have a Dream is now working with over 800 kids in Whāngarei. Eventually Gilmour wants to see New Zealand roll out the programme to all high-needs communities in the country so their young people can get an opportunity to share in the same kind of experience.

Learn more at *ihaveadream.org.nz*

NIGEL ZEGA



Otago's new Food Waste Innovation Research Theme brings together multidisciplinary expertise to address the complex problem of food waste, offering positive outcomes for society, the economy and the environment. **UNIVERSITY OF OTAGO** researchers are seeking solutions to a global problem that could turn into a win-win situation for humankind and the planet.

While people in some parts of the world are starving, people in wealthier countries are throwing away enough food to feed them all – and that waste makes a major contribution to climate change.

Associate Professor Miranda Mirosa (Food Science) is director of the University's new Research Theme, Food Waste Innovation – Auahatanga Parakai – which launched in October.

"I'm really excited about food waste because a lot of the solutions are quite simple. We don't have to radically change what we are eating, but we do have to make changes to the way we think about food and how we treat it.

"Food waste is everybody's responsibility so everyone should get involved. It's a winnable issue and solving it really can help society, the economy and the environment."

United Nations' estimates suggest that about eight per cent of annual global greenhouse gas emissions are generated by the 1.4 billion tonnes of food wasted each year. About a third of the food produced for human consumption does not get eaten. Yet more than 800 million people are going hungry.

Among the UN's Sustainable Development Goals is Target 12.3, which aims to halve food waste across the world by 2030. Mirosa's teams are supporting that target, investigating how and why food is wasted, and devising social and technical innovations to reduce it happening.

"We've been working on this issue for a number of years as individuals and in small collaborations," says Mirosa. "Research Theme funding for the next four years allows us to scale up and co-ordinate internal and external research teams for specific projects.

"The issue of food waste has been gaining momentum over the last five years, with interest ramping up recently nationally at government level and among businesses and the public." Mirosa will continue her role as a government consultant, following on from her "Mirosa Report" prepared for the 2020 Parliamentary Environmental Committee investigating food waste. She recommended that key stakeholders needed to develop a national consensus about how to tackle waste, gather data and take action now.

"New Zealand is lagging behind international efforts to combat food waste, which is surprising given our clean green image. We should be at the forefront of issues like these, but we've only really just got started with the government recently committing to establish a definition and measure of food waste and to include a food waste reduction target as part of a new waste strategy for New Zealand. We need to move fast.

"Otago is New Zealand's leading provider of research into food waste, which is why this latest Research Theme is so important. We can now gather all the multidisciplinary work that is being done and make it accessible to government, industry and the public.

"This issue has the potential to engage everyone, including the private sector, because solutions save money. Calculations show a median return of \$14 for every dollar invested in food waste reduction initiatives."

Many businesses in the food supply chain are already official supporters of the Research Theme as well as involved in New Zealand Food Waste Champions 12.3, a coalition co-chaired by Mirosa and committed to meeting the UN goal of halving waste by 2030 (*nzchampions123.org*).

The University of Otago's Food Waste Innovation team is currently running three research sub-themes: social innovations, measuring waste, and technical innovations, respectively led by Mirosa, Professor Sheila Skeaff (Human Nutrition) and Professor Phil Bremer (Food Science).

Skeaff, research leader for metrics and management, wants to understand the volume and nature of food being thrown away. "If we don't really know how much waste we have now we can't meet a target of halving it."

RESEARCH THEME LEADERS

Associate Professor Miranda Mirosa, Professor Phil Bremer and Professor Sheila Skeaff. They are working to measure food waste, develop reduction strategies, apply innovative technologies, and help modify producer and consumer behaviours.

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FEATURE

Data collection along the food supply chain from growers to consumers, including post-harvest, food outlets and retail, will provide a baseline to work from when developing waste prevention strategies designed to have the biggest impact with the least resources.

"Farmers and retailers have a good handle on how much is being wasted and are pretty good at keeping it to a minimum," says Skeaff. "It's just good business sense, but there are gaps and there is a lot of wastage by end-users. As consumers we need to change our mindsets and smarten up.

"A lot of people don't know what they are doing wrong and need help to find the right ways to reduce waste, especially in the home. It needs effort and behavioural change. Fortunately young people are very environmentally aware and want to tackle the problems. But it's going to take time."

Economic drivers are effective for both businesses and consumers, and COVID-19 has highlighted the importance of food, says Skeaff. "During lockdown we realised how basic a need food is. We also discovered how fragile our food system is. For example, when imported food ingredients are no longer available, that can stop production. We need to better use the foods we produce in New Zealand and rely less on imported, highly-processed products."

Food has a lot to answer for. The EAT-Lancet Commission on Food, Planet, Health estimates that a future planet population of 10 billion could be fed a healthy diet in theory, but only if we transform our eating habits by reducing our intake of animal foods and moving to a more plant-based diet, improving food production and reducing food waste.

Reports from almost 40 world-leading scientists led the commission to conclude that global food production is the single largest driver of environmental degradation, climate instability and the transgression of planetary boundaries.

Research being done by Food Waste Innovation is both timely and vital,

"Achieving food waste reduction will require big acts by big players, as well as millions of acts by everyone from farmers to consumers. We need to understand behaviour better, of both producers and consumers. We have to look at what we are doing and how we might change what we do to reduce food waste."

says Skeaff, and data will help to inform responses to the issues. "This is definitely a good start. It's a complicated issue with lots of players and we will need a lot of people across a variety of sectors to work on it. What gets measured has a better chance to get managed."

Mirosa, research leader for social innovations, sees the new Research Theme as a positive step after her recommendation to parliament that better co-ordination is needed to reduce food waste.

"Achieving food waste reduction will require big acts by big players, as well as millions of acts by everyone from farmers to consumers. We need to understand behaviour better, of both producers and consumers. We have to look at what we are doing and how we might change what we do to reduce food waste. "We need to get researchers together with representatives from all parts of the food supply chain so they can ask questions of each other and let each other know how they can help. We need to match research and practical applications. And we need to showcase success stories and see what went well and what we can improve.

"There are huge gains for the national economy and the public in general, which is a win on the social front. We need that progress, especially since finding that during the COVID pandemic one in five New Zealanders were recorded as having faced food insecurity."

Bremer, research leader for technical innovations, sees the Research Theme as the natural result of the number of people investigating related topics reaching critical mass.



"The Department of Food Science has been interested in this for a long time, but only lately has this explicitly fallen under the labels of sustainability and food waste," he says. "We already have strong connections with industry, learning about their product streams and their possibilities and limitations, and helping them with innovation."

Work includes finding uses for what is currently considered food waste. That may involve finding values within a waste product by breaking it down into its component parts and using them as raw materials to manufacture something new.

"We have already investigated uses for fish, meat, fruit 'waste' and even some shells, but there are many more possibilities to explore. Those could include turning products such as bread and milk, when they get close to their sell-by dates, into new products that could subsequently be sold.

"No one likes to see things thrown out, but up-cycling is still a fairly new idea for the general consumer and there has to be a need in the market for it to work. Once people might not have been interested in buying a recycled product, but now it is fashionable to act and buy responsibly. Sustainability is a big driver now."

Turning what was once considered waste into marketable food requires a wide range of skills.

"We need food scientists to work on what we can make and how, sensory scientists to ensure that any new product appeals to customers' tastes, food safety experts to ensure it is safe, nutritionists to ensure it is healthy and marketing specialists to investigate consumer behaviour. It involves disciplines such as food science, microbiology, nutrition, chemistry and marketing. The Research Theme will make bringing teams of experts together a lot easier."

There is strong support for change, says Mirosa. "Our goal with the Research Theme is to use this support to harness the best scientific expertise to provide effective solutions to Aotearoa's food waste problems."

NIGEL ZEGA

FOR FURTHER INFORMATION:

otago.ac.nz/food-waste

If your organisation is interested in becoming a supporter, please contact the research teams at food.waste@otago.ac.nz

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OTAGO ALUMNA GEORGIE NORTHCOAT: "My degree has helped me begin a journey where I am using what I know to make a meaningful change in the world."

A STREET STAND at the side of

a deserted road on the outskirts of Christchurch selling horse manure, alongside lemonade, marked the beginning of 10-year-old Georgie Northcoat's entrepreneurial dream.

But while Georgie, now 21, applauds the plucky attitude of her 10-year-old self that saw her convince her best friend to embark on that first entrepreneurial adventure together, she says she's learnt a lot since then about presenting the right product in the right place and right time.

"I'm not sure horse poo and lemonade was a great combination," she laughs.

"Nor was selling a product like horse manure into a farming community where there was already an abundance of horse manure."

Fast forward a decade and it could be argued that Northcoat's latest venture, EcoTex – an eco-solution that found a assistance for the winning concept.

Then along came COVID-19.

"Manufacturing in offshore markets, where we aimed to source textile offcut waste, virtually halted and we found it difficult making connections with the people we needed to work with on building the solution. Essentially, we couldn't find our product-market fit," says Northcoat.

"So a week or two into lockdown we made the call to pivot – to try to solve the same problem, but in a different way. While many of us are aware of the growing problem of microplastics in the ocean, most people are unaware that domestic laundering – the washing we do at home – contributes 35 per cent of all these emissions.

"Our solution is a product to remove this synthetic textile waste – created when the abrasive mechanical action of washing machines causes fibres to shed from clothing – from the natural environment." break down through the washing process, releasing plastics into waterways, grey water systems and impacting environmental and human health.

"At the moment, we're prototyping the product and doing consumer testing.

"I've learnt a lot of practically focused business information. I'm still a university student – now doing postgraduate studies at ICT Signal – so learning about all the steps you need to take as an entrepreneur to validate your business idea and get it ready for market has been a massive learning curve.

"While we unfortunately didn't win the prize, I'm looking forward to pursuing Lynk Solution, while working for a local company [Winely] over summer as the operations manager with mentors I very much admire."

Responding to new challenges and constantly evolving situations is something

University of Otago applied sciences graduate Georgie Northcoat is no stranger to confronting challenges in her life. Now she is pursuing her dream of entrepreneurship – a dream that saw her unique eco product, Lynk Solution (originally known as EcoTex), become a finalist in this year's Callaghan Innovation C-Prize awards.

patentable process to repurpose synthetic fibres from waste fabric into insulation materials for homes – was exactly the right product for the right place and time.

Armed with an applied science degree in textile science and marketing, her idea became one of eight finalists in the Callaghan Innovation's C-Prize, an annual science prize which offers \$100,000 and While the original idea for Eco-Tex may have changed, it still meets the company's original goal of finding a solution to mitigate the impact of synthetic textiles on the environment. The new solution – the Lynk microfibre filter – attaches to any washing machine and works to eliminate 93 per cent of the pollution caused by microfibre plastics that comes when synthetic fibres Northcoat is no stranger to. Born with cystic fibrosis, a condition that causes severe damage to the lungs, digestive system and other organs, she spent much of her childhood in and out of hospital.

"I have a really bad habit of downplaying everything, but I do treatments every day – preventive treatments – that help keep me well and have kept me out of hospital for

PROFILE

"I've learnt a lot of practically focused business information. I'm still a university student... so learning about all the steps you need to take as an entrepreneur to validate your business idea and get it ready for market has been a massive learning curve."



the past two years. Before that I probably spent a couple of weeks to a month in hospital at least once a year.

"Everyone talks about the physical aspects of cystic fibrosis, but the psychological aspects and the toll those take on me and everyone in my family is massive. It's definitely present in my day-to-day life. I've been extremely lucky to be healthy for the past two years and am really grateful for that."

Northcoat grew up in Christchurch and attended Burnside High School, before choosing the University of Otago for her study, where she won a Donna-Rose McKay Scholarship*, embarking on a degree in applied sciences (textile science) and marketing.

"I have always been hugely interested in textiles. At one point I considered studying fashion, but I knew I wanted to do something with real depth. My degree has helped me begin a journey where I am using what I know to make a meaningful change in the world.

"I really enjoyed Otago for the balance of

university and study and friends. I've loved it. It's taught me a lot about independence and, while I never considered myself an academic, I was able to pick up some great habits and do well."

Keen on developing her entrepreneurial skills, Northcoat joined Audacious in 2019, a programme for students that builds entrepreneurial skills through workshops and mentoring, run through Startup Dunedin.

"In November last year I went to China to take part in UNLEASH Innovation Lab for the Sustainable Development Goals [SDGs], a hackathon for trying to solve the world's most pressing issues. This is where EcoTex – now known as Lynk Solution – was born. After that I travelled around China visiting manufacturers and attending conferences. When I returned to New Zealand in December, I applied for C-Prize."

Northcoat is humble about her many achievements in her 21 short years and says doing something different from your peers may seem "a bit unnatural or off" at first, but is extremely rewarding.

"Expand your interests. You're never too young to start exploring your interests. Don't be afraid to uncover a person-driven or passion project.

"Last year I became very involved with Cystic Fibrosis NZ and this has been an incredibly rewarding experience. Prior to that I had been a bit more private, but I've found that educating people about what cystic fibrosis is and what it means has been really cool and I'm really proud to get involved."

AMIE RICHARDSON

*Donna-Rose Mackay was Head of the University of Otago's Disability Information and Support service. A suite of scholarhips for students with disabilities was named in her honour in 2014 following her death.

OPINION

PROFESSOR TONY BALLANTYNE:

"Cook's contributions to European knowledge and his engagements with indigenous communities across the Pacific were the very things that made him so effective in forwarding the interests of the British Empire."

Putting Captain Cook in his place

A polarising figure, variously described as a murdering invader and an accomplished navigator, cartographer and ethnographic observer: just what is Captain James Cook's legacy? Pro-Vice-Chancellor (Humanities) Professor Tony Ballantyne discusses these divergent views in the wake of Tuia 250. **NEW ZEALAND IS** a society that lives in the shadow of empire and colonialism, where the conflict, dispossession, inequality and painful legacies of the past frequently resurface in cultural life and political debate.

In recent times, the figure of Captain Cook has loomed large in these discussions. In part, Cook's prominence reflects the impact of global social currents, particularly the Black Lives Matter movement and heightened focus on memorials to empire and slavery in the wake of the toppling of a statue of Edward Colston, an influential merchant and politician whose wealth was underwritten by the Atlantic slave trade, in Bristol in June. Within a week of that statue being deposited in Bristol harbour, a Cook statue commemorating Cook on the Waikanae foreshore in Tūranga/Gisborne was inscribed with graffiti that read: "Black lives matter and so do Māori" and "Take this racist headstone of my people down before I do".

That text can be read as an intervention into the ongoing debates over Cook's particular significance in Tūranga/ Gisborne, which was the first landing site for Cook, the officers and crew of HMB *Endeavour* in October 1769. Violence studded the first collisions between Cook and local people – Rongowhakaata, Ngāti Oneone, Te Aitanga-a-Māhaki and Ngāi Tāmanuhiri. Te Maro of Ngāti Oneone and Te Rakau of Rongowhakaata were killed during the first two landings by the British.

Cook decided that capturing some local people and then treating them kindly would be an effective strategy to establish his friendly intentions. He pursued this plan by kidnapping three young Rongowhakaata men – Te Haurangi, Ikirangi and Marukauiti – after their four kin who had been out fishing with them were killed by British. These violent acts have had profound consequences for hapū and iwi, who continue to feel considerable mamae (pain) as a result of the violence that left their ancestors killed and wounded, and which inaugurated the beginnings of imperial intrusion and, ultimately, colonial settlement. As a result, Cook has always been a contentious figure in Tūranga/Gisborne: although many civic leaders have been proud of the city's connections with the *Endeavour* and seen Cook as a hero, Māori have remembered the violence and felt its enduring legacies.

Cook returned to the centre of national attention over the past three years as a result of the initiation of Tuia 250, a sequence of commemorations to mark the 250th anniversary of *Endeavour's* arrival. Although the initial government announcement had a strong focus on Cook, as this programme evolved

its aspirations widened to focus on New Zealand's "Dual Heritage; Shared Future". This vision accorded with the meaning of "tuia", which alludes to weaving together and emphasises interconnectedness and interdependence.

As Tuia 250 took shape, Cook increasingly moved to the margins, in part as a response to criticism of any desire to celebrate either Cook or the *Endeavour* itself. The Tuia 250 programme had a strong emphasis on mātauranga Maori (Māori ways of knowing) and Pacific knowledge traditions. Navigation and voyaging were particularly important here, through the figure of the Rai'atean ritual expert Tupaia, who joined the *Endeavour* crew, and through Pacific traditions of oceanic voyaging.

A key feature of the commemorations was a flotilla featuring six vessels, including two waka hourua (*Haunui* from Tāmaki Makaurau/Auckland, and *Ngahiraka Mai Tawhiti* from Tauranga) and a va'a moana



A statue of James Cook by the sculptor James Tweed unveiled in 1912, West Cliff, Whitby. The inscription celebrates Cook as "a great Yorkshire seaman".

(*Fa'afaite i te Ao Mā'ohi* from Pape'ete,) as well as the replica HMB *Endeavour*. The va'a moana and waka hourua proved particularly popular with the hapū and iwi that engaged with the Tuia 250 programme, reflecting their strong interest in waka, the ocean, navigational traditions and their links back across the Pacific.

But both the *Endeavour* replica and the Tuia programme were controversial. Tina Ngata (Ngāti Porou) criticised the planned commemorations at a United Nations forum in April 2018, suggesting it was designed as a celebration that failed to recognise the terrible consequences of Cook's arrival for Māori. Other critics were even blunter, suggesting that Cook was a murderer, a thief, an invader – and Arama Rata (Ngāti Maniapoto, Taranaki, and Ngāruahine) dubbed the *Endeavour* a "death ship".

These powerfully articulated critiques were rejected by other commentators who

"The past is remembered in different ways in different places. Communities remember in divergent ways; the culture of communities is shaped by what and how they remember, by what they ignore and by what they forget." suggested that these arguments failed to recognise Cook's accomplishments as a navigator, cartographer and ethnographic observer and that, in many instances, he was adept at crossing cultural boundaries.

Although these positions appear fundamentally irreconcilable, in fact Cook's contributions to European knowledge and his engagements with indigenous communities across the Pacific were the very things that made him so effective in forwarding the interests of the British Empire. Cook's three voyages into the Pacific produced vast stores of information, enabling Europeans to believe that they "knew" the region and this facilitated future imperial trade and colonial settlement.

Although Tuia 250 was contentious, it did provide an important opportunity for New Zealanders to reflect on the legacies of empire and colonisation, to hear Māori perspectives, and to have some conversations about the past, present and future that are urgently needed in a society where there are persistent and pernicious inequalities.

A number of hapū and iwi saw Tuia 250 as providing them with opportunities to pursue their own goals, particularly to reinvigorate waka traditions, to strengthen ties across the Pacific, and to ensure that their understandings of the past were shared widely. Ngāti Oneone, for example, emphasised the significance of Te Maro in the history of their community and he was celebrated in a striking 10-metre tall sculpture erected at the Ruatanuika lookout on Ngāti Oneone's maunga Titirangi, meaning that this key tupuna now looks over the city of Tūranga/ Gisborne. This was a very significant change: until earlier in 2019, a poorly executed and very contentious statue of Cook had stood on Titirangi, underlining Cook's symbolic importance in a city whose civic identity has often been defined through connections with the navigator.

This changing landscape of memory can be usefully contrasted with sites in

the United Kingdom that are associated with James Cook. Cook is memorialised in a number of sites in Yorkshire: in his birthplace Marton-in-Cleveland; in the village of Great Ayton, where Cook spent his boyhood; in the coastal village of Staithes where he was apprenticed to a grocer and haberdasher; and in the important port of Whitby. It was from there that Cook built a career as a sailor and officer and learnt his craft as a navigator. In Whitby today, Cook is prominent. His statue dominates the hill on the north side of the harbour and a museum marks his significance in the centre of the town. Cook in Whitby is celebrated as a great Yorkshireman and an outstanding sailor, rather than an imperial hero. In each of these places in Yorkshire, Cook is remembered slightly differently, but what is striking to a New Zealander is that, in the north of England, Cook seems settled and uncontentious. The pain and consequences of empire feel half a world away.

The divergence in how Cook is remembered in Whitby and Tūranga/ Gisborne is a telling reminder that memory is perspectival. The past is remembered in different ways in different places. Communities remember in divergent ways; the culture of communities is shaped by what and how they remember, by what they ignore and by what they forget.

Cook will not be quickly forgotten in contemporary New Zealand, even as the controversies surrounding Tuia 250 begin to fade. Cook will undoubtedly return to the centre of public attention at some point soon as communities continue to reflect on his significance and as the coming generations discover the past, its complexities and its ongoing weight in the present.

Professor Tony Ballantyne's research interests include the cultural history of the British Empire, New Zealand's changing place within that empire, and the development of colonial knowledge. Associate Professor Anne-Marie Jackson and Dr Louise Bicknell are joint winners of the 2020 University of Otago Rowheath Trust Award and Carl Smith Medal given to recognise the outstanding research performance of early career staff.

Research passion with Māori focus

Māori Physical Education and Health kairangahau (researcher) Associate Professor Anne-Marie Jackson studies how connections of wai (water), moana (ocean) and mātauranga (Māori knowledge) are beneficial for mauri ora (flourishing health), and she strives to create opportunities for Māori research excellence that, most significantly of all, serves Māori communities.

Starting out as a lecturer in the School of Physical Education, Sport and Exercise Sciences in 2011, Jackson (Ngāti Whātua, Ngāpuhi, Ngāti Kahu o Whangaroa, Ngāti Wai) co-founded kaupapa of Te Koronga with Dr Hauiti Hakopa. She now co-leads Te Koronga with Dr Chanel Phillips and Mr Danny Poa as a vibrant research kaupapa with excellent graduate research students, researchers and communities interested in mauri ora.

Mauri ora and hauora (health) is the core thread that binds Jackson's many strands of mahi, and which connects theory and application through working with Māori communities and "getting our hands dirty".

She co-leads two other research programmes: Te Tiaki Mahinga Kai (customary fisheries) and Tangaroa Ara Rau (Māori Water Safety), the later involving the development of a free Māori water safety programme that strengthens whānau connection to the water. This work is funded from the Health Research Council where she works alongside researchers and communities around Aotearoa.

It is these research programmes that encapsulate the interface and connections between Jackson's teaching, research and community-based mahi.

Her most recent research collaboration, Coastal People: Southern Skies, brings together education, government and community partners across Aotearoa, and focuses on the changes resulting from ocean warming and acidification, sea-level rise and climate, and how these issues affect our identities, histories and well-being as coastal people.

"Climate change is the biggest issue we are facing so we need holistic thinkers who can address such questions."

Jacksons says physical education has nurtured a broad base of theoretical and applied skills that can be applied to these challenges, and which includes the ability to adapt to constantly changing situations.

In 2019 her research was also recognised with the Royal Society Te Apārangi's Te Kōpūnui Māori Research Award for research forging new knowledge at the interface of mātauranga Māori and physical sciences.

She has also recently received a national Tertiary Teaching

Excellence award in the Kaupapa Māori category from Ako Aotearoa for her sustained excellence in teaching.

Jackson believes the key to this success is understanding her own 'why'. "I'm hugely passionate about my research which is what I teach on, so I think this enthusiasm is maybe part of the success. But I love seeing students develop their own passion and enthusiasm and then become engaged to go out into the world and do something about it in a practical way too.

"It's important I provide leadership as well as capability-building for Māori research and researchers by making sure we walk our talk and deliver."

However, it's that deep connection and relationships with people and place that continue to drive Jackson's mahi.

"For us, the more important evaluation of our work is from those communities whom we work directly with, to ensure we are accountable to them, to our own whānau and to ourselves."

And winning this award and medal is particularly significant. "It shows that there is a pathway for someone else like me to realise their potential in research."



ASSOCIATE PROFESSOR ANNE-MARIE JACKSON: "I love seeing students develop their own passion and enthusiasm and then become engaged to go out into the world and do something about it in a practical way too."

Genetic questions and answers

Dunedin geneticist and Rutherford Discovery Fellow

Dr Louise Bicknell's research focuses on understanding how changes in a person's DNA can impact development and lifetime health. Her particular focus is on single gene disorders of body and brain growth.

Initially coming to Otago to do medicine, Bicknell "got hooked by the science" and graduated with a BSc with first class honours in genetics.

"With genetics there are just four letters [bases that make up DNA]; it's that simple. To think that basic simplicity leads to the complexity in nature all around us, I mean, how? And it's that 'how' question that's inspired me."

Following her PhD she moved to the University of Edinburgh for postdoctoral work and a chance to work alongside Professor Andrew Jackson who was studying human genes acting in growth and inflammation.

"It has turned out to be really interesting in that it's quite a simple concept – what determines our size – but we still don't fully understand it. For example, the bumblebee bat weighs just two grams and the blue whale weighs 150 tonne. But both started from just one cell with a common ancestor and you luckily never see a bat the size of a blue whale, or vice versa.

"So, there must be controls for this in our instructions. That's what determines the size. And those instructions – that's the genetics."

It is changes in those genetic "instructions" that determine many conditions resulting in size differences among humans too, she says. "These conditions are caused by just a couple of these DNA spelling mistakes. Our goal is to find these spelling mistakes and understand them."

Trying to cure these health conditions is often not feasible, she says. It is the quest for knowledge about them that is of great use, for two reasons.

"One, for the families. They get an answer. Some of these conditions are more rare than one in a million, so just getting a genetic answer for the family is actually very powerful.

"Having an answer helps them understand about risks for other family members and can open doors for therapy and other help. Also, as we find other families with the same spelling mistakes, we can start to provide better clinical advice about what parents can expect as their child grows.

"The second reason is the biology and the insight these spelling mistakes give into what instructions help control our bodies and brains to grow. I am in awe of the power these spelling mistakes have – that a tiny alteration can have such dramatic consequences to development. We can harness this power to really help understand the biology of growth."

But research costs money. Bicknell's research has been funded by the University of Otago, the Marsden Fund, the Neurological Foundation and the Health Research Council. The quest for continued funding never stops though, and is a process which can be difficult for research in a relatively small field in New Zealand. That makes the recognition that comes from winning the Rowheath Trust Award and Carl Smith Medal so significant, she says.

"I just hope that through my research in understanding the consequences of changes in our DNA, I will be able to help in the bigger goal of extracting as much information from someone's genome as possible, to help understand their development and health throughout their lifetime."



DR LOUISE BICKNELL: "To think that basic simplicity leads to the complexity in nature all around us, I mean, how? And it's that 'how' question that's inspired me."

Vote of confidence

Single transferable voting has been ranked number one as an effective way of electing local body politicians.

Professor Janine Hayward (Politics) – along with Professor Jack Vowles from Victoria University – is researching what difference the single transferable vote (STV) system has made since it was introduced as an alternative to first past the post (FPP) in local government elections in 2004.

The research shows that STV makes elections more competitive: an average of one more person per contest will stand under STV than under FPP. Hayward and Vowles presume that this is at least partly because under STV some potential candidates are not put off by the vote splitting than can occur under FPP, and a greater diversity of candidates see a better chance of being elected.

They say that STV also ensures that mayors are not elected by a minority, and it can boost women's representation by up to 10 per cent, although it does not seem to have a positive impact on Māori representation.

FPP supporters argue that STV's candidate ranking system is confusing and turns people off voting, but Hayward and Vowles found that it makes little difference to voter turnout or confidence in the system.

Only a handful of city, district and regional councils currently use

STV, but Hayward points out that they include many of the larger local bodies.

She and Vowles are making their initial findings known to local bodies that are considering changing their voting system, while they continue their research project.



PROFESSOR JANINE HAYWARD: Her research concludes that the STV system makes local body elections more competitive.

Equitable modelling

A new HRC-funded research project led by Dr Melissa McLeod (University of Otago, Wellington) aims to put equity for Māori at the heart of cost-effectiveness modelling.

McLeod (Ngāi Tahu) is a senior research fellow in the Department of Public Health's Māori Health Research Centre, Te Rōpū Rangahau Hauora a Eru Pōmare.

She says traditional modelling, which looks at the benefits of a health intervention over the entire population, ignores how those benefits are distributed, in terms of who gains the most and who gains the least.

"Often by not focusing on health equity, we put in programmes that make inequities worse than they were to start with. A good example was the decision to implement colorectal cancer screening – which offered big improvements in health through the total population and improvements in health for Māori, but the benefits for non-Māori were far larger than the benefits for Māori."

McLeod's research will focus on cancer screening programmes, but the new modelling methods to be developed will be applicable to other health interventions too.

The research team will also work on ways to enable more than one health intervention to be modelled at a time.

"We want to maximise any opportunities for improving health with every interaction with the health system, so we want to combine interventions," McLeod explains. "Rather than modelling the impact of colorectal cancer screening separately, we will look at the benefits of combining it with smoking cessation programmes, or screening for stomach cancer."



DR MELISSA MCLEOD (centre) with Associate Prof Ricci Harris and Dr Anja Mizdrak: "We want to maximise any opportunities for improving health with every interaction with the health system."

Tourism and media narratives

Professor Neil Carr (Tourism) is analysing media representations of the COVID-19 pandemic and the implications for the tourism industry.

He and co-researchers Dr Ismail Shaheer and David Adeloye, have been harvesting data from media releases and social media platforms since 31 December 2019 (when China reported the novel coronavirus in Wuhan).

Analysing narratives around international and domestic tourism in New Zealand is allowing them to track reactions to the threat of COVID-19. By observing the collective consciousness of the people through this prism, they hope to gauge tourism's resilience in the face of emerging crises.

Initial findings showed that up until the third week in March 2020 social media narratives were mostly positive. "I am well aware of how resilient tourism is, but the fact that people were planning trips to New Zealand right up until the borders closed – even in the face of a global pandemic – is testament to this resilience," says Carr.

However, as the pandemic played out these narratives changed, with results betraying a new anti-tourism sentiment.

While New Zealand is being seen as a pandemic safe haven, results have shown a growing panic in the tourism sector. Carr says emerging themes include disappointment as travel plans have been cancelled, fear and uncertainty among tourists, both positive and negative attitudes to tourists from locals, and a growing call for domestic tourism as a fallback strategy.

He hopes this pilot study will serve as a springboard for further research into tourism and contagious diseases in the context of media representations and disaster management.



PROFESSOR NEIL CARR: An analysis of social media narratives shows an increasing anti-tourism sentiment as the COVID-19 pandemic has played out.

Family impacts

The loved ones of those who survived the Christchurch mosque attacks are the focus of a new study at the University of Otago, Christchurch.

Dr Ruqayya Sulaiman-Hill has been funded by the Canterbury Medical Research Foundation to study the psychological, physical, cultural and social effects of supporting loved ones who were at the two mosques during the 2019 attacks.

Sulaiman-Hill and her team hope to interview around 250 adult family members of survivors. The study will also involve inlaws of those who died, acknowledging the strong sense of family responsibility common in Muslim communities, as many moved to Christchurch to provide support to close relatives after the attack.

Sulaiman-Hill says preliminary interviews with the loved ones of survivors have identified significant impacts.

"We know those injured or present in the mosques had highly traumatic experiences and many people believed they were about to die. Anyone from these groups are likely to be at risk of mental health disorders so we want to also understand the impact that living with these survivors has had on their close family members, which is likely to also be significant and prolonged."

Clinical psychiatrists and psychologists, Muslim research assistants and specialist mental health nurses are part of the study group. Participants will be provided with appropriate mental health services and referrals for any other supports identified through the study.

Sulaiman-Hill is also involved in a HRC-funded study with Associate Professor Caroline Bell studying the mental health impacts on adults who survived the mosque attacks or lost loved ones on that day.



DR RUGAYYA SULAIMAN-HILL: "We know those injured or present in the mosques had highly traumatic experiences... so we want to also understand the impact that living with these survivors has had on their close family members."

HOCKEN LEGACY

Pioneering nutritionist on a mission

While she's not exactly a household name, the influence of Dr Muriel Bell on New Zealand's public health policies is far reaching. Now, the collection of her papers housed at the Hocken Library have been inscribed in the prestigious UNESCO Memory of the World New Zealand Register. DR MURIEL BELL was only the second New Zealand woman to obtain the research degree of MD.

"THE WAY TO PIONEER a new subject is to have a pioneer lineage, on both sides of the family!" So said Kiwi medical researcher and nutritionist Dr Muriel Bell – New Zealand's first state nutritionist whose pioneering work radically improved the standard of nutrition in New Zealand and was responsible for ground- breaking public health schemes such as milk in schools, the iodisation of table salt to prevent thyroid disease and public water fluoridation to combat tooth decay.

Distinguished by her biographer Diana Brown for her "unconventional career", Bell was one of the first New Zealand women to obtain the research degree of Medical Doctor. She studied physiology and biochemistry at the University of Otago, "The sun of hope for better teeth has already risen over the New Zealand horizon... today sees the expansion of the idea of mineral deficiencies affecting the resistance of teeth to decay."

– Dr Muriel Bell

Prime Minister's Department photograph, Box-184-127, Hocken Collections Uare Tao<u>ka o Hākena.</u>

with a focus on the newly established connections between disease and nutritional deficiencies, leading research on vitamins and minerals to prevent deficiency diseases and, later, optimise health. Her early research into fats and cholesterol tackled the complexity of nutrition-related aspects of coronary heart disease.

Driven by a deep social concern, especially for the health of women and children, Bell's nutritional advice – shared through radio talks, nutrition handbooks and her regular column with the *New Zealand Listener* – may be commonplace today, but was revolutionary at the time, such as: eat more fruit, vegetables and milk products, and cut down on sugar, fat and meat. During her 24-year tenure as state nutritionist (1940–1964), she increased scientific knowledge of nutrition and helped establish nutrition and dietetics as professional fields in New Zealand.

Muriel Bell was born in Murchison on the West Coast in 1898. Her parents (Thomas and Eliza) farmed and operated a sawmill. They also gave advice and medical help to the growing community – her father stitched wounds and set broken bones.

Says Bell: "The honour goes to my mother who gave me a strong body and to my father who acquired a great deal of medical knowledge from reading medical books – there was no doctor within 70 miles and he used to be a sort of doctor for the district we lived in, so I had the benefit of cod liver oil and such like in my childhood." In 1907, when Bell was nine, her mother was killed in a tramcar accident in Wellington. The family moved to Richmond and Bell eventually attended Nelson College for Girls, before winning a university scholarship and moving to Dunedin to study medicine, originally planning to become a medical missionary.

With women medical students still unusual in the early 20th century, she was one of a "close and friendly group of seven or eight women among only 30 students in all" who began their medical training in 1917 – receiving a mixed reception from the establishment.

She later reflected: "Women were not altogether welcomed, at the time, as medical students. Engraved on the desk that I sat in was the slogan 'Women's place is in the home'."

In 1922, Bell graduated from medical school, but decided to stay on and do research on human metabolism. Particularly concerned with the thyroid gland in people suffering from goitre, her research contributed to the introduction of iodised salt – showing that increasing the level of iodine in the diet was an effective protection against the illness. In 1926 she became New Zealand's second woman to be awarded the research degree of Doctor of Medicine (MD) – the first was Dr Margaret Cruikshank who obtained an MD at Otago in 1903.

Over the next decade, Bell's awardwinning work saw her hold a range of positions including lecturing at the Otago Medical School and conducting nutritional research into, for example, the role of vitamins (while based at University College London) and soil deficiencies. On returning to Dunedin in 1935 to lecture in physiology and experimental pharmacology, she later became a founding member of the Medical Research Council, serving on its nutrition committee alongside her role on the Board of Health as its only female board member at the time.

In 1940, she took up the position of New Zealand's first Nutrition Officer in the Department of Health alongside Director

HOCKEN LEGACY

of Nutrition Research at Otago Medical School. Over the war years, the government frequently consulted with Bell about food rationing and, when shipping losses cut down New Zealand's supplies of cod liver oil (at the time given to children because it contained vitamin D), she found an alternative source of vitamin D in New Zealand fish oils. She developed a recipe for making rosehip syrup so that children could get vitamin C when the supply of oranges ran out.

Later, when she became concerned that vitamin C and riboflavin in milk are destroyed by exposure to sunlight, it became a requirement that milk delivery vehicles were covered. She also worked to have milk pasteurised and have unhealthy cows destroyed. Her conviction that milk was a vital food source and should be part of New Zealanders' daily diet led to a nationwide programme of free milk to school students.

Another ground-breaking initiative was in showing a link between fluorine and good teeth, campaigning long and hard as "Battleaxe Bell" for the introduction of fluoride into town water supplies. This led to massive reductions in tooth decay across generations of New Zealanders.

As Bell eloquently describes in her essay titled "The Work of the Nutrition Research Department": "The sun of hope for better teeth has already risen over the New Zealand horizon... For the first of these two decades it was a voice crying in the New Zealand wilderness, but today sees the expansion of the idea of mineral deficiencies affecting the resistance of teeth to decay."

Muriel Bell's desire to build sound nutritional knowledge across the population meant she committed much of her time to sharing advice and research in various articles, interviews and guidelines. As her biographer puts it, "Muriel understood, nutrition is a cornerstone of individual and public health. Nutrition researchers, nutritionists and dieticians have a vital role in shaping the health of New Zealand."

Early on she helped create the handbook *Good Nutrition: Principles and Menus*

(1939), followed by Normal Nutrition – Notes for Nurses to help nurses care for patients better. Her contributions to The Listener explained in everyday language the latest research in nutrition - everything from "The Nutritive Value of Potatoes" to "A Talk on Liver" or advice for parents about how to feed their babies cod liver oil or arguments for milk as "our best single food".

As Bell put it in an essay titled "Nutrition Research": "A great many people have enquiring minds that make them want to know whether they are doing the right thing by themselves or their families and though it isn't always a good

thing to be fussing about either health or foods, it's good to see whether there is from time to time any 'news from the stomach front' and then put its items into practical effect in one's daily habits, but keep them somewhere in the back of one's consciousness."

According to her biographer, many of the current topics in nutrition research bear a "striking resemblance" to the range of projects that occupied Muriel Bell throughout her career, "reminding us malnutrition and nutritional deficiencies are still a major concern".

Muriel Bell died in 1974. In 2020 the Muriel Bell papers, held by the Hocken Collections, were accepted to the UNESCO Memory of the World Register. The register lists inscriptions of significant documentary heritage that contribute to New Zealand's history and heritage, and are significant to the identity of New Zealanders today – a feat no one would argue Muriel Bell achieved over her career. THE NEW ZEALAND TRADES ALPHABET



"MISS MY SCHOOL MILK? – I WOULDN'T BE SO FOOLISH"

My, Munn and Dart have told rea and 1 can see the model, ten, that if you exert to be happy quive give to stay healthy. You, even statistic or spinst it aliancy on this. Di coose, not even stiller wants to be an athinks, but he drees went to be pand of his build. I think give wort to have nice Tayares when they get idder, tool. Well, some scientral. I head about prevent that bayes and gives need nor mills. That globan members and the state of the state of the sector of the build here barres and help control their models. I don't have build here barres and help control their models. I don't have that here in thirts in globas at home to I alware drive m Schell Mills. Taki my word the in-mills does are spring the globandoes are in Mills.





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DR MURIEL BELL'S conviction that milk was a vital food source led to a nationwide programme of free milk to school students. *Milk in Schools, MS-1078/001, Muriel Bell* papers, Hocken Collections Uare Taoka o Hākena.

> Yet despite the volume of papers and materials that share the life of Muriel Bell, she remains a somewhat enigmatic figure. Little is known of her personally, says Diana Brown.

"We can discover little for example about how the early deaths of two siblings and her mother might have affected her. She married twice, both times to men many years older than she was; beyond the knowledge that they, most unusually for the time, took on the primary housekeeping duties."

What we do know of this remarkable pioneer is that Muriel – who was awarded both a Fellow of the Royal Society of New Zealand and Commander of the British Empire – became a missionary in her own country. As her friend Marion Robinson described: "Dr Bell did become a medical missionary, but in a somewhat unusual way – as a home missionary bringing good nutrition to everyone through New Zealand."

AMIE RICHARDSON

Funding for two core projects

Two University of Otago projects have been successful in the latest Centre of Research Excellence (CoRE) funding round. They will receive a combined \$69 million over a seven-year period beginning July 2021: the Dodd-Walls Centre for Photonic and Quantum Technologies (\$36,750,000) and Coastal People: Southern Skies (\$32,250,000).

Deputy Vice-Chancellor (Research and Enterprise) Professor Richard Blaikie says the funding is a significant show of support for two national research centres that will benefit local and global knowledge.

"We are extremely grateful to the TEC [Tertiary Education Commission] for this important funding. The Dodd Walls Centre for Photonic and Quantum Technologies – initially funded as a CoRE in 2014 – will continue its work in worldclass physical sciences research, while our Coastal People: Southern Skies project will investigate ways to strengthen coastal communities in the Pacific as they deal with the challenges and opportunities of a changing climate."

International rankings

The University of Otago has placed at 184th in the 2020 Quacquarelli Symonds (QS) World University Rankings. This confirms Otago's place as one of the top two universities in New Zealand and among the top one per cent of universities internationally.

QS has ranked four Otago subject areas in the world's top 50 (up from two in 2019). They are: sports-related subjects (13th); dentistry (33rd); anatomy and physiology (45th); and classics and ancient history (47th). A further 10 subjects have been ranked in the 51–100 band, and 11 in the 101–200 band. QS has also ranked the Otago Business School's Online Master of Business Administration as number 10 in the world, up three from last year.

The University has maintained its position in the 301–400 band of the AWRU (Shanghai) rankings and in the 201–250 band in the *Times* Higher rankings.

Impact rankings

The University of Otago has been ranked 23rd in the 2020 *Times* Higher Education University Impact Rankings.

The rankings measure how more than 800 international universities are performing against – and contributing to – the United Nations' Sustainable Development Goals (SDGs), established in 2015.

Vice-Chancellor Professor Harlene Hayne says the results reflect the University's ongoing dedication to sustainable teaching, research and operations.

"We were the first New Zealand university to sign the international SDG accord in 2018, at which time we pledged to contribute to sustainability, not only around our campuses and the country, but also around the world."

HRC funding success

Otago researchers were awarded a total of \$26,557,602 in the Health Research Council's June funding round.

Two significant programmes were supported. Infectious diseases expert Professor Michael Baker (Public Health, Wellington) received almost \$5 million for a programme called SYMBIOTIC (Syndemic Management of the Biology and Treatment of Infections and Chronic conditions) to investigate the connection between infectious diseases and longterm conditions to improve health and equity in New Zealand. Otago's Wellington-based housing and health research programme, He Kāinga Oranga, received just under \$5 million to continue research to maximise the health and wellbeing gains from housing.

Researchers from across the University's Dunedin, Christchurch and Wellington campuses also received funding for projects including antimicrobial resistance, abdominal aortic aneurism, Alzheimer's disease, health inequities, heart disease, ketamine therapy for neurotic disorders, inflammatory responses following viral infection, and the hormonal regulation of maternal behaviour.

A further \$4.3 million was received by Otago in the HRC's new Health Delivery Research Investment round. This will support research in areas including partnerships between DHBs and PHOs; access to medicines; and the potential for CT scans in the treatments and diagnosis of heart attack patients.

Sophia Charter launched

The University together with the Crestani family have launched The Sophia Charter, following the tragic death of Sophia Crestani at a student party in North Dunedin in 2019.

This is a shared commitment by Dunedin stakeholders, including the University, Police, Fire and Emergency New Zealand, Otago Property Investors Association, the Dunedin City Council and OUSA. Its aim is to enhance the safety and well-being of the student community in North Dunedin, within a fun, vibrant, safe and secure environment, where residents take responsibility for themselves, each other and the wider community.

Emeritus professors

The University Council has awarded the status of Emeritus Professor to: **Professor Barbara Brookes** (History); **Professor John Broughton** (Oral Diagnostic and Surgical Sciences, Preventive and Social Medicine); **Professor Jennie Connor** (Preventive and Social Medicine); **Professor Grant Gillett** (Bioethics Centre); **Professor Pat Langhorne** (Physics); **Professor Paul Roth** (Law); Professor **Warren Tate** (Biochemistry); Professor **Andre van Rij** (Surgical Sciences).

Queen's birthday honours

Otago alumni and staff who received Queen's Birthday Honours included:

DNZM: Dr Karen Olive Poutasi, CNZM, for services to education and the State.

CNZM: Professor John Norman Nacey, for services to health and education; Mr George Ngaei, ONZM, for services to health and the Pacific community.

ONZM: Dr Daryle Elizabeth Anne Deering, for services to nursing; Professor Alec Joseph Ekeroma, for services to health and the Pacific community; Dr Garry Vernon Forgeson, for services to oncology; Professor Ian David Lambie, for services to clinical psychology; Dr Brian Lindsay Turner, for services to literature and poetry.

MNZM: Ms Carol Bartle, for services to health; Mr David Michael Benton, for services to addiction support and treatment; Mrs Patricia Gwenieth Broad, QSM, for services to gymnastics; Mr John McGregor Buchanan, for services to music; Ms Sharon Anne Kearney, for services to physiotherapy and netball; Dr Alison Margaret Keeling, for services to gerontology; Dr Kevin Bartley Knight, JP, for services to education; Dr Priscilla Muriel McQueen, for services as a poet; Dr Janet Catherine Turnbull, for services to health. MNZM (Honorary Member): Dr **Johan Hellemans**, for services to triathlon.

QSM: Ms Gillian Clare Bishop, for services to conservation; Mr Trevor John McGlinchey, for services to Māori and the community; Mr Malcolm Alan Walker, for services to sport and education.

Appointments

Professor Colin Gavaghan (New Zealand

Law Foundation Chair in Emerging Technologies) has been appointed to the Digital Council for Aotearoa New Zealand. Associate

Professor Robert

Consumer NZ.

epidemiologist



(Humanities) Professor **Tony Ballantyne** will take up the role of Deputy Vice-Chancellor (External Engagement).

Pro-Vice-Chancellor (Commerce)

Professor **Robin Gauld** takes over the presidency of the Association of Asia-Pacific Business Schools (AAPBS) in November 2020. Faculty of

Law professional



practice fellow **Allie Cunninghame** has been appointed as a Coroner, with her warrant taking effect on 30 March 2020.

Dr Katharina Ruckstuhl (Otago

Business School) has been appointed to the international research board of the Open Researcher and Contributor ID (ORCID).



Awards and achievements

The University's 2020 Distinguished Research Medal has been awarded to Professor **David Murdoch** (Dean, University of Otago, Christchurch). Professor Murdoch is also one of only three independent international experts invited to advise the Oxford University COVID-19 vaccine development effort (see pages 14-17). The University's 2020 Research Group Award has been won by the **Christchurch Heart Institute**.

The Rowheath Trust Award and Carl Smith Medal have been jointly awarded to Dr Louise Bicknell (Pathology) and Associate Professor Anne-Marie Jackson (Physical Education, Sport and Exercise Science) (see pages 36–37). Associate

and public health researcher, Professor **Diana Sarfati** has been confirmed as the chief executive of the government's Cancer Control Agency.

Aitken (Marketing) has been elected

Zealand Marketing Academy (ANZMAC).

University of Otago, Wellington cancer

He has also been elected chairman of

president of the Australia and New



Professor Helen Nicholson will step

aside from her position as Deputy Vice-Chancellor (External Engagement) to take up the role of Deputy Vice-Chancellor, Academic from

January 2021. Pro-Vice-Chancellor



Professor Jackson has also received a national award for Sustained Excellence in Tertiary Teaching from Ako Aotearoa, Kaupapa Māori category.

Early Career Awards for Distinction in Research have been received by: Dr Htin Lin Aung (Microbiology and Immunology); Dr Rebecca Kinaston (Anatomy); Dr Khoon Lim (Orthopaedic Surgery and Musculoskeletal Medicine); Dr Rachel Purcell (Surgery); Dr Stefanie Zollmann (Computer Science).

Associate Professor Tim Woodfield

(Orthopaedic Surgery and Musculoskeletal Medicine, Christchurch) has received the Australasian Society for Biomaterials and



Tissue Engineering Award for research excellence.

Associate Professor **Anita Gibbs**, (Social and Community Work and Sociology, Gender Studies and Criminology) and Professor **Michael Baker** (Public Health, Wellington) have received Critic and Conscience of Society Awards from the Gama Foundation.

Professor Sarah Hook and Dr Allan Gamble (Pharmacy) have won Otago Innovation's Proof of Concept Grant competition for 2020 with their novel approach to combatting antibiotic resistance in farm animals. They will use the \$100,000 prize to make chemicallymodified antibiotics – known as prodrugs – which only activate in the presence of infection.

Dr Dianne Sika-Paotonu (Pathology and Molecular Medicine, Wellington) and Professor Stuart Young (School of Performing Arts) have received 2020 Scholar Awards from Fulbright New Zealand.

Eight Otago graduates have won

Fulbright New Zealand awards: Tom Devine, Emily Gordon, Ngarangi Haerewa, Anežka Hoskin, Laura Mackay, Alice Marsh, Nathaniel Otley and Hamish Prince.

Dr **Carolina Loch** and **Dr May Mei** (Dentistry) have won international emerging leader awards from the International Association for Dental Research.

Leanne Te Karu (Pharmacy) has won the Community or Primary Healthcare Pharmacist of the Year Award at the inaugural New Zealand Primary Healthcare Awards, He Tohu Mauri Ora.

Professor **Mark Stringer**, (Paediatrics and Child Health, Wellington) has received the Farquharson Award from the Royal College of Surgeons of Edinburgh.

English and Linguistics honorary fellow Dr John Hale has received the Milton Society of America's honoured scholar award for his "notable contribution to Milton Scholarship".

Faculty of Law Dean Professor **Jessica Palmer** has won the Institute of Directors' Otago Southland Branch Emerging Director Award for 2020.

Dean of the Otago Medical School

Professor **Rathan Subramaniam**, has been made an inaugural Fellow of the Association of University Radiologists (AUR).

PhD candidates Holly Still

(Geology) and **Taylor Hamlin** (Zoology, Maths and Statistics) have received \$20,000 doctoral scholarships from Antarctica New Zealand.

Professor **Etienne Nel** (Geography) received the 2020 Distinguished New Zealand Geographer Award and Medal for his sustained contribution to Geography and development.

Otago's Peer Assisted Study Sessions

(PASS) programme has been awarded a Heroes Award for its "exceptional quality of learning support care" during the COVID-19 lockdown. The award was made by the Higher Education Research and Development Society Australasia (HERDSA) New Zealand branch.

Microbiology and Immunology assistant research fellow **Tom Devine** has won the Gordon Watson Scholarship from New York's Columbia University enabling him to study the implications of a global pandemic on indigenous selfdetermination and autonomy.

Dr Haneen Alayan has been awarded the 2020 International College of Dentists (ICD) Young Dentists Volunteer Grant.

Obituaries

Dr Lindsay Brown MNZM was a member of the University Council for 16 years and was Chancellor from 2004–2008, having previously served as Pro-Chancellor. He was awarded an honorary LLD degree by the University in 2008.

Emeritus Professor **Margaret Loutit** CBE was appointed to a Personal Chair in Microbiology in 1981. In a distinguished career at Otago which spanned 40 years, she was instrumental in establishing the Research and Development Office, and was a gifted and highly respected teacher, researcher and administrator.

Emeritus Professor **Patrick Molloy** FRCS, FRACS was instrumental in establishing the South Island's first cardiac surgery unit in Dunedin in 1973. A staunch advocate of the unit, he led the surgery team for two decades and pioneered cardiac surgery on small babies.





Pūtea Tautoko responds to student need

THE STORIES STARTED in March.

Many students were struggling financially due to the impact of the COVID-19 pandemic. They were facing additional costs and the loss of part-time work, which they relied on for vital income. For others, financial support from their families had greatly reduced. Some postgraduate students were facing extra tuition costs in order to extend their studies so they could complete their courses.

In response to the emerging need, the University acted quickly. In April, it launched Pūtea Tautoko, which translates as "financial support". The University committed an initial \$1.5 million to the fund, making it the largest hardship initiative in its history.

At the time of its launch, Vice-Chancellor Professor Harlene Hayne said the fund was an important way for the University to provide meaningful support for those students facing the greatest need.

"The pandemic has created unprecedented levels of hardship within our student community and Pūtea Tautoko is a critical part of Otago's response to support students through this challenging time."

Reaching out to the wider University community to seek support for the fund, she said "we are running out of words to describe the impact this virus has had on our community, our country and the world. But we have also seen extraordinary kindness and generosity as a result and I believe this fund will be a way for our community to express our support for students in a concrete way." The response was immediate. The University's Development and Alumni Relations Office (DARO) led the announcement of the fund, emailing a letter from the Vice-Chancellor to all alumni and friends. In the first hour \$12,000 was raised and, by the end of the first week, more than \$95,000 had been donated.

In the following months, the University community continued to respond generously to the needs of the students. By the end of September, 714 alumni, friends, staff, current students and parents had donated more than NZD\$408,000 to the fund. More than 388 donations have come from first-time donors to the University. "The response to the hardship fund from the University community has been extraordinary and heart-warming," says the Vice-Chancellor. "We are extremely grateful for the generosity shown by our alumni and friends, staff, students and parents. The way they have reached out to help makes it possible for so many of our most vulnerable students to receive the support they need."

Professor Hayne has also donated 20 per cent of her salary for six months, with similar commitments from other senior staff; University Council members have donated 20 per cent of their Council fees for six months.

DARO Director Shelagh Murray says Pūtea Tautoko is a practical way people can make a difference, by helping to ensure the pandemic does not disadvantage a vulnerable group at a critical time in their lives.

"The response from our alumni and friends to help ease the impact of the pandemic on our students is a wonderful expression of generosity from the heart of our Otago community," she says.

With further funding received from the government, Pūtea Tautoko now totals \$3.5 million. By early October, approximately \$3.0 million in grants had been made to support more than 2,000 students.



POSTGRADUATE STUDENTS DUNCAN COUTTS AND VICTORIA SUGRUE WITH THEIR DAUGHTER LUCY: "With both of us living off our scholarship stipends, knowing that the fund was there... took a lot of stress off the immediate worry of would we be able to pay our rent, our power, food."

The fund is helping students cover their utility and electricity bills, accommodation costs, travel costs back to campus, essential groceries and toiletries. Postgraduate research students have received tuition fees rebates and scholarship extensions.

Students from across the University community are being supported by the fund – from international students, to first-year undergraduates, to final year PhD students. Around 80 per cent of grants have been allocated to domestic students, and 20 per cent to international students.

For postgraduate students Duncan Coutts and Victoria Sugrue, the financial support they have received from the fund has meant Duncan has been able to continue with his MSc in Anatomy and they have been able to pay the bills over winter.

Duncan received a two-month extension for his scholarship stipend, while the couple, who have a one-yearold daughter Lucy and are expecting another baby at New Year, also received a contribution towards living costs.

"With both of us living off our scholarship stipends, knowing that the fund was there, that there was somewhere we could go to for support, took a lot of stress off the immediate worry of would we be able to pay our rent, our power, food," says Duncan. "It made it a lot easier at a very stressful time, especially when we have a wee one to care for as well."

Victoria, who is studying for a PhD in Anatomy, says the biggest help was receiving the extension to Duncan's stipend, because if he had needed to extend his study without getting any funding it would have been very stressful, and he may have had to finish up and find a job to pay the bills.

Professors cycle for students

Deputy Vice-Chancellor (Research and Enterprise) Professor Richard Blaikie, together with Professors David Lont (Accountancy and Finance) and Gerry Closs (Zoology) have turned an annual group cycle tour from Dunedin to Nelson in November into a fundraiser for Pūtea Tautoko, with its own dedicated Givealittle page (givealittle.co.nz/cause/cycleforstudents).

Professor Blaikie says it is a logical way to help "students who are trying to hang in there – completing their programmes, remaining in study. They're a tenacious group that needs support, so anything we can do to help them is a good thing."

"I cannot thank you enough for the grant I received today. I feel so privileged to not only have the opportunity to apply to the hardship fund, but to receive financial means to support me in completing my final semester at University. The grant has already eased some of my financial stresses, where I can spend less time worrying about money and more time on study. I am truly, truly grateful."

"Ngā mihi nui to the student relief Pūtea Tautoko fund. I am absolutely grateful for your support."

"Thank you, Thank you, Thank you. This is going to be a huge help to me and my whānau."

Donors too have attached notes to their contributions, explaining why they have chosen to support the fund. Alumna Nicole Warren says:

"I don't want students who have worked so hard to be at university, or were given a life-changing opportunity to attend university, to have that taken away from them by factors outside their control."

One of many staff members to donate to the fund, Professor Craig Rodger says:

"In my life I have been an undergraduate and postgraduate student at Otago, and now a staff member. I know financial pressures can have a big influence on a student's life when they should be studying – the scale of the COVID disruption is far bigger than anything which occurred in my lifetime. Knowing what a difference some financial help can make, I felt compelled to help today's students by donating to the hardship fund."

All students are eligible to apply to the fund. Applications are considered by several panels, all including student representation. The panels robustly assess hardship, using tools the University already has to assess applications for existing hardship funds and for needs-based scholarships. Significant ongoing demand is expected for 2020 and the fund will continue to operate in 2021 as well.

To contribute to Pūtea Tautoko please go to the secure donation page: alumni.otago.ac.nz/donate/puteatautoko

A legacy of excellence

WRITING YOUR WILL, or updating it, is an inspiring time. It offers you the opportunity to make the type of gift you always wanted to be able to make. A Will enables you to plan to safeguard the future of family and friends, and also to further your philanthropic interests.

From its earliest days, the University of Otago has benefited from philanthropic gifts. With the generous help of alumni and friends who left a provision in their Wills, Otago has been able to advance quality education and gain world renown for both scholarship and research. Such generosity has consistently contributed to academic excellence. Chairs, lectureships, scholarships, buildings, libraries, sporting facilities, special collections, research programmes and community outreach programmes have all been supported and funded by income from bequests.

Each gift is a legacy: a unique, personal and enduring contribution to the University. It is a gift that passes forward, ensuring that future generations have the resources and opportunities they need to be successful and to make a difference.

For over 150 years, our national and international communities have been enriched as University of Otago's staff and students have led the way in innovative thinking, research, creativity and learning. You too can contribute to this. We invite you to share our vision and consider leaving a bequest to the University of Otago Foundation Trust. This special Foundation has been established by the University to receive and administer bequests and donations. The terms of the Trust ensure that the University gains the full benefit of all gifts made and that the wishes of donors are fully observed.

All endowed gifts, whether modest or large, have lasting benefit. Leaving such a legacy will enhance the University's future and, through its influence on students and society, the future of generations to come. Such gifts keep alive the memory of those to whom they were dedicated and link the name of the donor to the University in perpetuity. Any and all gifts can be a way for you to honour someone living or the memory of someone who has died.

You will want to think carefully about your legacy to the University of Otago. We urge you to discuss your Will, or a codicil to your Will, with your solicitor and your family (if applicable) and decide how you want your legacy to be used by the University.

In making your decision, you have many options open to you, including leaving:

- an exact sum of money or a percentage of your estate
- property (home, bach/crib, land)

- works of art, books, etc.
- stocks and shares
- the residue, or part of the residue, of your estate after all other specific legacies have been met
- a contingent bequest make a gift dependent on specific conditions.

In leaving a legacy to the University of Otago, there are also options in how it can be used by the University.

A general purpose legacy

- an unrestricted gift.

You could assist the University of Otago in five key areas:

- scholarships/student support
- community outreach
- teaching and research
- buildings/facilities
- libraries and collections.

The needs within these areas vary widely from year to year. Changes in the funding of students may mean that assistance by way of scholarships is required to ensure that there is equitable access to the University, or that books may be purchased for the library, or that teaching facilities may be updated. The development of a key piece of medical or scientific research may depend crucially on the purchase of new and expensive equipment. A general purpose legacy to the University of Otago gives the University the flexibility to respond quickly to new and changing circumstances and, for that reason, is of immense value.

Or: A specific purpose legacy – a designated gift. You may have a particular affinity to a student organisation, a school, department or centre, a student club, or an area of study or research.

You can also choose to make your legacy an endowed or current-use fund.

Both unrestricted (general purpose) and restricted (specific purpose) gifts can be endowed or create current-use funds. Endowments, also known as permanent funds, are designed to make annual distributions, preserving the capital, to support specific objectives. In contrast, current-use gifts are not permanent and the principal can be used all at once or over time.

We hope that those who have had the advantage of an Otago education, and those who recognise the invaluable benefits the University has bestowed on the community for more than 150 years, will consider supporting the University of Otago by including a bequest in their Wills.

In all of these cases, the Director of Development or the Bequest Manager will be happy to discuss, in confidence, with you or your representative, your requirements in making a specific purpose legacy, or to develop other possibilities. We are committed to maximising the benefit of your legacy while, at the same time, ensuring that your wishes are fulfilled.

Thank you for considering to assist the University of Otago in this way.

If you have made, or you intend to make, a bequest to the University, we would greatly appreciate you informing us by returning the interest indication form on this page. We would like to acknowledge your generosity, and will understand and respect any wish for anonymity.

Also, a sample codicil form is available on request. This can be used for a more straightforward bequest. Please seek legal advice and, when completed, send us a copy. It would help us greatly if you would share an indication of your intentions. We value the opportunity to thank you. Your pledge will be held in the strictest confidence and will only be used to help us in our planning for the future. This is not a legally binding document.

Please tick:

I have already made arrangements for a legacy to the
University of Otago Foundation Trust.

- I am considering a legacy to the University of Otago Foundation Trust and would like more information.
- □ I would like to discuss in confidence a legacy to the University of Otago Foundation Trust.
- ☐ May I please have an appointment? I have not left a legacy to the University, but I might do so in the future.

Name:
Address:
Telephone number:
Email address
Signature(s)

Date / /

All donations to the University of Otago Foundation Trust made within New Zealand are tax deductible up to the maximum set by the Inland Revenue Department. The University of Otago has registered charities in the UK and the USA. If you are living outside New Zealand, please contact a solicitor in your country of residence for advice on making a bequest.

For further advice, or to discuss in confidence your particular circumstances, please contact:

Murray Lopdell-Lawrence Bequest Manager Development and Alumni Relations Office University of Otago PO Box 56 Dunedin 9054 Tel +64 3 479 5286 Email bequest@otago.ac.nz

Events & reunions

We are looking forward to being able to meet with alumni in-person in 2021. But, rest assured, if this is not possible, we will be hosting a number of events and activities digitally and would love to meet with you via a virtual platform.

We will also be extending another invitation to join our online book club in 2021.

If you would like to organise a reunion please contact us for more information: *reunions.alumni@otago.ac.nz*



DENTAL CLASS OF 1970 REUNION attendees and special guest, the School's current Dean Professor Mike Morgan, outside the University Staff Club which was the Dental School's first building.

2020 REUNIONS

Medical class of 1970	18 November, Dunedin and Central Otago
Physical Education class of 1964	28 November, Mautere, Tasman
Dental class of 2010	4 December, Dunedin

2021 REUNIONS

Dental class of 1980	February, Dunedin
Home Science first-year class of 1970	TBC, Dunedin
Medical class of 1971	19 October, Bay of Islands
Medical class of 1976	28 October, Christchurch
Medical class of 1980	TBC, Dunedin
Medical class of 2000	TBC, Dunedin
Salmond College 50th anniversary	26 November, Dunedin

Final dates are subject to change. Please contact us for confirmation.

otago/ac.nz/alumni/events







FORMER SCHOOL OF MINES STUDENTS (1960s–1980s) and Associate Professor Mike Buckenham gathered for a reunion in Thames.

Please look out for our emails and we invite you to follow us on Facebook *(facebook.com/otagoalumni)* to see the latest news.

ALUMNI NEWS

New members welcomed to Court of Benefactors

Around 40 senior staff and members of the Court of Benefactors of the University of Otago attended the Court's annual reception in October.



UNIVERSITY CHANCELLOR DR ROYDEN SOMERVILLE QC addressed the Court of Benefactors' annual reception, attended by around 40 guests.

The Court of Benefactors was established in 2006, with the aim of ensuring major donors are kept informed of developments at the University. A general guideline for eligibility to the Court is a donation of \$1 million or more and members include trusts, foundations, organisations and individual donors.

New members admitted to the Court in 2020 are: Dr John and Mrs Susan Ward; the Estate of J. A. Bell; and Port Otago.

Dr Ward was Chancellor 2009 – 2017 and Chairman of the University of Otago Foundation Trust Board of Trustees 2009 – 2019. He has facilitated many major donations to the University. In addition, Dr and Mrs Ward have personally supported various projects including the establishment of the John F. Ward Southland Entrance Scholarship; support for research in the consequences of pre-term birth; the Chair of Earthquake Science; and support for research into brain health.

The late Dr John Arnaud Bell, a graduate of the University of Otago School of Dentistry, bequeathed \$1.56 million to the University. This bequest will be held by the University of Otago Foundation Trust as an endowment to provide ongoing funding for a Professorial Chair in Oral Biology in the School of Dentistry. The Chair will be known as the John Arnaud Bell Chair in Oral Biology and a refurbished lecture theatre in the Faculty of Dentistry will be named the John Arnaud Bell Lecture Theatre.

To mark the University's 150th anniversary in 2019, Port Otago gifted the University 0.45 hectares of harbourside land, which in the short term will be used as a recreation space. Over time, this property will be used to enhance Otago's education, research and outreach efforts.

This year, the Court of Benefactors' function was held in Te Korokoro o te Tūī, the new Performing Arts facility and included performances by music, dance and theatre students. In addition, members gathered for dinner and to hear speeches from the Chancellor Dr Royden Somerville QC, Vice-Chancellor Professor Harlene Hayne, and Pro-Vice-Chancellor Humanities Professor Tony Ballantyne.



20Twenties awards celebrate young graduates

The University of Otago is delighted to announce the winners of the inaugural 20Twenties awards, celebrating the outstanding achievements of our youngest alumni.

Hitaua Arahanga-Doyle: in recognition of leadership, mentorship and of his higher studies.

Lisa Blakie: for her contribution to creative and ethical video game development.

Thomas Devine: in recognition of his leadership as Kaiāwhina Māori, mentorship and of pursuing higher studies.

Sinead Ford: in recognition of leadership and volunteer work.

Emily Fry: for her contribution to the field of digital technologies and their security implications.

Sargam Goundar: for her contribution to climate change initiatives and her leadership.

Martin Hannah: for his contribution to child and youth development.

Francisco Hernandez: in recognition of his leadership of climate change initiatives.

Abby Howells: in recognition of her success as a comedian, actor, improviser and writer.

Pinky Lal: in recognition of her extensive volunteer and leadership work.

Bethany Lomax: for her contribution to space research.

Sophie Mathiesen: for her contribution to science communication.

Aidan Meyer: in

recognition of scientific curiosity for the betterment of the community.

Jo Mohan: in recognition of her entrepreneurial spirit to better the environment.

Sophie Oliff: in recognition of leadership and volunteer work in the health sector.

Daryl Pupi: for his contribution to health and well-being through leadership and innovation of nutrition programmes.

Georgia Robertson: in recognition of leadership in a non-profit organisation that benefits education projects.

George Taiaroa: in recognition of research ir response to Covid-19.

Georgia Thomson-Laing: in recognition of research into aquatic health for the betterment of community health, and mentoring.

Kawiti Waetford: in recognition of his success as a performer and for commitment to rangatahi

Our 20Twenties winners will be profiled on the Development and Alumni Relations website: **otago.ac.nz/alumni**

Books by Otago alumni

Colonizing Madness: Asylum and Community in Fiji, by Jacqueline Leckie, University of Hawai'i Press, November 2020.

Kalimpong Kids: The New Zealand Story, in Pictures, by Jane McCabe, Otago University Press, June 2020.

Southern Spirit: The People and Places of Southland, by Ian Dougherty, Saddle Hill Press, June 2020.

Merchant, Miner, Mandarin: The Life and Times of the Remarkable Choie Sew Hoy, by Jenny Sew Hoy Agnew and Trevor Agnew, Canterbury University Press, June 2020.

A Partly Anglicised Kiwi: a Psychiatrist Remembers, by Brian Barraclough, edited by Jennifer Barraclough, Overcliff Books, April 2020.

Camphor for the Collywobbles: Ship's Surgeon Dr Augustus Florance's Voyages 1857-1862, by Claire Le Couteur, The Cotter Medical History Trust, 2019.

Vaccines & Vesicles: a History of Smallpox Vaccination in New Zealand, by Claire Le Couteur, Cotter Medical History Trust, 2019.

The Colour of Stealth, by Mark Porath, Paradox Books, 2019.

George R.R. Martin and the Fantasy Form, by Joseph Young, Routledge, 2019.

Alcohol: a Dangerous Love Affair, by George A.F. Seber and D. Graeme Woodfield, foreword by Sir Geoffrey Palmer, Wild Side Publishing, 2019.

The Holy Spirit as Person and Power: Charismatic Renewal and Its Implications for Theology, by Rob Yule, Wipf and Stock, 2019.

The Treatment of Kidney Failure in New Zealand, by Kelvin L. Lynn, Adrian L. Buttimore, Peter J. Hatfield, Martin R. Wallace, 2018.

Alumni: if you have recently published a book please email *mag.editor@otago.ac.nz*

BOOKS



Ko Aotearoa Tātou • We Are New Zealand

An anthology Editors: Michelle Elvy, Paula Morris, James Norcliffe Art editor: David Eggleton

In the aftermath of the Christchurch terrorist attacks of 15 March 2019, Prime Minister Jacinda Ardern declared "We are all New Zealanders". These words resonated, an instant meme that asserted our national diversity and inclusiveness and, at the same time, issued a rebuke to hatred and divisiveness.

Ko Aotearoa Tātou • *We Are New Zealand* is bursting with new works of fiction, nonfiction, poetry and visual art created in response to the editors' questions: What is New Zealand now, in all its rich variety and contradiction, darkness and light? Who are New Zealanders?

The works flowed in from well-known names and new voices, from writers and artists, from Kerikeri to Bluff. Some are teenagers; some are in their eighties. Māori, Pākehā, Pasifika, Asian, new migrants, young voices, queer writers, social warriors...

Aotearoa's many faces are represented in this unique and important compendium. This anthology shows that creative work can explore, document, interrogate, re-imagine – and celebrate – who we are as citizens of this diverse country, in a diverse world.



Nouns, verbs, etc.

Selected poems *Fiona Farrell*

One of New Zealand's most versatile writers, Fiona Farrell has published four collections of poetry over 25 years, from *Cutting Out* (1987) to *The Broken Book* (2011). *Nouns, verbs, etc.* collects the best work from these books, and intersperses them with other poems thus far "uncollected".

The themes are wide ranging: political and personal, regional and global, including love and birth and death, war and emigration, history and landscape. The poems mix lyricism with the flat and plainspoken mode of Kiwi vernacular; they channel

voices infrequently heard in poetry in traditional song and ballad forms. They are well crafted but unpretentious, jokey yet illuminating, self-deprecating but wise, sad and funny and deeply human.

For further information: Otago University Press | otago.ac.nz/press | university.press@otago.ac.nz

ANOTHER GREAT DISCOVERY - Conor Hassan with his great-grandfather Miles Barnett's MSc thesis.

BARNETT

ADDENDUM

One family: generations of discovery

WIRELESS TELEDING

What are the odds? Two Beverly Scholarships in one family, one hundred years apart. That's a question that statistics honours student Conor Hassan might be able to solve, along with his great-grandfather, distinguished Otago physics and maths alumnus Miles (MAF) Barnett OBE.

Add to that the improbability of Conor recently discovering Miles' master's thesis in a cabinet in Otago's Department of Physics and the treasure chest of stories in a remarkable family history just keeps on growing. WHEN CONOR HASSAN came to Otago in 2017 from Christchurch he says he didn't know much about his greatgrandfather, apart from the fact he had studied physics and maths at the University and that his family was from Dunedin, having come from England.

"I knew more about Miles' dad, Louis, my great-great grandfather. The Barnett lecture theatre at the hospital is named after him – he was one of the first surgeons in Dunedin."

That great-great grandfather is Sir Louis Barnett CMG, one of New Zealand's most renowned surgeons. Sir Louis attended Otago from 1883 to 1884, later attaining his MB, CM from the University of Edinburgh and was the first New Zealander to become a fellow of the Royal College of Surgeons of England.

After returning to Dunedin he become Professor of Surgery at Otago in 1909. He was instrumental in the establishment of the College of Surgeons of Australasia and

ADDENDUM

a pioneer in hydatids' research. The Ralph Barnett Chair of Surgery at Otago is named in memory of his son who was killed in action in WWI.

This was a high achieving family. Sir Louis' other children were Geoffrey, also a surgeon and lecturer at Otago; Denis who was appointed an Air Chief Marshal with the RAF in the early 1960s and knighted KCB in 1957 and GCB in 1964; and Marjorie, who became deputy director of the nursing division of the Department of Health and was awarded an OBE in 1954.

Louis, Ralph and Geoffrey were all at Gallipoli.

SCHOLARSHIPS A CENTURY APART

When Conor first received the Beverly Scholarship in statistics and mathematics in 2019, he didn't realise that Miles had received it too – in 1920, 1921 and 1922 – until someone in the Physics Department told him.

"I've never really cared about awards, but perhaps the coolest thing about getting the Beverly Scholarship was that Miles got it 98 years ago."

Conor, who has recently received the scholarship for the second time, says Miles "obviously did pretty well" and after Otago went off to the University of Cambridge in the UK to do his PhD.

Conor's uncle John Harte has been trying to track down Miles' work to fill in gaps in the family history, especially concerning the research Miles was doing before and after Cambridge.

As part of his research, he asked Conor if he'd like to try to find Miles' master's thesis. Conor admits he wasn't very optimistic about the possibility of it being there.

"I'm like how long ago, 1922? I'm not sure I'm going to have much luck. So I just went to the Physics Department and they asked if I knew what year it was, and I said 1920s sometime. Then we went and looked – and there it was. It was probably one of the oldest ones they had in the cabinet – a small hardbound book. Miles Barnett's Beverly Prize certificate 1921

"He had all these hand-drawn diagrams. I'd heard about the work he'd done and it was pretty cool seeing something physical from so long ago."

He said his uncle was "super-excited" at the find, which is actually the second-oldest thesis in the department's thesis cupboard, and all the family has learned something new about their relative.

Miles' thesis is entitled *Analysis of Modulation in a Wireless Telephone Transmitter* and analysed the operation of some of the equipment used by Otago's Professor Robert Jack in his experimental radio broadcasts of 1921 and 1922.

The current Beverly Professor of Physics at Otago, Craig Rodger, says Professor Jack was a pioneer in radio research in New Zealand, undertaking the first "wireless" broadcasts in this country using his equipment.

"The Physics Department was then located in the University Clocktower, putting it right at the heart of this piece of history," he explains. "In some of his first broadcasts he asked listeners to telephone the University if they could hear his transmissions. Professor Jack was initially pleased when calls came in from the hill suburbs of Dunedin city, but later very surprised when telegrams arrived from other parts of the country to confirm they too could receive his signals.

"Miles was working alongside Professor Jack on this world leading research – preparing him for his next step into the world."

FROM CAMBRIDGE TO THE MET OFFICE

Miles graduated MSc with double firstclass honours in physics and mathematics in 1924.

At Cambridge he entered Clare College and studied in the Cavendish Laboratory where he was assigned by famous New Zealander Sir Ernest Rutherford to an investigation of the propagation of radio waves under the supervision of English



physicist Edward Appleton.

Their experiments confirmed the existence of an electrically conducting layer in the upper atmosphere that could reflect radio waves beyond the curve of the earth, and also showed that at times the reflections could come from a second, higher layer. Their initial findings were published in *Nature* in 1925.

Professor Appleton was later knighted for his pioneering work in radiophysics and, in 1947, received the Nobel Prize for Physics – and is said to have mentioned Miles in his Nobel Lecture.

Miles was awarded his PhD in 1927 and elected a fellow of the Institute of Physics in 1929. After marrying, he returned to New Zealand, settling in Wellington where he and his wife Margaret (Peggy) raised three children. He worked as a physicist for the newly-established DSIR before being appointed to the New Zealand Meteorological Office in 1935 to develop the services needed for aviation, serving as director from 1939 to 1962.

During WWII, the Meteorological Office became a branch of the Royal New Zealand Air Force. Miles became a Wing Commander and, at the height of the war, had nearly 500 staff stationed from the equator to the sub-Antarctic islands.

Highly regarded for his judgement, tact, quiet guidance and setting of high standards, he was made an OBE in 1945, a fellow of the Royal Society of New Zealand in 1947, and Officer of the US Legion of Merit in 1948. He became the first vice-president of the World Meteorological Organisation (WMO) 1955-1959 and was a member of the executive committee 1959-1962. He was also chair of the National Committee for the International Geophysical Year in 1957-58. He died at Waikanae in 1979.

His daughter Jane, now living in Paraparaumu, remembers her father as a "modest and quiet man".

"He took his time thinking things through at the weather office. At the WMO it was very much the East and West block and you voted for your block. Dad was known for thinking about what was said and would vote on the other side depending on what he thought was right. They couldn't rely on him to follow the pack."

She says he was away a lot of the time for meetings to do with his work, including trips to the Antarctic and up to Norway and frequently in between. She has a photo of him at the South Pole.

"I think he was the most-travelled public servant during that time."

'PRETTY DECENT' AT MATHS

Maths talent runs through each generation of the family – Conor's mother Trish Harte is a maths teacher and another of Conor's uncles, David, was a lecturer in statistics at Victoria University of Wellington, before moving to Statistics Research Associates.

"Everyone's pretty decent at maths," says Conor. "People always said to me you're just going to go and do a maths degree and I was always like, no I'm not. But then I guess it just happened: you can't control things sometimes."



His older brothers Papu and James also came to Otago and studied computer science and anthropology.

Last year Conor was awarded the Prime Minister's Scholarship for Asia and spent a semester studying stats and maths and assorted sciences at the National University of Singapore. Before starting his term there, he travelled in China for five weeks on a volunteer programme teaching English.

"It was just to see China a bit: you always hear so many stories about it. I went over by myself and I don't know Mandarin and didn't go to Shanghai or Beijing and people didn't speak English, so it was a bit touch-and-go sometimes, but it was fun, I enjoyed it."

His honours research project is on the topical subject of modelling for fake news in elections and he says he definitely wants to go on to do a postgraduate degree afterwards.

"It would be kind of cool going overseas, but we'll have to see how that goes. It's a bit of a weird time."

With the discovery of the thesis, Conor and his great-grandfather's story has also caught the interest of other academics at Otago, including Professor Craig Rodger, a fellow recipient of the Beverly Scholarship.

Like Miles, Professor Rodger works in radio and did his postdoctoral studies at Cambridge.

He says while he knew about the work in radio done by Professor Jack, he's enjoyed learning about MAF Barnett as this piece of his department's history has come back to light.

"Physics is one of the founding research areas at Otago University," he says. "But we have not strongly focused on our history – discovering that Prof Bobby Jack worked with a student who went to Appleton in Cambridge and then did great things for New Zealand has been a new thrill for me. And now Conor: well, I suspect he's brilliant, just like his relative."

MARGIE CLARK

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