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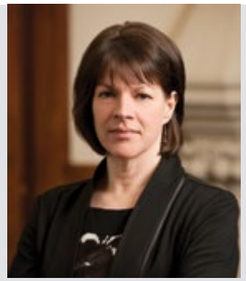
VICE-CHANCELLOR'S COMMENT



"2017 was an amazing year for us, but there is more yet to come. In less than 365 days, we will begin the biggest celebration in our history as we mark the 150th birthday of the University of Otago, our sesquicentenary."

Here at Otago we are currently finalising our 2017 Annual Report and it struck me that much of the rich information we provide in that document never makes its way to our friends and alumni. Given that 2017 was such an amazing year for us, I thought that I would share just a few snippets from material that is covered in our Annual Report.

Students continue to be the lifeblood of Otago. Our graduates are well known for their independence, communication skills and teamwork, which are cultivated in our unique residential environment. But what is less well known is the high level of academic excellence our students also achieve. In 2017, University of Otago students topped every one of the Tertiary Education Commission's eight annual key educational performance indicators. This unprecedented result highlights the high quality of teaching at Otago and the commitment of Otago students to making the most of the rich learning opportunities we offer.

In 2017, we also enjoyed an unprecedented year in research funding, attracting more than $100 million in funding for the first time in our history. We received more than $24 million in the Health Research Council's main funding round and achieved our best result ever from the Marsden Fund, gaining a further $24 million for 33 projects across all four of our academic divisions.

2017 also marked an important year for strategy development. We launched two new strategies that will have a major impact on the shape of our future. First, we launched our new Māori Strategic Framework (MSF) to 2022. This framework builds on the inaugural 2007 MSF, fostering our on-going engagement with iwi and other Māori entities, and strengthening our commitment to achieving equitable Māori success rates in tertiary education. The MSF also sets ambitious goals to embed mātauranga Māori across our core activities throughout the University. Māori students achieved to their highest level ever at Otago in 2017 and we are currently on track to have a record-breaking number of Māori students studying at Otago in 2018.

We also launched our new Sustainability Strategic Framework in 2017, which sets out our bold ambitions to 2021. This framework not only outlines our sustainability objectives for the future, but also a plan for how we are going to achieve them. The framework is the culmination of rigorous planning, consultation and negotiation that has taken place over a number of years, and it sets us on a brave new path for the future. By treating our campuses as "living laboratories" of sustainability practice and research we will address our own sustainability challenges and equip our students with sustainability skills – skills they can take with them when they graduate.

We are currently in the midst of the largest and most complex building programme in our history. A number of new and redeveloped facilities were opened in 2017 including purpose-built premises for the world famous Dunedin Study, a new marine teaching laboratory at Portobello and the refurbished School of Business. Work continued in the Science precinct and on the $130 million redevelopment of the Faculty of Dentistry. We also announced plans for a new facility for Music, Theatre and Performing Arts. These are substantial projects that are having – and will continue to have – real benefits for the wider community and considerable impact on the regional economy. The latest economic impact figures estimated the impact will be $1.64 billion for Dunedin alone, supporting 14,748 jobs.

It was also the end of an era for our University Council in 2017 when Mr John Ward stepped down from his position as Chancellor at the end of the year. Mr Ward was the 18th Chancellor of the University of Otago and he gave many years of dedicated service to the University. He was first appointed to Council in 2003, he became Pro-Chancellor in 2007 and Chancellor in 2009. His most public role was at graduation where he presided over 103 graduation ceremonies and capped more than 31,000 graduates. He also oversaw the University's ambitious capital development programme and guided Council through changes to the 2015 Education Amendment Act. Through all of this, Mr Ward committed his heart, his mind, his time and his own personal philanthropy to the University of Otago. The University is extremely grateful for his service. Dr Royden Somerville QC became our new Chancellor in 2018 and Dunedin accountant Mr Stephen Higgs became our Pro-Chancellor. We are very fortunate to have these high calibre graduates in these very important roles and I look forward to working with them, and the rest of Council, in the year ahead.

In closing, 2017 was an amazing year for us, but there is more yet to come. In less than 365 days, we will begin the biggest celebration in our history as we mark the 150th birthday of the University of Otago, our sesquicentenary. A list of events is published on page 50 of this issue and updates will be posted on the website *otago.ac.nz/150*. Our goal is to hold at least 150 events in New Zealand and across the world to mark 150 years. The *Otago Magazine* will dedicate its first issue of 2019 to the anniversary and we are inviting alumni to be part of this by sharing their memories with us. You can find out more about this opportunity on page 51. 2019 will provide multiple opportunities for you to reconnect with old friends, to share in the celebration of our proud history, and to be part of our ambitious and successful future.

Professor Harlene Hayne
Vice-Chancellor, University of Otago

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Genomics Aotearoa: leading the way

Society, health care, the economy and the environment all stand to benefit from the new Otago-led Genomics Aotearoa collaboration.

Scientific knowledge is growing at such a pace that it can be difficult to keep track of who is doing what and how new discoveries can best be used to benefit society.

Technological advances in genomics – the study of genes and their functions – for example, are revolutionising research across a wide spectrum of subjects with increasing national and international importance.

So when the Ministry of Business, Innovation and Employment called for proposals to guide new developments based on genomic research, Professor Peter Dearden (Biochemistry) and colleagues saw a way for the University of Otago – and New Zealand – to lead the world.

"Many of us involved in the subject had been considering a research strategy for some years," says Dearden. "We seized the opportunity to focus many of the strands that were lying around to try to ensure that New Zealand scientists could stay up to date and produce world-leading research."

The researchers' proposal succeeded, attracting $35 million of government funding over seven years, with Dearden becoming the founding director of Genomics Aotearoa.

The collaborative project is an alliance of the Universities of Otago, Auckland and Massey, Crown Research Institutes AgResearch, ESR, Landcare Research, and Plant and Food, and 32 associate organisations that include researchers and end users of genomics and bioinformatics, which works to help understand genomic data. *(See Bioinformatics focus sidebar page 9.)*

Genomics Aotearoa director Professor Peter Dearden: "Genomics has had such a step change in the way it has been done: we wanted not just to keep up to date, but lead the way."
Photo: Graham Warman

"We are trying to look at where we have gaps and how we can fill them by using genomics to solve problems for as many people as possible. Genomics Aotearoa is a very serious collaboration and it's all about knowledge building."

"Genomics Aotearoa is simply the most exciting, important and profound project we have ever undertaken as a country."
– Dr William Rolleston

The aim is to develop new genomic and bioinformatic information that will translate into a wide range of social and economic benefits, including a strong Māori component.

Genomics has become a core discipline, underpinning all kinds of science vital to New Zealand. It's a fast moving and fast growing research and commercial field, with a high turnover in technologies and approaches, so Genomics Aotearoa has emerged at a good time, says Dearden.

"Genomics has had such a step change in the way it has been done: we wanted not just to keep up to date, but lead the way.

"We've come so far since 2002, when sequencing the first human genome took hundreds of scientists 12 years and cost several billion dollars. Now new technology means sequencing human genomes costs about US$1,000 and can take less than a week, and you can do many sequences at the same time. With these advances, the economics of investigating variations in genomics in various species change dramatically.

"Genomics Aotearoa will be a collaborative research system that significantly up-skills us in the application of genomics and bioinformatics through acquiring new techniques from overseas, developing new and novel methods, and maintaining best practice.

"We are poised to provide infrastructure that will lead to improvements in the health of our people and the state of our environment, while adding value to New Zealand Inc."

The collaboration will advance New Zealand's capabilities by developing genomic tools and technologies, building international connections and increasing national collaborations between genomics researchers and end users across life sciences relevant to social well-being, the economy and the environment.

Dearden doesn't draw a distinction between "blue sky" research and applied science.

"I don't believe there is a fundamental difference between basic knowledge and its application. Even the most basic genomic research is destined to be put out into useful areas ranging across both fundamental and applied sciences. We have so many partners and associates working on and applying the research results we generate.

"Genomics is useful in so many ways that we are confident that our work will see beneficial outcomes."

General benefits include increasing the adoption and impact of genomics technology for scientists, relevant end users and their sectors. Sectors standing to gain include health, society, the environment and the economy.

On the health front, North America and Europe have learnt much about such things as breast cancer because of the amount of human genome sequencing they have done, says Dearden. But their findings don't always apply to us, as we have our own population and we haven't found out about it yet. *(See Health focus sidebar page 10.)*

"Analysing variations in the New Zealand population is going to be a critical piece of foundation work and will have ongoing benefits almost indefinitely, helping health providers with the diagnosis and prognosis of disease and genetic conditions."

This includes respecting cultural differences while working effectively with Māori – which could pay handsomely in many ways, says Dearden. *(See Māori focus sidebar page 10.)*

"We have to work in a way that works for Māori: working with them and developing trust; working together and developing relationships so they can work independently.

"We want to engage Māori so they can do the work themselves. It's a huge challenge, but it's a great challenge and there's lots of goodwill on both sides so we are hoping to lead the world in a study of our own unique indigenous people."

New Zealand also has unique flora and fauna, and the environment could be a big winner with genomic support for a pest-free New Zealand.

"There's been a lot of discussion about the technology involved in gene editing and gene drives for pest control. A lot of research has already been done in these areas, but there is still much to do with the basics, such as finding genetic variations in pests. For example, the ship rat, which is a major problem in New Zealand, has still not been sequenced.

"Providing that kind of background information would provide huge opportunities for developing technologies for pest control. And that's just one project. Our goals include helping look after our environment, conserving rare species and caring for such things as soil and water."

Economic benefits should follow research into improving the breeding of existing and emerging primary production species.

"Some of our primary production industries are doing really well, but still want to breed stock faster and more economically. Other industries need support and genomics can be a big boost to them, helping with technology issues and providing information from our data sets. We can also come up with strategies and tools in many areas so industries can use them and do development work themselves.

"Rather than focusing on single areas of research we're aiming to develop wide-reaching technologies across all areas and help everybody to help themselves. Genomics underpins so many things and sequencing one species is quite likely to benefit many other species.

"We are trying to look at where we have gaps and how we can fill them by using genomics to solve problems for as many people as possible. Genomics Aotearoa is a very serious collaboration and it's all about knowledge building."

For Genomics Aotearoa Board chairman Dr William Rolleston (CNZM), the study of the genetics of life in New Zealand offers a fundamental definition of its people, plants and animals. "Genomics Aotearoa is simply the most exciting, important and profound project we have ever undertaken as a country."

NIGEL ZEGA

Bioinformatics focus

The science of genomics generates so much data that it needs expert wrangling to get the best from it.

Associate Professor Mik Black (Biochemistry) is one of Genomics Aotearoa's key people, tasked with establishing bioinformatics infrastructure for various teams and projects.

He'll be helping to co-ordinate the development of methods and software tools for the analysis of biological data derived from research, as well as working on a national genomics data repository and investing in up-and-coming young academics.

"Apart from setting up processes and handling data for Genomics Aotearoa, a very important part of our work is building New Zealand's research skills and capability for the future. Involving younger researchers in Genomics Aotearoa projects will obviously help us generate data, but it will also help them get a good start in developing their own research careers."

The leading members of the team are passionate about their own work, says Black, but equally passionate about growing research capabilities in New Zealand science.

"The combination of research and infrastructure is one of the best things about large-scale projects like this. As we look to build teams around the country, we'll be holding training workshops and opening them up, not just to Genomics Aotearoa researchers, but also to other researchers in the New Zealand science community."

Black's own research has included developing and applying statistical methods for analysing data from genomics experiments, with a particular emphasis on colorectal and breast cancer.

Once the main bioinformatics programmes have been launched, he plans to focus his expertise on the Genomics Aotearoa Health Theme, which includes projects on human genetic variation, precision oncology and epigenetics.

"A very important part of our work is building New Zealand's research skills and capability for the future."
Associate Professor Mik Black

Health focus

Professor Stephen Robertson (Curekids Chair in Child Health Research, Clinical Genetics Group) is involved in co-ordinating a number of Genomics Aotearoa's health projects across New Zealand and internationally.

CURRENT PROJECTS INCLUDE:

A collaboration between the University of Otago (Dunedin and Christchurch) and the University of Auckland looking at improving the statistical analysis of genetic and epigenetic data sets. Epigenetics is how genetic material – our DNA – can be modified and altered due to various environmental effects such as nutrition, exercise and drugs. These effects don't change the code, but change how the code is read.

"Now we can measure not only DNA, but also alterations to DNA, so these scientists want to develop new tools and new statistical techniques to correlate the effects of environmental exposure," says Robertson. "They will be looking at large cohorts of people with aneurysms in Dunedin and working with Christchurch-based researchers looking across a wide spectrum of traits in populations enrolled in studies at that centre."

Beginning a genetic research theme across the lifespan, particularly for Māori and Pacific peoples.

"Internationally there have been intensive genetic studies focusing on Western and Asian people, but Māori and Pacific peoples have been relatively underserved. We want to apply genetic science to improve health outcomes for Māori and Pacific peoples. That will start with conversations about how to do that optimally with respect to their culture, especially around aligning the approach with all-important concepts such as whakapapa, consent and protection of data."

Trying to get a better clinical understanding of tumours.

"If we can genetically understand a tumour, we can adopt rational approaches to the best treatment to combat the disease for that person."

Wellington and Otago-based research on viruses and bacteria.

"We are trying to develop culture-independent diagnostic testing so we can sequence DNA directly from body fluids rather than using culture-based methods to identify disease-causing micro-organisms.

"We're looking at new technology, new skills and new understanding to enable genomics to be delivered more effectively into health care," says Robertson. "We want to improve medicine to individualise treatment and make it more accurate and, ultimately, more effective."

"We want to improve medicine to individualise treatment and make it more accurate and, ultimately, more effective."
Professor Stephen Robertson

Māori focus

Dr Phil Wilcox (Mathematics and Statistics) co-directs Māori-related components of Genomics Aotearoa.

Wilcox (Ngāti Rakaipaaka, Rongomaiwahine, Ngāti Kahungunu ki Wairoa and Pākeha) also co-leads Vision Matauranga, which shares the aim of unlocking the science and innovation potential of Māori knowledge, resources and people.

He has long championed science and Māori working together to the benefit of both. In 2001 he started the Te Arotūruki initiative, which developed processes for scientists to engage with Māori communities regarding controversial technologies, and has been involved in multiple projects including the Mata Ira: He Tangata Kei Tua project, which developed ethically-informed guidelines for medical genomics.

"Genomics Aotearoa has a lot of Māori-specific work going on," says Wilcox. "The main themes of health, the environment and the primary sector all have Māori components because Te Ao Māori – the Māori world – has major interests in each of these areas.

"Some of the research and resources being developed focus on Māori-specific outcomes including hauora – Māori health and social well-being – and tiakitanga – the principle of environmental sustainability – from genomics research on indigenous biota.

"For many reasons it's important to have Māori participating in the research, governing some of the research and benefiting from some of the research. We want to maximise positive outcomes for Māori communities from genomic sciences."

Genomics Aotearoa director Peter Dearden agrees. "A lot of genomic research is going on overseas and will be solved overseas. But in New Zealand we have the opportunity to work towards the benefit of our unique fauna, unique environment, unique primary production industries and, particularly, our unique people.

"It's really important to us to achieve positive outcomes for Māori so that our work involves and enthuses them, and is of value to them across the board. We want to be seen as an example of how to work with an indigenous population with close links to the environment."

"We want to maximise positive outcomes for Māori communities from genomic sciences."
Dr Phil Wilcox

Rhodes to travel

What does it take to win one of the world's most prestigious scholarships? For one Otago student it was a combination of commitment, compassion and being very, very busy.

Being "ridiculously busy" has paid off for graduate Jean Balchin, who will soon move from Otago to Oxford on a Rhodes Scholarship.

Balchin, who has just completed a Bachelor of Arts Honours in English Literature, is one of only three New Zealanders to be selected in the latest round for the sought-after scholarship, which provides tuition at the University of Oxford in England, accommodation and a monthly stipend for a minimum of two years.

"I'm absolutely stoked about what an amazing opportunity this is," says Balchin. "I'm really looking forward to studying at Oxford and being part of such an incredible international community. I feel very honoured to have been chosen and am very grateful to the English Department, the scholarship office and to Rhodes scholar Professor Merata Kawharu [Tu Tumu – School of Māori, Pacific and Indigenous Studies] for their support."

The "beauty of the Rhodes" is that selection is not based purely on academic results, but also on values such as integrity and care for fellow human beings, she says.

"I think the reason I was given the scholarship – besides my academic success – is that I'm really passionate about making a change, especially in terms of suicide prevention, mental health awareness, student journalism and science communication. It's about all those extracurricular activities and your ability to show that you actually care about other people. And I do genuinely care about the volunteering that I do."

Balchin became involved with teen and youth suicide prevention after her younger brother, John, died by suicide in 2014. His suicide, and her own struggle with depression and anxiety, are topics she doesn't shy away from.

"Keeping hush hush about these sorts of issues just perpetuates the stigma more. I am very honest in my writing and on my radio shows, and I also spoke at the University's SilverLine Wellbeing Festival last year: about my brother's story, my story, certain myths surrounding suicide and how we can dispel them and combat the stigma around mental health in general."

As well as regularly volunteering with the Life Matters Suicide Prevention Trust, Balchin shaved her head in 2016 to raise money for the trust and last year she organised an art exhibition at the Dunedin Community Gallery. The "Hope" exhibition featured around 130 artworks, including one of her own paintings, and raised approximately $4,000 for Life Matters.

On top of this, Balchin hosts two radio shows and writes for a variety of magazines and newspapers, including a regular column in the *Otago Daily Times*. She is also the editor of Sciblogs – a Science Media Centre of New Zealand website featuring science bloggers – and for the student volunteering organisation UniCrew blog.

"I'm ridiculously busy, but I love doing my radio work and my writing and I love provoking people through my journalism. I actually relish it."

Balchin's interest in science communication was sparked after doing a Humanities internship at the Science Media Centre last year. Her major project was a series of articles titled *A History of New Zealand Science in 25 Objects,* based on the idea of *The History of the World in 100 Objects* by the British Museum.

"We punch above our weight in the international scale of things. I wanted to represent New Zealand in an accurate and diverse light, so as well as Rutherford and the atom, Hamilton jet boats and the bungy jump, I included work by women scientists like Beatrice Tinsley, who was an astrophysicist in the '50s and '60s, and I also looked at tā moko uhi [chisels] and pā fortifications. It's fascinating."

During her time at Oxford, Balchin plans to complete a master's degree and a DPhil, which will look at social Darwinism in New Zealand colonial literature.

"I'm interested in how Darwin's theory of evolution was perverted and used to justify racism and colonial expansion. It's looking at science communication through a historical and literary lens. It's a mix of all my interests rolled up into one."

Looking to the future, Balchin sees no reason to choose between these areas of interest.

"I don't see my careers as an academic and as a communicator as being mutually exclusive. I'd like to continue in science communication and I'd like to come back to Otago and be a lecturer. I love the English Department here: their ability to believe in you and their insistence that you can do what you want to do. The English Department, and Humanities in general, are so integral to our University.

"I also love New Zealand and I want to see it change for the better. I'm going to try to influence things with my journalism, my activism and my public speaking. And if I can't make enough of a change, I'll go into politics."

LAURA HEWSON

"I'm going to try to influence things with my journalism, my activism and my public speaking. And if I can't make enough of a change, I'll go into politics."

Rhodes scholar Jean Balchin: "I think the reason I was given the scholarship ... is that I'm really passionate about making a change."
Photo: Sharron Bennett

Quality of science

Professor Emerita Carolyn Burns has dedicated her career to understanding – and helping to protect – New Zealand's freshwater ecosystems. This lifetime of outstanding service to science has recently been recognised with the Marsden Medal.

Professor Emerita Carolyn Burns: "For me, our lakes, wetlands, rivers and streams are part of what it is to be a New Zealander. So, I've always felt privileged to be able to work in these dynamic ecosystems."
Photo: Graham Warman

After a lifetime of distinguished research into freshwater ecology, Professor Emerita Carolyn Burns (Zoology) is well qualified to judge the health of our lakes and rivers.

It's not good news. Just as climate change has only recently become a hot topic – despite decades of dire warnings from scientists – our freshwater resources have been allowed to decline in quality because years of far-sighted predictions from experts like Burns have been ignored.

"We're sitting on a slow-ticking time bomb in places like Taupo and many other parts of New Zealand," says Burns, "waiting to inherit the legacy of farm practice from 50 years ago. Now, no matter what we do, some of these lakes are unlikely to recover for a long time."

Burns has recently been honoured by her peers, being awarded the prestigious 2017 Marsden Medal by the New Zealand Association of Scientists, not just for her stellar academic career, but also for her support for up-and-coming science leaders and her ability to communicate the importance of what science is and does, now and in the future, to a wide range of audiences.

"We're sitting on a slow-ticking time bomb … waiting to inherit the legacy of farm practice from 50 years ago. Now, no matter what we do, some of these lakes are unlikely to recover for a long time."

The medal is the latest in a long line of accolades, including the world's top award for the study of inland waters – the Naumann-Thienemann Medal – and high-level involvement with a range of influential organisations spanning academia, government and conservation.

Her expertise has benefited the World Conservation Union, the Department of Conservation, the Nature Conservation Council, the National Parks and Reserves Authority, the National Institute of Water and Atmospheric Research (NIWA) and Antarctica New Zealand. She has served on Performance-Based Research Fund panels, advised the Marsden Fund, chaired academic audits and supported the promotion of science on panels selecting a diverse array of prizes, awards and fellowships.

She became a Fellow of the Royal Society of New Zealand in 1993 and was subsequently the first woman to chair the society's Academy Council.

Having selected worthy recipients of awards for so many years, receiving the Marsden Medal was a surprise.

"Acknowledgement by one's peers in science is the ultimate accolade and I feel enormously privileged to be honoured in this way. It's really nice to be recognised, but I still worry about science in New Zealand not being acknowledged and thought of as highly as it is in other countries."

Time has brought some progress, says Burns. "There's been more recognition that science is expensive to do and needs resources and funding and time. There are no immediate answers, especially in ecological areas where research can take years rather than months or weeks to get answers.

"But at least it's acknowledged that it really does cost thousands just to get a multi-measurement probe into a lake. It's also good that now teams of scientists work on things rather than just one person, which is how it used to be."

Burns' career began with her childhood fascination with tiny organisms she found living in a ditch close to the family home in Lincoln, near Christchurch. That early exposure led to university field trips to ponds, lakes, rivers, estuaries and seashores – and then a difficult decision: whether to study planktonic organisms in fresh or marine environments.

She decided inland waterways were more accessible and would give her more control over her research. She also realised early on that the growth of New Zealand's population and agricultural economy would see freshwater quality become increasingly important.

"New Zealand's freshwater ecosystems have a strong aesthetic and cultural appeal for many people and, for me, our lakes, wetlands, rivers and streams are part of what it is to be a New Zealander. So, I've always felt privileged to be able to work in these dynamic ecosystems.

"I love the way they are constantly changing physically and biologically in response to internal and external drivers – weather, land development, seasons etcetera – and, increasingly also now, to climate change and invasive species. Every answer in freshwater ecology raises new questions and new challenges.

"In particular, I love the challenges raised by the microscopic organisms in the plankton, whose role in freshwater ecosystems worldwide has largely been overlooked until relatively recently, yet they underpin open water food chains and often have significant effects on water quality."

Burns understands tourism campaigns promoting New Zealand's clean green image, but the scientist in her can only report the facts.

"We have never been 100 per cent pure since human settlement. We are in the happy situation that we have a good image only because we have so few people that we have just not caused much impact. Europe has done a lot to clean up its act, but we have done very little to ensure our environment really is 'clean and green' and it will take considerable time and money to change our practices. We have just been lucky so far."

Now our luck is running out.

"Our lakes have become increasingly low in quality and there are more algal blooms that cause problems. Water clarity has decreased. Intensification of dairy farming is having an increasing impact."

Farming has always influenced water quality.

"In New Zealand in the '70s we knew that lakes such as Rotorua were in a very bad state because of high levels of phosphorus and nitrogen causing algal blooms. More than 40 lakes were in trouble and farming, in general, was a major contributor.

"I've come to realise that, in situations like this, people, governments and countries may acknowledge the problem, but only pay lip service to it until they are really up against it. They don't take early action, which would save money and time in the long term. We can see that happening again now with climate change.

"In retrospect I'm not that surprised – but if action had been taken back then, we would have saved millions of dollars on improving water quality in lakes like Rotorua and Taupo, where we have recently spent more than $150 million. And, even when we remove direct sewage inflows from lakes like Rotorua and Horowhenua, we still have run-off from the land. Waste goes into fast flowing rivers or into the sea from developments on the coast."

Science can identify the problems, and science may be able to provide some solutions.

"Recent research has been looking at the use of slow-release fertilisers, applied appropriately, to mitigate the effects of artificial fertiliser put on to the land.

"For years we didn't apply nitrogen fertiliser because we used clovers and other legumes that fix nitrogen in the soil. Now we do. We also have an intensification of dairying. Cows' urine and dung contain more nitrogen than that of most other livestock, which they expel – in large volumes – onto pasture, concentrated in small areas so that it quickly percolates deeply in the soil and may reach the groundwater. Where these underground aquifers discharge into lakes and inflowing streams it can take 50 or 60 years for the additional nitrogen to reach the lake and the effects seen.

"Years of neglect and poor practice have led to nitrogen and phosphorus building up in lake sediments. When you have nutrient-rich organic sediments, oxygen is lost from the bottom waters of the lake, which has happened in Lake Hayes, near Queenstown.

"In the absence of oxygen, nitrogen and phosphorus are released from the sediments and are carried into the upper waters where they promote algal growth and blooms. When these algae die and sink, they add to the organic material breaking down on the lake bottom, a process that uses more oxygen, so that increasingly more bottom water becomes anoxic – and fish can't live without oxygen. It's a vicious cycle that is very hard to break."

NIWA is looking at ways to break the cycle, from using chemicals to installing plastic sheeting to physically isolate lake sediments from the overlying water.

Burns has been investigating using more natural mechanisms in the form of shrimp-like *Daphnia* species that eat algae that cause blooms. But recently the bloom-forming algae have tended to be larger species – too big to be eaten by the *Daphnia*.

The microscopic world remains one of multiple mysteries and Burns is far from done with it.

"Although I am now a professor emerita it doesn't mean it's the end of my career. I'm still active in research and I'm still going to be working in science. There are so many things I would still love to do, but there is not enough time in the rest of my life to do them all."

Burns is also working on her bucket list, travelling widely to explore the problems, pressures and other mysteries in the rest of the world.

"It's a horrifying thought that one day I might be confined to a rocking chair regretting that I know so little about the rest of our planet, so I want to get things done while I can, travelling to see different countries and different cultures and learn from them. It's astonishing what people achieved as long ago as 5000 years BC – but what happened to all that knowledge?"

Burns' passion for life and science is infectious, something generations of students and colleagues have appreciated.

"For me, a university academic position has provided an ideal opportunity to pursue my love of scientific research while at the same time passing on my enthusiasm, knowledge and curiosity about aspects of Earth's ecosystems and biota to students and staff through my teaching. I couldn't have chosen a better career."

NIGEL ZEGA

DRL developments

Transitioning from a University research laboratory to a more commercially focused venture, Disease Research Limited is now taking its deer disease expertise to the much larger dairying industry.

From Deer Research Laboratory to Disease Research Limited: the DRL of 2018 owes a lot to the DRL of 1985.

Established by Professor Frank Griffin as part of the Department of Microbiology and Immunology, the small but influential Deer Research Laboratory broke new ground, particularly around the industry scourges of TB and Johne's disease. But now, with the support of Otago Innovation Ltd (OIL) – the University of Otago's commercialisation arm – DRL, now known as Disease Research Limited, is translating that expertise into other areas of animal management, including dairying.

Although he officially retired in 2016, Griffin remains keen to maintain a research role, with links to the University of Otago.

"To me just transitioning DRL into a service laboratory wasn't that appealing: research was the thing that gave me a buzz," he says.

"Our research has always been applied – looking at new diagnostics, finding genes of resilience and developing vaccines. We weren't plumbing the depths, we were looking at functional responses to see how we could use those to bring commercial gain or economic gain."

DRL has always reinvested surpluses into research and Griffin estimates it now totals around $15 million. "We've always paid our way. But now we are transitioning from a cloistered University environment to a much more rugged commercial environment."

To do that, DRL is expanding its portfolio from focusing on deer – a relatively small industry which couldn't guarantee a future – into one embracing dairy, an obvious target for future research and growth.

For example, Johne's disease is common to cows, sheep, deer and goats, so DRL is translating its deer expertise into dairy, a significant challenge given it is an industry of big players.

Their first incursion involved a memorandum with CRV Ambreed – a key player on the breeding side of the industry – making DRL their preferred technical and diagnostic services provider.

They are also working with a large corporate dairy farmer, testing 59,000 cows on more than 50 farms for Johne's disease and bovine viral diarrhoea (BVD), and they are assisting the Southern Dairy Hub which runs a number of research farms focusing on animal health, nutrition and sustainable management systems.

"It means for the first time we can have a volume of service which could make the lab quite independent financially. But it also brings with it some research challenges because historically the dairy industry has done very little in those disease areas."

Griffin says dairy requires quite a different disease management approach. A diseased deer would be culled immediately, but its carcass would still retain commercial value because Johne's is not deemed a health hazard.

In dairying all the value comes after calving and milk production begins, so this means being more discriminating about culling.

For example, a 1,200 cow herd in which 300 animals are reactive seems like a huge problem, but DRL's solution was to take a two-tiered approach, using a screening test for markers of disease exposure, with a follow-up test to identify those that are actually diseased and present a risk of shedding disease to other animals. These cows can then be stratified according to their disease status, allowing farmers to make informed choices about culling.

> **1** farmer with **1,200** cows was losing **80** to **100** animals per year, but that number has now been reduced to just **4**.
>
> "After just one year we have stopped all this wastage and, equally, we think we are in even better shape in terms of disease control."

"We can then go from around 25 per cent of the herd to around five per cent and say these are the animals you must cull. You can leave the others behind because even though they have been exposed they are doing okay: they're not going to break down and cause disease."

Griffin says one farmer with 1,200 cows was losing 80 to 100 animals per year, but that number has now been reduced to just four.

"After just one year we have stopped all this wastage and, equally, we think we are in even better shape in terms of disease control."

Much of the day-to-day work is carried out by research manager Dr Rory O'Brien and laboratory manager Simon Liggett, long-serving DRL staff who are now happily based at the Invermay Agricultural Centre alongside AgResearch with whom they have always had close links.

"It's always been a gumboots in this corner and lab coats in that corner sort of thing," says O'Brien. "We're not just boffins confined to the laboratory: we're out there as well, sampling our own animals for research purposes which makes us very relatable to farmers and vets."

They tend to share roles, especially when things are particularly busy, but usually Liggett looks after the diagnostics and talks to clients about the tests and results, allowing O'Brien to focus more on research.

Getting involved in dairy poses challenges, says Liggett, particularly trying to get into the heads of dairy farmers and vets.

"Fortunately there are deer vets who have branched out into dairying, so there are a number out there who know us well. Unfortunately we are competing with large, established companies."

Most of the herds they deal with have serious problems, Liggett explains: "We don't deal with average farm animals. These guys have come to us because the vet recognises they have a major problem."

On the research side, they have recently completed a study using an AGMARDT Agribusiness Innovation Grant, with co-funding from the New Zealand Deer Farmers Association, looking at augmenting their Johne's faecal test to also diagnose parasitic disease.

O'Brien says their University background has given them the ability to design their own tests and think outside the box a bit more, a unique point of difference for a diagnostic laboratory.

"This also means we don't have to pay for off-the-shelf solutions which keeps our pricing very competitive.

"We grew out of a University research lab so we have that sort of enquiry-driven mentality: we need to retain that ethos in our new incarnation."

DRL has already developed proven diagnosis methods using blood and dung samples, and also utilised a test using milk, which is more readily collected and commonly used for Johne's testing in the dairy industry.

Studies so far suggest milk testing is not as sensitive as blood testing, but

Emeritus Professor Frank Griffin, Dr Rory O'Brien and **Simon Liggett:** "Our research has always been applied ... we were looking at functional responses to see how we could use those to bring commercial gain or economic gain."
Photo: Graham Warman

"DRL is a stand-out example of this University's contribution to the primary sector, and is readily identifiable."

Griffin says his team are looking to evaluate the relative performance of the different sample types through a series of systematic comparative studies.

Looking ahead, they are also applying for funds from MBIE (the Ministry of Business, Innovation and Employment) for new areas of research, including parasites, which Griffin reckons probably cost New Zealand animal producers about a billion dollars in economic loss and drugs.

"Anti-parasitic drugs are the most widely used drugs in veterinary medicine."

From the age of three months some animals are drenched every 28 days.

"This increases the risk of resistance – and it's costly. It also prevents the very thing you want to happen: the animal developing its own protective immunity."

Griffin argues it would be better to reduce drenching and simply use it to control rather than kill the parasite. They could then use a stimulant to enhance the animal's own immunity.

"If you look at cancer research, the real advance has been in immune therapy – reprogramming immunity and encouraging the body's own killer immune response to the tumour.

"We believe you can apply the same strategy to parasites and are putting together a programme at the moment where we will use only one dose of drench along with an immune stimulant like probiotics."

Griffin is encouraged by DRL's future prospects, especially being able to work with OIL and be part of the new research theme Agriculture at Otago which is pulling together all the researchers at Otago doing work that relates to food production systems.

"OIL provided us with coverage in a commercial sense, so going in with them made sense. It meant the research and diagnostic side could continue to exist within a University environment and I could retain my opportunities here as an emeritus professor."

DRL is now managed by a board under the control of OIL. Outgoing OIL CEO Dr Pete Hodgson – a former veterinarian – says there were several reasons why they got involved. One of the key ones was Griffin and his staff whose expertise they were keen to maintain.

"Another factor was that the University was wishing to emphasise the fact it had considerable agricultural skill that it wasn't telling people about. That gave rise to Agriculture at Otago – headed by the same Frank Griffin," he says.

"DRL is a stand-out example of this University's contribution to the primary sector, and is readily identifiable.

"As Frank will tell you, there were 432 deer herds with TB and now there are two. Also, Johne's disease in New Zealand deer herds is now being managed – and managing Johne's in deer is a bit of a challenge."

Hodgson says they are also interested in DRL's research in areas such as parasites, and disease resistance and susceptibility.

"We couldn't lose that. We couldn't lose those guys and we couldn't lose the service to the New Zealand economy."

Hodgson can see plenty of scope for growth through offering services to dairying, including providing cost-effective management for Johne's disease.

"We don't try and get rid of Johne's for you – it's too expensive to kill the last bacteria. What DRL does is manage it in a cost-effective way so your production goes up, consistent with getting rid of the most affected cases."

Hodgson says any decision to spin out or hang on to DRL is likely to depend on how important the ongoing research is to the future of the company.

"If it continues to be half of the company, which it is at the moment, that would suggest that you would have it somewhat attached to the University because that provides a better research environment.

"On the other hand our job is not to become huge animal testers. So if DRL became a huge testing company it should, logically, be owned by someone else."

MARK WRIGHT

Kyrgyzstan challenge

What key attributes are required to practise medicine in a country most people in the West cannot identify on a map? Aside from recourse to years of experience, the answer – according to Otago alumnus Dr Nick Woolfield – is self-reliance and self-sufficiency.

Paediatrician Dr Nick Woolfield says that the skills he gained during his rural upbringing in the Bay of Plenty and while studying medicine at the University of Otago – coupled with lessons learnt during three decades practising in Australia and New Zealand – now underpin his work in a remote region in Kyrgyzstan treating children with cerebral palsy (CP).

Woolfield, with wife Fay, arrived in the Central Asian country in 2013 as a volunteer with the Scientific Technical and Language Institute.

He now does clinical work at the Soviet-era Ak-Suu sanatorium in the Issyk-Kul province, where he is involved in multiple initiatives to inform policy and improve treatment, rehabilitation and education processes nationwide.

"We considered this type of work earlier in life, but embarking on this adventure as a more experienced health-care professional has been hugely beneficial. I'm drawing on professional and personal knowledge that has formed a strong foundation for my wide-ranging work here."

Recognition of how his work is changing the medical landscape nationally came in July last year when Woolfield received a medal and commendation from Kyrgyzstan's Ministry of Health for progressing health in the country, and a certificate from the province's governor acknowledging work done in conjunction with UNICEF. And, late last year, Kyrgyzstan's Department of Labour and Social Development awarded him its highest honour for his work.

"I think the best thing about these awards is that they show the authorities' engagement in the process of change and that, long term, what we are doing will assist both the children and the country."

His clinical and public health work in the landlocked Central Asian country is part of a multi-agency partnership that includes UNICEF and Japanese aid group JICA, with funding from several countries, including New Zealand and Australia and support from Kyrgyzstan's Ministry of Health.

Son Kul Lake at 3,000 metres.
Photo: supplied

While he is making "steady progress introducing treatments that work and stopping ones that don't", much remains to be done in a country where the number of children with CP is several times higher than in Western countries.

He estimates he sees more cases of dyskinetic CP – one of the most disabling forms of the condition – in a month in Kyrgyzstan than he did "in 30 years in Australia".

Sadly, many cases are the result of severe jaundice, while others are linked with mother-child rhesus incompatibility. An overarching theme is that many cases are preventable "at a low cost".

This highlights the need for effective preventive strategies that will inform health policy nationally, he says.

"I've been involved in writing a number of national guidelines, which is challenging, but over time and considering local resource levels, I believe we can implement good practice despite the limited resource base."

A first step in this process has been gathering and analysing information on children coming to Ak-Suu, which Woolfield and staff have done since 2015. At any time about 130 children with CP are patients at the sanatorium.

A key finding was that many children who came to the hospital with acute illness ended up with brain damage. This realisation led Woolfield, with UNICEF support, to initiate paediatric advanced life support training for specialists and now more than 200 doctors and nurses have received this training.

Last year he began a national CP database and information on more than 750 children has since been added. Once more data – including factors determining risk – are integrated the database will guide resource allocation and inform efforts to manage CP and associated conditions.

Anecdotally, "half or more" of the mothers of children who present with CP have suffered violence during pregnancy, and Woolfield says solid data on possible links between domestic violence and the disability may greatly aid preventive measures.

Educating health-care professionals to work in their own regions to improve outcomes for children with CP is also a priority. In 2015 he was joined by three Allied Health specialists to train 28 Kyrgyz professionals in diagnosis and management of cerebral palsy. Earlier this year he held training sessions with a group from south Kyrgyzstan.

Dr Nick Woolfield: "More impressive than any of my medical skills to my local friends is that a doctor can fix taps, repair the roof, fix the car, make furniture and kill a sheep. These skills ... have been invaluable here."

"It is very pleasing to see that training is now becoming established as the norm and part of every physician's work."

He also works with agencies and parent groups that support the parents of children with disability.

Another priority has been introducing the international classification of functioning, disability and health model for children with disability. The preceding system categorised children as either disabled, or otherwise, and this limited the potential for rehabilitation programmes to be developed for individual cases.

Crucially, better methods for determining levels of disability may also challenge negative perceptions associated with CP and other conditions.

Once children have a "disabled" label, schools are reluctant to accept them. There is also a reluctance to accept that these children can actually do well at school, he says.

Woolfield estimates that while between a third and a half of the children he sees at Ak-Suu could attend a regular school, a much smaller number actually do. Many children with CP are sent to institutions or kept at home.

"One of the challenges is transferring our up-to-date knowledge base from the West to a low-resource nation, and seeing it implemented for improved outcomes. The research work, which is

"One of the challenges in paediatric medicine is bringing the great developments and achievements in child health that have occurred in the West to low-resource countries with developing or emerging economies, and countries that have most of the world's paediatric population."

mostly data gathering – and there is so little accurate data here – has assisted in bringing about national changes.

"A legacy of the Soviet era is the continuation of many practices that are not supported by evidence, and we are slowly seeing these change and disappear – but this may take another generation."

Woolfield also describes clinical work as "challenging".

"I'm forced to rely mostly on skills and experience, especially in decision-making. MRIs are available in the capital Bishkek, but lab work is mostly basic stuff with limited metabolic work available."

Woolfield says that during clinical training in Christchurch – he graduated with a Bachelor of Medicine and Bachelor of Surgery in 1978 and a Postgraduate Diploma in Child Health in 1982 – several Otago faculty members challenged him to continuously strive to develop better skills.

"I particularly remember Ross Bailey, Don Beavan (then Professor of Medicine) and, most of all, George Abbott emphasising the importance of getting good clinical skills and the need to hone them well.

"George was particularly astute in his clinical and deductive skills; assessing what needed doing and what needed not to be done. Now that I'm somewhere with limited investigative abilities I am glad that these people assisted, inspired and challenged me – I have to use this ability constantly in decision-making."

As with his clinical work, a high degree of self-sufficiency and practical skills are essential for life in the remote mountainous region where he and Fay have bought a property. Along with the "standard chickens and a dog", which most Kyrgyz houses have, Woolfield is also brushing up on his horticultural skills. In a climate that is "like Central Otago's, just at higher altitude" their apricot, cherry and apple trees produce good fruit each summer.

"More impressive than any of my medical skills to my local friends is that a doctor can fix taps, repair the roof, fix the car, make furniture and kill a sheep. These skills, learnt during my upbringing on a farm in the eastern Bay of Plenty, have been invaluable here. When things break you need to fix them because there's little alternative."

The nearby Ak-Suu sanatorium is located in an area with no mobile coverage, but the installation of a 10 kilometre fibre optic cable from the nearest village means Woolfield and his colleagues can hold telemedicine conferences from a fully-equipped room. The funds for this came from a grant from the Australian embassy in Moscow.

Since December he has held several of these meetings with five centres across the country at which doctors present and discuss cases.

"[In early December], for example, we used the teleconference to look at the case of a child with CP who cannot safely take food orally and now has a gastrostomy tube in place – this led to wider discussion on ways we can work out which children this is necessary for."

Access to internet capabilities also allows the Woolfields to keep in touch with family in Australia, and these connections may mean they stay in the remote region for longer.

He is also motivated to stay and ensure the work he and others have started is continued for the long-term benefit of many children with CP and other disabilities in Kyrgyzstan.

"One of the challenges in paediatric medicine is bringing the great developments and achievements in child health that have occurred in the West to low-resource countries with developing or emerging economies, and countries that have most of the world's paediatric population.

"The challenge is to contextualise these advancements and I think it's what we are doing here bit by bit."

Woolfield says the experience has reaffirmed his belief both in the need to think like a global citizen to identify where specialist skills can be put to use for the greatest benefit, and in the value of education.

"I think it's hard for people from comparatively affluent countries like New Zealand to comprehend how different things are in countries such as Kyrgyzstan, and how different the education system is.

"One of the greatest gifts we get in the West, at institutions like Otago, is a sound and excellent education. Many places do not have this so we need to ensure access for all, and create opportunities that mean the quality of that education is forever maintained."

SAM STEVENS

FEATURE

Pandemic disasters: what have we learnt?

2018 marks 100 years since the end of World War 1, which killed around 18,000 New Zealand soldiers. It also marks the centenary year of the influenza pandemic of 1918-19 which was this country's worst public health disaster. New estimates of around 9,000 flu deaths in two months far surpass our next biggest natural disaster, the 1931 Hawkes Bay earthquake in which at least 256 died.

Despite killing almost one per cent of the population, the severity of the flu pandemic seems to be largely forgotten. We have very few memorials, and no national commemorations for the volunteers, nurses and doctors who were part of the pandemic response.

So in February, as part of its annual Public Health Summer School, the University of Otago, Wellington, held a centenary symposium to review the 1918 pandemic and what we've learnt for modern-day pandemic planning.

"Most societies are ill-prepared for pandemics, earthquakes, extreme weather events and other disasters. It is therefore important to study these threats so we can learn how to prevent them or mitigate their effects and respond more effectively," suggests Professor Michael Baker, an expert on infectious diseases and co-organiser of the Public Health Summer School.

"Public health researchers have a role in maintaining our collective memory for hazards that may return long after they have disappeared from daily life, and reminding us of questions that need to be asked and responded to. We also teach disciplines such as epidemiology at the Public Health Summer School each year, which provides a way of thinking about threats to health and how we manage them."

The symposium reviewed the historical epidemiology of the 1918 pandemic in New Zealand, the international picture, contrasting patterns from New Zealand, Australia and South Pacific Islands, and an extra focus on the impacts on different ethnic groups. Speakers also looked at comparisons with more recent influenza pandemics (1957, 1968, 2009), and asked why the 1918 pandemic was so severe and what range of severity can be expected in future.

"The symposium had a good mix of history and lessons for the future – including useful updates on what New Zealand is doing now for pandemic planning," says Professor Nick Wilson.

In reviewing the 1918 pandemic, Wilson says there was a disproportionately high death rate for Māori in successive flu pandemics (1918, 1957 and 2009), but particularly 1918 with a seven-fold higher death rate compared with the European population. This difference could reflect many factors such as exposure to a milder "immunising wave" of infection in spring

Speakers at the Public Health Summer School pandemic symposium (from left): **Professor Nick Wilson, Professor Geoff Rice, Professor Michael Baker and Dr Ryan McLane.**
Photo: Luke Pilkinton-Ching

1918 (which may have helped protect people in cities), the role of pre-existing conditions such as tuberculosis, and access to supportive nursing care in rural areas where most Māori lived.

Another notable feature of the pandemic was the much higher death rate for adults in their late 20s. One possible explanation is that this age group was exposed in infancy to an earlier pandemic (in the 1890s) which impaired their immune system response to the 1918 pandemic.

Wilson says the pandemic's impact on crowded military training camps and troopships was particularly severe.

However "living rurally was somewhat protective against dying in the pandemic for the civilian population, probably reflecting a lower risk of becoming infected in the first place". Also, good organisation of nursing care and basic support in cities such as Christchurch may have lowered the death rate compared, for example, with Wellington. But, in general, there were few successful control measures used in New Zealand at the time.

"Lessons from the 1918 flu pandemic can help us make better decisions when coping with the next one," suggests Professor Geoff Rice, who gave the keynote public lecture on the pandemic at the opening of the Public Health Summer School. He has also recently published a book on the pandemic, *Black Flu 1918,* which has the updated best estimate of 9,000 deaths.

Rice highlights the need for community resilience: this helped in 1918, particularly with the provision of basic care by volunteers. He says the value of community response was shown more recently with volunteer effort around the Christchurch earthquake.

On this topic, Baker suggests a possible national Public Health Day as a potential awareness raiser and aid for planning, similar to the national earthquake planning day in recent years (New Zealand ShakeOut – Get Ready).

"Preparing for our next pandemic or other natural disaster is just one more good reason for getting to know your neighbours."

Will it happen again?

Typically there are several influenza pandemics per century, however none are known to have been as severe as the one in 1918/19. Although we now have access to antibiotics (to treat bacterial pneumonia that can occur after flu infection), there are concerns that in a sudden major pandemic there may be limits on how many sick people could be treated.

Besides the increased risk of rapid dissemination of new pandemic strains via mass movements of people with the growth of international air travel, there is also some evidence of increased emergence of new avian flu strains in recent years.

While mixing livestock in "wet markets" may have reduced in some parts of the world, there are still many places where pigs and poultry cohabit; or where these animals could potentially become infected with new flu viruses carried by wild birds. There is then potential spread of these new virus strains to humans.

"We also face the risk of pandemics from other diseases as we saw when Severe Acute Respiratory Syndrome (SARS) emerged," Wilson says. Similarly, Professor Raina McIntyre, from the University of New South Wales, refers to advances in synthetic biology and the risks of synthesised biological agents causing pandemics. This prospect might highlight the need for more generic pandemic planning that can address a very wide range of existing or novel diseases.

Speakers at the symposium noted how quarantine measures in 1918 may have sometimes helped prevent spread to Pacific Island countries, but also that the pandemic was probably already in Australia after maritime quarantine started. In a comparison study done with another island country (Iceland), Wilson noted successful use of travel restrictions in 1918 in this setting.

There are complex pros and cons around border control in the modern era, but Wilson argues that, for severe pandemics, the cost of border control for New Zealand (in terms of lost tourism revenue) might be outweighed by the benefits of saving many lives. Even if such border control subsequently failed, it could buy time to make further preparations for pandemic control.

"There are still some unresolved mysteries around the pandemic, such as the peak age of risk being young adults, the much higher male death rate, and the various reasons for the very much higher Māori mortality rate," says Wilson. It is also a mystery why the usual pattern of higher death rates among poorer people has not been seen in New Zealand (in contrast to some other countries).

The researchers suggest that sustained investment in pandemic planning is an important means to mitigate the impact. Such central government activity needs to be complemented with building community resilience at the local level. "Preparing for our next pandemic or other natural disaster is just one more good reason for getting to know your neighbours," says Baker.

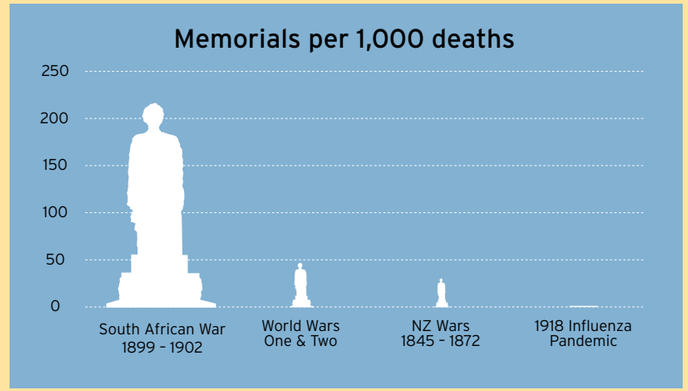
FLEUR TEMPLETON

Watch Professor Geoffrey Rice's presentation at https://youtu.be/5MrQzOWPtIE

To find out more about the Public Health Summer School: *otago.ac.nz/uowsummerschool*

Memorial reminders

Professors Wilson, Baker and Rice have all researched New Zealand public memorials relating to the 1918 pandemic and found only seven in the entire country. They suggest that memorials can be useful reminders of the threat of future pandemics, and can provide a focus of school field trips and other events.



Dental disadvantage

Associate Professor Jonathan Broadbent discusses the results – and long-term implications – of dental data gathered by the Dunedin Study.

The Dunedin Multidisciplinary Health and Development Study is a somewhat unusual but highly successful – and internationally recognised – collaborative research enterprise, involving investigators from many different disciplines tracking the lives of more than a thousand babies born in Dunedin between April 1972 and March 1973. When I joined the team as a dentist in 2004 the Dunedin Study (as it had become known) already had a proven track record and a wealth of existing data. While many other studies ignore teeth, or include minimal dental data as an afterthought only, the Dunedin Study had benefited from the expertise of a team of dentists since the 1970s, first led by Dr Harvey Brown and later by Professor Murray Thomson. For me it has been exciting to work as part of a dental team to build on the existing dental data and work with scientists from other disciplines to make new discoveries.

However, I must confess that as a dentist the most exciting aspect of all is simply looking at teeth. As the study is a birth cohort, we see people from all walks of life: from those with teeth as perfect as the day they "erupted" into the mouth, through to people who lost all their teeth in their twenties. It is not uncommon to see a study member who normally avoids the dentist at all costs, but is willing to let me have a look for the sake of contributing to the research.

Now that the study members are adults, it is possible to investigate how their childhood influences their adult dental health. The Dunedin Study provides a unique opportunity to investigate one of the big questions we have: how do inequalities in dental health come about? Having dental data is an important first step, but combining this with data from other disciplines is where the value is really added.

So what do I think about the findings?

Up to age 18, more dental decay occurred among children from socio-economically disadvantaged families, but there were no serious differences in the dental treatment they received, thanks to New Zealand's universal dental health care for children and adolescents. However, this all changed once access to state-funded dental care ended after the study members turned 18. By the time they were 26, the average number of teeth with untreated decay was five times greater than it had been at age 18. This was worst among those who had been born into more deprived families. For example, by age 18 there was no difference in tooth loss measured by the occupations of the study members' parents, but, during the following 20 years, the inequality gap got wider and wider. By age 38 the average number of teeth lost was six times greater among those who had been born into disadvantaged families than for those born into well-off families.

Socio-economic differences in tooth decay rates don't explain socio-economic inequality in dental health alone, because well-off people who eat too much sugar and have poor oral hygiene have a high rate of tooth decay too. In dental research, we count a person's total disease experience as the number of teeth affected by decay, whether the teeth are missing due to decay, have fillings, or have untreated decay. It tends to be tooth loss and untreated tooth decay that really stand out in the inequality difference.

Proponents of the "personal responsibility for your health" argument may contend that having tooth decay problems is "your own fault", but this is an over-simplistic and unsympathetic viewpoint. If you have a high rate of decay as a child and are born into a

Associate Professor Jonathan Broadbent: "Innovative public health interventions targeted to reduce inequalities – like a sugary drink tax – and expanded publicly-funded dental care (including preventive care for adults) deserve to be given a chance."
Photo: Graham Warman

"If you have a high rate of decay as a child and are born into a family with low-income parents, this will affect your risk of having poor dental health right through your life, not just during childhood."

family with low-income parents, this will affect your risk of having poor dental health right through your life, not just during childhood.

We investigated some of these questions in one recent paper, in which we identified a pathway that helps to explain how we get from "who our parents are" to having dental problems as an adult. Socio-economically disadvantaged parents were less likely to understand the dental problems caused by sugary foods or how to effectively care for the teeth. Their beliefs rubbed off on their children (the study members), who were more likely to hold similar unfavourable beliefs through their teens and into their 20s. As adults, this was reflected in the frequency at which they brushed their teeth and went for dental check-ups. Add to this the fact that the relative poverty or affluence of parents also tended to be reflected by their grown children, which was also associated with whether and how often they went for dental check-ups as adults. What it all came down to was more untreated dental cavities, more teeth lost due to decay and a worse quality of life due to dental problems for those whose parents were less well-off.

Is it just that dentistry is too expensive?

Dentists are regularly given a hard time by the media for being "too expensive", but most dental interventions are surgical and involve costly imported dental products, expensive equipment, compliance-related costs, salary for support staff – and a lot of time. Dental surgery is always going to be expensive relative to many other things in life. Acknowledging this, it doesn't get around the problem that the people most in need of dental care are frequently the same people who can't afford it. It is not uncommon for a dentist to be unable to provide the most optimal, modern care to a patient because finances come in the way. Existing publicly-funded dental services (such as WINZ grants) cover only emergency dental care, while routine and preventive care is not covered. Innovative public health interventions targeted to reduce inequalities – like a sugary drink tax – and expanded publicly-funded dental care (including preventive care for adults) deserve to be given a chance.

Associate Professor Jonathan Broadbent
Sir John Walsh Research Institute,
Faculty of Dentistry.

By age **38** the average number of teeth lost was **6** times greater among those who had been born into disadvantaged families than for those born into well-off families.

Ahead of the crowd

PledgeMe founder Anna Guenther was drawn to crowdfunding while studying at Otago. The company has become an innovator in this new and crowded market, helping raise more than $23 million for 1,200 campaigns.

Turning up to work in a panda suit might be career-limiting for some CEOs, but PledgeMe head and founder Anna Guenther knows otherwise. "Why should business and fun be mutually exclusive?" she asks.

In fact, mentioning her Wellington office's "onesie Wednesday" in a 2014 blog post on entrepreneurship attracted national media interest in both her management style and business.

Speaking to Otago Master of Entrepreneurship students in early 2018 about ways companies can "break through", Guenther said the "onesie" example underscores the value of the unconventional. The story also hinted at the 33-year-old's ethos: business should be transparent, fun, open and social, she says, but while it is okay to have senior staff dressed as matching dinosaurs, you have to be credible enough to back up the hype with good planning, and ethical and sustainable best practice.

Guenther was first drawn to crowdfunding while completing her 2010 Otago Master of Entrepreneurship (MEntr). Crowdfunding relies on businesses approaching a "crowd" of friends, family, customers or fans for support, typically using social media as the main way of attracting interest.

"Crowdfunding really appealed because of the way it democratises capital and challenges the gatekeeper model to make funding more community-focused and collaborative. Projects that might not be funded through normal channels have a shot."

Guenther was working as a grants administrator while studying and says that, although she enjoyed the job, she was not always convinced "the right decisions were being made".

"I remember reading that only 21 per cent of arts funding applications in New Zealand were successful, which didn't seem fair because 88 per cent of people said they believed arts were an intrinsic part of our national identity."

Soon after graduating she put theory into practice and founded New Zealand's first alternative funding service provider.

The company's history since 2011 shows New Zealanders have a healthy appetite for unconventional capital raising: more than 90,000 pledgers have helped raise over $23 million for 1,200 campaigns. Innovation has been key to surviving in the increasingly crowded crowdfunding market. While PledgeMe was a leader, the Financial Markets Authority has had 14 applications for equity crowdfunding licences since 2014 and currently has eight licence holders.

In recent years PledgeMe has augmented its services to include equity platforms (in 2014) so investors could retain an interest in a company or venture, and peer-to-peer lending services in 2016.

Guenther says she is often staggered by the range of campaigns funded and their potential to transform businesses.

"One guy raised money to build a bionic hand for a friend. [Dunedin-based] Powerhouse Wind raised capital for its single-bladed turbine project.

"Many of the campaigns, like the Christchurch arts projects and Dunedin's Ocho chocolate, have been truly inspiring."

The Ocho campaign is also a good example of what happens when

"I still think crowdfunding is going to be a force in changing who funds and who gets funding, and I am still convinced of its power in democratising and humanising financial markets."

crowdfunding stars align. In November 2017, in response to the announcement that a parent company would scale back operations and eventually close Dunedin's Cadbury chocolate factory, the Otago Chocolate Company launched their "Own The Factory" campaign.

Less than two days later 3,200 people had bought shares in the company and the campaign's final target of $2 million was hit, crashing PledgeMe's website in the process.

So why, other than the offer of discounted chocolate, did the campaign resonate?

Guenther says it literally capitalised on public sentiment because of timing and messaging. Their value proposition outlined a commitment to a "broad base of community ownership, paying fair wages to workers, keeping worker-CEO pay ratios within an agreed multiple, and a strong commitment to regional development through profitable businesses".

There is also much to be learnt from unsuccessful campaigns and, while her job title reads CEO and "chief bubble blower", she jokes that the role often involves bubble bursting.

"Communicating to activate customer groups can be the most difficult part of the process for our client businesses. A common complaint from clients whose campaigns didn't hit their target is the expectation that there would be a crowd waiting for them. We always say the companies that do well either have good customers, or people like their idea. Our service isn't necessarily for start-ups or companies who need help; it works best for established companies that want to go to the next level."

Guenther champions communication skills and says the abilities she gained pre-MEntr studying English, with a minor in German, at Otago have been invaluable "in business, and in life".

In recent years these skills have been employed to campaign for equality, rather than equity.

"I was asked to speak at a conference on the future of feminism and suggested my boyfriend should speak because he was more of a feminist than I was. They asked me to speak anyway and the process of discussing the bigger dimensions of job inequality, domestic abuse and violence with my crowd really added to my understanding of how complex these issues were."

The ongoing conversation also led to some uncomfortable personal questions about whether her own "unconscious bias" had influenced the make-up of her company's board and she now requires PledgeMe to "walk the walk" in terms of representation and the campaigns it facilitates.

"In a sense it's sad to see the number of women funded through PledgeMe is far higher than through traditional venture capital systems, in which eight per cent of companies have female founders, with half a per cent being CEOs.

"With crowdfunding models we see about 50 per cent female founders, with 40 per cent female CEOs – but still, the amount of money they raise is less than that raised by companies at the same stage of development that are led by men and there's disparity in the way their companies are valued."

In 2015, Guenther took online innovation and business entity *Idealog* to task over an article on how few women were represented on the front cover of their 10th anniversary magazine. With GoodSense managing director Kath Dewar, she invited her crowd to contribute to a list of inspiring New Zealand business women that the media could interview. Nine hours after the list launched 350 names had been amassed and, by the time the spat ended, more than 800 names had been added and *Idealog* had revised its position.

She has also been co-instigator for several Women Who Get Shit Done Unconference events, which provide a forum for women of different ages, ethnic groups and backgrounds to meet and discuss defining issues.

Last year PledgeMe "realised equity-based crowdfunding isn't necessarily equitable" and changed its model.

"While more women are getting funded, it's still predominantly people who are white and in networks with capital that get the money, so I really wanted to address what business can do about inequality – not in relation to women – and that's why we are exploring a whānau lending platform.

"I write or speak about diversity and inclusion pretty regularly and enjoy returning to Otago or speaking to students, businesses or public groups because, ultimately, I believe patriarchy is bad for everyone."

Sharing ideas and speaking up has seen Guenther nominated for various national awards, including the 2017 *NEXT* Woman of the Year Awards and the Innovation and Science category of the 2016 New Zealand Women of Influence awards. She believes the interest garnered by this recognition is useful as it puts inequality or the question of what constitutes ethical business practice squarely in the spotlight.

In early 2018 Guenther relocated to Brisbane to take PledgeMe trans-Tasman. In Australia she will also work with the Queensland Government on its start-up relocation programme Hot DesQ, which provides mentoring for local businesses.

While Australia's many new rules are "a challenge" – and it is too hot for panda suits – Guenther is enthusiastic about her future crowdfunding and social equity work.

In a TEDx talk in 2012 she enthused about crowdfunding's socially transformative potential and, while years of experience in the sector have helped temper her observations with reality, she remains convinced of the need to constantly renegotiate the relationship between the unconventional and the traditional.

"I'm very excited about our plans for campaigns with indigenous communities and evolving what we do in the social enterprise space. I still think crowdfunding is going to be a force in changing who funds and who gets funding, and I am still convinced of its power in democratising and humanising financial markets."

SAM STEVENS

Anna Guenther: "Many of the campaigns, like the Christchurch arts projects and Dunedin's Ocho chocolate, have been truly inspiring."

For better or worse

We can easily speculate as to whether colonial settlers were better off here than had they stayed at home, but a University of Otago researcher is seeking to replace speculation with science.

Postdoctoral research fellow Dr Charlotte King (Department of Anatomy) is analysing samples from the remains of 27 people recently exhumed from unmarked graves at the historic St John's burial ground near Milton as part of a project to identify who they were, before they are re-interred.

She hopes to extend the research to unmarked graves in the Lawrence Cemetery, in a proposed project also led by Professor Hallie Buckley and Dr Peter Petchey.

"I will be reconstructing the lives of these early European settlers using the chemistry of their bones, teeth and hair," King explains.

Noting that this is the first time such research has been undertaken in New Zealand, King says that, using state-of-the-art techniques, she will track changes in diet, health and stress levels through the settlers' lives, and compare them with results from similar research projects in Britain and Ireland.

"I will be looking at these everyday people, who the history books often forget, and seeing whether their lives matched the colonial propaganda of the time about achieving a better life in New Zealand."

King will run a blog to keep descendants and other interested people up to date and hopes to produce a book at the end of the three-year project, which is supported by a Marsden Fund Fast-Start grant.

Dr Charlotte King: "I will be looking at these everyday people ... and seeing whether their lives matched the colonial propaganda of the time about achieving a better life in New Zealand."

Vamping up vaping research

Otago research aims to replace hazy information about e-cigarettes with clear evidence.

The research is being led by Professor Janet Hoek (Departments of Public Health and Marketing), who co-directs ASPIRE2025, a University of Otago Research Theme that supports the government's smokefree 2025 goal. Hoek explains that her research team has obtained Health Research Council funding to probe the controversy surrounding electronic cigarettes.

"Some people have claimed the use of e-cigarettes, or 'vaping', as a game-changing innovation that will dramatically reduce tobacco smoking, while others argue it will put at risk decades of tobacco control achievements."

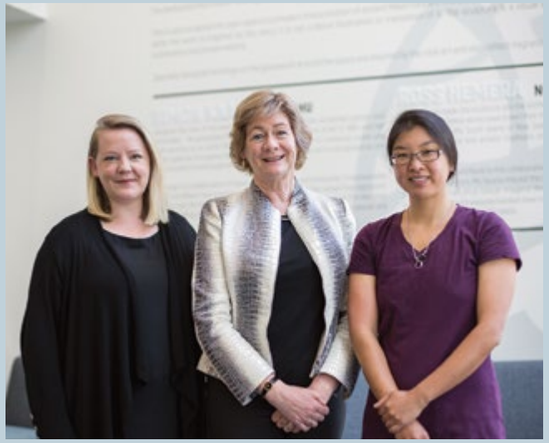
Research fellow Mei-Ling Blank (Departments of Public Health and Marketing) has conducted a feasibility assessment of a prototype "smart" e-cigarette that passively records vaping behaviours. The team hopes to undertake an expanded study after piloting newly available, more sophisticated devices.

"I am interested in the transitions that might occur – or not occur – for people who are trying to quit smoking using e-cigarettes," Blank says.

In a related study, research fellow Dr Lindsay Robertson (Department of Preventive and Social Medicine), whose PhD examined tobacco retailing, has been conducting in-depth interviews with people who vape.

Robertson is particularly interested in dual-users – people who continue smoking tobacco while vaping. "We want to figure out what is contributing to this pattern of dual use and why people have not managed to switch completely."

A new Marsden Fund grant will further explore the transition from smoking to vaping.



Dr Lindsay Robertson, Professor Janet Hoek and Mei-Ling Blank: They plan to probe the controversy surrounding electronic cigarettes.

Food web insights

Fur seal and sea lion bones ranging back to the earliest human occupation of Aoteoroa are helping Dr Lucy Wing (Marine Science) piece together historical changes in marine food webs.

Human impacts such as over-fishing, climate change and pollution are altering how marine ecosystems work.

"We can identify changes happening now, but not what happened in the past or what our pristine ecosystems used to be like," Wing explains. "By working out how and when marine food webs changed, I hope to help guide the restoration of fully functioning marine ecosystems."

Seals and sea lions make excellent food-web ambassadors for this research – as apex predators at the top of the food chain, their diet provides insight into the whole food web.

To understand their present-day diet Wing collects fur samples from the endangered sea lions by gently rubbing them on the back, using a disposable razor on a broomstick.

Collaboration with Associate Professor Ian Smith (Archaeology) provides access to sub-fossil bones from Māori middens to describe the diet of animals before Europeans arrived (1250-1800).

Stable isotope analysis by the Department of Chemistry enables Wing to identify whether her subjects are eating from a coastal or an open-ocean food web. "I can also find out what trophic level they are feeding at. This is important because more pristine food webs tend to have more trophic levels, while human impacts can reduce the number of trophic levels, creating simpler food webs which are less stable."

The project is supported by a Marsden Fast Start Grant.

Dr Lucy Wing: "By working out how and when marine food webs have changed, I hope to help guide the restoration of fully functioning marine ecosystems."

Hydrogen peroxide mystery

With every breath we take, cells in our body make small amounts of hydrogen peroxide. In some conditions, such as Alzheimer's disease, too much hydrogen peroxide is made, causing widespread disruption to cells.

It is very difficult to prevent this type of damage, however Professor Mark Hampton and his team from the University of Otago, Christchurch are trying a new strategy to address this problem in a three-year project, "Investigating the Role of Peroxiredoxin Redox Relays in Cell Signalling", supported by the Marsden Fund.

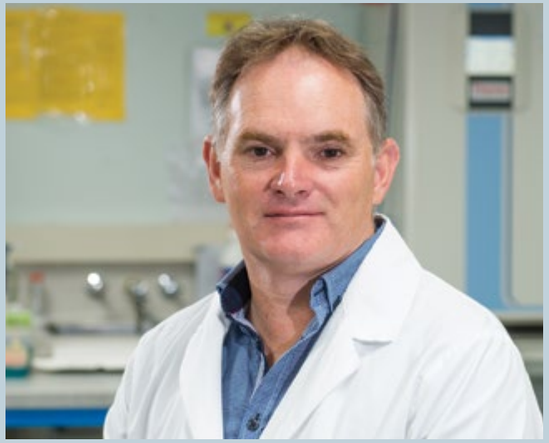
Hampton says the best way to develop new therapies is to unravel the fundamentals of what is going on inside our cells.

"Hydrogen peroxide triggers many different responses in cells, but we think it does so via a relatively small number of sensor proteins," he says.

"Understanding how these sensor proteins relay information to other proteins – and designing ways of disrupting that information flow – might provide a novel way of protecting our cells from excess hydrogen peroxide."

Diseases that could potentially benefit from these novel therapeutics include neurological disorders such as Alzheimer's disease, in which hydrogen peroxide is made by abnormal proteins; and heart attacks and stroke, in which hydrogen peroxide production is increased after blood flow returns.

Immune cells can cause damage by making too much hydrogen peroxide in inflammatory conditions, and some tumours also appear to have disturbances in hydrogen peroxide metabolism.



Professor Mark Hampton: "Understanding how sensor proteins relay information to other proteins ... might provide a novel way of protecting our cells from excess hydrogen peroxide."

Molecular motor possibilities

The search for efficient and sustainable ways to produce energy is not new, but one form of nanotechnology being investigated at Otago takes things to a new level.

Dr Michael Jack (Physics) has joined other scientists globally investigating "molecular motors".

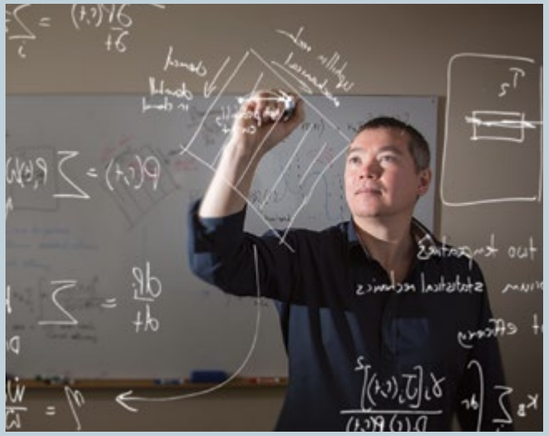
These are specialised proteins inside the cell that act like molecular-scale motors to convert chemical energy into mechanical forces. They power our body, including our muscles, and they are a very efficient way to convert energy from one form to another – far more so than many current technologies.

Molecular motors, or motor proteins, are of enormous interest in both biological and physical sciences, with implications for biological energy use and as an excellent example of a far-from-equilibrium physical system. Taking technology to the limits presents enormous possibilities. There are possible biological applications, such as wireless sensors for monitoring bodily chemical levels powered by molecular motors embedded in cells.

The potential to disrupt the activity of molecular motors in bacteria and viruses, inhibiting their energy mechanisms, is being tested as a new form of drug treatment.

Molecular motors may also offer potential as energy-efficient room-temperature catalysts for many industrial processes, such as fertiliser production. Jack's group is specifically interested in the physics of what is occurring, wanting a deeper understanding of the mechanisms at the nanoscale which will, in turn, open research possibilities for many practical applications.

"It's a challenging new area of theoretical physics research. The research focuses on developing non-equilibrium statistical mechanics theories and involves applying mathematical techniques developed in quantum mechanics."



Dr Michael Jack: Molecular motors, or motor proteins, are of enormous interest in both biological and physical sciences ...

Bach behaviours

Holiday homes are not a new phenomenon in New Zealand, but there have been many changes due to shifting housing, land, fiscal and social policies; and changing trends in leisure consumption over the last 100 years.

Department of Tourism researcher Dr Trudie Walters says some of the earliest second homes were simply caves in which men stayed while hunting or fishing. However, the introduction of the Annual Holidays and Family Benefit Acts in the 1940s changed thinking around leisure and affordability.

"People were able to capitalise on the benefit to invest in a bach – holidaying with the family and owning a second home was within the reach of more New Zealanders."

Further changes came with less expensive air travel (particularly to and from Australia), higher prices resulting in owners renting out their properties (facilitated by new online booking systems) and a move away from tourist hotspots to more affordable areas.

Walters says there are implications for local government. While there is little data on this to help with planning, she believes local authorities need to monitor a range of factors that can impact on second home ownership.

"Low interest rates, for example, have allowed people to use their first home as leverage to buy. Other factors that may influence second home ownership include foreign exchange rates, trends in how people navigate the work/life balance and shifts in holiday patterns."

Further implications include non-resident property owners voting in local elections, something that has been problematic overseas, and the renting trend's impact on local communities.

Dr Trudie Walters: "Factors that may influence second home ownership include foreign exchange rates, trends in how people navigate the work/life balance and shifts in holiday patterns."

Achievement monitored

Primary and intermediate school pupils will ultimately benefit from a further vote of confidence – and cash – in the Educational Assessment Research Unit at the University of Otago's College of Education.

After spending five years running the National Monitoring Study of Student Achievement on behalf of the Ministry of Education, the research unit is being funded for a five-year follow-up study.

The study's project leader, Sharon Young, explains that they are monitoring student achievement in Years 4 and 8, focusing on two learning areas of the curriculum each year.

Young, who is a co-director of the research unit, says that the study involves members of the unit, lecturers with expertise in specific curriculum areas, and up to 24 seconded teachers who administer the assessments.

She says that the specially trained teacher-assessors spend two and a half days in each of 200 randomly selected schools around the country each year, testing 25 randomly chosen students from each school who are withdrawn from their normal classes (with their parents' permission) to participate in a range of assessment activities. Teachers are also employed to mark the assessments.

"The data are important in informing ministry policymakers about where children are sitting in relation to the curriculum, and where there might be gaps and more resource development needed," Young says.

"The data from the first cycle indicate that more Year 4 students than Year 8 students are meeting the curriculum expectations, so it will be interesting to see whether anything has changed in this new cycle."

Sharon Young: "The data are important in informing ministry policymakers about where children are sitting in relation to the curriculum ..."

Emotional history

Stumbling across 1870s love letters received by an Italian circus acrobat from various women who fell madly in love with him has sparked new historical questions for Associate Professor Mark Seymour (Department of History and Art History).

Do emotions and their expression change over time and, if so, how do historians find out about such changes?

Seymour, who studied European history and Italian language as an undergraduate student, explains that his research on marriage, extramarital affairs and divorce got him thinking about what he dubs "emotional arenas" – any social spaces from circuses to courtrooms – as a new analytical tool for studying the role of human emotions as they change over time.

"My basic idea is that emotions are often prompted, or curtailed, by particular social spaces. Spaces of all types tend to make people feel in certain ways: we pick up cues and behave in particular ways," Seymour asserts.

"If people are at a stadium when the All Blacks win, they can emote in a way that they would never do in, say, a lecture theatre, because the space gives them cues about what they can do in terms of expressing their emotions.

"Changing social spaces can thus be used as historical barometers of emotion. That is the paradigm I am developing in the Italian case, but it could be applied in any culture."

An article Seymour published in 2012, based on the letters, has led to a nearly completed book, *Emotional Arenas*, to be published by Oxford University Press.

Photo location: Weber Bros Circus

Associate Professor Mark Seymour: "My basic idea is that emotions are often prompted, or curtailed, by particular social spaces."

Aneurysm breakthrough

University of Otago vascular researchers have developed a process that could revolutionise aneurysm management – and save lives.

An aneurysm – a blood-filled bulge in a weakened blood vessel wall – is most commonly found in the aorta. Often described as "ticking time bombs", aneurysms can be managed if they are detected early. There are aortic aneurysm screening programmes for those considered high risk, but Professor Greg Jones says the 30mm measurement used to define an aneurysm is based on the average size of blood vessels in men.

This does not account for differences in body size, particularly in women. When blood vessel measurement is adjusted to reflect body size, his team showed that men and women have similar risk.

"The New Zealand study clearly showed we are underestimating the true prevalence: women and smaller men have more chance of having an aortic aneurysm than health professionals previously realised."

This is a particular problem in New Zealand, with a high prevalence of Māori women who smoke and are, therefore, at higher risk. "Using this false assumption has likely contributed to a health inequality."

The researchers are working with a national consortium of vascular surgeons on a pilot study to test a new screening programme with standards taking body size into account.

The bench-to-bed research has taken a basic interest in biology through to community health delivery. "It's a game changer that will save lives, but the discovery is controversial, as global screening programmes are based on a belief that aortic aneurysms are a disease primarily of men. This assumption will have to change."

Professor Greg Jones: "Global screening programmes are based on a belief that aortic aneurysms are a disease primarily of men. This assumption will have to change."

Austen the satirist

Jane Austen: gentle ironist or courageous political satirist? In her recently published book, Professor Emerita Jocelyn Harris (CNZM) concludes the latter.

Harris has dedicated much of her career to Austen's life and works, and describes her as "quite simply inexhaustible".

Satire, Celebrity and Politics in Jane Austen (Bucknell University Press) examines Austen's work through the newspapers she perused, gossip she heard, streets she walked and the sights she saw – made possible through accessible online resources.

"With the help of the internet I realised that Austen probably based Elizabeth and Jane Bennet [*Pride and Prejudice*] on two royal mistresses of the time – celebrity actress Dorothy Jordan and Mrs Georgina Quentin.

"This was a time when the cult of personality was in its infancy and Austen targeted celebrities up to and including the Prince of Wales. She was a patriot, never more than one degree of separation away from royalty. She believed the prince was endangering the nation so she attacked him in the only way she could: through her characters – such as the unlovely John Thorpe in *Northanger Abbey* – and her plots.

"She criticised him for his appearance, his lewdness, his vanity, his instability, his outrageous spending, his desire for absolute power and his braggadocio."

Harris says Austen's in-jokes about public figures demonstrate her worldliness, a fascination with fame and enjoyment of rumour: snippets of Fanny Burney's correspondence about life at court reappear in Austen's novels.

"The current resurgence of political satire in social media, newspapers and cartoons would have delighted this savvy, progressive and thoroughly modern woman."

Professor Emerita Jocelyn Harris: "The current resurgence of political satire ... would have delighted this savvy, progressive and thoroughly modern woman."

Accounting for confidence

Just how important is self-efficacy when it comes to learning accounting?

Very important, says University of Otago accounting teaching fellow, Nicola Beatson, who won 2017's three-minute thesis competition with her talk "Confidence Matters".

Beatson's PhD study on the role of self-efficacy in accounting education is showing behaviour is crucial – self-efficacy is a better predictor of passing than prior learning at high school.

Her research has identified three types of self-efficacy with certain tasks which influence a student's self-efficacy beliefs: confidence to achieve academic success, confidence to ask for help and confidence to be organised.

She says all three factors can impact on student learning.

She is hoping this will inform teaching. "I care about the students, but I have 600 students in Semester 1 and 400 in Semester 2 that I have to help learn accounting, while getting them into the right headspace at the same time. It's a challenge we all face as teachers."

She is also hoping these findings will make a difference to the pass rates of accounting students.

"Accounting and Information Systems is a core paper, but has a bad rap for being dull – I don't want that to affect students' belief in whether they can learn."

Her own approach to teaching has already changed. "Armed with the understanding of what can influence self-efficacy beliefs in my students, I am now more careful to convey to them that they are capable of doing what I asked and I believe they can do it. It's only one aspect, but if it helps a student learn and believe in themselves, then it is worth it."

Nicola Beatson: "It's only one aspect, but if it helps a student learn and believe in themselves, then it is worth it."

Working with wasps

Dr Jenny Jandt (Department of Zoology) likes getting kitted up and blowing air into wasp nests to provoke the residents, but it is all in the name of science.

Jandt is investigating the invasive behaviour of two species of ground-nesting social wasps: the German and common wasp. She notes that these species have spread, since their accidental introduction to New Zealand last century, to become the densest populations in the world and "quite devastating" to New Zealand ecosystems.

Jandt explains that by placing a target – a black plastic plate with a microphone inside – at the entrance to wasp nests and blowing air through a tube into the nests, they can record the relative aggressiveness of colonies by the number of attacks on the plate.

"We want to investigate how differences in colony aggression might be explained by species differences, ecological differences, geographical locations and population densities," Jandt says. She adds that they will also identify the genes that correspond with aggressive behaviour.

"What drives me is really understanding the basic biology of these wasps and their social behaviour but, by identifying the factors that correspond to the most aggressive behaviour in these invasive wasps, we can begin to develop strategies to combat them and their spread," she says.

Dubbed "The Wasp Lady" by former United States colleagues, Jandt is undertaking the research with the assistance of an Otago PhD student, Mateus Detoni, and in collaboration with Professor Phil Lester, from Victoria University, and students from his laboratory.

Dr Jenny Jandt: "We want to investigate how differences in colony aggression might be explained by species differences, ecological differences, geographical locations and population densities."

Social service hybridisation

New Zealand is seeing increased commercialisation of traditional not-for-profit and social enterprises, but it seems this hybridisation comes at a price.

University of Otago researchers Drs Richard Greatbanks, Maria Amoamo and Diane Ruwhiu have been surveying Dunedin social service providers to better understand the implications of hybridisation. Intense competition among social service providers was one of the first issues they identified. The research also focused on Māori and non-Māori perspectives – a unique aspect in New Zealand social service provision.

The pilot study shows most have been competing for funding from government that prefers funding larger national providers. Social service leaders perceived a "one-size-fits-all" approach with a narrow perspective of social issues that did not fit with regional challenges or the cultural needs of Māori.

This further promoted "short termism", where funders contracted specific services with narrow time frames, jeopardising the sustainability and long-term planning of social service providers. The consequent marketisation of social services has resulted in more competitive behaviour, and compliance issues are becoming a big part of organisations' operations.

The research identified increasing vulnerability of Dunedin social services, with many local organisations unable to bid for national service contracts.

However, the researchers say it's not all bad – hybridisation has improved reporting and recording standards, with potential to leverage off a more qualified workforce. But the tensions created by disenfranchising local values shouldn't be ignored.

A case study will follow to better inform policymakers about the regional impacts of the funding environment.

Drs Maria Amoamo, Richard Greatbanks and Diane Ruwhiu: Their research found intense competition between social service providers.

Insights into kids' world

What do New Zealand children see and experience in their world? An innovative research method is helping researchers find out. The Kids'Cam study, led by Professor Louise Signal (Public Health, University of Otago, Wellington) used automated wearable cameras and GPS units to discover significant insights into children's' lives.

168 children aged 11–13 took part in the study, wearing the devices which recorded photos every seven seconds and locations every five seconds over four days. The children were randomly selected from 16 schools in the Wellington region.

"Our research found, among other things, that New Zealand children were exposed to 27 junk food ads a day, alcohol marketing nearly every time they visited a supermarket, that many are not sufficiently protected from the sun at school and most spend most of their time within 500 metres of home," says Signal.

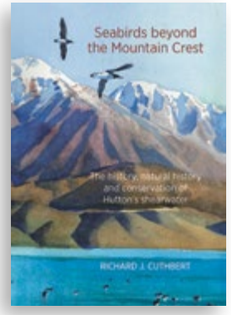
"It is important that children's perspectives are considered in decisions about their world: often they are best placed to inform adults. Also New Zealand is obligated to consider children's views under the United Nations Convention on the Rights of the Child.

"Working with the children was a privilege and they were wonderful researchers."

Kids'Cam data analyses have been occurring since 2015 and include studies on other aspects of the children's world, including exposure to smoking and gambling, and their use of "green" space and screens. A parallel study has also been completed with children in Tonga.

The research was led by UOW researchers in collaboration with the University of Auckland, and funded by the Health Research Council.

The UOW Kids'Cam research team (from left): **Dr James Stanley, Dr Moira Smith, Ryan Gage, Michelle Barr, Professor Louise Signal and Tim Chambers.**



Seabirds beyond the Mountain Crest

The history, natural history and conservation of Hutton's shearwater

Richard Cuthbert

Seabirds Beyond the Mountain Crest tells the story of New Zealand's endemic Hutton's shearwater, a species that breeds only at two remote locations, high in the Kaikoura Mountains.

Richard Cuthbert spent three years living with 200,000 Hutton's shearwaters and their neighbours, studying their behaviour, observing their interactions, measuring and recording facts and figures to build a detailed picture of why and how these birds have survived. This became the subject of his Otago PhD.

In this beautifully illustrated book, he recounts the challenge and exasperation, heartbreak and hardship, and the sheer joy of conservation hardship in a remote environment – interwoven with other fascinating stories of how these endangered birds were "discovered" and protected.

Floating Islanders

Pasifika Theatre in Aotearoa

Lisa Warrington and David O'Donnell

Floating Islanders: Pasifika Theatre in Aotearoa celebrates 30 rich years of Pasifika theatre in Aotearoa/New Zealand, featuring the achievements of many individuals and theatre companies, and provides an insightful guide to its diversity of styles and themes.

The immigrant experience of living in two worlds is often seen as troubled, but co-author Lisa Warrington says this "in-between-ness" has been turned to advantage in Pasifika theatre to create unique and often subversive performances.

And, not only is Pasifika theatre a success story within New Zealand, it is also an intriguing case study of migrant theatre that has international resonance, says co-author David O'Donnell.

The book features a comprehensive performance listing as well as 32 pages of photographs.

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

Books by Otago alumni

William Farquhar and Singapore: Stepping out from Raffles' Shadow, by Nadia Wright, Entrepot Publishing, Penang, April 2017.

Saved to Save and Saved to Serve: Perspectives on Salvation Army History, by Harold Hill, Wipf and Stock Publishers, July 2017.

Boots: A Selection of Football Poetry 1890-2017, edited by Mark Pirie, HeadworX, July 2017.

Homeless, poems by John Howell, Makaro Press, October 2017.

Jack's Journey: a Soldier's Experience of the First World War, by Trish McCormack and Andrew Gibson, Glacier Press, October 2017.

A Wise Adventure 2: New Zealand & Antarctica after 1960, published in October 2017 – Malcolm Templeton, Victoria University Press, October 2017.

The Tale of Mrs Possum: A Reflection on New Zealand Society, by Rachel Ovens, Land of the Long White Cloud Productions, November 2017.

Navigator, by Anne Moir, Garnet Press, September 2017.

Sidelights: Rugby Poems, by Mark Pirie, 2nd enlarged edition, HeadworX, November 2017.

Satire, Celebrity & Politics in Jane Austen, by Jocelyn Harris, Bucknell University Press, 2017.

The General's Goose: Fiji's Tale of Contemporary Misadventure, by Robbie Robertson, ANU Press, 2017.

Dunedin: Founding a New World City, by Ian Dougherty, Saddle Hill Press, November 2017.

A Terrifying Grace: Sexuality, Romance and Marriage in Christian History, by Rob Yule, Bloomington, Indiana: WestBow Press, 2017.

Restoring the Fortunes of Zion: Essays on Israel, Jerusalem and Jewish-Christian Relations on the Fiftieth Anniversary of the Six-Day War, by Rob Yule, (Bloomington, Indiana: WestBow Press, 2017.

Leadership Material: How Personal Experience Shapes Executive Presence, by Diana Jones, Nicholas Brealey Business Books, Boston, London, 2017.

We Gathered Here: A History of Matakana, by David R. Grant with Helen Jack, Jeff Oliver Print, Whangarei, 2017.

Dark Forest Deep Sea: Reflections of a Hunter, by Richard Hall, Mākaro Press, October 2017.

New Zealand: Paradise Squandered? Reflections on what we've lost and where we're headed, by John Hawkes, Copy Press, 2016.

Alumni:

If you have recently published a book email **mag.editor@otago.ac.nz**

New University of Otago Chancellor announced

The University's new Chancellor is Dunedin-based Dr Royden Somerville QC. He succeeded long-serving Chancellor John Ward in January.

Dr Somerville was previously the Pro-Chancellor of the University. He joined the University Council in 2010 and became a ministerial appointee in 2012.

His association with the University began as a law student and later he became a lecturer in environmental law. His wife and children all attended the University of Otago. Dr Somerville also served for a number of years on the Council of Knox College and Salmond College and is a Fellow of Knox College.

"I consider it a great privilege to serve as the University's 19th Chancellor. I am looking forward to working with the Vice-Chancellor, Professor Harlene Hayne, the newly elected Pro-Chancellor for 2018, Mr Stephen Higgs, and the members of the Council," he says.

The University wishes to thank Mr Ward for his 15 years of distinguished service to the University Council. While he stepped down as Chancellor on 31 December 2017, Mr Ward's association with the University of Otago will continue, as he remains Chair of Otago Innovation Ltd and the University of Otago Foundation Trust.

Otago tops educational performance measures

The University of Otago has topped every one of the latest key government indicators measuring the educational performance of students at New Zealand's universities.

Released late last year by the Tertiary Education Commission, the annual Educational Performance Indicators examine course and qualification completions, overall and first-year retention rates, and progression to higher levels of study. Having been top in all but one of the indicators in 2016, Otago has now completed a clean sweep by ranking first across all of the key measures.

Otago Vice-Chancellor Professor Harlene Hayne says the University's unprecedented success "highlights not only the excellence of our academic staff and teaching and learning environment that the University offers students, but also the commitment Otago students put into achieving to their full potential".

Unprecedented Marsden Fund success

University of Otago researchers have gained around $24 million for 33 world-class research projects in the latest Marsden Fund annual round – the University's most successful round ever.

The results of this highly competitive funding round were announced in November, with researchers from across the University's Divisions of Commerce, Health Sciences, Humanities and Sciences securing funding.

Deputy Vice-Chancellor (Research and Enterprise) Professor Richard Blaikie welcomed the outstanding success of so many Otago applicants.

"We are delighted that the exceptionally high quality of Otago research ideas has been rewarded with our largest success ever, both in terms of the number of researchers supported and the total amount of funding," he says.

The Royal Society Te Apārangi administers the Marsden Fund on behalf of the government. It is regarded as a hallmark of excellence that allows the country's best researchers to explore their ideas.

World Leisure recognition

The University of Otago has been recognised as a new World Leisure Centre of Excellence (WLCE) by the World Leisure Organization (WLO), a worldwide association dedicated to fostering the leisure experience as a force for human development and well-being.

This acknowledges the University as having highly qualified international research and teaching staff, and top class facilities. The research specialisation of the Department of Tourism on well-being, personal and ecological well-being through tourism and leisure were some of the points highlighted by the evaluators.

The centre will be known as the WLCE University of Otago, and will be situated within the Department of Tourism.

Otago's Head of Tourism Professor Neil Carr says the association with the WLO is important as it gives the University access to a global network of leisure researchers and educators. He says quality leisure experiences are becoming increasingly central to modern life and it's important that research and research-informed teaching can provide meaningful insight into enhancing the human condition.

Otago Business School redevelopment opens

The newly redeveloped University of Otago Business School's common space (right) opened in early December.

The building was redeveloped over two floors, in a major project which began in October 2016.

The redevelopment brings it into line with a more modern learning environment, and replaces the wet and cold atrium which was worsened by leaks and the lack of a wind-proof door.

The newly developed ground level incorporates teaching, study and social spaces, an information sharing area, as well as a café and the Dean's Office. This new common area will be known as Te Wao Nui.

Otago Business School Dean Professor Robin Gauld says it will provide an engaging central common space for collaborative, formal and informal learning and social interactions for students and Business School staff, as well as the wider business community.

UNESCO honour

A University of Otago architectural collection spanning 150 years has been recognised for its significance to New Zealand history.

The Salmond Anderson Architecture records held at the Hocken Collections, Uare Taoka o Hākena, were listed on the UNESCO Memory of the World New Zealand documentary heritage register.

Hocken Head Curator, Archives, Anna Blackman says the Salmond Anderson Architecture records document architectural development in southern New Zealand from 1862 to 2008.

"The extensive collection charts the broad development of architectural style and the technology of design and draughting representative of architectural history in New Zealand.

"For the Hocken, Memory of the World registration is a wonderful and lasting way we can recognise the significance of these records to the history of architecture and the built environment in New Zealand," she says.

This latest inscription brings the Hocken's total on the register to five.

Other collections inscribed are: Charles Brasch Personal Papers (2011); Hocken Church Missionary Society Collection (2013); Pickerill Papers on Plastic Surgery (2015); and Lance Richdale Papers on ornithology (2016).

Te Kāika officially opens

The University of Otago has partnered with Te Putahitanga o Te Wāipounamu (the South Island Whanau Ora commissioning agency), Ngāi Tahu, health and social service provider Arai Te Uru Whare Hauora, and the Pacific community to provide an affordable, high-quality health and social service in South Dunedin.

Te Kāika, which was formally opened at the end of February, is based at the former College Street School and offers GP and dental services, gym facilities and social service providers in the same complex.

Teaching is also an important component of Te Kāika, with the University training students from across the Health Sciences' professional schools on site.

QS subject rankings

In the latest QS World University Rankings by Subject, the University of Otago has five subjects in the top 50 worldwide.

They are: physical education, 12th; dentistry 27th; archaeology, 28th; anatomy and physiology 29th; and development studies, 39th.

A total of 15 Otago subjects were ranked in the top 100, a further seven subjects in the top 150, and six in the 151 to 200 band.

City College re-named

The University of Otago has renamed City College the Caroline Freeman College (right) after the University's first female graduate.

"The University of Otago was the first university in this part of the world where women could study. This is a part of our history that brings us great pride. I am very pleased to recognise that proud history by renaming our College after our first female graduate," says Vice-Chancellor Professor Harlene Hayne.

The name-change at the College – which originally housed students from both the University and Otago Polytechnic – took effect on 1 January 2018, when the University took full ownership of City College after buying the third owned by the Otago Polytechnic.

Awards/Achievements

Dr **Htin Lin Aung** (Microbiology and Immunology), Dr **Hamish Jamieson** (Medicine, Christchurch), Dr **Michael Pankhurst** (Anatomy) and Dr **Daniel Ribeiro** (Physiotherapy) have each been awarded around $500,000 from the Health Research Council (HRC) to pursue world-class projects aimed at improving New Zealander's health and well-being and contributing to international progress in these areas. They are among a total of 17 Otago health researchers and students to receive the latest funding through the HRC career development awards for 2018.

Two University of Otago academics have received Fulbright New Zealand Scholar Awards to undertake research in the United States. Professors **Neil Gemmell** (Anatomy) and **Tony Merriman** (Biochemistry) have been awarded up to US$37,500 to support research for three to five months in the US. Gemmell will research the usefulness of new "gene drive" technologies for the control of predatory pests, at Massachusetts Institute of Technology and the Broad Institute. Merriman will research the genetic basis of urate control and gout in African-Americans, at the University of Alabama Birmingham.

Three Otago researchers were among those presented with medals at the 2017 New Zealand Research Honours Dinner hosted by the Royal Society Te Apārangi. Associate Professor **Jonathan Broadbent** (Dentistry) received the Health Research Council of New Zealand's Liley Medal (see pages 28-30), Professor **Sally Brooker** (Chemistry) the Society's Hector Medal, while PhD student Mr **Ryan Thomas** (Physics) won the Hatherton Award.

Professor **Lisa Stamp** (Medicine, University of Otago, Christchurch) has won the Medicines New Zealand's Value of Medicines Award for research into how increasing dosages of gout medicines can dramatically improve patients' lives.

Professor Emerita **Carolyn Burns** was awarded the prestigious 2017 Marsden Medal by the New Zealand Association of Scientists in November (see pages 14-17).

Many years of service to Dunedin's French community and to French culture in the city have earned Otago's Dr **Christiane Leurquin** (Languages and Cultures) the French National Order of Merit.

Five geoscientists from Otago's Department of Geology received awards at the Geoscience Society of New Zealand Annual Conference in December. Associate Professor **Daphne Lee** was awarded the McKay Hammer Prize for her Marsden-funded publications from 2014-2016. Emeritus Professor **Alan Cooper** is the Hochstetter Lecturer for 2018. Professor **Dave Craw** was awarded the S.H. Wilson Prize for Geochemistry. Master's student **Marcus Richards** won the Royal Society of New Zealand Best Student Oral Presentation Award and PhD student **Ian Geary** received the Harold Wellman Prize for the most significant fossil discovery made in the previous year.

An idea that could revolutionise the management of severe pain has won the University's 2017 Translational Research Grant. Dr **Ailsa McGregor** (Pharmacy) will work with Associate Professor **Natalie Medlicott** (Pharmacy) and Professor **Paul Glue** (Psychological Medicine) to develop a novel medication for severe pain that will increase pain control, prevent tolerance and reduce side effects.

Teaching excellence

Four staff members have been honoured in the University of Otago's annual Teaching Excellence Awards.

They are: Faumuina Associate Professor **Fa'afetai Sopoaga**, Centre for Pacific Health, Va'a o Tautai, Division of Health Sciences; Associate Professor **Sheila Skeaff,** Department of Human Nutrition; Dr **Kristin Hillman**, Department of Psychology; and Dr **Rebecca Bird**, Department of Anatomy.

Deputy Vice-Chancellor (Academic) Professor Vernon Squire says Otago has a proud tradition of teaching excellence. "The four teachers who have won awards this year join a select group of our very best educators whose remarkable accomplishments in learning and teaching place them in the company of the best in the world."

Appointments

Associate Professor **Chris Button** as the new Dean of the School of Physical Education, Sport and Exercise Science. Associate Professor Button, who came to Otago from Edinburgh in 2003, says his "healthy obsession" with physical activity will be a driving force in his new role. His research and teaching concerns the use and application of technology to aid skill acquisition and how its use promotes physical activity.

Dr **Dianne Sika-Paotonu** as Associate Dean (Pacific) at the University of Otago, Wellington (UOW). Dr Sika-Paotonu is the first Tongan, Pacific biomedical scientist to be appointed to this role within the Division of Health Sciences at Otago. She is based in the Department of Pathology and Molecular Medicine at the UOW.

Shelagh Murray, a highly experienced facilitator of non-profit fundraising, as the Director of Development and Alumni Relations Office. (*See page 49.*)

Emma Neale as the new editor of *Landfall*, published by Otago University Press. Ms Neale has published six novels and five poetry collections, and edited several anthologies. She is a former Robert Burns Fellow (2012) at the University of Otago and has received numerous awards and grants for her writing.

Te Poutama Māori – the University of Otago's Māori Academic Staff Caucus – has appointed a new co-chair. Dr **Diane Ruwhiu** from the Otago Business School is joining co-chair Professor **Jacinta Ruru** (Law).

Professorial promotions

Twenty-three University of Otago academics – across a range of research fields – were promoted to full professor, effective 1 February: **Haxby Abbott** (Surgical Sciences), **Greg Anderson** (Centre for Neuroendocrinology and Anatomy), **David Bell** (College of Education), **Jim Cotter** (Physical Education, Sport and Exercise Sciences), **Sarah Derrett** (Preventive and Social Medicine), **George Dias** (Anatomy), **Ruth Empson** (Physiology), **Ruth Fitzgerald** (Anthropology and Archaeology), **Paul Hansen** (Economics), **John Horwood** (Psychological Medicine, Christchurch), **Greg Jones** (Surgical Sciences), **Merata Kawharu** (Te Tumu: School of Māori, Pacific and Indigenous Studies), **Stephen Knowles** (Economics), **James Maclaurin** (Philosophy), **Patrick Manning** (Medicine), **Jessica Palmer** (Law), **Suetonia Palmer** (Medicine, Christchurch), **Inguruwatt Premachandra** (Accountancy and Finance), **Anthony Ritchie** (Music, Theatre and Performing Arts), **Louise Signal** (Public Health, Wellington), **Claudine Stirling** (Chemistry), **Michelle Thompson-Fawcett** (Geography), and **Sarah Young** (Pathology).

New Year Honours

Alumni and academic staff recognised in the New Year Honours include:

Companion of the New Zealand Order of Merit (CNZM): Dr **William Blair Rhodes Rolleston**, for services to the farming industry.

Officer of the New Zealand Order of Merit (ONZM): Mr **Frederick John Graham**, for services to Māori art; Dr **Andrew Alexander Hill**, for services to endoluminal vascular repair; Dr **Andrew Hugh Holden**, for services to endoluminal vascular repair; Dr **James Malcolm Macpherson**, for services to local government and the community; Ms **Julia Morison**, for services to visual arts; and Ms **Helen Mary Pollock**, for services to art.

Member of the New Zealand Order of Merit (MNZM): Professor **Barbara Brookes**, for services to historical research and women; Ms **Suzanne Louise Ellison**, for services to Māori, the arts and governance; Dr **John Clive Guthrie**, for services to education and sport; Associate Professor **Michael John Hilton**, for services to conservation; Ms **Donna Matahaere-Atariki**, for services to Māori and health; Mr **Nigel Dean Skelt**, for services to badminton; Dr **David Collins Tipene-Leach**, for services to Māori and health; and Mr **Graeme Richard Wallis**, for services to music.

Companion of the Queen's Service Order (QSO): Ms **Evelyn Marion Weir,** for services to seniors and the community.

Queen's Service Medal (QSM): Mr **Philip John Craigie**, for services to music; Mrs **Kathleen Patricia Fletcher**, for services to music, science education, and the community; Mrs **Margaret Ann Miles**, JP, for services to local government and the community; and Mrs **Julie Patricia Syme**, for services to the community.

Honorary degree

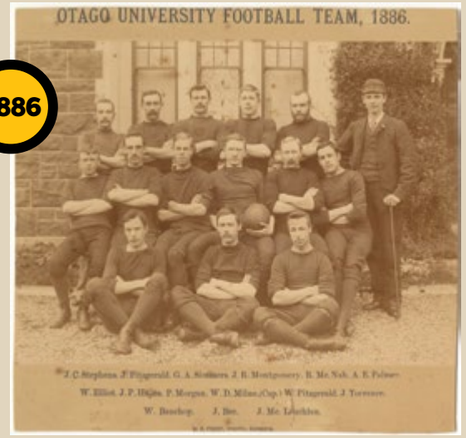
Otago alumnus **Graeme Hart** was awarded an Honorary Doctor of Commerce by the University of Otago in December. Dr Hart is an internationally renowned businessman and philanthropist. His current profile relates to building, owning and managing the largest business enterprise in New Zealand – Rank Group – under which sits a vast global platform. (*See page 53.*)

Emeritus Professors

The University Council has recently awarded the following academics the status of Emeritus Professor: Professor **Stuart Anderson** (Law), Professor **Amanda Barusch** (Sociology, Gender and Social Work), Professor **George Benwell** (Otago Business School), and Professor **Douglas Booth** (Physical Education, Sport and Exercise Sciences).

With the University of Otago's 150th anniversary now less than one year away, the *University of Otago Magazine* continues to look back over the activities of staff and students, drawing on photographs from the Hocken Collections – Uare Taoka o Hākena, University of Otago.

1886



Otago University Football Team, 1886. W.R. Frost photograph, Box-137-003.

1919

Otago University Hockey Club, 1919. Private collection.

1920s

University of Otago Capping, 1920s. Hugh & G. K. Neill glass plate, P1971-008/6-159.

1949

Laboratory for Chemistry of Foods and Chemistry of the Household, School of Home Science, 1949. Prime Ministers' Dept. photograph, Box-184-022.

1949

University of Otago School of Physical Education 1949. Prime Ministers' Dept. photograph, Box-184-122.

1952

Staff and lecturers and wives at the NZUSA Congress, Queen Charlotte Sound, 1952. E.L. Phelan photograph, P2000-045-001.

1952 -1953

University of Otago Easter Tournament Ball, 1952-3. Private collection.

1957

University of Otago Capping Procession, 1957. Private collection.

SHAPING THE FUTURE

together

The excellent response to Otago's 2017 Annual Appeal highlighted how alumni and supporters can make a positive difference for our students, important research projects and the global community.

University of Otago Development and Alumni Relations Office (DARO) staff say the generosity of 668 supporters worldwide – including 150 new donors – meant the Shaping the Future Together appeal exceeded its target by almost $20,000 to top $158,000.

Appeal funds will be passed on to seven projects in three areas – student exchange and scholarships, research and community outreach – in accordance with donors' wishes.

While most donors were New Zealand-based, a significant donation came from an alumnus in South-East Asia who graduated in the late 1970s. In a letter to DARO he enthused about his time at Otago, and explained his formula for giving to this appeal which saw him donate a set amount for each of his 43 postgraduation years; this equated to a gift of almost NZ$14,000.

DARO Director Shelagh Murray says the Annual Appeal results highlight the potential for the Otago community to support projects that have wide-ranging benefits.

"We promised funds would help translate academic endeavour into real-world solutions, and help students and our community: we are very pleased the Appeal's collaborative, future-focused theme resonated with supporters. Gifts of every size helped us surpass our target and every dollar given will be used well. We sincerely thank all who contributed."

The Shaping the Future Together 2017 Annual Appeal projects were: The University of Otago Marine Science Aquavan; the Brain Health Research Centre's Alzheimer's early detection research; the Centre for Translational Cancer Research's work on treatment for child cancer; the Otago Global Student Exchange programme; undergraduate entrance scholarships; the Legal Services Mapping Project and the Student Volunteer Aspire Programme.

$157,963 received

668 donors

150 first-time donors

$38,833 for general fund

$55,611 for research

$49,923 for scholarships

$13,596 for community outreach

"Gifts of every size helped us surpass our target and every dollar given will be used well."

New faces at DARO

Photo: Sharron Bennett

New Director of Development and Alumni Relations **Shelagh Murray** (right) and alumni engagement manager **Donnella Aitken-Ferguson**.

Recently appointed Development and Alumni Relations Office Director Shelagh Murray is looking forward to engaging with, and growing, Otago's strong alumni networks.

Murray, who started her role in February, says while Otago has a "strong existing culture of philanthropy and alumni engagement", a future priority will be communicating the value of supporting Otago's many areas of activity and excellence.

"The generosity of our alumni and donors already helps important research initiatives, and support for several longstanding and recently-established scholarships improves access to quality education for our young people. I believe there is tremendous potential for further giving to make an impact in many important areas."

In addition to enhancing existing networks, Murray says encouraging alumni who have not been in contact with the University since graduation to reconnect will also be a priority in the lead-up to Otago's 150th anniversary celebrations next year. The 150th celebrations will be an excellent opportunity to showcase the wonderful research and teaching undertaken at the University and promote support for some important projects.

Murray has amassed extensive experience in developing and implementing successful fundraising and alumni relations strategies as Head of Alumni and Development at the University of Canterbury (for nine years) and in her subsequent five-year role as Executive Director of Development and the Foundation at Victoria University of Wellington.

From 2015 until her Otago appointment she was a senior consultant at Australasian fundraising consultancy AskRIGHT, which works with non-profit organisations, including many schools and universities in Australia and New Zealand, to optimise their fundraising and donor engagement programmes.

Otago Deputy Vice-Chancellor (External Engagement) Professor Helen Nicholson says that Murray was selected for the Director's role following an extensive international search.

"Among her duties will be developing and implementing strategies to foster long-term mutually beneficial relationships between the University and its graduates, corporations, foundations and the broader community."

The University also has a new alumni engagement manager. After a decade as the Division of Health Sciences' marketing communications manager, Donnella Aitken-Ferguson was appointed to this new role in late 2017.

Aitken-Ferguson looks forward to connecting with many alumni in 2018 at national and international events, and encourages supporters to discuss opportunities to network, and support Otago, at any time throughout the year.

"Attending these events will provide me with many great opportunities to discuss how best the University can engage with alumni and supporters to build mutually rewarding relationships."

One of Aitken-Ferguson's main goals is to build an awareness of the "alumni concept" as an integral part of University experience.

"We want to increase our students' awareness of the value of being part of alumni networks from the time they begin their Otago journey so they know the value of forming lifelong, meaningful, connections with their alma mater," she says.

Mark your diaries

Key dates for the University's 2019 150th anniversary celebrations have been confirmed

25 January	Burns Night – Supper
15 February	Clocktower Lawn Picnic
16 March	Street Parade
12-14 April	Homecoming Weekend
13 April	Concert
19 – 22 April	EASTER
11 and 18 May	Graduations
29 May–3 June	QUEEN'S BIRTHDAY WEEKEND
29 May	Otago Museum – 150th Exhibition Opening
1 June	The Official Convocation Ceremony & Anniversary Dinners
2 June	Church Service
2 June	Gala Evening, Town Hall
3 June	Sporting Fixture
29 June	Fortune Theatre Play
July	Winter Symposium
9 -11 August	Homecoming Weekend
10 August	Anniversary Ball
17 August	Graduation
September	International Regatta
28 October	LABOUR WEEKEND
November	University College 50th Reunion
December	Graduations

otago.ac.nz/150

150@otago.ac.nz

Alumni events and reunions

150th anniversary launch, Christchurch, 19 April
Medical class of 1998 reunion, Dunedin, 4-6 May
Teachers College class of 1968 reunion, Christchurch, 5 May
Otago School of Mines reunion, Noosa, 11-13 May
Alumni events, Sydney, 19 and 21 May
Alumni event, Melbourne, 24 May
Alumni events, Brisbane, 25 and 26 May
Medical class of 2003 reunion, Dunedin, 2-3 June
Dental class of 1998 reunion, Dunedin, 1-3 June
Alumni event, Fiji, 30 June
Alumni event, London, 3 July
Alumni event, Berlin, 7 July (tbc)
Dental alumni event, London, 24 July
Alumni event, Hamilton, 24 July
Alumni event, Tauranga, 26 July
Alumni event, New Plymouth, 23 August
Alumni event, Edmonton, September (tbc)
Alumni event, Toronto, September (tbc)
Surveying class of 1968 reunion, Dunedin, 3-7 October
Dental class of 1973 reunion, Queenstown, 19 October
Alumni event, Queenstown, 23 October
Alumni event, Wanaka, 24 October
Medical class of 1988 reunion, Dunedin, 26 October
Teachers College class of 1968 reunion, Dunedin, October
Alumni event, West Coast USA, early November
Alumni event, East Coast USA, 3 November
Alumni event, Shanghai, 17 November
Alumni event, Hong Kong, 20 November
Alumni event, Singapore, 22 November
Alumni event, Kuala Lumpur, 24 November
Medical class of 1968 reunion, Dunedin, 27-29 November
Teachers College class of 2008 reunion, Dunedin, 1 December
Phys Ed class of 1969 reunion, Dunedin, 18-20 January 2019

For more information: *otago.ac.nz/alumni/news/events*

Share your memories with us

The *Otago Magazine* will dedicate its first issue of 2019 to celebrating the University's 150th anniversary – and we would like you to be part of this.

We are looking for at least 150 standout memories that we can highlight – and there is no limit to the scope of this.

- **What is the thing you loved most about Otago?**
- **What is the one most important thing you learned at Otago, or that you did for the first time?**
- **Tell us about your favourite lecturer/tutor; the friends you made; relationships forged; your most memorable activities – academic, social, cultural and sports.**
- **How did your time at Otago change your life?**

Email your memories to: **mag.editor@otago.ac.nz**
Or post to: **Otago Magazine Editor**
PO Box 56 | Dunedin 9054 | New Zealand

Please include your name, your degree and the years you were at Otago. Any photos you have are welcome as well.

Dunedin, 26 September 2017

The national launch of *Undreamed of . . . 50 Years of the Frances Hodgkins Fellowship* was held in the Link at Otago's Dunedin campus.

Editor Imogen Coxhead, Otago University Press publisher Rachel Scott, designer Karina McLeod, co-authors Andrea Hotere, Priscilla Pitts

New York, 26 October 2017

AUOA president Neil Matheson, University of Otago Vice-Chancellor Professor Harlene Hayne and Sir Murray Brennan.

Brian Portis, Professor Helen Nicholson, Charmaine and Alan Portis.

Auckland, 28 November 2017

Alumni and guests joined Vice-Chancellor Professor Harlene Hayne and Chancellor John Ward at the Auckland launch of *Undreamed of ... 50 Years of the Frances Hodgkins Fellowship* at Pah Homestead.

Medical class of 1963 reunion, Hawkes Bay, 5-7 March 2018

San Francisco, 20 October 2017

Alumni of the University of Otago in America (AUOA) members and guests joined senior Otago staff, including Deputy Vice-Chancellor (External Engagement) Professor Helen Nicholson, at an alumni event held in San Francisco's financial district.

AUOA members Andrew Hamner and Geoff Nichol.

Jennifer Marks and AnnMarie Oien.

Honorary degree for MBA alumnus

Photo: McRobie Studios

An honorary doctorate conferred last year continued the University of Otago's tradition of recognising alumni who value success and philanthropy. At the December 2017 graduation ceremony international businessman and Master of Business Administration alumnus Graeme Hart received an Honorary Doctor of Commerce degree.

Dr Hart shared insights with graduates at the Dunedin Town Hall ceremony into how his personal and professional values have underpinned his success.

He left school at 15 with "too much attitude in one pocket and not a cent in the other". But hard work and some savvy business acquisitions led to him heading an international business empire and becoming New Zealand's richest man.

Aged 30 he undertook a University of Otago MBA and was "immensely grateful" for the opportunity to study, learn from Otago Business School academics and to have experienced life on the Dunedin campus.

Former University of Otago Chancellor John Ward who conferred Dr Hart's degree (above) described him as an "outstanding" graduate and said he was proud that the University had recognised Dr Hart's substantial contribution to New Zealand, its business community and people.

Dr Hart approached study in the same way he did business and enjoined graduates to develop interpersonal skills, carefully consider their options, be passionate, look for opportunities as they arose and to be bold in seizing them.

Central to Dr Hart's career has been owning and managing New Zealand's largest enterprise, Rank Group, which is the hub for a range of international business activities. The group has built and developed several substantial financial entities including Whitcoulls Group, Goodman Fielder and Carter Holt Harvey.

While he prefers to keep a low profile, individuals, family groups, organisations and schools have all benefited from his generosity. Dr Hart's philanthropic activity included: supporting the City Mission Christmas appeal; replacing a boat that carries up to 40 Fijian children to school; donating a studio building at Pine Ridge Indian Reservation; American grizzly bear protection efforts; and support for cancer treatment.

… the Student Christian Movement?

Founded in 1896 as the Christian Union, the Student Christian Movement at Otago is perhaps best known for running annual second-hand textbook sales, but it has contributed much more to campus life over the last 122 years.

The Student Christian Movement (SCM) evolved out of the World Student Christian Federation, formed in Sweden in 1895 to unite Christian groups in universities under one international banner. When the federation's general secretary toured New Zealand the following year, students at Otago and elsewhere formed SCM branches.

SCM grew quickly in size and influence: more than a third of university students in Australasia in 1908 were members of SCM. Otago was the strongest and most enduring of the New Zealand branches: by 1915, just over 47 per cent of Otago students were members. SCM Otago was particularly popular among arts and divinity students. Initially it was a Protestant organisation, although a few Roman Catholics joined from the 1970s.

Former Otago "SCMers", as members are known, have told of being attracted to SCM because it was "a place without boundaries" and had "an atmosphere of questioning and openness" in which students were free to explore what being a Christian meant for them.

SCM Otago set up a lending library; members took part in study circles and discussion groups; and they listened to guest speakers – often local ministers and academics – concerned with social issues and mission work. Several members later became overseas missionaries.

Some members, interested in left-wing political thought, became involved in the New Zealand Labour Party. They included a future Labour Party leader and minister of finance and health, Arnold Nordmeyer, who was a SCM official at Otago in the early 1920s.

From the 1920s, members raised money for diverse New Zealand causes, from victims of unemployment and earthquakes, to the Crippled Children's Society. Overseas campaigns included post-war fundraising for European refugees and for a 1925 European student relief fund. In support of this expression of internationalism, SCM asked, "Are you a citizen of the world, or a mere villager?"

SCM Otago members continued to support various causes and campaigns over the years, from marching along George Street in 1959 in Dunedin's first anti-nuclear protest, to joining Registry occupation protests in the 1990s, brandishing their "God Hates Fees" sign, and distributing healthy snacks to keep protestors' energies and spirits high.

The Student Christian Movement at Otago was also in the forefront of providing services to students. In 1900, for example, SCM members edited the first *Student Handbook*, which introduced the University to new students.

In 1906, SCM initiated fundraising through public subscription for the construction of a building with a hall and common room for use by all students. The government refused to subsidise the scheme, mistakenly believing that the intention was to erect a Christian mission hall. The Otago University Students' Association took over the plans and the fundraising, which the government then agreed to subsidise, and Allen Hall opened in 1914 as a student union building.

The highest profile SCM campus activity has been the annual book sales. Each New Zealand branch organised a second-hand textbook stall at the beginning of each academic year, with students buying and selling textbooks and a percentage of the proceeds being donated to charity.

The Otago book sales began in 1931, during the Great Depression, and although SCM book sales at other universities fell by the wayside, Otago's became a permanent institution. Most recently, the sales have been held in late February in the All Saints Anglican Church Hall, with proceeds going to charities such as Rape Crisis Dunedin.

SCM Otago tenaciously struggled on while branches at other universities became defunct in the late 1980s. Branches were later resuscitated at Canterbury and Victoria, and revival attempts are underway at Waikato and Auckland.

The heady days of nearly a half of Otago students belonging to SCM are long gone. SCM Otago president Rachel Tombs says that about 15 to 20 students are connected with SCM, but the core group of regular attenders is about 10.

The dramatic membership decline is partly a reflection of the decrease in the number of students who identify as being Christian. Tombs, who has uncovered some of the above history of SCM Otago as a part of her undergraduate history studies, says that it is also partly due to the proliferation of other religious groups and societies on campus, and students having less time to devote to groups such as SCM.

In addition to running successful book sales, members regularly meet at Knox Church, and continue the tradition of supporting good causes, from last year joining an Octagon sleep-out to raise awareness of and money for the Dunedin Night Shelter, to organising a suicide awareness march and hosting a workshop with Rape Crisis.

IAN DOUGHERTY

The Student Christian Movement camp at Tirohanga, July 1961: Hocken Collections – Uare Taoka o Hākena, S17-174c, private collection.