

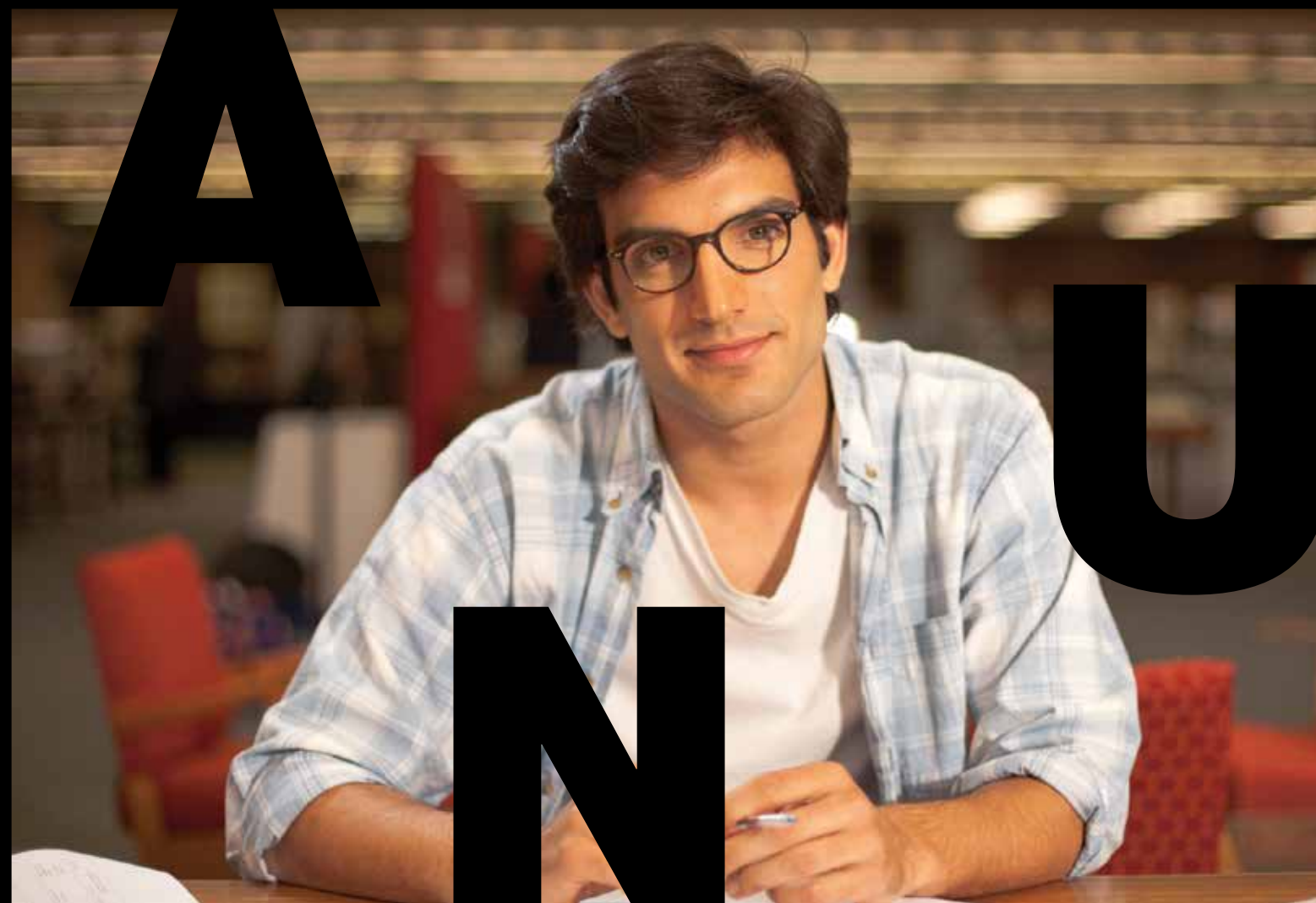
ANUreporter

The Australian National University

Autumn 2013



\$50M gift for student scholarships



"I travelled to ANU because of the university's international reputation. This is the place where world-leading minds are meeting down the corridor.

I want to make a real difference and I know that ANU graduates do."

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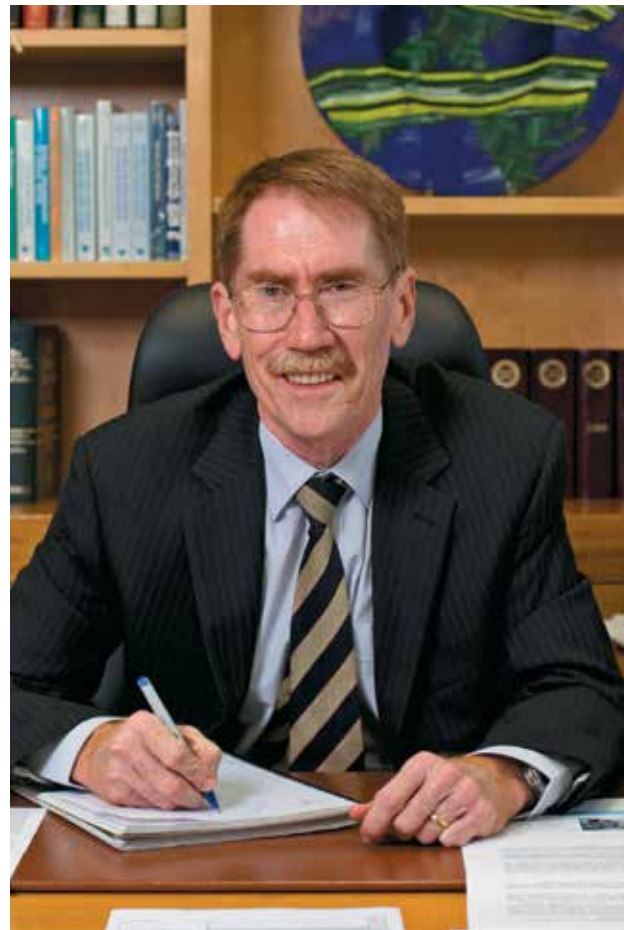
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Vice-Chancellor's introduction



It was with great pleasure and honour that I had the opportunity on February 5th to announce one of Australia's most transformational and forward-thinking scholarship programs.

The new Tuckwell Scholarship program was born from a vision of one of our most distinguished graduates, Graham Tuckwell, and his wife Louise.

At the heart of their vision is a desire to see a program that nurtures talented young students to fulfil their potential and reinvest their knowledge, skills and experience in ways that positively benefit others.

Each year, 25 new Tuckwell Scholars will receive \$20,000 per annum for up to five years as they complete their undergraduate degree.

In support of the scholarship the Tuckwells have made a gift of \$50 million to the University through the Graham & Louise Tuckwell Foundation.

This gift is the largest ever to an Australian university from Australians and the largest gift ever given to an Australian university for the benefit of students.

On behalf of the University and our community I would like to deeply and sincerely thank Graham and Louise for their most generous and visionary gift.

It is unlike anything that has come before it.

We really are very proud to count Graham as a member of our community and a distinguished alumnus.

Professor Ian Young
Vice-Chancellor and President



CANBERRA BY NIGHT
BY ZHUORAN XU

This stunning image is the combined result of 200 long-exposure photographs taken from the top of Mount Ainslie over two hours in September 2011.

"This picture captures the apparent motion of the stars above Canberra due to the rotation of the Earth. When I looked closely at the final photograph, I was excited to see a meteor in the left part of the sky," says Xu.

The photograph earned Xu an honourable mention in the Capture Science Photography Competition run by the ANU College of Medicine, Biology and Environment. An exhibition of the photographs will be held later this year.

For more information and to view the other winning photographs visit http://bit.ly/rep_captsci

Chancellor Evans reappointed

Professor the Hon Gareth Evans AC QC will continue as Chancellor of ANU for a further three-year term.



"Professor Evans makes an invaluable contribution to ANU in many ways, but especially in positioning ANU as Australia's leading public policy institute," said Vice-Chancellor Professor Ian Young.

"He works tirelessly in Australia and around the world to raise the profile of, and generate support for, this great institution. He has contacts, reach and respect, and is an asset to ANU."

Menzies Library Anniversary

A celebration marking the 50th anniversary of the RG Menzies Library will be held on 13 March. The celebration will also commemorate the first ANU theses, which were awarded 60 years ago. The theses from 1953-55 have been digitised and are available online at digitalcollections.anu.edu.au. For more information on the celebration visit <http://anulib.anu.edu.au>.

Extension diploma launched

The ACT region's best and brightest senior secondary students will get a head start on university study with the launch of the ANU Extension Diploma of Advanced Studies.

Year 11 and 12 students will be able to attend ANU at the same time as completing school, and will get academic credit for completed subjects. At the end of year 12, students will be able to transfer straight into a degree with full credit for the university subjects completed.

Father of ecological economics joins ANU

One of the world's leading ecological economists, Professor Robert Costanza, has been appointed Chair in Public Policy at the Crawford School of Public Policy.



Director of the Crawford School, Professor Tom Kompas, said Professor Costanza will be an asset to the University.

"This appointment brings to the School a researcher who is innovative, inspirational and highly distinguished, and one who is regarded – quite rightly – as the founding father of the discipline of ecological economics."



The launch of the Canberra Centenary Community Tapestry. PHOTO BY ANNE-MARIE BRYANT.

First threads for Centenary tapestry

The first threads of the Canberra Centenary Community Tapestry have been woven in the ANU School of Art Textiles Workshop.

The 2.7m by 1.4m tapestry, which will include key landmarks such as Parliament House, the Australian War Memorial and Black Mountain Tower, has been designed to commemorate Canberra's history.

The project is open to everyone and several training workshops will be held for members of the public who wish to get involved.

Robyn Archer, Creative Director of the Centenary of Canberra celebrations, was one of the first people to contribute to the tapestry.

"The participatory nature of the making of this tapestry means that many who are not skilled in the art will still be able to make a contribution. I encourage everyone to come and pick up the needle," she said. ■

For more information visit www.canberra100communitytapestry.com

New solar projects

Researchers from ANU have partnered with leading Australian and American institutions on four major new solar energy projects.

The projects, supported by more than \$83 million funding from the Federal Government, will see the University team up with researchers from UNSW, CSIRO and RMIT to drive breakthroughs in solar energy technology.

"These are very exciting projects and we are delighted that ANU will be part of this extraordinary collaboration to deliver the next generation of



Solar panels on the ANU Union building.

solar energy innovation," said Dr Andrew Blakers, Director of the Centre for Sustainable Energy Systems at ANU. ■



The new Jaeger 8 Building. PHOTO BY BEN WRIGLEY, PHOTOHUB.

Jaeger Building opens

The award-winning Jaeger 8 Research School of Earth Sciences Building was opened by Parliamentary Secretary for Higher Education and Skills the Honourable Sharon Bird in December.

Featuring double-glazed windows and external sun screens, the highly energy-efficient building has been designed to encourage collaboration between students and teachers. It was the recipient of a 2012 Master Builders Association National Public Buildings Award.

Other features of the new building include rainwater collection for irrigation, toilet flushing and air cooling. The foyer displays a cabinet of travertine, granite, marble and volcanic stones to be used as a teaching tool for students studying earth sciences.

A memorial bench commemorating lifelong

research collaborators and 'legends of geology' the late Professors Allan White and Bruce Chapman was installed in the garden behind the building in October.

In his speech on the day, Vice-Chancellor Professor Ian Young paid tribute to the achievements of the two researchers.

"Allan and Bruce were renowned scholars and experts in their field. Both men, in their own unique ways, were also exemplars of philanthropy. Generous with their time and expertise, they mentored many young scientists," he said.

The unveiling of the memorial coincided with the launch of the Allan White Endowment, a new scholarship which supports higher degree students in the Research School of Earth Sciences. ■

Research tops nation

ANU topped the nation in the Commonwealth's 2012 Excellence in Research Australia ratings.



"More than four out of five ANU academics evaluated in the report are working on research in disciplines where performance is rated above, or well above, world standard," said Deputy Vice-Chancellor (Research) Professor Margaret Harding.

"This is a tremendous result which confirms the University's world-class research standing across a broad range of areas.

"These results are a cause for celebration right across the University community and a tribute to the work of both academic and professional staff."

Food crisis research boost

Plant scientists at the Research School of Biology have been awarded up to \$7 million by the Bill & Melinda Gates Foundation.

The grant will fund a five-year project led by the University of Illinois to enhance photosynthetic efficiency in crop plants to tackle the looming global food crisis.

New Drill Hall Director

Terence Maloon, former Senior Curator of Special Exhibitions at the Art Gallery of New South Wales, has been named as the new Director of the Drill Hall Gallery and ANU Art Collection.



Vice-Chancellor Professor Ian Young said that Mr Maloon was an ideal fit for ANU.

"Mr Maloon was the senior art critic for the *Sydney Morning Herald* during 1980-1982. Throughout this period he was intensely involved in creating and researching historical exhibitions for the Art Gallery of New South Wales, enabling Australian art to be seen in an international context," he said.

"Mr Maloon has a proven record of motivating collaborators and getting results and I welcome him to ANU."

Alumni Awards launched

A new annual awards program will recognise and celebrate alumni achievements. The ANU Alumni Awards will recognise the outstanding and diverse range of ANU graduates and culminate in a gala dinner in March 2013.

The ANU Alumni Awards fall into four categories: Alumni of the Year, International Alumni of the Year, Young Alumni of the Year and Student of the Year.

For more information visit <https://alumniandfriends.anu.edu.au>

life sentences

The Australian Dictionary of Biography is edited by staff at the National Centre of Biography at ANU. Research Fellow **SAMUEL FURPHY** explores Canberra's early history.

Canberra's centenary celebrations will mark the day when Governor-General Thomas Denman (1874–1954) laid the foundation stone for the new capital. As *Australian Dictionary of Biography (ADB)* author Chris Cunneen explains, Denman was, however, somewhat upstaged on the day by his wife Gertrude: 'tall, slim with an aquiline nose and red hair, wearing an extravagantly feathered hat, [she] outshone her husband, his own plumes notwithstanding'.

Another significant figure at the moment of Canberra's birth was Walter Burley Griffin (1876–1937), the Chicago-based architect who had won an international competition to design the new capital. Griffin receives a longer-than-normal entry in the *ADB*, part of which is devoted to his wife and collaborator, Marion Lucy née Mahony (1871–1961). While the most well-known, the Griffins and Denmans are not the only noteworthy figures in the capital's early history.

The surveyor Charles Robert Scrivener (1855–1923)

became a rival to the American architect: 'He could never appreciate Griffin's intentions, in particular his geometric symbolism'. Scrivener was the main author of the 1912 'departmental plan' for Canberra, a cheaper and technically simpler alternative to Griffin's bold design. His most lasting legacy was a simplified plan for Griffin's lake system. When it was finally realised in the 1960s, the lake was named after Griffin, but a dam named for Scrivener impounds the water.

Another influential departmental figure was civil engineer Percy Thomas Owen (1864–1936), who had worked with Scrivener investigating possible sites for the capital. He, too, was caught up in the controversy surrounding Griffin's plan, elements of which he considered 'extravagant or unsound from an engineering viewpoint'. Owen was later a member of the Federal Capital Advisory Committee and supervised the construction of Parliament House.

Owen's secretary, Charles Studdy Daley (1887–



The Denmans, King O'Malley and Andrew Fisher at the Naming of Canberra ceremony. PHOTO BY WILLIAM MILDENHALL, NLA11030057-215

1966), initially shared his colleagues' suspicion of Griffin, but 'in later years became its principal protector'.

Others rose to prominence due to the chance occurrence of an association with Canberra in its formative years, such as Patrick Maurice Haydon (1890–1949), a Catholic priest at Queanbeyan from late 1912. As Canberra began to grow, Haydon acquired a motorbike, which he used to visit work depots, celebrating Mass under canvas at the Cotter River and in temporary huts at Westridge (Yarralumla) and Molonglo (Fyshwick).

These are just some of the lives associated with Canberra that are documented in the *Australian Dictionary of Biography*. ■

Find out more at adb.anu.edu.au



Dr Ajay Limaye. PHOTO BY BELINDA PRATTEN.

word watch

The Australian National Dictionary Centre is a joint venture between Oxford University Press and ANU. Director **AMANDA LAUGESSEN** delves into the Canberra vocabulary.

It is perhaps only appropriate that I use the first Word Watch column of 2013 to celebrate the Centenary of Canberra by taking a look at some words that are associated with our *bush capital*. Some of these words are Canberra inventions – familiar to those of us who have lived here for some time, but less familiar to the outsider; some terms are not uniquely Canberran but are closely associated with Canberra in the Australian imagination.

Canberra as the nation's capital and seat of Federal Government and the Australian Public Service has generated a number of terms with which the city is associated. Although not originally or exclusively Canberra words, Canberra is surely identified with *public servants* and *pollies*. *Public servant* had its origins in the convict era in Australia to refer to prisoners of the Crown; another popular Australianism for a *public servant* is a *shiny bum* – while a *shiny bum* in a higher pay bracket is a *fat*

cat. Canberra has created its own unique term for a public servant: *pube*.

Pollies have also contributed many terms to Australian English – from Menzies' *forgotten people* to Howard's *battlers* – but they are perhaps most responsible for Canberra coming to be equated with 'Federal Government' – an association Canberrans are not always happy about – and the subsequent *Canberra bashing*.

One of the best-known words of local invention is *govie* (or *guvvie*) for a house that was originally built by and owned by government; such houses are now often referred to as *ex-govies*, because they have been sold into the private market. In the past, *ex-govies* were often cheaper and smaller than other houses, and usually bought for the purposes of renovation and extension – they are now highly desirable properties.

Two unique Canberra words for phenomena found elsewhere are *booner* and *Civic*. *Booner* is a local term for a *bogan* or *Westie* – 'a person regarded



as being uncultured and unsophisticated'. *Civic* refers to the central business and shopping district, which in other parts of Australia is more likely to be referred to as 'the city'. ■

Do you know any Canberra words? Use the Australian National Dictionary Centre's Word Box: <http://andc.anu.edu.au/webform/word-box> to let us know about them. We will also be blogging about Canberra words throughout 2013 at <http://ozwords.org>

What lies beneath

We can now explore the mysterious insides of ancient fossils and the human body without leaving a mark, thanks to software developed at ANU, writes **LUCY GUEST**.

In a dark room flooded with black water in Tasmania's Museum of Old and New Art stands a central dais with two cabinets that glow from within. On the left lies the mummy of Pausiris, dating to 100BC. On the right, an animation peels away the casket and wrappings, revealing the skeleton of the man who lies within.

Thirteen hundred kilometres away at the Canberra Museum and Gallery, 500-million-year-old fossils are on display. Exact replicas of these fossils are standing by to be handled, scrutinised, and even sawn in half to reveal the complex internal structures.

The opportunity to explore in detail what was previously a mystery is made possible by software developed in Vizlab – part of the National Computational Infrastructure at the ANU Supercomputing Facility – by mathematician-turned-software programmer Dr Ajay Limaye.

Ten years ago, ANU developed a micro-CT scanner for specimens such as bone, rock, insects – anything that could fit. The only limitation was that a software package capable of processing the large amount of data the machine produced didn't exist.

In response, Limaye started to write his software, *Drishti* – a word meaning vision or insight in Sanskrit. The revolutionary tool is now being used in fields as diverse as oil and gas exploration, dentistry, art and palaeobiology.

"The software allows us to digitally remove the skin from an animal, and then colour each bodily system separately to clearly distinguish, for example, muscle from bone," says Limaye. "After scanning artifacts that are millions of years old, we can intricately explore the internal components without damaging the original sample."

The images can be created in real-time, meaning medical conditions can be diagnosed without the need for invasive surgery, geologists can map the internal structure of stone to identify if oil is present, and entomologists can get up close to some of the world's smallest insects.

Pairing *Drishti* with a 3D printer takes things to the next level, making it possible for the digital images to become tangible physical objects, says Limaye. "Ancient fossils can be colour printed and handled without fear of damage. We scanned the skull of

“Ancient fossils can be colour printed and handled without fear of damage.”

a nine-year-old child and printed the image from the software. Not only were the external features an exact replica, but the internal structures also printed, revealing teeth that were yet to break through gum, the makeup of sinuses, and the fusion lines on the internal walls of the skull." Limaye has made sure *Drishti* users don't need to learn complex calculations, making it available to research institutions and museums around the world.

Be it an eerie museum exhibition or diagnosis in the dentist's chair, *Drishti* has revealed that there's always more than meets the eye. ■

Blood and ink

A collection of artworks has been donated to ANU to ensure the world never forgets the horrors of the Khmer Rouge regime, writes **GEORGIA NIELSEN**.

Cambodian-born artist Bun Heang Ung's work is a perfect example of the saying 'a picture is worth a thousand words'. Not being able to speak the language of his adopted home, Ung used his artistic talent to give voice to some of the worst atrocities committed against humanity. With delicate strokes of Indian ink, Ung poured his haunting memories of life under the notorious Khmer Rouge regime onto paper for all to see and remember. Now, thanks to the generosity of Ung and other donors, these important sketches will be preserved at ANU, permanently documenting one of the most devastating periods of recent history.

Arriving in Australia in 1980 as a refugee who could not speak English, Ung had a heavy burden to fulfil: a promise made to his wife and family to document the experiences and nightmares they had witnessed and endured. Each night for two years he drew, telling Cambodia's story in a

way that he did not have words to describe.

At first glance Ung's drawings seem to be fairly innocuous black-and-white cartoons composed with meticulous detail. But when you look closer, the reality of what has been drawn sets in. Most striking is the suffering etched into his subjects' faces. Each of his 90 drawings has its own story, but the common thread is the overwhelming humanity captured in his images – masses of people, brutally suffering together.

In drawing number 75 you see men crouching on the floor, their heads hanging low as they await execution. Number 80 depicts a mass of people being forcibly evacuated from their homes. The people look calm and resigned as they march away, creating a chilling contrast to the frantic scene depicted behind them; as the crowd leaves, desperate escapees are shot in the back by soldiers.

Each of Ung's 90 drawings took a painstaking 12 hours to complete.

"Every night I drew I got a nightmare," he says. "After that I felt so good because it was like therapy for me. I finally could let it all out."

And while Ung drew from his own memories, he says he also borrowed some from his wife Phiny, friends and family.

"I combined all sorts of experiences in the same place but for different people; I tell a lot of their stories in my drawings. I'm the one that captured them, that's all. I spoke on behalf of the Cambodian people, to make sure that what happened to them throughout the Khmer Rouge period is never forgotten."

The Khmer Rouge ruled Cambodia from 1975 to 1979. Under the leadership of Pol Pot, the regime sought to establish a classless communist state, abolishing money, private property, free markets, religious practices, schooling, foreign clothing styles and traditional culture. Public schools, mosques, churches, universities, shops and government

buildings were shut or turned into prisons, stables and re-education camps.

At the beginning of their reign, the Khmer Rouge arrested and killed thousands of members of the previous government. In the years following, hundreds of thousands of intellectuals, professionals, members of minorities and ordinary citizens were also killed in a systematic campaign to eliminate those who were deemed unable to conform. While figures on the number of people who died during the Khmer Rouge's rule are disputed, most estimates say between 1.4 million



Bun Heang Ung with his drawings. PHOTO BY ADAM DA CRUZ.

“Every night I drew I got a nightmare.”

and 2.2 million lives were lost. Whole generations were eradicated.

Ung and Phiny are some of the only survivors of their age from Cambodia. The story of their survival is a remarkable one which hinges on Ung's ability to draw. Ung was born into a prosperous middle-class family. From a young age, despite his family's

disapproval, he wanted to become an artist.

"When I started fine arts, my uncles blamed my father for allowing it. They said I should follow a proper career. But when Pol Pot came, they were always being chased by the Khmer Rouge; their lives were always under threat. I'm sure that if I had become

a doctor or an engineer, as they wanted, that I would never have survived.”

Ung's ability to draw was his salvation, but it soon turned into his potential undoing. In 1979, he found himself working for the new Vietnamese-controlled government. Ung had been given the task of drawing cartoons for animated propaganda films that heralded the kindness of a Vietnam that had 'liberated' Cambodia from the Khmer Rouge. Before Pol Pot's victory in 1975, Ung had worked for five years as a political cartoonist for a leading independent Phnom Penh newspaper and had developed a

habit, born from a cartoonist's nature to humorously exaggerate, of drawing Vietnamese with oversized front teeth. Unfortunately, Ung was unable to suppress this tendency when drawing for the propaganda films and was accused of deliberately poking fun at Cambodia's new leaders. The charges against him were serious; imprisonment and deportation to a re-education camp seemed inevitable.

But the skill that had put him in danger would again come to his aid. Ung used his drawing ability to forge official travel papers that enabled him and his family to travel freely into the countryside where they could escape into neighbouring

“ I’m sure that if I had become a doctor or an engineer, as they wanted, that I would never have survived. ”



Thailand. After six months in a Thai refugee camp, he travelled with Phiny, who was six months pregnant, and their 10-month-old daughter, Chan Kreusna, to Australia.

Now, over 20 years later, Ung has donated 88 of his drawings to the University’s rare books and manuscripts special collection in the Menzies Asia Pacific Library. His gift to ANU is a valued addition to the University’s existing resources and will be available to local and international scholars and researchers. In support of Ung’s gift to the University, two other generous donors came forward to contribute to the safekeeping of the collection.

“Knowing that I would not be able to redo them, I held them very dear to me, but I consider that they belong to mankind, not for my private possession, and so I wanted to find them a safe and permanent home,” explains Ung.

“In making this gift, my wife and I feel that we have fulfilled our duty to bear witness to the catastrophic history of the Khmer Rouge.”

Ung also points out why he has

gifted his drawings to a university in Australia, rather than taking them home to his people.

“They [Cambodia] say they are a democratic country, but they are not a democracy. You look at them, the Prime Minister and the people high up in the country, are all Khmer Rouge. The Cambodian Government has blocked my website so that no one can see my drawings. My drawings would not be safe in Cambodia. They must stay here. In a country which is truly free. I can say that because I know what it is like to not have freedom.

“By gifting this art to ANU, I am so happy. My dream came true – to share these drawings with mankind around the world to let them know how sad the experience in Cambodia was. I don’t ever want people to have to endure that suffering again. That’s why I drew these pictures and that is why I have donated them to the University.”

As time passes and memories fade, Ung’s drawings will ensure that the atrocities of the Khmer Rouge are never forgotten. ■



Venomous bytes

Could something lethal help make us stronger? **CASEY HAMILTON** reports.

Venomous creatures have somewhat of a PR problem. Staring down at a scorpion, pincers raised and tail poised for attack, would strike fear in the hearts of many. But what if the venomous telson at the end of its tail held the cure to crippling diseases?

Deep in the corridors of the Research School of Biology, sandwiched between experimental laboratories, Professor Shin-Ho Chung and his team are using terabytes rather than test tubes to figure out the ins and outs of cell biology, including whether venom can be used for good.

The group is using the National Computer Infrastructure’s new supercomputer to understand biological ion channels – intelligent molecular gatekeepers that confine some molecules inside cells while allowing others to flow out.

“It is only in the past several years that we are beginning to understand how the gate opens and closes and the way atoms navigate across when the gate is open,” explains Chung.

When these channels malfunction, they give rise to neurological, muscular and autoimmune diseases. In a case of foe becoming friend, the team is looking to venomous animals for answers. Scorpions, spiders, snakes and worm-hunting cone

snails produce a vast array of toxins in their venom which target certain types of channels to quickly paralyse prey.

Dr Rong Chen, who joined Chung’s group last year, has been investigating the way these toxins interact with channels and plans to modify the toxins’ structure to block a specific channel type.

“There is a genuine possibility we will find compounds, specifically targeted for certain ion channels, that can cure several debilitating disorders,” says Chung.

Another group member, Dr Tamsyn Hilder, is focusing on designing nanotubes – tiny synthetic tubes that have the ability to mimic some functions of ion channels. These exquisitely designed hollow pores have broad potential application, from ultra-sensitive biosensors to the treatment of bacterial infections.

“One such prototype nanotube that only lets through positively charged ions, such as potassium and sodium, mimics the function of antibiotic compounds produced by a type of bacteria,” explains Chung.

The team have also succeeded in designing nanotubes that collect the salt from seawater.

“ There is a genuine possibility we will find compounds ... that can cure several debilitating disorders. ”

“These nanotubes may form part of a desalination membrane to more efficiently remove salt from seawater,” says Chung.

“Not all research needs to be experimental. In fact, sometimes using a computational method is the best way – some experiments just aren’t practical. Computational research can be more cost effective, faster and can reduce animal testing. We are solving real world problems virtually.”

The drugs and technology created by the team may one day take the sting out of the scorpion’s reputation. ■

Bright star

Discoverer of dark matter and winner of the 2012 Prime Minister's Prize for Science, Professor Ken Freeman, recalls the past 50 years of his stellar career. By **TEGAN DOLSTRA**.

Professor Ken Freeman, one of Australia's most influential astronomers and recent recipient of the nation's most prestigious science prize, had absolutely no interest in the field when he started out. The world-renowned galaxy-gazer says he "got into it almost by chance".

"There was no special moment the first time I looked through a telescope," he says. "I've never been into that side of astronomy – the thrill of the sky and all that stuff. It's all about the physics for me."

Freeman was completing an undergraduate degree in mathematics in Perth when he spotted a flyer on a noticeboard advertising the Mount Stromlo Observatory student vacation scheme.

"I was really just looking for something I could use my mathematics degree for," he says. "I considered all sorts of things – even actuarial studies! But that flyer caught my attention."

The young Freeman applied for the program and received a very enthusiastic reply from then Director, Bart Bok.

"Everybody in Canberra knew about Bart Bok," recalls Freeman. "He was a real character."

"As a promoter of astronomy he was absolutely unparalleled. He wrote a very enthusiastic letter back to me about all the exciting things they were doing and said that I should come along."

That letter sparked the beginning of a meteoric 50-year career. Freeman attended the vacation program twice and, after completing a PhD at the

University of Cambridge ("Stephen Hawking started in the same department the same year that I did") and a post-doc in Texas, he returned to ANU in 1967 and has been here ever since.

It was in his first few years at ANU that Freeman made the discovery that would see him celebrated by the scientific community, honoured by the Prime Minister and dubbed 'Mr Galaxy' by ANU Nobel Laureate and fellow astronomer Professor Brian Schmidt.

Freeman was calculating the rotation speed of spiral galaxies like our own Milky Way. When he compared the actual rotation speeds with what the maths showed they ought to be, he discovered that the galaxies were spinning much faster than would be predicted on the basis of the mass of the stars inside them. There was some unknown entity, huge and invisible, filling the shadowy spaces between the stars – a whole new type of matter.

"What you see when you look at a spiral galaxy – the typical flat, spinning disc like a Catherine wheel – is only a tiny fraction of its total mass," explains Freeman. "We now know that about 97 per cent of the total mass of these galaxies is invisible dark matter."

"And it turned out around 84 per cent of the matter in the entire Universe is dark matter. At this point we don't know what it is. It's one of the biggest problems in astrophysics today."

Surprisingly, it wasn't the dark matter discovery that got people excited when Freeman published the findings in 1970.

"That paper actually had another discovery in it, which, incidentally, is now called Freeman's Law," he explains. "It was a very unexpected effect – that the brightness of the surface of disc galaxies is always the same, no matter what size they are. I remember the night I discovered that very clearly."

"I used to come back into the office after dinner to work and that night a very famous visitor called Allan Sandage was also working late. I brought the data in to him and I said, 'Hey Allan, I've found something interesting'. And I remember him looking at this stuff and just putting his hands over his face. He couldn't believe it – it was just too much."

"So when we published the paper, there was a lot of interest in this other bit, which Allan had got so excited about, but there was almost no reaction at the time to the dark matter aspect of it. That didn't start rolling until later."

Although the existence of dark matter is now taken

dark matter existed went on for about a decade, but it was really just because of the data quality."

In his 45 years at Mount Stromlo, part of the ANU College of Physical and Mathematical Sciences, Freeman has witnessed many changes; he's seen many directors come and go since the charismatic Bart Bok and turned down more job offers than he can remember. But the most devastating event was the bushfire of 2003, in which Freeman and his wife, along with 500 others, lost their family home. While Freeman's office of more than 30 years survived mostly intact ("a huge fireball roared over the building and cracked the windows and shrivelled the curtains, but only a few papers on my desk were singed"), most of the other buildings and all the telescopes were destroyed.

"We had the fire on Saturday, and by Monday our computer guys had us all set up in little cubicles on the Acton campus," Freeman recalls. "Meanwhile Facilities and Services got the windows reglazed

“The argument about whether or not dark matter existed went on for about a decade.”

as reality, the idea was initially met with scepticism, even by Freeman himself. When asked if he was convinced by his original finding, he replies: "Oh, absolutely not! The data was really crummy. The equipment back then was nothing like what we have now."

"Until we got these radiotelescopes that could do very detailed work, the subject of dark matter was very uncertain. The argument about whether or not

Professor Ken Freeman. PHOTO BY BELINDA PRATTEN.

and the water and electricity back on, and in three weeks we were back on Mount Stromlo. It was an amazing and fantastic effort by the staff, and we are immensely grateful for what they were able to do for us."

One thing has stayed constant during Freeman's time at Stromlo: the vacation program he first attended in 1959 is still running. Freeman is himself an enthusiastic and committed supervisor and has guided more than 50 PhD students in their own journeys of discovery.

And there are plenty of discoveries to come. At 72 and with no plans to retire, Freeman is eager to get started on the latest project in his stellar career: analysing the chemistry of one million star 'fossils' to trace the assembly history of our galaxy over its ten-billion-year existence. Not bad for a man who happened upon astronomy by chance. ■

Video: Ken Freeman talks about his work http://bit.ly/rep_Freeman



The butterfly effect

The largest gift ever given to an Australian university for the benefit of students will go much further than transforming students' lives, writes **GEORGIA NIELSEN**.

In chaos theory, the term 'butterfly effect' means that a small change in one place can result in large differences to a later state. In making the largest donation ever from Australians to an Australian university, Graham and Louise Tuckwell have put this theory into effect. While their gift is in no way small, it will result in large and widespread changes in the future.

The gift, given through the Graham & Louise Tuckwell Foundation, will fund the newly established Tuckwell Scholarship program, the most transformational undergraduate scholarship in Australia. Every year, 25 new Scholars will be awarded \$20,000 per annum for the length of their degree to support a community-based residential experience at ANU.

With a strong focus on giving back to Australia, the program is as unique as the gift. It is the only one of its kind to nurture students to fulfil their broader community ambitions over and above the pursuit of a university degree.

The Scholarship, open to students Australia-wide, is also unique in that it allows recipients to study a single or double undergraduate program, including honours and vertical degrees (degrees that combine undergraduate and graduate study in a reduced time-frame) in any discipline. With such broad offerings, the Tuckwells hope to attract a talented and diverse group of students who will go on to

“Both my wife and I benefited enormously from our educational experiences. We just went to normal state schools, but our university experiences were life-transforming.”

contribute to many different areas of Australian society.

The Tuckwell's vision for the program was born of a desire to give young Australians the same opportunities and experiences that they had as students, says Graham.

“Both my wife and I benefited enormously from our educational experiences. We just went to normal state schools, but our university experiences were life-transforming. We would like to give that opportunity to other young Australians who we feel can use their education to transform not only their lives, but also the lives of others,” he says.

When Vice-Chancellor Professor Ian Young first heard about Graham and Louise's vision, he was immediately struck by the scale of it.

“I was enormously impressed by their vision and the exciting possibilities that it provided for the University, the nation and our students,” he says. “I was delighted and surprised at the magnitude of the gift, but also at the fact that they wanted to ensure it had longevity to it.”

With 25 Scholarships awarded every year beginning in 2014, a community of Tuckwell Scholars will quickly emerge. The Tuckwells hope the group will create a bond that outlasts the Scholars' time on campus.

“Over time there will be an increasing number of graduates and hence alumni and an ever-expanding body of people who have benefited from the program and continue to benefit the program,” says Graham.

In forming this group Graham hopes to achieve what he terms a 'balanced class' – ensuring that the impact of the program reaches far and wide into different disciplines, industries and corners of society.

“The Scholars will be from a broad range of backgrounds and interests and they will be developing these interests in different ways; some may be undertaking academic medical research, or working in finance or on social outcomes, all

Graham Tuckwell. PHOTO BY BELINDA PRATTEN

Terms & Conditions

Information on how to enter, and the prize, form part of the conditions of entry. Entry into the promotion is deemed acceptance of these conditions of entry. (ACT TP 13/00343)

- The promoter of this competition is The Australian National University (ANU), ABN 52234063906.
- Entry is open to anyone.
- To enter the promotion, participants must complete their entry and return it to ANU via mail (to Level 1, Chancery Building, East Road, ANU, Acton, ACT, 0200); email (to reporter@anu.edu.au); fax (02 6125 8255); or online at http://bit.ly/ANU_survey.
- The prize draw starts at midnight 18 February 2013 and closes at midnight 9 April 2013.
- Only one entry per person is permitted.
- The promoter shall determine the winner of the promotion.
- The draw will take place at Level 1, Chancery Building, East Road, ANU, at midday 12 April 2013.
- The prize is a gift voucher from the ANU Shop valued at \$200.00. If the prize is unavailable, for whatever reason, the promoter reserves the right to substitute the prize for a prize of equal or greater value.
- The winner of the prize shall be notified in writing advising that they have won and how to collect their prize. Subject to the approval from the appropriate state and territory regulatory authorities.
- Should the prize remain unclaimed for a period of three months, a redraw shall be conducted in the same manner as the original draw on 15 July 2013. Subject to the approval from the appropriate state and territory regulatory authorities.
- The promoter reserves the right to remove any

entry or entries by any individual who the promoter has reason to believe has breached any of these conditions, or engaged in any unlawful or other improper misconduct calculated to jeopardise the fair and proper conduct of the promotion.

- All entries become the property of ANU. All entries may be entered into databases and ANU may use the entrant's names, addresses, telephone numbers and mail addresses for future promotional, marketing, recruitment and publicity purposes in any media worldwide without notice. By entering the promotion, entrants confirm that they allow their details to be used for this purpose. If entrants do not consent to their details being used for future marketing purposes, the entrant should notify the promoter in writing.

Fold along this line

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0200

Use sticky-tape
to seal this edge

Cut along this line



Chemistry student Craig Stewart shows Graham Tuckwell how to make ice-cream, with (L-R) Professors Andrew Roberts, Ian Young and Ian Chubb, and Dr Vince FitzGerald. PHOTO BY BELINDA PRATTEN.

Australia at a single university, which enables them to interact with each other – and that university is Australia's best university, ANU. I can tell you it's the best university because I benefited enormously from the springboard of opportunities that it gave me in life," he says.

"I have certainly found that in interviewing for jobs, a degree from ANU is a passport for success. I have been interviewed in New York and London and certainly the ANU degree was looked at as top quality as compared to Oxford, Cambridge, Princeton, Yale, Harvard, etc. They just looked at it and said, 'this is Australia's best university unquestionably, you went to a top school, you're in'."

With the highest percentage of students living in residence on campus in Australia, ANU is well-placed to deliver the interconnected learning experience that sits at the heart of the Tuckwell vision, says Professor Young.

"Through our unique residential experience and through the quality of education we provide, we deliver a full, rounded education that enables students to do a whole host of extra-curricular activities as well as their academic activities. This mix enables us to deliver the sort of education that Graham and Louise envisage," explains Professor Young.

He adds that the impact of the Tuckwell gift will reach much further than their vision.

“The Tuckwell Scholarship is a powerful demonstration of transformative philanthropy.”

"Philanthropy in the Australian university sector is at a much lower level than you would find, for example, in the United States. One of the important results of the Tuckwell donation will be to set an example of what people who have succeeded in business or other activities can do.

"I am hopeful that this gift will act as a catalyst for other philanthropists to make similar donations to Australian universities. It will begin a conversation, I think, about the magnitude of these types of contributions and the transformative nature they can have, not only on universities, but society more broadly."

Dr Colin Taylor, Director of Alumni Relations & Philanthropy at ANU echoes Professor Young's sentiment for the future of philanthropy in Australia.

"The Tuckwell Scholarship is a powerful demonstration of transformative philanthropy.

Building on a long history of giving by our alumni and friends, the Tuckwell gift marks a new chapter in the story of philanthropy at ANU. That their vision so clearly encompasses the idea of 'giving back' inspires us all and will help to build a generation of future philanthropists, who will give back in ways significant to them, for the benefit of Australia and the world."

Professor Young commends the Tuckwells for looking to the future to ensure their generosity has longevity.

"I think by investing in scholarships, what the Tuckwells have been able to do is ensure that there's longevity to the impact this has, and they very much see that by developing young people, those young people will be able to contribute to society in the future. The Tuckwells have been extremely generous, not only with their donation, but with their gift of time, thought and knowledge to developing such an outstanding and unique program. For that I, on behalf of the University, am truly grateful," he says.

With a strong vision propelling it, the impact of the Tuckwells' gift is sure to reverberate far and wide: there is no doubt of the potential for a Tuckwell Scholar to go on to become Australia's next Prime Minister, Nobel Laureate or butterfly effect expert. ■

Video: Learn more about the Tuckwell Scholarships http://bit.ly/rep_tuckwell

The first scholars

Local historian **SUSAN-MARY WITHYCOMBE** traces the early history of ANU and the contribution of the University's first scholars to a budding bush capital.

Canberra possesses more intellect to the square mile than any other Australian city' declared writer George Farwell in 1952 when The Australian National University was only an infant. Brain-child of the Chifley government, ANU had been established six years earlier as a new kind of university: not primarily a provider of tertiary education to undergraduates from the local area, but one recruiting its scholars from the whole world and dedicated to research. The first National Librarian, Harold White, described it as 'a bold experiment' – like Canberra itself, which this year celebrates its centenary.

In the 1950s, the Canberra population was small – still under 50,000 by 1960, but about to grow rapidly – and the influx of scholars to the ANU made a significant contribution to that growth. They came at an exciting stage in Canberra's development, when the city was at last becoming the capital of Australia in fact as well as in name. Most of them were young, with a distinguished career ahead of them; many of their accompanying spouses were also graduates, and pursued their chosen professions in Canberra, making their own contributions to the development of this remarkable city.

The new recruits also created more work for the building industry in

a city but under construction and very much under-supplied with infrastructure. But while they needed buildings, libraries, laboratories and equipment for their academic work, above all they needed the stimulus of interaction with one another.

Until they could find accommodation of their own, many scholars with their families lived at University House. One of the first permanent buildings constructed on the campus, this was built on the model of an Oxbridge College, offering residents a set of private rooms with some shared facilities, and a common room, library, meeting rooms, and a dining hall that supplied meals. It was, however, also recognisable to Canberra residents as

“ There must be few people living in Canberra who do not have some connection with the national University. ”

an up-market version of the numerous hostels that had accommodated newcomers to the city from its earliest construction phase. Like the hostels,

University House provided company, entertainment and the opportunity for making friends. When they moved into new homes in Canberra's developing suburbs, many maintained these friendships, as well as their membership of University House as a place for meeting friends and colleagues for that informal exchange of ideas and interaction of minds that stimulates scholarly activity as it builds a community.

Some members were better behaved than others. *The Making of the Australian National University* by Foster and Varghese records a particularly unruly occasion:

In February 1957, when a group of Anglican bishops was in residence for a conference, several students returned late one night from a party in a nearby suburb and continued their drunken revels in one of their rooms...The debauching culminated when one of the revellers stripped naked [and] jumped into the ornamental lily pond...with [future Prime Minister Bob] Hawke and

others offering loud and ribald encouragement.

Hawke was fined £15 and banned from University House for foul language and later abandoned his PhD studies.

As well as fun and 'endless dinner parties', early ANU academics and their spouses loved and wanted art and literature, theatre and music. Many set about supplying themselves the deficiencies of 1950s Canberra in these areas. As libraries, galleries, museums, concert halls and theatres were established, grew and thrived, the University supplied graduates to staff and develop them.

As Farwell perceived in 1952:

The new university is attracting some of the best minds from European countries; much scientific research is going on; government departments have called for the services of economists, agronomists and scholars, while the less material arts are growing in support, notably music and the theatre. It is not

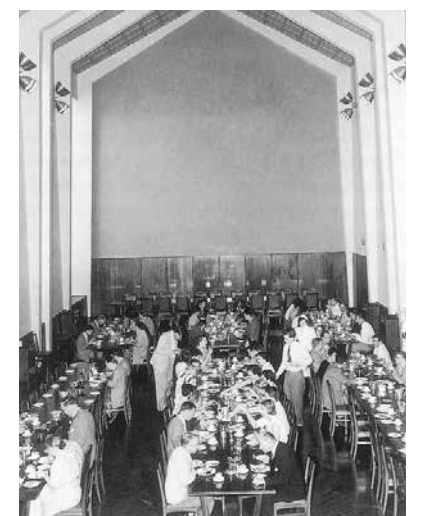
inconceivable that Canberra may one day become the intellectual capital, too.

Sixty years later, one can argue that it has indeed become so. Today some 27,000 ANU alumni are based in Canberra – more than one in 20 of the city's residents. With a higher proportion of graduates than any other Australian city, many are actively engaged in public affairs and community issues, or commenting on them in the local press; Canberra has an expert for every occasion.

ANU is also a major employer, not only of academics but of professional staff, maintenance workers, technicians, cleaners, gardeners, cooks and waiters, not to mention numerous construction workers – for the University is always building something. There must be few people living in Canberra who do not have some connection with the national University. And I'm sure all will acknowledge the contribution of ANU to our national capital as it celebrates its centennial year. ■



Oliphant, Hancock and Florey inspecting the ANU site, 1950.



Far left, Frank Fenner inoculates eggs with myxoma virus, c 1958.

Far right, a scholar's study bedroom, and above, the Dining Hall, in University House.

PHOTOS FROM 'THE MAKING OF THE ANU'.

From paddock to politics

The ANU Heritage Office has developed a suite of tours to celebrate the University's remarkable place in the Canberra landscape, writes **TEGAN DOLSTRA**.

It's hard to imagine that just over 65 years ago ANU consisted of a couple of old buildings in a very large paddock. Australia's national university has come a long way since then: it now boasts close to 150 buildings – and each has its own story to tell.

Amy Guthrie, ANU Sustainability Officer – Heritage, has been compiling the fascinating history of the University's heritage-listed buildings and surrounds for four new ANU Heritage Tours to mark the Centenary of Canberra celebrations.

"We wanted to celebrate the significant role ANU has played in Canberra's development and honour the many people who have studied and worked here, the significant events in our history and the places where it all happened," says Guthrie.

"They will be run as guided tours throughout March to complement the Centenary. They will also be offered in a self-guided format, with online brochures providing all the information about the highlighted sites and why they are significant, along with photographs to show how the sites have changed over the last 100 years."



Old Canberra House c 1930s. ACT HERITAGE LIBRARY.

The tours have been designed to cover a wide range of themes, buildings and landscapes. The Acton Conservation Area tour showcases some of Canberra's earliest buildings, such as Old Canberra House, which was built in 1913, and the remaining buildings of the Canberra Community Hospital.

"When the Hospital first opened in 1914 it was extremely basic, housed in timber and corrugated iron

buildings with canvas tents attached for additional accommodation and originally operating without running water," says Guthrie. "The Hospital was also under huge demand from the growing population and often operated way over capacity – sometimes with more than 150 people vying for just 90 beds."

The Landscapes of ANU tour will attract nature-lovers and culturists as it meanders past features such

as Sullivans Creek, avenues and significant trees, some of which have surprising origins.

"ANU is a stunning campus with a huge variety of plants and wildlife," says Guthrie. "On a sunny afternoon, University Avenue is full of people playing frisbee or sitting in the shade of the gorgeous old trees. But not many people would know that the paved footpaths lining the Avenue were laid in the lead-up to a visit from Queen Elizabeth II, when it was agreed that Her Majesty could not be expected to walk on the grass."

Another tour with a wealth of hidden gems and stories is the Architecture tour.

"ANU is a veritable smorgasbord of architectural styles, from the first-ever two-storey building in Canberra to a very modern building with a vibration-proof laboratory, to the RG Menzies Library, which celebrates its 50-year anniversary next month," says Guthrie.

"There are also many interesting stories, such as the bickering surrounding the construction of the first John Curtin School of Medical Research, which caused the University Architect's untimely resignation and



Queen Elizabeth II opens the RG Menzies Library in 1963. ANU ARCHIVES.

“ANU is a veritable smorgasbord of architectural styles.”

Sir Howard Florey to state that he would not 'be pushed around by an architect for architectural reasons'."

Finally, no tour in Canberra would be complete without some political intrigue. The fourth tour highlights the University's political connections, ranging from its establishment in 1946 to the antics of notorious student protestors.

"Being so close to the centre of Government, ANU has naturally played a big part in politics," says Guthrie. "A number of our alumni

went on to become politicians, such as Bob Hawke, Kevin Rudd and Peter Garrett, so there are many stories to tell."

Guthrie and her team have created a treasure map for people of all ages and interests with which to explore the unique heritage of ANU. It's a rich and impressive history for an institution that began life as just a paddock and a good idea. ■

To find out more about the new ANU Heritage Tours visit <http://heritage.anu.edu.au>

Upcoming events

Conference: Weaving the nation's story
National Museum of Australia
28 February – 3 March
www.sellingyarns.com

Menzies Library: 50 Years
RG Menzies Library, ANU
13 March
<http://anu.lib.anu.edu.au>

Thinking Space: Discover ANU at night
Main ANU campus
13 – 27 March
<http://anuthinkingspace.com/>

Mount Stromlo Observatory
Site tours
19 March, 13 April, 11 May
Star-gazing nights
22 March, 19 April, 17 May
Music under the stars: Canberra Youth Orchestra in the dome
6 April
<http://rsaa.anu.edu.au>

Drill Hall Gallery
John Young: *The Bridge and the Fruit Tree – A Survey*
14 February – 24 May
Sally Gabori – *Vessel as Metaphor*
28 March – 5 May
www.anu.edu.au/mac/content/dhg/

Into the light

Dr Anne Gallagher has worked tirelessly to bring the plight of modern-day slaves to the international agenda, writes **LISA VISENTIN**.

Until very recently, the widespread exploitation and trade in people, more commonly known as human trafficking, existed only at the very periphery of international human rights issues. Conceptually, it remained shackled by its entanglement with an antiquated notion of slavery as a practice that had been all but relegated to the dusty pages of history books. But alumna and former faculty member of the ANU College of Law and human rights lawyer Dr

Anne Gallagher has been at the forefront of the campaign to redefine the issue of human trafficking as a modern form of slavery.

"Trafficking isn't just about sexual enslavement of women and girls," says Gallagher. "It encompasses a whole range of contemporary exploitative practices that were previously at the margins of international law and had almost no regulation attached to them."

Gallagher's entrance into the anti-trafficking arena came when she was handpicked to become the first United Nations Special Advisor on Trafficking. In this role, she was highly influential in shaping the first international anti-trafficking laws and policies.

In 2003 she was appointed to lead an AusAid-funded anti-trafficking project in Southeast Asia. Still in operation today, the project has become the largest criminal justice intervention on trafficking in the world – but not without overcoming some major hurdles.

"We've had to face the fact that trafficking continues because the exploitation of human beings for profit is woven into the fabric of the global economy. It serves the interests of many individuals, corporations and even governments," says Gallagher.

“We've had to face the fact that trafficking continues because the exploitation of human beings for profit is woven into the fabric of the global economy.”

"Thankfully, it's no longer possible for countries to say that forced labour or forced marriage or exploitative working conditions are their own concern. For me, that's a huge change and, in human rights terms, the recognition of these practices as issues of international concern changes the rules of the game fundamentally."

Gallagher has recently been honoured with a number of prestigious accolades – a testament to the legacy she has forged. In 2011 she was awarded the inaugural Australian Freedom Award. In June 2012 she was appointed an Officer of the Order of Australia and named one of ten 'Trafficking in Persons Heroes', the highest of honours conferred in this field. The award was bestowed upon her by another hero in the fight against trafficking, US Secretary of State Hilary Clinton. An Australian ceremony to mark the award, presided over by US Ambassador Jeffrey Bleich, was held at ANU in September to coincide with the 150th anniversary of President Lincoln's Emancipation Proclamation.

"Meeting Hilary Clinton was a great honour for me," says Gallagher. "She was really at the beginning of this international exposure of the problem of trafficking and related exploitation."

Another highlight of the ceremony was the opportunity to meet the select few individuals whose passion for the cause mirrors her own, she says.

"These people are truly heroes in the classic sense of the word. They are working with victims of trafficking, exposing horrific abuses and are really putting their lives on the line."

The tireless work of Gallagher and her fellow Heroes has seen human trafficking recognised as an endemic problem; no country is unaffected. By taking the campaign to the frontline, they have given a voice to the thousands of people who would once have slipped between the cracks of international human rights law. ■

Video: Anne Gallagher discusses her work http://bit.ly/rep_gallagher



Dr Anne Gallagher.



Dr Kerry Sargent-Cox. PHOTO BY TEGAN DOLSTRA.

Retirement blues

Dr Kerry Sargent-Cox tells **SIMON COPLAND** why older Australians are still bearing the brunt of the Global Financial Crisis.

The Global Financial Crisis (GFC) sent shock-waves around the world as images of banks shutting down, stock prices plummeting and people being evicted from their homes filled television sets. What didn't get much attention was the longer term health impacts of the global downturn.

Now a long-running ANU health survey has found that older Australians who suffered during the crisis were still feeling low as stocks began to rise.

"Our research has shown that older people had increased depression and anxiety after the period of the GFC compared to before the GFC," says Dr Kerry Sargent-Cox from the Centre for Research on Ageing, Health and Wellbeing, part of the ANU College of Medicine, Biology and Environment.

"The study has three cohorts that we've been following for the past 12 years," explains Sargent-Cox. "When the study started off, they were aged 20-24, 40-44 and 60-64 years. What was fortuitous about this was

that with our older age group we conducted interviews just before the GFC – in 2008 – and then followed up right in the middle of the GFC period across 2009 and 2010, and again when the crisis had slowed down."

Sargent-Cox's research has shown that not only did the older cohort have worse mental health outcomes during the peak of the GFC, but they deteriorated further over the following year.

"We were expecting people to have worse mental health during the peak of the GFC. We actually found the opposite: that it was those that we interviewed in 2010, after the GFC had slowed down, who actually had worse anxiety and depression symptoms overall."

Sargent-Cox explains that people in this age group may have continued to suffer mentally because they were still feeling the effects of the crisis after their younger counterparts had moved on.

"What we think is going on is that at the height of the GFC it was 'normal'

to feel anxious. If it is expected that everyone is feeling bad then this becomes a type of social norm, which can protect us from distress.

"But stepping outside a social norm can provoke anxiety. Therefore, when the GFC was considered over and everybody was getting back to normal – that is, the social norm had reverted to 'all is well' – those that were still feeling an impact may have had those negative effects compounded; it can be worse, because it's no longer 'normal' to be suffering."

Sargent-Cox explains that older Australians may also have continued to feel the effects of the GFC because of the nature of their financial status.

"I suspect one of the reasons for the increase in depression and anxiety in this age group is to do with being around retirement age. Other people who have got a little bit longer in the workforce know they can rebuild after such a crisis. But if you experience a financial crisis around the time you're retiring and you don't have the opportunity to continue

“In the height of the Global Financial Crisis it was 'normal' to feel anxious.”

to keep working, that could impact significantly on your superannuation or savings."

Sargent-Cox says the next stage of the research is underway and will show whether the effect of the GFC on people's mental health is finally wearing off.

"This older group is currently going through the next wave of interviews. What will be really interesting is to see whether they've recovered or if the levels of anxiety and depression symptoms have stayed up. I'm hoping for the former." ■

Devil in the detail

The White Paper on Australia in the Asian Century set out an ambitious plan for this country to make the most of its role within the world's fastest growing region. But is the plan achievable? **MARTYN PEARCE** reports.

How can Australia grasp the opportunities offered by the world's fastest growing economic region?

If the recent *Australia in the Asian Century White Paper* is to be believed, the answer comes in five broad areas: domestic productivity reforms; making Australians more Asia-literate; growing trade; supporting regional security; and building relationships with our Asian neighbours.

The aims may be laudable, but are they achievable? For a number of ANU experts, the plan is big on vision, but small on detail.

Professor Glenn Withers from the ANU College of Asia and the Pacific – an economist and the founding CEO of Universities Australia – put in a submission to the process with the College's Dean, Professor Andrew Macintyre.

"The White Paper is good in the sense that it has vision, and we've been lacking in vision in the recent politics of Australia," says Withers.

"It also puts people and productivity at the core, and we think that's exactly the focus that was needed.

"So in its big picture, it is an excellent White Paper. However, it doesn't colour in the foreground quite as much as one might like for a big picture, and there's a lot of detail that remains to be done. Ultimately, it is big on vision, but small on new initiatives, new activities and any detail as to how to go forward."

That's a sentiment shared by Professor Michael Wesley of the ANU National Security College, an expert in international relations and regional security.

"I was a bit underwhelmed by the White Paper," he says.

"There are a lot of aspirations in it. Many of them are laudable, but there's been little about how we're actually going to get there and very few resources have been committed."

The White Paper places a special emphasis on giving Australians Asian language skills, but even this, says Wesley, presents significant future challenges.

"The level of language teaching that the White Paper aspires to is a very, very difficult target to hit.

"The teaching infrastructure needed is simply not there to be able to deliver that provision of language training and, if it was, it would cost literally billions of dollars," he says.

Greg Lopez is a Malaysian-born PhD candidate in regional trade from the Crawford School of Public Policy at ANU. He says that while there are a number of things that the White Paper gets right, it fails to recognise that Asia's seemingly unstoppable growth might stall.

"I think the White Paper is a statement of intent by the Government which recognises that Australia is part of Asia – that's extremely important. It also got right that it's becoming an increasingly complex environment that Australia is navigating; it recognises the complexity of the region's political, economic, social and environmental issues. But most importantly, it creates a theme for Australians to discuss the country's future.

"But the White Paper is too optimistic about Asia's continued growth, and it didn't properly capture the downside of Asia not doing well. What would



The streets of Shanghai. PHOTO BY TREY RATCLIFF WWW.STUCKINCUSTOMS.COM

Australia do if China went off the rails, or India, or Indonesia?" says Lopez.

For Wesley, an expectation that Asia will continue its rapid economic growth represents both a narrow focus and a big gamble on the region's future.

"It is a very narrowly economic document and it doesn't seem to acknowledge that there are other factors that relate to how Australia fits into the Asian Century that will affect the economics of what's happening. I think it was an opportunity missed.

"It seems to me that the White Paper sees the Asian Century as all upside for Australia. To me, that represents a very big one-way bet."

“It seems to me that the White Paper sees the Asian Century as all upside for Australia. To me, that represents a very big one-way bet.”

But although a lack of detail was highlighted by all three experts as a recurring issue in the White Paper, so too was the broadly positive response the plan is likely to receive in Asia.

"In a lot of countries in the region, I've heard the White Paper has been received with quite a lot of interest," says Wesley. "I think a lot of people see it as a visionary document of Australia committing to be part of this particular part of the world."

"The indications are that the plan has been very well received in Asia," adds Withers.

"Here's a former outpost of Europe that now wants to embrace the region and be part of it, is saying so sensitively and with a clarity about how its present policies contribute to that, and with a hint of how it will contribute in the future through new policies."

In the long run, however, the greatest benefit to Australia and Asia from the White Paper may come in the geo-political equivalent of pester power.

"I think just like we in Australia, many people in our region will be coming back to our Government and saying 'that was a great White Paper. Now, what's happening to its implementation? Where is it going? What have you delivered?'" says Withers.

"I think that will put some really nice pressure – coming not just from the dynamics of Australian politics, but the dynamics of the politics of our region – on the Government of Australia. That's a great thing, because it'll be external pressure, not local parochial politics."

Videos: Michael Wesley and Glenn Withers discuss the Asian Century http://bit.ly/rep_wesley and http://bit.ly/rep_withers



Community clinic

Dr Jason Agostino is bringing smiles to the faces of Aboriginal children in Far North Queensland as he works to close the healthcare gap. By **SIMON COPLAND**.

It's muggy. We've been driving for about 40 minutes, air-con blasting. As we hit the top of the mountain, we decide to get out and have a look at the town below. Nestled on a thin strip of land between the ocean and the mountain we're standing on, it looks like paradise. The houses, which all look the same, are lined up in a couple of perfect rows. This early in the morning, it is quiet, peaceful.

It's late October and I've headed north to visit Dr Jason Agostino, a GP in the Gurriny Yealamucka Health Service in the Yarrabah Aboriginal Community, just south of Cairns.

As we take in the view, Agostino explains some of the major health problems the community is facing.

"The main issue is overcrowding," he says. "On our health checks, we ask if people live with 'too little', 'too many' or 'enough' people. If someone says 'enough', that typically means 8 to 10 people in a three-bedroom household. When you're in close contact with so many people, it makes transmission of infections, especially skin diseases such as scabies, really easy."

We arrive at Agostino's clinic, a welcome respite from the heat outside. It's a modern facility that services the entire town, providing GPs, pediatricians and dentists, as well as a range of community health services, such as the Aboriginal health workers who look after the social and emotional wellbeing of patients.

The walls of Agostino's consulting room are covered with different health posters. One looks like an eye-testing chart, but instead of letters there

are different-sized pictures of animals; it's a sign of Agostino's particular interest in children's health.

As we take a seat, he explains how a Cronulla-raised boy came to be working as a qualified GP in Far North Queensland.

"I guess I probably got interested in medicine from my mum," he says. "She is a nurse who has spent a lot of time in the area of disability. I spent a lot of time in those old group homes that they used to have for disabled kids. Same with my little sister; she's now an occupational therapist. So I guess being around mum and seeing those things she did inspired us to do it."

Agostino was drawn to Cape York by an outreach job for which he travelled to different communities every week to provide pediatric services. After two years on the road, he decided he would like to settle in one community.

"I decided I'd come here to Yarrabah as I really like the idea of being part of a community. In my previous job I'd just see a community for a day at a time on a six-week rotation, whereas here I really feel part of the community. It's taken a while, but I've gotten to know a lot of the people here."

While we speak, Agostino receives a call from Joe, a guidance officer in the local school.

"Joe and I were just talking about ways we can fast-track the eye and ear checks for those children who are falling behind at school," he says. "And that's something that only comes from being here and knowing everyone."

Agostino's connection with the community is obvious as I watch him work. He seems to know everyone who comes in and is friendly with all.

“If you are going to make a difference in a community, you need people that are there for a long time.”

After treating one child whose foot had become infected after he accidentally caught it in a screen door, Agostino turned his focus to the boy's brother. His brother had a foot problem from birth that hadn't been treated yet. Even though he wasn't the one who had come in for treatment, I could see the determination on Agostino's face to find a solution to the problem. He pursued it all day.

While Agostino is obviously a talented and passionate GP, he has also long been interested in public health. When he heard about the Master of Philosophy in Applied Epidemiology (MAE) through the National Centre of Epidemiology and Population Health, part of the ANU College of Medicine, Biology and Environment, he jumped at the opportunity to combine his interests.

"I started doing a public health degree but I didn't quite see it connecting with my everyday practice," he says. "After talking to a few doctors in the region who were graduates of the MAE, I saw how it could provide a really meaningful contribution to my medical career."

Jason Agostino. PHOTOS BY SIMON COPLAND.



The Yarrabah Aboriginal Community, above; Agostino performs an ear check-up, below.

The MAE is based on taking a practical approach to medical research. Students are required to complete a clinical placement as well as conduct relevant research in the field. Agostino says that his research project – looking at birth weight trends – is already revealing some positive outcomes and aiding him in his everyday work.

“If you go back to 1999, approximately 1 in 6 Aboriginal children in the Cape York region were underweight. There are lots of reasons for children being born small. Risk factors include having a high number of children, being a young mum, smoking, alcohol and also mum’s nutritional state. Diabetes can contribute as well. We sort of traditionally think of diabetic mums having big kids, but the opposite can happen as well.”

Agostino’s study looked at the data from 1999 to 2008 and found that these high levels of underweight children dropped dramatically over this period.

“We did an audit of the paper and electronic records from children from nine remote communities around the Cape York region. By the end of the study we found that the number of underweight children got down to less than 1 in 20. That’s a really big change over a short period of time.”

Agostino says three long-term approaches have helped solved this problem.

“The things that I believe contributed to this drop are the new community health initiatives that have been introduced in the region,” he says.

“For example, the amount of primary health care staff has increased over the past few years. Back at the start of the study, a GP would visit three communities in a week with a child health nurse. Now, in each of those communities they would have at least one and maybe two dedicated GPs and child health nurses all the time.

“There have also been three immunisation programs that have been introduced in that time. They will affect how kids grow.

“And finally, my belief is that recent alcohol management plans have probably helped as well. These plans restrict the sale of alcohol in the community. Alcohol consumption is a risk factor for having an underweight baby and when alcohol is around it means there’s less money around to buy food and things like that. Although we can’t show causality, it’s an association that I think’s really important.”

It is understanding the benefits of such community approaches that Agostino believes will help him in his work back here in the clinic.

“Doing the MAE and this research has really given me a different way of looking at things. Definitely the research I’ve done on underweight children affects the way I see children when they come into the clinic.

“To be part of health care in the community, you’ve got to understand it’s not just about what happens in the clinic. I think if you are going to make a difference in a community, you need people that are there for a long time; it takes a long time to



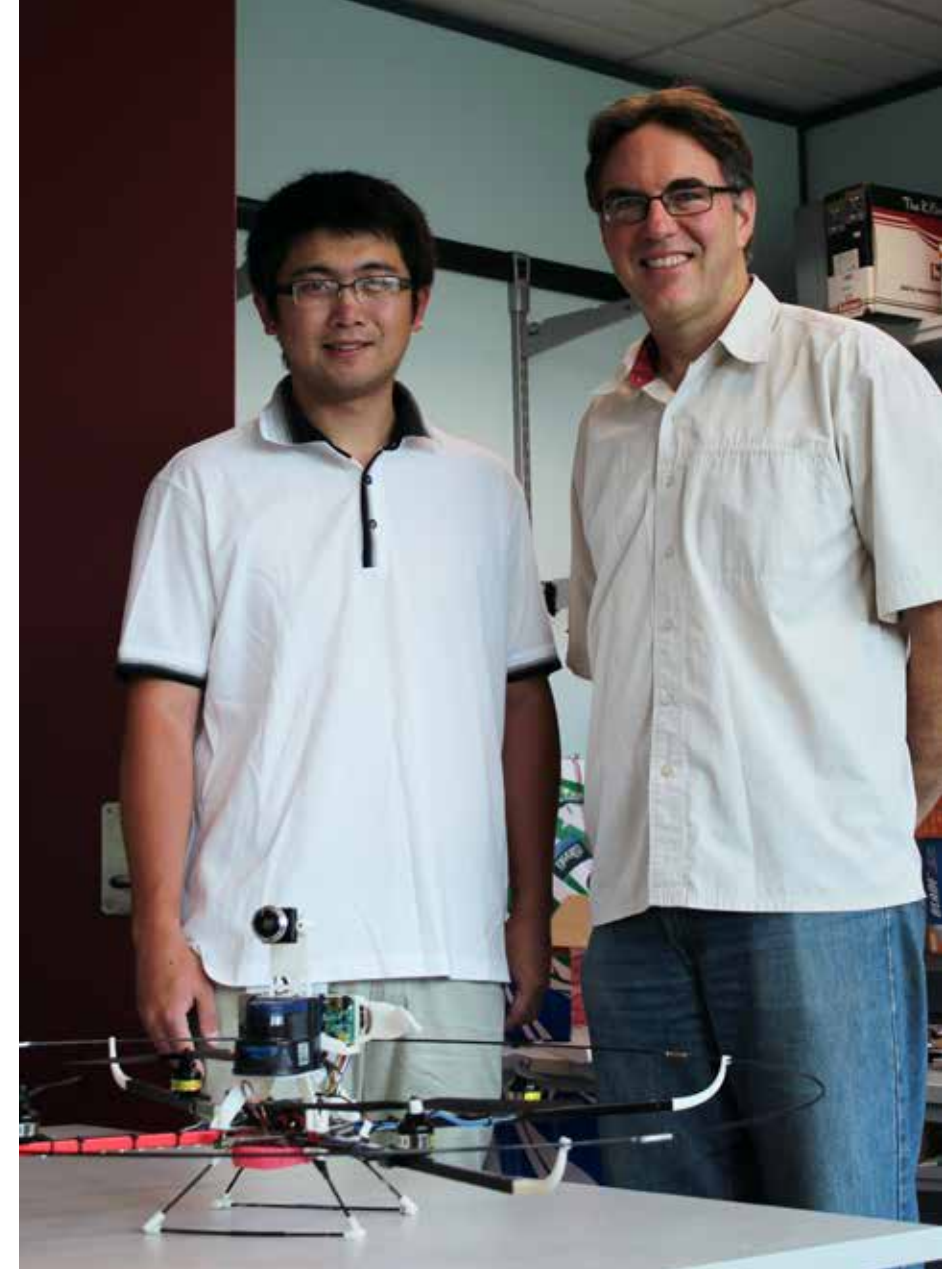
build trust and a long time to change things. That’s why I came here. I want to give to the community as much as I can.”

As we head over the mountains on our way back to Cairns, there is something comforting in knowing that Agostino is going to continue his work. Even though I’ve only been here for a few days I can already see the impact he’s having. ■

Video: Join Jason Agostino in the clinic http://bit.ly/rep_agostino

Flying high

Research at ANU could revolutionise the way we think about aviation and its practical uses, writes **JENNIFER TANNER**.



Xiaolei Hou and Professor Rob Mahony with a UAV. PHOTO BY JENNIFER TANNER.

The flight controls feel smooth in your hands and as you navigate through your surroundings you have to remind yourself that you are not actually in the air. And you don’t have a pilot’s licence.

You’re flying an unmanned aerial vehicle (UAV), a high-tech version of a toy remote-controlled helicopter.

Aerial robotics is a field of research that has Professor Rob Mahony and PhD student Xiaolei Hou, both part of the Computer Vision and Robotics group at the ANU College of Engineering and Computer Sciences, excited about how it can be used in the real world.

“The military have been using UAVs for years, and fire-fighters and the police engage them in search-and-rescue missions,” says Mahony. “But it takes months to train specialist operators on existing systems, whereas future commercial systems will need to work straight out of the box. What we are working on is an interface that allows anyone to walk right up and start flying one of these vehicles.”

This interface involves the user, or ‘pilot’, controlling the vehicle by a joystick system through which they can see and feel the motion of the vehicle and the environmental conditions it is flying through. The complex flight control is taken care of automatically.

The research group is also investigating long-distance operation of aerial robots, when the pilot is located far from where the vehicle is flying.

“Distance itself doesn’t really matter,” explains Mahony. “The real issue is transmitting enough data back and forth to provide the pilot with a good ‘feel’ for the vehicle and its surroundings fast enough so they actually feel like they’re in the vehicle.”

In order to test these issues, Mahony and his team chose to challenge themselves in a big way by taking their research half-way across the world.

“We are currently in collaboration with colleagues from the University

“We are interested in getting vehicles flying amongst trees, inside buildings and through doorways.”

of Twente in the Netherlands,” explains Hou, who spent a week there recently.

“I developed an environment in our lab here at ANU, and we attempted to fly a vehicle through that environment while we were physically in the Netherlands. The results were very exciting,” he says.

Mahony explains that the potential number of applications for these small UAVs is enormous.

“People hear about UAVs but don’t really know of the potential this technology has. We are not just interested in flying a vehicle up in the sky and looking at the ground; we are interested in getting vehicles flying amongst trees, inside buildings and through doorways,” says Mahony.

“I believe that the revolution in aerial robotics lies in its broad applications. For example, in civil infrastructure, things like bridges, dams and factory pressure vessels need to be inspected regularly for faults, and right now this is being done by hand.

“While in the entertainment industry, the ‘eye-in-the-sky’ is already being used for sporting events. Aerial robotics is going to become a ubiquitous technology.”

We may be able to glimpse the exciting developments on the horizon, but only the experts can guide us into the high-flying future of aerial robotics. ■

Video: Watch a UAV in action http://bit.ly/rep_uav

Best foot forward

Brad Carron-Arthur battled severe dehydration and crocodile-infested waters to raise money for a cause close to his heart, writes **KATHARINE PIERCE**.

Brad Carron-Arthur was in trouble. Standing on a roadside in the middle of nowhere in Far North Queensland, he was struggling with the oppressive heat and humidity, the blisters on his feet rubbing painfully as he fought to stay upright. His drinking water had run out hours before and he was experiencing the first signs of serious dehydration.

And then, on the hazy horizon, he saw a car approaching. After signalling the driver to stop, he shuffled over to the window, leaned in and told them he needed some help.

"We know," said the driver. "We heard about you a few towns back, and thought we'd bring you some food and water, see that you were ok."

Four months earlier, the ANU graduate had embarked on a 5,000-kilometre journey from Canberra to Cape York to raise money for the Australian Foundation for Mental Health Research (AFFIRM).

"I wanted to direct all my energy towards a cause that was really worthwhile and close to my heart. That cause was mental health," says Carron-Arthur.

"My Dad suffered from depression for about 15 years, but in 2009 he began to recover because he started to seek treatment.

"He started living life to the fullest again and taking up all sorts of sports, which really inspired me to chase the things I'm passionate about, and running happens to be one of those things."

Packing only the essentials – toothbrush, toothpaste and a snake-bite bandage – Carron-Arthur set out solo on the epic journey, with only a vague route and a mobile phone for support.

It took him 131 days and five pairs of shoes to complete his journey. Running for such long distances meant the days were often lonely. He stayed positive by focusing on where he was, rather than thinking about how much longer he had to go.

"Rather than run the shorter path from Noosa to Bundaberg, I took the longer route and decided to run across the beaches," he says.

"Even though it was pretty agonising running across the soft sand on Fraser Island, I was in much better spirits because of the scenery that accompanied it."

But battling dehydration and exhaustion, the sweltering hot, humid days eventually took their toll.

Quite close to the finishing line, after running for

nearly 50 kilometres without water, Carron-Arthur started to feel like he couldn't go on.

"After four consecutive days of running on sand, I got lost and had to paddle through a flooded creek," he says. "I remember grabbing tree branches to make it through; the water was above my head, getting into my backpack and ruining my food."

"After all that, I still had 30 kilometres to run, and then the battery died on my phone. All these factors combined with sheer physical exhaustion – it was like being drunk but feeling every painful detail."

"For about a month after that I woke up without the zest and sense of adventure that had gotten me there – it was more like fear was the only thing keeping me going."



Brad Carron-Arthur. PHOTO BY BELINDA PRATTEN.

In the end, it was the kindness of a family in Bundaberg that allowed Carron-Arthur to recover and regain his motivation for the run; throughout the journey, he depended on the generosity of strangers to welcome him into their homes and offer a bed and a meal for the night.

"Having that support really got me through," he says.

"It also made me think a lot about my family and friends back in Canberra; I was most looking forward to seeing them when I got back."

Several months after finishing the run and raising more than \$30,000 for AFFIRM, Carron-Arthur was awarded the 2012 Young Canberra Citizen of the Year Award in recognition of his efforts.

"It was a great honour, I was really stoked to win, and I wasn't expecting it. I'm third-generation

“I remember grabbing tree branches to make it through; the water was above my head.”

Canberran so it meant a lot for me to win as I was produced by this city," he says.

"Having done the run and raised money for mental health, it's become an increasingly important cause for me, so I'm really grateful for the opportunity to use the role to raise awareness for mental health."

Carron-Arthur has also taken his passion for mental health and applied it to his everyday life, recently taking on a research position at the Centre for Mental Health Research at ANU.

"A lot of the work we do here involves developing online programs to allow people to look at their own mental health and assess their own thoughts anonymously," says Carron-Arthur.

“Most people don't want to ask for help until they perceive it to be at a crisis point – a lot of people know to ask for help when they've broken their leg, but the point at which your mind is broken is already too late.”

And as Carron-Arthur knows well, offering a little help to someone who might need it can be a life-changing experience. ■

Keeping the peace

History PhD student **KIM DOYLE** explores the extraordinary lives and work of three Canberra peacekeepers.

Ask any Canberran and they will tell you their city is home to many hidden treasures; you just have to know where to look. What we newcomers don't hear so often is that Canberrans themselves mirror their city in that, with time and the presence of curious ears, they too will offer up a treasure trove of interesting stories. For me, those stories have been about the experiences of Canberrans who have lived part of their lives in the Pacific region working as peacekeepers on behalf of the nation.

Having moved here in mid-2011 to take up a PhD in history, I learned quickly how to navigate Canberra's endless roundabouts as I was invited into homes and workplaces and into people's Pacific peacekeeping memories. The aim of my research, supported by the Army History Grant Scheme, is to tell the stories of what it meant to be an Australian peacekeeper in the Pacific between 1996 and 2006. Historically speaking, we know much about the decisions of governments and militaries in forming and carrying out these peace missions, but we know very little about the everyday human realities for the peacekeepers on the ground.

Peacekeeping is near impossible to define and even more difficult to do. My first interview was with Joan Gardner, who served as a civilian peacekeeper in Bougainville in the late 1990s, living amongst the locals on Buka Island. Joan's job was to facilitate the peace process by spreading word about its progress via the popular newsletter *Nius Bilong Peace*, as well as assisting peace activities like reconciliation ceremonies and sport games. Sometimes this would involve what she called a "magic moment" of staying in a village and singing with Bougainvilleans under the clear skies of the Pacific.

For Navy Lieutenant Commander David Hannah in the Solomon Islands, peace was kept from inside a ship. As the Commander of *HMAS Tarakan* throughout 2003 and 2004, he and his crew provided transport and assistance to Australian Federal Police peacekeepers. Those Federal Officers had various jobs that ranged from investigating murders and exhuming bodies, to acting as mentors to Solomon Islanders in the civil service. These jobs were often described to me as at once harrowing, frustrating and, if luck was on your side, rewarding.



Kim Doyle. PHOTO BY TEGAN DOLSTRA.

“Keeping the peace was about cleaning up the remains of countless Timorese massacred by militia, or handing out sweets to children.”

For Ben Wilson, a Lieutenant in the Army, facilitating peace in Timor required a different approach. Serving with the United Nations Transitional Authority in East Timor in 2001 and 2002, his time was based around patrolling the countryside and villages to secure the area. He would interact with Timorese in an incidental

way; though, in what seems a common feature of peacekeeping in the Pacific, he would join in games of soccer and volleyball with the locals. For others in Timor, keeping the peace was about cleaning up the remains of countless Timorese massacred by militia, or handing out sweets to children.

Peacekeeping is a patchwork of experiences; no patch alone is enough to tell us the story, but put many pieces together and we can start to grasp, if only just by our fingertips, what it was like for Australians to do a job often thought impossible. It is no small thing to fly in the face of impossibility and it has been a privilege to get to know Canberra through those people who have tried to do so. Search and chances are you will find a peacekeeper at the table across from you, in the queue behind you or at the next desk. Ask them what it was like and you may just be surprised by the kinds of lives that are lived in this most unique of cities. ■

Some names have been changed.



The Domestic Renewal exhibition. Below, fob watch salt vessel by Norman Cherry. PHOTOS BY CREATIVE IMAGE PHOTOGRAPHY.

Table talk

An exhibition involving ANU artists is giving old objects a new lease on life, with a gourmet twist. By **KATHARINE PIERCE**.

Dinner parties can sometimes be anxious events. When the best crockery is brought out, there's always a possibility that an item or two might meet an early retirement at the hands of animated conversation.

But what if there was a way to revive your precious family heirlooms and keep them gracing your table for many years to come?

Rohan Nicol from the ANU School of Art has curated an exhibition, *Domestic Renewal*, which explores the idea of recycled tableware through the eyes of 19 artists from Australia, the United States and the UK.

"The artists were invited to make objects for a table setting," says Nicol. "They were encouraged to consider the idea of renewal and the reuse of existing materials."

The initial idea for the exhibition,

which was shown at CraftACT late last year, spun out of a repair job that Nicol performed after he accidentally broke his wife's espresso maker.

"It was an object she can remember from her childhood. It accompanied her family on holidays when she lived in Switzerland and she brought it with her when she immigrated to Australia. And I broke it," he says.

"Luckily, being a gold and silversmith, I had the skills to fix it. I decided to put a new handle on the espresso maker, kind of layering our own history onto it. I actually thought it looked pretty good once it was finished, so I made a sugar bowl and milk jug to go with it. Somehow I made this object, which had become invisible in our house, visible again."

The exhibition, which includes Nicol's tea set, brings together artists from a diverse range of disciplines and backgrounds such as architects, interior designers and studio artists.

“If you want to spark conversations, you need contradictions.”

The result is an exhibition of diverse works that use a table setting as the starting point, but without the complete setting you'd expect to see. "They range in scale from very intimate small objects right through to the very large – Norman Cherry has turned 100-year-old fob watches into salt and pepper vessels, while Jason Wades has taken an old Fosters beer tray and turned it into a vessel for flower arrangements," he says.

"One of the things about this exhibition, and what makes it distinct from many other craft and design



projects, is that it's not actually all neat and well-rounded.

"If you want to spark conversations, you need contradictions and this exhibition contains that. We tried to present the real world in the micro-setting of a table setting."

So next time you have a dinner party, there's no cause for anxiety on behalf of your best china – it may be a chance to breathe new life into a family heirloom. ■

catch up

Been a while since you visited the ANU campus? That doesn't mean you should miss out on the many events taking place at the University.

Watch the latest videos at: youtube.com/ANUchannel



Insurgent Intellectual: A career with global impact

Professor Desmond Ball
Strategic and Defence Studies Centre, ANU

Watch: http://bit.ly/rep_ball

This year marks the 25th anniversary of Professor Desmond Ball's Special Professorship at ANU. Over more than four decades, Professor Ball has investigated a broad range of fields, including nuclear, electronic and cyber warfare, signals intelligence, Asia-Pacific security and Australian strategic and defence policy.

In this video, he speaks to Dr Nicholas Farrelly about some of the highlights of a career that has seen him become one of the world's foremost strategy and defence experts.



2012 Annual ANU Reconciliation Lecture

Alison Page
Saltwater Freshwater Arts Alliance

Watch: http://bit.ly/rep_page

The daughter of an Aboriginal man and a ten-pound pom, Alison Page talks about her identity and family, arguing that we need to embrace Aboriginal culture and its values as central to our national identity.

Alison is an award-winning Aboriginal designer, cultural planner and Manager of the Saltwater Freshwater Arts Alliance on the NSW mid-north coast, and was a regular panelist on ABC's *The New Inventors* for eight years.



Crawford School Reflections Lecture 2012

Dr Bob Brown
Former Parliamentary Leader of the Australian Greens

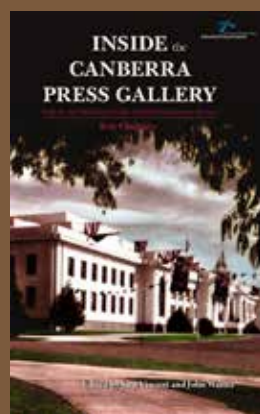
Watch: http://bit.ly/rep_brown

In this video, Dr Bob Brown, former Leader of the Australian Greens, delivers the Crawford School's Reflections Lecture, which provides the opportunity for influential Australians to discuss their role in public policy.

During his time as a senator, Dr Brown raised a number of important and controversial issues in Parliament, including self-determination for West Papua and Tibet; opposing the war in Iraq; stopping the sale of the Snowy Hydro scheme and opposing the dumping of nuclear waste in Australia.

bookshelf

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Inside the Canberra Press Gallery: Life in the Wedding Cake of Old Parliament House

By Rob Chalmers. Edited by Sam Vincent and John Wanna

Before television, radio – and later the internet – came to dominate the coverage of Australian politics, the Canberra Press Gallery existed in a world far removed from today's 24-hour news cycle, spin doctors and carefully scripted sound bites. This memoir offers a rare insider's perspective on how the gallery once operated and its place in the Australian body politic.

Rob Chalmers (1929-2011) entered the Federal Parliamentary Press Gallery in 1951 as a 21-year-old reporter and would retire from political commentary 60 years later. No parliamentary figure – politician, bureaucrat or journalist – could match Chalmers' experience, from his first Question Time on 7 March 1951 until his reluctant retirement from editing the iconic *Inside Canberra* newsletter.



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JOHN YOUNG
The Bridge and the Fruit Tree – A Survey

14 February – 24 May 2013

Image (detail) John Young, *S Painting*, 1992, oil on canvas, 274 x 183cm. Collection of the artist. CRICOS #00120C | 080113ANUR