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uniken

Fighting the global HIV crisis

UNSW

NEW CENTRES ON CAMPUS; VIRTUAL REBIRTH; SHOCK WAVES IN ART

Contents

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Five minutes with ...

Photo courtesy of Bob Beale

Bob Beale's enthusiasm for Australian trees and the stories they tell led to his book, *If They Could Speak: Stories of Australia's Greatest Trees*. His passion for nature and communication is also at the heart of his role as Public Affairs Manager for the Faculty of Science.

What made you decide to write a book about trees?

I wanted to draw attention to the under-appreciated but crucial role that trees play in our lives. Our extraordinary native trees give the landscape much of the look and feel we associate with being Australian. They're the backbone of our ecosystems, the lungs of our planet, hotels for countless critters and were the single most important raw material that let us build our society.

Because they live so long they are also enduring links with our amazing natural and social history. You can go and visit the famous Dig Tree, for example, where the explorers Burke and Wills perished so tragically: it's still alive and well.

Trees are just as important to our hopes and aspirations today: as carbon sinks, sources of bio-fuels and for repairing damaged land. But we have a kind of love–hate relationship with them, because they also bring us bushfires and stand in the way of our hunger for cleared land for agriculture and urban settlements. We ought to respect them more.

Describe the process you went through to write your book?

It gradually developed into an idea over many years of travelling around Australia. I made a series of specific trips over about 18 months to visit individual trees – and met some great tree-loving people in the process – and trawled through many books and research papers.

Once I'd assembled it all, I took six weeks off and wrote from dawn to dusk almost every day until it was done. It was exhausting but exhilarating as well: I wanted to keep a consistent narrative style going and I hope that comes through for the reader.

Do you have a favourite tree, or type of tree? Why?

I have asked many people this same question and most nominate a tree they played in as children – the ubiquitous backyard jacaranda.

The one I favour most right now is the one on the front cover of the book, a massive and elegant spotted gum (*Eucalyptus maculata*) near my home. The ever-changing play of light on its leaves and trunk, the sounds it makes in the wind and the constant flurry of bird activity are all enchanting; most of all though, its great age, sturdiness and strength are calming and reassuring.

Describe your role at UNSW.

I am Public Affairs Manager for the Faculty of Science. It's a diverse role, but my main task is to winkle out and publicise stories of interest from our many wonderful researchers. Taxpayers underwrite most of what we do, and they have every right to be informed about how we spend their money: increasingly, funding bodies are demanding that research results are publicised as widely as possible – beyond the traditional learned journals. We hope, of course, that keeping ourselves in the public eye will attract good students and staff, and attract the attention of benefactors and collaborators who might not otherwise have known about us. It works.

Do your writing and your role at UNSW complement each other?

They do, very well. My job brings me into contact with so many talented and thoughtful people, and my storytelling skills help them communicate their passion for what they do. I learn so much in the process that informs my life and my writing. ■

If Trees Could Speak: Stories of Australia's Greatest Trees is published by Allen & Unwin.

Photo courtesy of Bruce Ferguson

Cardinals prepare for World Youth Day in the John Niland Scientia.

A tribute to Sir Anthony

Former Chancellor Sir Anthony Mason's contribution to UNSW has been recognised with the opening of a commemorative sculpture garden in his name.

Funded by a donation from the U Committee and with the help of the Faculty of Law, the Sir Anthony Mason Garden is located outside the Law Building on lower campus.

Sir Anthony was the fifth Chancellor of UNSW and served between 1994 and 1999. He continues to serve the University through his work on the Gilbert + Tobin Centre for Public Law Advisory Committee and the Law Selections Committee.

The garden features a sculpture designed by Kate Cullity entitled *Seeing the Wood for the Trees*, and was the winning entry in the 2006 UNSW Sculpture Commission Competition.

A good university

UNSW outscored every university in Australia in the *2009 Good Universities Guide*.

The guide, an annual handbook for anyone choosing a university course or campus, gave UNSW the maximum five-star rating for ten key performance indicators, more than any other university. UNSW also topped the bill in total points across all of the categories assessed.

UNSW achieved a top score in the following categories: research grants, research intensivity, student-staff ratio, staff qualifications, graduate starting salary, student success in gaining employment, teaching quality, acquisition of generic skills, cultural diversity and positive graduate outcomes.

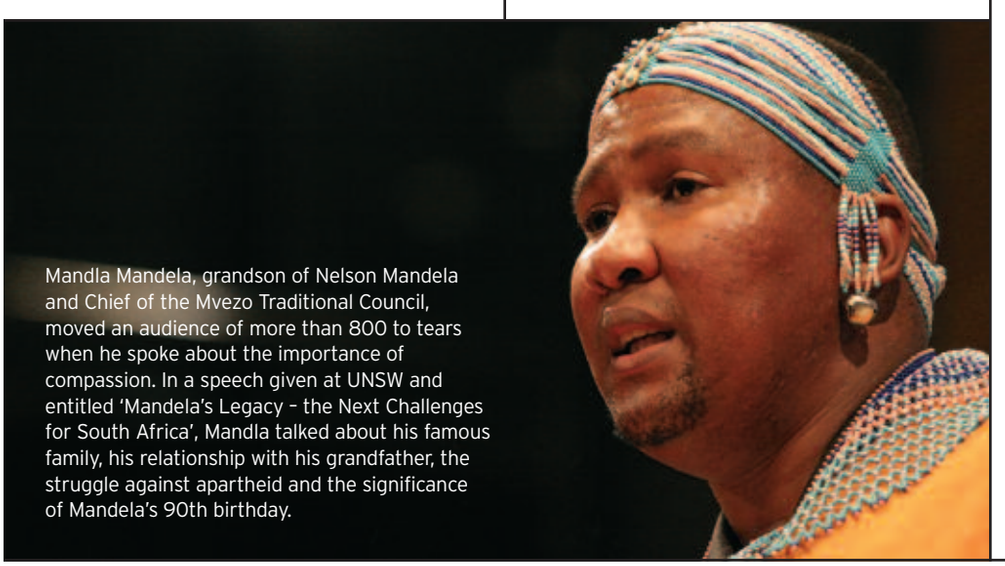
The guide described UNSW as "one of the heavyweights of Australian higher education ... offering an intense, rich tertiary experience".

The great debate

Last month UNSW hosted the annual Asian education debate – the first time the globally televised regional competition has been held in Australia.

University debating teams from China, Hong Kong, Malaysia, Taiwan and Singapore joined Chinese-language debating teams from UNSW and the University of Melbourne to debate such questions as: Should Asian students aim to stay in Australia to start a new life after university, or feel obliged to take their qualifications back home?

The two-day forum was televised by the Hong Kong based Chinese satellite channel, Phoenix TV, which also sponsored the event. Phoenix has a worldwide Chinese-language audience of about 1.2 billion people, and is part of Rupert Murdoch's News Corp.



Susan Trent, Gasbag Studios

Mandla Mandela, grandson of Nelson Mandela and Chief of the Mvezo Traditional Council, moved an audience of more than 800 to tears when he spoke about the importance of compassion. In a speech given at UNSW and entitled 'Mandela's Legacy – the Next Challenges for South Africa', Mandla talked about his famous family, his relationship with his grandfather, the struggle against apartheid and the significance of Mandela's 90th birthday.

For the **record**

"Under the current situation there is little for the Petrol Commissioner to do other than to watch." Professor Frank Zumbo arguing that the commissioner needs additional powers to reign in the fuel industry's pricing – Herald Sun.

"The idea that magically because you're hosting the Olympics you're going to turn an authoritarian society into a democratic one is more idealistic than real." Justine Nolan on human rights in China – The Age.

"There are ticking time bombs that, if we don't deal with them, are going to make it ... a seriously impaired system." Vice-Chancellor Professor Fred Hilmer on the need for reform in the higher education sector – Sydney Morning Herald.

"China's demand for power is outstanding ... But they're also conscious that the problem wasn't created by China but by the developed countries that have had a free ride with cheap fuel and energy." Dr Richard Corkish on China's attitude to climate change – Daily Telegraph.

"The problem is people do not tend to think about the dangers of the pills they're putting in their mouth ..." Professor Andrea Mant on the risks of multivitamin supplements – Canberra Times.

Promotions success

More women promoted to senior lecturer: Wendy Swift and Kim Jenkins

For the first time in the University's history more women applied and were recommended for promotion to senior lecturer than men, with an overall success rate for female academics of 86 percent in the most recent promotions round.

> **"Applying makes you realise how much you have done ..."**

The outcome suggests a positive impact from policies, procedures and strategies implemented over several years to increase the representation of academic women at more senior levels.

Dr Wendy Swift, a cannabis researcher at the National Drug and Alcohol Research Centre, was one of the women promoted. She job-shares with Dr Joanne Ross, who was also promoted.

"When I went to the first promotions meeting I thought I had no hope but the process makes it manageable," Wendy says. "I was amazed at how many women there were at the promotions meetings. Apparently women tend to wait a long time to apply.

"As a working mother it is tricky balancing family and work responsibilities, and that made me less confident about applying. However, once you get going the system is very supportive. David Gleeson (UNSW Promotions Officer) made the system so user-friendly and logical. It's that kind of support that gives you the confidence to go for it.

"Applying makes you realise how much you have done and what you have achieved."

Dr Kim Jenkins, a full-time wetlands researcher from the School of Biological, Earth and Environmental Sciences, also found the application process beneficial.

"In coming to work at UNSW I was conscious of the number of male academics in the Sciences, but I have found the University to be very supportive of women. The process of applying for promotion was very positive with support from David Gleeson's workshops, my school and faculty. It turned out to be a good networking opportunity," she says.

"It's very good for your confidence to build a picture of your career and then be recognised for it. For women, and for men, that is a very positive process." ■

- Victoria Brown

A+ for teaching

The Australian Learning and Teaching Council, formerly the Carrick Institute, has awarded Citations for Outstanding Contributions to Student Learning to seven individuals and one team from UNSW. The awards, which were announced by Deputy Prime Minister and Minister for Education, Julia Gillard, acknowledge staff who have made a sustained contribution to the quality of student learning.

Dr Wallace Bridge, Faculty of Science; Dr Julie Cogin, Australian School of Business; Associate Professor Barbara Junghans, Faculty of Science; Dr Warren Smith, Australian Defence Force Academy (ADFA); Dr Sue Starfield, The Learning Centre; Associate Professor Stephen Yeomans, ADFA; and Associate Professor Robert Zehner, Faculty of the Built Environment (FBE), were individually recognised for their work.

In recognition of the innovative use of teams, Associate Professor Linda Corkery, Ann Quinlan, Ben Roche and Karin Watson of FBE Out There!, a community engagement program targeting schools, were acknowledged for their "approach to collaborative built environment design learning that connects community, students and University in mutually beneficial partnerships". ■

- Victoria Brown

Barry Rosenberg 1935–2008

A memorial service was held in the John Niland Scientia in August for longstanding staff member Barry Rosenberg.

Barry worked at UNSW from 1957 to 1990. He joined Unisearch, UNSW's original commercialisation arm, in 1967 and was appointed as Director and General Manager in 1977, a role he held until 1990.

During that time he took the company from strength to strength, negotiating over 80 licence and joint venture agreements with industrial partners in Australia, Europe, North America and Asia. Unisearch became a model for universities around the world and Barry subsequently assisted numerous institutions to establish similar operations.

In 1990 Barry left UNSW to work in the United States. In 1992 he was appointed Director of Technology Licensing at Georgia Tech, a position he held until his retirement in 2001.

Barry is survived by his first wife Sylvia, two sons and six grandchildren. ■

Susan Trent, Gasbag Studios

Teaching a love of learning

A passion for human resources and an enthusiasm for her students has made Julie Cogin an educator to be reckoned with.

By **Jared Reed**

When a nasty spider bite sent a Canberra-based AGSM MBA lecturer to hospital recently, the course was stuck for a teacher with less than six hours until show time. Dr Julie Cogin gathered some notes, her wits and a sprinkle of good humour and caught the first flight to Canberra, where the lecture went off without a hitch (and the lecturer later made a full recovery).

It's Julie's professionalism, adaptability, and passion in linking her human resource management (HRM) know-how with her academic work, which has received many prestigious accolades over a 20-year career – most recently, a citation from the Australian Learning and Teaching Council for services to teaching in Organisational Behaviour and the UNSW Vice-Chancellor's Award for Teaching Excellence.

Julie, Associate Head of Organisation and Management at the Australian School of Business, confesses that she is a born teacher.

"I think the test of a true teacher is how one can embed a love of learning in their students; to cultivate a desire for continuous learning that doesn't end at week 12," she says.

Julie came to academia in the 1990s after she grew frustrated at the lack of research in workplace harassment prevention. As an HR manager at Qantas for 10 years, she had run the full gamut of grievances and complaints and seen that harassment was more far-reaching than stereotypical manager–subordinate, men versus women cases.

Since dealing with her executive education students, Julie has realised that her research can directly provide answers in the subjects that she teaches. For instance, she has recognised that academic literature does not readily acknowledge the existence of different generations – Baby Boomers, Generation X and Generation Y – and how to modify leadership behaviours and HR practices to meet the different needs of these groups. This is a problem faced by many of her Executive Education clients.

> **"The test of a true teacher is how one can embed a love of learning in their students ..."**

"I've done some formative research to suggest that Baby Boomers are motivated by different factors to Gen X and Gen Y. I can really build this into my teaching," Julie says. "I'm working towards really aligning my teaching and my research."

Aware that she needs to maximise the learning opportunities of her students, Julie is a firm believer in harnessing technology to build independent learning. For example, in addition to face-to-face consultation, she has online consultation times for students uncomfortable with individual sessions, uses web discussion forums after lectures, and also uses games and activities in class.

"With games and experiential activities, you've got to make a really tight connection to the theory or learning outcomes," she explains. "If you support an activity by having a WEBCT line of discussion you build reflective practice and deeper learning. I often see engagement of students who come online and talk about their experiences – both successes and failures – after class. The learning environment is built in such a way that these students feel comfortable to take these risks."

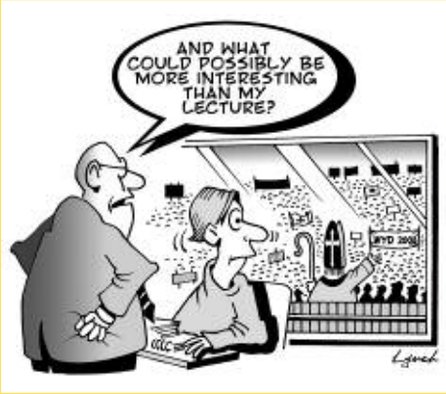
Her method seems to work – Julie says some students continue to stay in touch 10 years after a class is run.

"I think that I'm so lucky to play that sort of role in people's lives. You really have the opportunity to transform people's lives, to work with them at such a deep level," she says.

"I'm privileged to have a job where I can take people on a personal change journey, and help them to transform their leadership style and the type of person that they become. One student told me they had become a better manager, husband and father as a result of competencies they had built during a course.

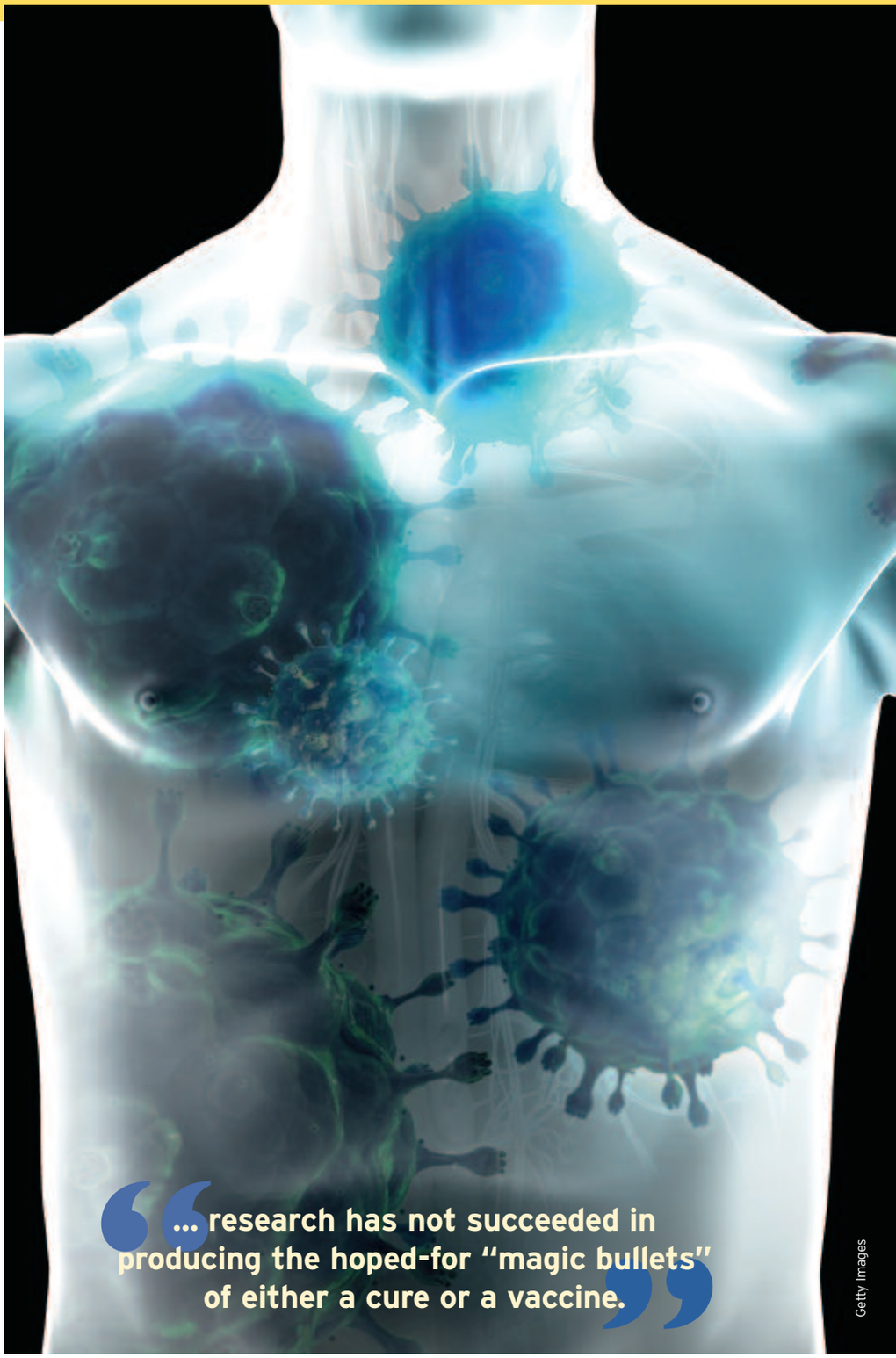
"What better job is there?" ■

LIGHT RELIEF



Fighting the good fight

More than a quarter of a century after HIV was declared an emerging infection by the US Centers for Disease Control, science is still coming up with solutions to the epidemic. Despite the setbacks UNSW remains committed to tackling the disease through its social and clinical research and a massive building project, as **Susi Hamilton** reports.



Getty Images

With an estimated 2.5 million people newly infected with HIV and 2.1 million deaths last year alone* HIV remains one of the world's most intractable problems.

With no vaccine and no cure in sight for the virus, the focus remains on prevention.

UNSW's research in the field is world-leading and the University has now earmarked more money for the establishment of a National Institute for Virology, incorporating UNSW's National Centre in HIV Epidemiology and Clinical Research (NCHECR).

The NSW Government has pledged $20 million to help establish the state-of-the-art facility, to be located within the St Vincent's Hospital precinct, on land provided by the trustees of the Sisters of Charity.

The $120 million facility will bring 300 of the nation's top scientists working on HIV/AIDS and other sexually transmitted infections (STIs) – both viral and bacterial – under the one roof.

The new Institute, which will be led by NCHECR director Professor David Cooper, will be partially funded by government, with the balance provided by private philanthropy and UNSW.

"Science has achieved great strides towards shaping a more effective response to HIV. Yet research has not succeeded in producing the hoped-for 'magic bullets' of either a cure or a vaccine," says David.

"We need to escalate our research efforts while sustaining and expanding what we know works: good prevention and access to lifesaving antiretroviral therapy and integrated care."

The Centre is doing just that through its seven scientific programs including work on epidemiology, clinical research and clinical trials.

After a steady decline from 1985 to 1996, NCHECR is now predicting an increase in HIV diagnoses in Australia with the 2007 figure being a 65 percent increase from what was apparent in 1996.

"This increase varies greatly across our states and it illustrates quite clearly that this is an issue requiring a combined medical, research and community response," David says.

Recent research co-authored by David shows that the majority of patients who have not responded to traditional treatments have had good results from a new combination therapy involving raltegravir.

Raltegravir is already available in Australia and was listed on the Pharmaceutical Benefits Scheme on 1 July, with clinical trials showing that it is safe, effective and has minimal side effects when used with other anti-HIV medicines.

The challenge of Aboriginal health

NCHECR has long taken an interest in HIV, viral hepatitis and STIs in Indigenous people and has recently initiated an Aboriginal and Torres Strait Islander health program.

This year, the Centre produced the inaugural annual report on blood-borne viruses and STIs in Aboriginal and Torres Strait Islander people.

"We have always had a section on Indigenous people in our annual surveillance report, but this is the first time we have had a stand-alone report publication on the subject," says the Deputy Director of the Centre, Professor John Kaldor.

"It is written in a way which is accessible to Aboriginal health services and communities."

One of the biggest issues highlighted by the report is the ongoing high prevalence of bacterial STIs within some Aboriginal communities.

"The rate of chlamydia, gonorrhoea and infectious syphilis among Aboriginal and Torres Strait Islander people in some major locations is almost four times higher than non-Indigenous people," said one of the report's authors, Aboriginal researcher James Ward.

"In remote areas it is much more of a problem. Chlamydia is 13 times more prevalent in remote Indigenous communities in some states and the Northern Territory, compared to non-Indigenous people in the same regions."

"These STIs can cause discomfort and shame, as well as serious complications such as infertility," says James. "They can also increase the risk of HIV being transmitted."

The other big issue highlighted by the report is the particular vulnerability of Aboriginal people to blood-borne viral infections including HIV, due to injecting drug use.

These discrepancies have the potential to impact on already high rates of morbidity and mortality experienced by Aboriginal and Torres Strait Islander people.


Corbis

"These STIs can cause discomfort and shame ..."

Another of the Centre's commitments to Aboriginal health has been to support a new sexual health research position based in Central Australia, through a collaboration with the Menzies School of Health Research. The position will engage with Aboriginal community-controlled and government health services to develop and implement a sexual health research agenda.

"We wanted to help define the issues from a local perspective," says James. "We want to help develop mechanisms so Aboriginal health workers and services can monitor their own progress in attempting to reduce the disparity that exists in STI prevalence in the NT and other remote communities."

The Centre also recently signed a landmark Memorandum of Understanding with the National Aboriginal Community Controlled Health Organisation (NACCHO). This paves the way for NACCHO and NCHECR to work collaboratively in addressing some of the pressing, sensitive and complex issues that exist in this discipline of health research. ■

The study, which has been published in the *New England Journal of Medicine*, shows raltegravir lowers the amount of virus in the blood to undetectable levels in 62 percent of people taking it in combination with other anti-HIV medicines.

"This is the first drug in a new class of antiretroviral drugs called integrase inhibitors," says David.

"The drug has a different mechanism of action, is very potent, seems very safe and has helped patients who have a virus that is resistant to older drugs and classes.

"It initially will be used in developed countries, but hopefully it will be made available at cheaper prices for patients in developing countries who are facing the same problems."

The overall results have been drawn from two major ongoing clinical trials in Europe, Asia, Australia and North and South America. Both studies are supported by Merck & Co, Inc., the manufacturer of raltegravir. ■

*World Health Organization figures

Hep C hope

Beyond HIV, NCHECR also researches other blood borne viruses, particularly hepatitis C and other STIs.

While one in four people clear the hepatitis C virus naturally, others go on to develop chronic infection which, if left untreated, can lead to liver inflammation, cirrhosis and liver cancer.

The research effort of NCHECR's two Viral Hepatitis Programs is increasing in response to the problem. In the past five years, staff in these programs has increased from five to over 30.

One of the most promising findings relates to early treatment for those with the condition in its acute form. The researchers believe the treatment is most effective up to two years after infection.

"If you get treatment early, our research shows that there is a good chance that patients will be cured," says Associate Professor Greg Dore, the head of the Viral Hepatitis Clinical Research Program.

The researchers used the same drugs which are currently used in chronically infected patients, but often for shorter periods. Further, they examined the response to treatment at a very early stage (four weeks) and found this to be highly predictive of a cure, which is assessed 24 weeks following completion of the 24-week course of therapy.

"The results were particularly good for those who also had HIV," says Greg. "Until now it has been hard to eradicate hepatitis C from patients who are co-infected."

The researchers now want to see if further reductions in treatment duration could still be effective for patients. This could reduce significant side effects and increase patient compliance.

"Some of these people could also have partial immunity from re-infection with hepatitis C," says Greg.

Re-infection is highly significant, as another part of the study has shown that further exposure to the virus through ongoing injecting can lead to re-infection.

The results about re-infection could also have a bearing on future vaccine development.

These findings were all part of the Australian Trial in Acute Hepatitis C (ATAHC), which is funded by the US-based National Institutes of Health. ■

Susan Trent, Gasbag Studios

The challenge to make a difference

The new director of the National Centre in HIV Social Research, John de Wit, is determined to be a bridge between HIV research and practice.

It was the international reputation of the National Centre in HIV Social Research (NCHSR) which drew an urbane Dutch researcher to live on the other side of the world.

Professor John de Wit is well known for his work on the sexual behaviour of men who have sex with men. As a gay man starting a research career in psychology in the late 1980s, it was impossible for him to ignore the pressing need for work in the area of HIV/AIDS.

While he plans to continue researching the health-related practices that put people at risk of HIV, hepatitis C and related infections, he has a fresh vision for the Centre and his new role as its director.

"The Centre has been very important worldwide in contextualising sexual and drug-related behaviours, and elucidating how potentially risky practices are influenced and shaped by social processes and situations," he observes.

"Our challenge is now to use our expertise to contribute to the development of new theoretical frameworks that improve the appropriateness and effectiveness of prevention, treatment and care."

John sees the Centre's work as crucial in informing public health campaigns and government policy, in particular in promoting novel ways to address the important social aspects of health-related behaviours.

"Understanding how people regulate themselves in a sexual context underlies most of my research," John says. "People are not simply at risk because they pursue hedonistic pleasures, are unmotivated or uninformed. Risks occur when people have strong desires and are unable to pursue those in a safe way – because their self-regulation fails."

Most recently, John has completed a study which addresses just this area. The three-minute online video that he helped develop attempts to prepare men for sexual situations and control the practices they want to engage in – with remarkable success. There was almost a 20 percent reduction in unprotected sex among the group six months after they were exposed to the intervention.

"This intervention doesn't explain the advantages of using a condom. It doesn't say you need to use them. It's about how people don't do that in the heat of the moment," he says.

John is particularly excited about the potential that new technologies have to reach large audiences with novel, targeted prevention messages.

"I try to position myself as a bridge between behavioural research and prevention practice – or between academia and the world around us. It makes us relevant, interesting and firmly grounded in reality. It is also makes for important research." ■

- Susi Hamilton

A Pacific solution?

UNSW researchers have won over $2 million to help combat HIV in the Asia-Pacific region.

Indonesia, Papua New Guinea (PNG) and the Pacific are the focus of the work, which is led by Associate Professor Heather Worth, from the National Centre in HIV Social Research (NCHSR).

AusAID has given $1.2 million to the researchers to train local researchers in HIV-specific research methods about the social aspects and impacts of HIV and to strengthen institutional capacity. The remaining $830,000 is to look at social research in those countries.

The Pacific has a low prevalence of HIV, but as there are high rates of other sexually transmitted infections (STIs). Heather believes this may be the "precursor of an epidemic, because people are clearly having sex and not using condoms".

"PNG is one of the few countries outside of Africa where HIV prevalence is such that there is now what is called a 'generalised epidemic'," explains Heather. "It doesn't just affect groups such as sex workers and injecting drug users.

"We need to find out why people aren't using condoms," she says. "Another problem is that those who are infected are stigmatised and often don't access life saving antiretroviral drugs because they believe that God will heal them."

Some of the money will also be spent on collaborating to build a Pacific Centre for HIV and STI Research in Fiji. The Centre will be a partnership between NCHSR, the Australian Research Centre in Sex, Health and Society at La Trobe University, the University of the South Pacific and the Fiji School of Medicine. ■

- Susi Hamilton

Vulnerable to HIV

Social factors, as well as climate change and the world food crisis, increase susceptibility to HIV.

"We look at the health and human rights perspective of HIV," explains Professor Daniel Tarantola. "How risk-taking behaviour is influenced by a person's vulnerability and how their level of vulnerability is, in turn, influenced by social factors."

Daniel, Dr Anna Whelan and their team from the School of Public Health and Community Medicine are working in Vietnam with Dr Hoat and his team of researchers at the Hanoi Medical University, looking at the sexual and reproductive health of sex workers and injecting drug users.

"We are interviewing them about their needs, what services they access to protect themselves and others from HIV, and what discrimination they experience and how that reduces their ability to protect themselves," Daniel explains.

The next phase of the project involves looking at how sexual and reproductive health is being addressed in Vietnam's "rehabilitation centres" where sex workers can be held for several years.

According to Daniel the centres have a lower standard of care and advice than is available in the community.

"The advice is non-existent," he says. "There is no attempt to refer people to facilities that could offer sexual or reproductive healthcare after their release. This increases the exposure of this population — and their sexual partners — to HIV, STIs and unwanted pregnancy."

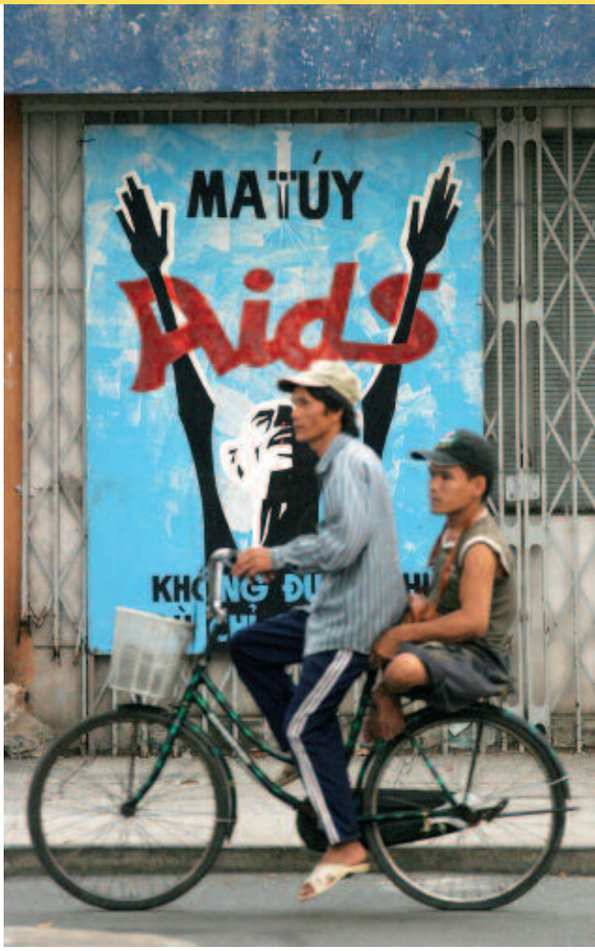
Daniel is also looking at how the three major trends in world health – HIV, climate change and the food crisis – combine to threaten vulnerable populations.

> **"The groups that are vulnerable to one, are vulnerable to all."**

"These three trends are likely to impact disproportionally on the same people," he says.

"Climate change and the food crisis generate social stress and unplanned population movement, both of which increase vulnerability to HIV. Globally, the groups that are most vulnerable to one, are vulnerable to all. We need to take a broader approach to these threats, recognise their commonalities, create a synergy rather than a competition between responses to each, and make the best use of available research and international investment." ■

- Victoria Brown



Corbis

The vexed question of circumcision

Circumcision of baby boys might be out of fashion in Australia, but it is gaining attention among some medical professionals – especially in some countries of Africa.

"An effective HIV vaccine is out of immediate reach," says Dr Limin Mao, from the National Centre in HIV Social Research (NCHSR). "So some researchers are trying to verify whether male circumcision could play a critical role in curbing the current HIV epidemic."

Research carried out in Africa shows that if a man is circumcised, it is probable that he is 60 percent less likely to contract infection from an HIV-positive female partner through vaginal intercourse when a condom is not used.

Limin's research focuses on whether male circumcision affects homosexually active men in Australia's sexual behaviour, including condom use during anal intercourse.

While both circumcised and uncircumcised men have the same rates of condom use, there is a surprise finding for those who are circumcised after one year of age.

"Gay men circumcised after infancy are more likely to practise anal receptive sex and to report erectile dysfunction," says Limin. It therefore increases the chance for this group of men to get HIV if a condom is not used during sex with an HIV-positive male partner.

"If male circumcision does take place, our study confirms that infant circumcision is much safer," says Limin, who notes that while male infant circumcision was routine in the 1970s, it dipped to just over 10 percent in 2000 in Australia. ■

- Susi Hamilton

On top of the world

A UNSW researcher is the only Australian and one of only three people outside of the United States to be listed in the top 10 HIV/AIDS researchers in the world.

Professor Andrew Carr, who is based at St Vincent's Hospital, was named by *Science* as the author with the seventh-highest impact in the field over the past decade. Authors who had the most citations per paper, with a minimum of 100 publications, were listed.

Andrew is best known for his work on the complications of antiretroviral therapy. He was the first to describe a very common and clinically important side effect of therapy: HIV lipodystrophy, which changes the way body fat is distributed, and which causes metabolic changes that increase the risk of heart disease. ■

New partnerships, new approaches

In recent months a number of new centres have sprung up around campus. Here we take the opportunity to have a closer look at a selection of them.

Centre for Energy Research and Policy Analysis

When leading US environmental economist Professor Michael Hanemann visited UNSW to open the new Centre for Energy Research and Policy Analysis (CERPA), he warned of the enormous complexity involved in combating climate change.

"What is needed is behaviour change and new technologies – and this is a wonderful start you are making with CERPA," he said.

CERPA, which was launched on 12 August, brings together the diverse capabilities of seven UNSW faculties: Engineering, Science, Law, Arts and Social Science, Built Environment, the Australian Defence Force Academy and the Australian School of Business.

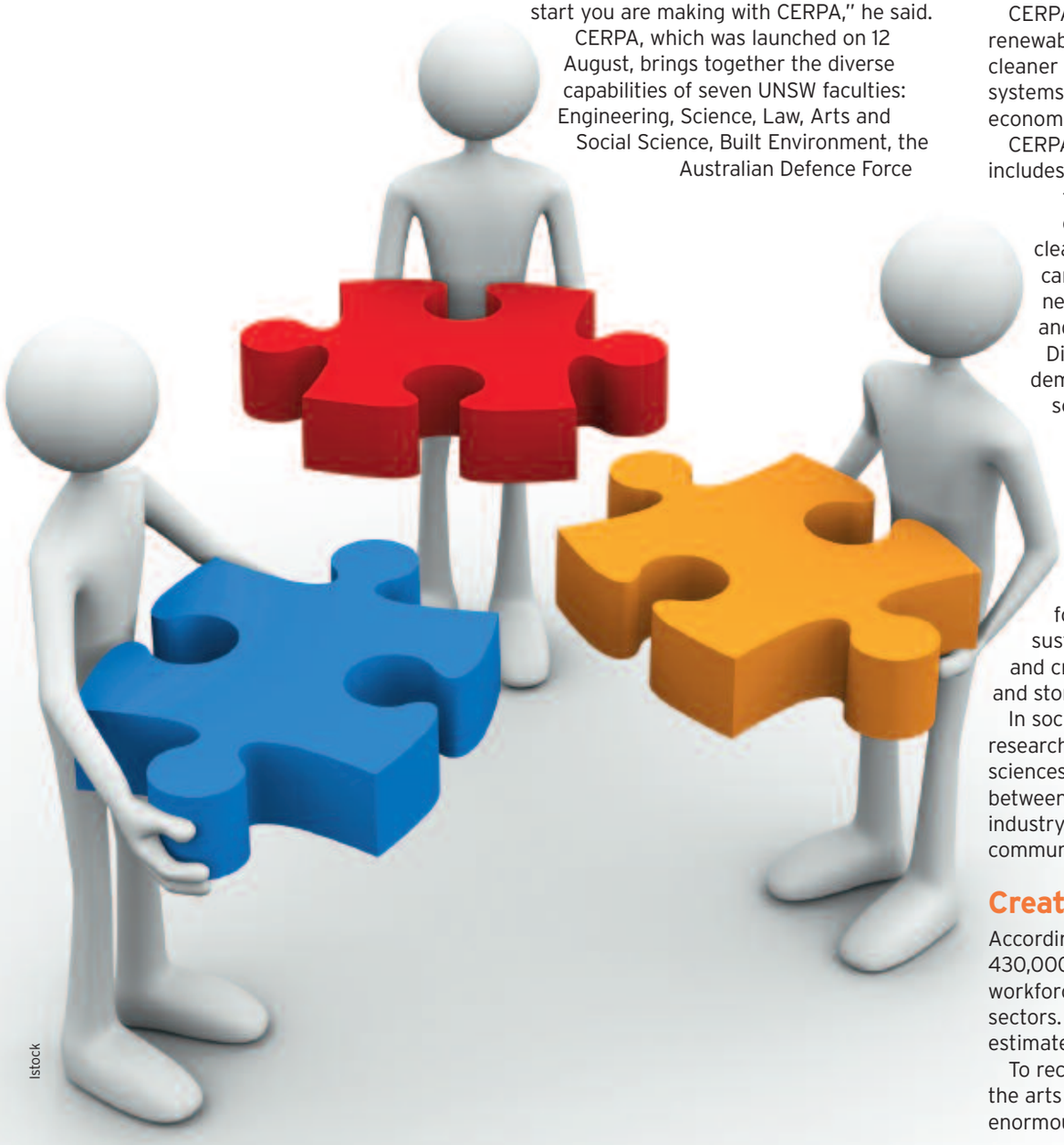
Backed by more than $25 million in total annual research funding, CERPA is believed to be the first Australian institute to cover all aspects of energy research – from renewable technologies and sustainable fossil fuel use to markets policy. The purpose of CERPA is to develop multiple solutions to the complex challenges posed by climate change and rising global energy demand.

CERPA concentrates on five key areas: renewable energy technologies, fuels for a cleaner environment, distributed energy systems, efficient energy technologies and economic, social and regulatory policy.

CERPA's renewable energy research includes photovoltaic cells, wind power, solar thermal energy, biofuels, geothermal energy and solar hydrogen. Their clean fuels research is focused on carbon capture and storage, and new, alternative fuels from gas, coal and biomass.

Distributed energy systems – demand-side systems such as local solar, cogeneration and biomass – are attracting growing interest worldwide for their ability to avoid the high costs associated with new centralised energy generation, such as power stations. Similarly, energy-efficient technologies are a vast new field of research focused on optimising energy use, sustainable design and manufacturing and creating new materials for capturing and storing energy.

In social and regulatory policy, CERPA researchers in law, economics and social sciences are working on bridging the gaps between what scientists can create, what industry will pay for and what the community is ready to use.



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Creative Media Institute

According to the latest estimates, more than 430,000 Australians – or 5.4 percent of the workforce – are engaged in the creative sectors. Our digital content industry alone is estimated to be worth around $21 billion.

To recognise the crucial contribution of the arts to our identity and creative media's enormous economic potential UNSW has

> **It brings together world-leading research capable of generating new ventures ...**

formed the Creative Media Institute (CMI).

The CMI is a platform for world-class multidisciplinary research and application of new forms of technology-enabled creative media. It will focus on incubating and supporting collaborative research with industry in new media, contemporary art, media studies and intelligent systems.

A partnership of three host faculties – Arts and Social Sciences, the College of Fine Arts and Engineering – the Institute brings together four creative media research centres – the iCinema Centre for Interactive Cinema Research, the Centre for Contemporary Art & Politics, the Journalism and Media Research Centre, and the Centre of Excellence in Autonomous Systems.

CMI Convenor and one of the new Institute's four co-chairs, iCinema Centre Co-Director Dennis Del Favero, says the CMI represents a consolidation of one of UNSW's emerging research strengths, namely digital technology and content creation and analysis.

"It brings together world-leading research capable of generating new ventures in artistic and cultural fields that engage with contemporary social and economic issues in a way that will enable UNSW to lead Australian creative media research. We will be able to seize new opportunities for funding, and for developing and implementing innovation," Dennis says.

The Disability Studies and Research Centre

The Disability Studies and Research Centre (DSARC) is the only national disability studies research centre in Australia.

DSARC promotes the social perspective of disability in education and research to maximise Australia's capacity to ensure an equitable, participatory and accessible society for people with a disability.

Building on the achievements of the community/University-based Disability Studies and Research Institute, DSARC contributes to the disability community's ability to develop credible research and policy positions to assist them to engage effectively in public policy debates.

As well as undertaking and managing research, DSARC assists UNSW faculties to develop and deliver educational programs and improve funding outcomes by identifying opportunities for collaborative research programs.

DSARC is aligned with the Social Policy Research Centre, the Faculty of Arts and Social Sciences and the Faculty of Law. The Acting Director is Ms Rosemary Kayess from the Faculty of Law.

The Centre for Interdisciplinary Studies of Law

A new interdisciplinary centre within the Faculty of Law seeks to explore the institutions, practices and consequences of law from a range of points of view across the humanities and social sciences. The Centre for Interdisciplinary Studies of Law encourages meetings both literally by bringing people together, and metaphorically by bringing ideas of varying provenance to bear on the law, its character, effects and interactions.

"The institutions, practices and consequences of law itself are of significance from many points of view other than those of insider experts," says Associate Professor Adam Czarnota, who is heading the Centre along with Professor Martin Krygier.

"Legal processes are of interest to, and can be illuminated by a variety of disciplines. And when law hits life, experts on various aspects of life are as important as experts on law, but they often do not mix enough or well enough."

While based within the Law Faculty, the Centre maintains strong connections with other schools and faculties as well as other universities in Australia and internationally. Its programs include: Expertise, Evidence and Law (led by Gary Edmond); Juries: Citizen Participation in Criminal Trials (Professor Jill Hunter); European Law (Adam Czarnota); Justice in Peace Building and Development (Whit Mason); and the Sociology of the Rule of Law (Martin Krygier).

Centre for Implantable Bionics

UNSW's Faculty of Engineering launched the Centre for Implantable Bionics in July. Established with substantial assistance from the NSW Government, the Centre is a world-class research facility focused on the development of a new generation of implantable bionic devices for the human body.

Research efforts at the Centre include the commercialisation of a bionic eye, refined bionic hearing devices and artificial heart technologies, and development of electronic stimulation technology which could restore movement to the limbs of people who have suffered paralysis.

A new research chair, the Paul M Trainor Chair in Biomedical Engineering, will be affiliated with the Centre.

Institute of Health Innovation

Experts in health services, e-health and hospital organisation are being brought together to provide new insights into how to improve our health system.

The newly formed Institute of Health Innovation is the largest health services research team in the country.

The "health futurists" as they call themselves, see the health system as their patient.

"The health system is already under a lot of pressure," says Professor Jeffrey Braithwaite, who heads the Institute.

"In a short time we will have further pressures, such as an ageing population. So we need to reinvent the way healthcare is delivered."

The Institute is made up of three UNSW Centres – the Centre for Health Informatics, the Centre for Clinical Governance Research and the Simpson Centre for Health Services Research.

Each of these has a fine tradition of producing research results for the health system's improvement over many years but now they are combining their expertise to solve some of the hardest problems around. ■

– Compiled by Victoria Brown

To see more on CERPA go to UNSW TV www.youtube.com/unsw

Micro-flight team hits new heights

A UNSW-developed fleet of mini-helicopters and ground vehicles which are able to support each other and operate free of all human control have caught the attention of the world.

It was the toughest mission the UNSW MAVSTAR team had ever faced: across a dusty plain, armed extremists had taken staff hostage in a bank. MAVSTAR's mission was to use their unmanned air and ground vehicles to approach the bank, locate the hostages and map a rescue path while avoiding landmines and gun-toting perimeter guards.

Fortunately, the mission was a hypothetical scenario created for MAV 08, the inaugural US-Asian Demonstration and Assessment of Micro-Aerial and Unmanned Ground Vehicle Technology, held earlier this year in Agra, India. But the demands of the challenge were still exacting and the UNSW unmanned air and ground micro-vehicle team proved itself to be among the best in the world.

The Faculty of Engineering's MAVSTAR (Micro Aerial Vehicles for Search, Tracking and Reconnaissance) team took out the competition award for Best Unmanned Ground Vehicle (UGV) Performance – and with it gained the opportunity to submit a research grant proposal to the US Army.

MAVSTAR is developing a fleet of mini-helicopters and ground vehicles able to support each other and operate free of all human control. Autonomous micro-vehicle technology has enormous potential for search-and-rescue operations in dangerous situations such as collapsed buildings and battle zones – one of the reasons the US Army was a principal backer of MAV 08.

Since its MAV 08 performance, the MAVSTAR team have further improved the capabilities of their clever mini-machines.

Team leader Lin Chi Mak, a third-year PhD student in the School of Mechanical and Manufacturing Engineering, says the UNSW team is now close to perfecting "indoor localisation" ability, which uses a camera on the UGV to automatically track the Micro-Aerial Vehicle (MAV) and relay information to the micro-chopper about its proximity to walls and other obstacles.

"I think by the end of this year we should be able to have our UGV working autonomously with the MAV to help it navigate indoors," Lin Chi says.

"We have two key aims at present: one is to make the MAV fly on its own in an indoor environment and the second is to make it stable when flying in an outdoor environment."

The current MAVSTAR team comprises directors Dr Jayantha Katupitiya, Dr Jose Guivant and Dr Ray Eaton, team leaders Lin Chi Mak and Mark Whitty and undergraduate members Anselm Ma, Charoline Ng, Christopher Chare, Derek Taprell, Farhan Qureshi, Gabriel Kalkbrenner, Harry Xiao, Kai Zhan, Karthik Sukumar, Michael Woods, Ronald Choi, Steven Lee and Warren Jones.

The MAVSTAR project operates within the School of Mechanical and Manufactuing Engineering and is supported by the Centre of Excellence for Autonomous Systems (CAS), the Defence Science and Technology Organisation (DSTO), the Cooperative Research Centre for Advanced Composite Structures (CRC-ACS) and the US Air Force. ■

- Peter Trute

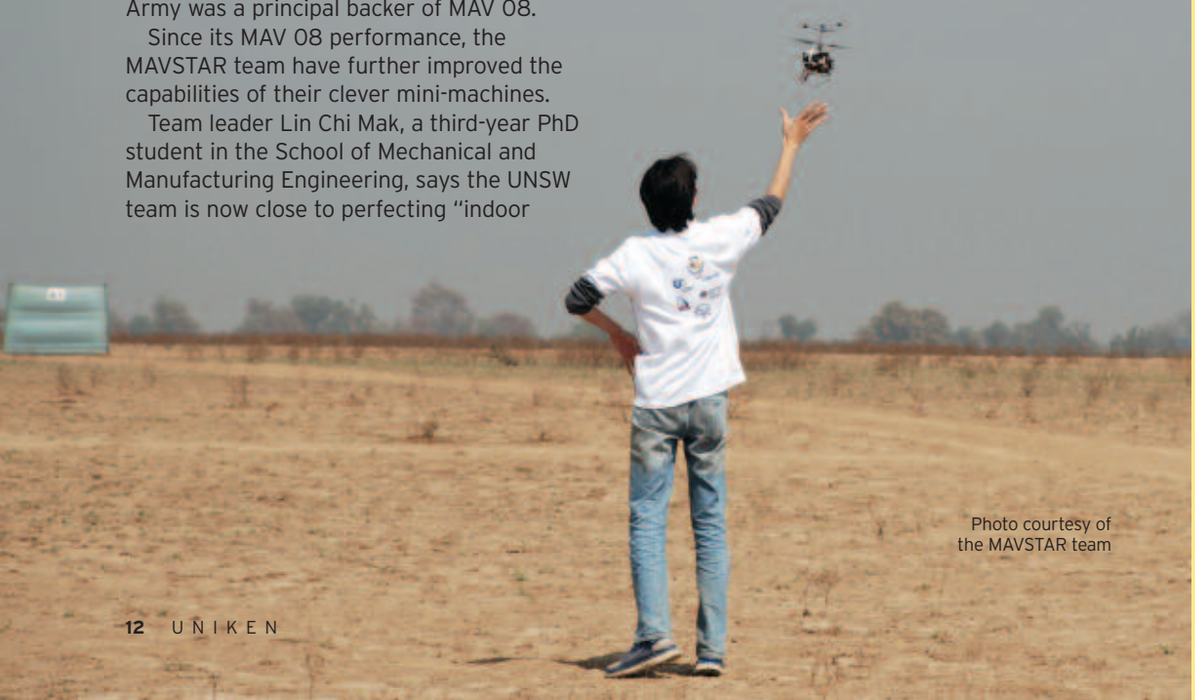


Photo courtesy of the MAVSTAR team

Cleaner flights, smaller footprint

Smarter air traffic control could save 500 kg of fuel and reduce airport noise by 35 percent for a typical Boeing 747 flight between Sydney and Melbourne, according to a team of Australian Defence Force Academy (ADFA) researchers.

Sameer Alam was recently announced as one of the winners in the 2008 Fresh Science competition. The award recognises his unique air traffic simulator which produced these estimates and which is now being trialled with the support of EUROCONTROL (the European Organisation for the Safety of Air Navigation).

> **"ATOMS leads to a smarter, cleaner system of air traffic management."**

Sameer, who developed the system with assistance from his colleagues at ADFA, hopes it will transform the management of airspace – saving fuel, reducing carbon emissions and reducing ground noise.

"Our system is the first in the world to integrate air traffic modelling with data and computations on aircraft noise and emissions," he says.

"It can simulate existing and advanced air traffic control procedures showing the resulting emission and noise patterns. In the future we expect that air traffic controllers would use the system to evaluate and modify flight paths to reduce noise and emissions.

"The Air Traffic and Operations Management Simulator (ATOMS) leads to a smarter, cleaner system of air traffic management." ■

- Jane Farrell

Vive la différence

New research shows that a healthy diet for men is not necessarily the same as a healthy diet for women.

Istock

Diet can strongly influence how long you live and reproduce but science reveals that what works best for males may not be best for females.

Australian and New Zealand researchers have shown that gender plays a major role in determining which diet is better suited to promoting longer life or better reproductive success.

In the evolutionary "battle of the sexes", traits that benefit males are costly when expressed in females and vice versa. This conflict may have implications for human diet, ageing and reproduction.

"When it comes to choosing the right diet, we need to look more closely to the individual, their sex and their reproductive stage in life," says Associate Professor Rob Brooks, Director of UNSW's Evolution and Ecology Research Centre. "For example, women in their child-bearing years need a different diet to those who are post-menopausal.

"It also underlines the important lesson that what we want to eat or, if you like, what we're programmed to eat, isn't necessarily best for us."

"... what we want to eat or ... what we're programmed to eat, isn't necessarily best for us."

The researchers are conducting long-term studies on Australian black field crickets and have discovered that the life span of both males and females is maximised on high-carbohydrate, low-protein diets, they say in the latest issue of *Current Biology*.

But reproductive success differs dramatically between the sexes when the carbohydrate–protein balance is changed: males live longest and have the greatest reproductive success with a diet that favours carbohydrates to protein by eight-to-one, whereas females have greatest success when the ratio is just one-to-one. Given a choice, however, females eat only a small amount more protein than males. The shared ability to sense and choose food dooms both males and females to eat a diet that is a compromise between what is best for each sex.

The researchers believe the sexes share most of their genes and this can constrain the evolution of sex differences in traits such as diet choice, because many of the same genes are likely to be responsible for trait expression in both sexes.

"Men and women invest differently in reproduction, a difference that is even more marked than that between male and female crickets," says Rob.

"Consider the tremendous amounts of energy and protein required of a mother in carrying a baby to term and breastfeeding. We also know that men and women need to eat different diets – think of the careful attention we pay to what expectant mothers eat.

"What men and women need to eat might be more dramatically different than we had realised. However, men and women eat very similar diets and our results suggest that our tastes and food preferences could be a shared compromise, as they are in crickets." ■

- Dan Gaffney

Photo courtesy of the Faculty of Science

Bat girl's quest

Caragh Threlfall haunts Sydney by night in search of tiny insect-eating bats, to learn more about one of Earth's least-studied mammals.

Under cover of darkness, a 25-year-old UNSW PhD student searches tunnels, stormwater drains and abandoned warehouses.

"Sydney is host to 20 species of insectivorous bats, and nearly half this number are threatened, although nobody knows for sure why this is so," says Caragh Threlfall, who says there are 1,000 known species of bats worldwide.

During warmer months, when bats are most active, insectivorous bats can eat eight to ten times their body weight in insects in one night, making them a friend to farmers and other mozzie-swatting humans.

"There's some thought that black rats might be threatening insectivorous bats," Caragh says, "because they're very agile climbers, and therefore capable of invading tree hollows and other places where bats roost."

According to Caragh, increasing urbanisation means bats are being forced to find new places to live.

"Habitat destruction, predation, poisoning and competition for roosting sites mean bats are being forced to find new and obscure places to call home," she says. ■

- Dan Gaffney

Preserving our sense of nation

Professor Michael Pusey hopes that the challenges we face will bring a renewed focus on nation building.

Building a nation: the opening of the Sydney Harbour Bridge, 1932

Getty Images

The aim of the past 25 years of top-down, neo-liberal re-engineering of society was to drive the market ever more deeply into the grain of daily life. It was meant to bury deliberative politics, to reduce popular expectations of government, to redefine politics as economic management *tout court* and to neutralise moral cultures. Thankfully it has not succeeded. A certain pragmatic utilitarianism is still actively shaping our will and imagination, our intuitions and value judgements about fairness, and about what progress and national development *should* mean: and we care about it!

So what are the prospects for nation-building to wake from its 25 years of amnesia? Nothing can happen unless governments can make it happen. And here the news is good. Canberra has demonstrated that it can call up reserves of power to change the course of national development. We have ample revenues and a hugely more efficient administrative apparatus with a capacity to deal coherently with the complexity of modern government.

Four points give me hope that the challenges we now face may yet bring a history of nation-building to our rescue.

First, it's likely that *a constructive adaptation to global warming* will give rise to structural and cultural changes of a kind last seen in the aftermath of World War II. Facing up to global warming has the potential to resuscitate our national imagination. It presents us with challenges that call, not only for incremental changes at the household level, but also for whole-of-government action at the national level. This challenge alone has the potential to break up much of the rusted, stalemated framework of current federal–state relations. More fundamentally it has the potential to restore the legitimacy of state intervention and to generate the cultural energy for nation-building government – those very resources that our economic "reformers" have tried so hard to erode.

A second challenge has to do with *the rebuilding of our infrastructure*. Australia is an OECD member with a per capita national income about the same as France. However France has a first-world national transport and rail network: ours is not much better than India's or, at best, Malaysia's. We have some of the world's most livable cities but they are stressed by bad public transport and the absence of coherent planning. The same is true of our run-down education system. Ditto for our broadband capacity and our research and design investments. Put simply, our infrastructure deficits are huge and glaringly incommensurate with our aspirations as a first-world nation. However, now for once in a lifetime, we have both the revenue and compelling economic justifications for doing something about it.

Third, at the level of ideas, *the neo-liberal opposition to constructive governance and nation-building is eclipsed or even exhausted*. No-one is listening any more to the worn out ideological catch calls for more privatisation, user pays, cuts to government spending, more competition and, thankfully, labour market reform. For the moment at least the vested interests have lost their voice. Even Treasury's blind ideological objections to public borrowing could – it's only a possibility – be swept away by renewed political calls for constructive nation-building.

> **"...economic reform also brings reduced standards of living for our children."**

Fourth, and here is the prospect about which I care most, national surveys confirm that *more of us are seeing, for the first time, that more economic reform also brings reduced standards of living for our children*. Intuitively we may be waking up to the truth that under the present doctrines a booming economy and increasing GDP mean environmental degradation, reduced real whole-of-life incomes, endangered futures and falling quality of life.

What is the use of *more* money, *more* economic growth and *more* economic reform if it makes us – and the nation – poorer? That unsettling question has the potential to change both the meaning of money and the priorities of economic policy. ■

Extracted from Michael Pusey's address "New Prospects for Nation-Building", which he presented as part of the Faculty of Arts and Social Sciences' "So, what?" public lecture series.

Susan Trent, Gasbag Studios

"... if you're being raised in a poor family you're more likely to be poor yourself in later life."

Protecting our children

Supporting families is one of the best ways to end poverty, according to researcher Peter Whiteford.

By **Steve Offner**

"No Australian child will live in poverty." Bob Hawke's pledge in the 1987 election campaign has entered political folklore as one of the most ridiculed statements of modern times, with Hawke himself admitting it's one of his biggest regrets.

For Dr Peter Whiteford it was a seminal moment as a social policy researcher. At the time a senior fellow in the Social Policy Research Centre (SPRC), he went on to be involved in the first assessment of the Government's performance on meeting the controversial pledge.

"That promise was probably not very sensible," he says, "But they did roughly halve child poverty in three years – an amazing achievement."

Returning to the SPRC this year after eight years abroad working for the OECD was something of a homecoming for the one-time acting deputy director of the Centre.

The SPRC has undergone an overhaul. In the '80s and '90s it was a small unit largely funded by the Federal Government through the department of social security. Now it has funding from a variety of sources and its research has increased in scope.

"The Centre has grown quite a lot since I was here last and has a much broader range of research," Peter says.

While at the OECD Peter's research focused on the social security and labour market systems of member and non-member countries. He gained a valuable perspective on Australia's comparative performance on social inclusion issues, particularly on child poverty.

"Currently child poverty rates in Australia are about 10 percent when you define poverty as a family receiving less than half the median income. In Scandinavia the rate is five percent. In the United States it's 21 percent. So we do a lot better than a lot of OECD countries but not as well as others," he explains.

> **"... they did roughly halve child poverty in three years – an amazing achievement."**

His research at the OECD revealed that countries with the lowest child poverty rates were also the ones with effective income redistribution systems and low rates of family joblessness.

"When you look at benefits and at how much goes to the poor compared to how much goes to the rich, Australia is the most progressive country in the OECD," he says.

But, he argues, what lets Australia down is the high number of jobless families – that is, families with lone parents who aren't employed or couples where neither is working. Australia's is one of the highest rates in the OECD.

"There's research that shows that if you're being raised in a poor family you're more likely to be poor yourself in later life. So family joblessness is a concern," he says.

"The Rudd Government has indicated that this is a priority for them and they've established a special social inclusion unit in the Prime Minister's Department."

Peter believes reforms are needed to encourage more parents into the workforce.

"I don't think it's a matter of cutting benefits ... it's a matter of maintaining benefits for the poor but at the same time encouraging people into work and supporting them when they are there.

"Nordic countries have the same level of generosity of benefits as Australia but when a child turns four, the municipality has to provide child care and parents are expected to look for work," he says.

"It's this level of support – good-quality child care and parental leave, and effective employment services for the most disadvantaged – that makes the difference."

It's here that Peter's interests dovetail perfectly with the wider research of the SPRC which is looking at paid parental leave, the provision of child care and gender divisions of labour.

"Australia can achieve a similar family joblessness rate as Scandinavia, but the family support needs to be there. It's one of the best ways to improve children's well being," he says. ■

Changed forever: The American Stock Exchange circa 1970

Corbis

Ray Ball and Philip Brown

Photo courtesy of the Australian School of Business

Accounting for history

When UNSW graduates Ray Ball and Philip Brown came together at the University of Chicago they rocked the financial world. By **Chris Sheedy**

At the University of Chicago in the mid to late 1960s there was a feeling of revolution. And in their own special way two young Australian UNSW graduates, Ray Ball and Philip Brown, were about start their own revolution by shaking the foundations of accounting research.

"Change was in the air," Ray recalls. "It was a truly exciting time. Momentous events in world politics included Vietnam, the assassination of Martin Luther King and Robert Kennedy, revolution in the streets of Paris, the loosening of socialist reins in the Prague Spring and the brutal Soviet response, the black power salute at the Mexico Summer Olympics, and civil unrest at the Democratic Convention in Chicago."

Against this backdrop the two began a research project they called *An empirical evaluation of accounting income numbers*. It was an unassuming name for a report that would change the way people evaluated an entire industry, which is perhaps why it's now simply known as *Ball and Brown, 1968*.

"Almost all of the evaluations of accounting had been largely in terms of the consistency or agreement between what practices were followed by accountants and what some theoretician said they should be doing," Philip says.

"We believed accounting had survived too long to be just ritual. There must be some point to it. The fact that it doesn't correspond with what some theorist says is not sufficient grounds to reject what's taking place. So we said let's evaluate it empirically, let's have a look at the correspondence between accounting information and one of the major user groups – investors – as reflected in stock prices."

Reported profits today drive the share market. A dive in profits will be followed by a dive in share price, and vice versa. But prior to *Ball and Brown, 1968* reported profits from a company's accounting department were considered unconnected to share price. In fact the accounting ritual itself was thought of as unimportant and arcane. Ray and Philip looked for a connection between reported earnings and stock returns and discovered what many thought they would never find – a deep, undeniable relationship between the two.

The research involved the analysis of 2000 annual reports (dated between 1957 and 1965) from 261 companies and proved conclusively that profit had an enormous impact on stock price. It showed the importance of accounting in the modern market, and opened up an entirely new band of empirical research in the field of accounting and finance.

While the two say there was no way they ever could have guessed the far-reaching implications of their research, they did have some sense of its importance. Perhaps this was what kept them going as some senior academics told them the project was a waste of time, and when the paper was originally rejected by *The Accounting Review*.

"I was a young man, hence naive and cocky, and the negativity was very disconcerting," Ray admits. "But we knew we were onto something from the minute we started. It was rough going until somewhere around 1972. I think a lot of people began changing their minds around this time, and follow-on research started to flow. I don't recall thinking about it that rationally. We just did it because we believed it would work."

At a recent dinner celebrating the 40th anniversary of *Ball and Brown, 1968*, Professor Alec Cameron, Dean of the Australian School of Business, summed up the paper's great value: "The 'Ball and Brown' paper has been widely acknowledged as the most influential piece of accounting research at that time. It truly represented the start of modern capital markets-based accounting research. Ray and Philip's research transformed our understanding of the effect of corporate disclosure on share prices, and of earnings releases in particular." ■

To see more on this story go to UNSW TV www.youtube.com/unsw

Shock waves in art

Dr Harald Kleine is turning science into beauty.

By **Fran Strachan**

"Shock waves are all around us, whether it's a bubble bursting in a glass of mineral water, thunder cracking in the sky or a book landing with a thud on the floor – my research makes the invisible visible," says Dr Harald Kleine.

Often audible but rarely seen, shock waves punctuate our everyday existence, but what do they look like?

Harald, senior lecturer in the School of Aerospace, Civil and Mechanical Engineering at Australian Defence Force Academy, is a leading expert in the field of high-speed flow visualisation. The filming and photography of compressible flows have helped advance the field of fluid mechanics but Kleine has revealed a dual purpose to his research records.

Using cameras that can take up to one million frames per second, Harald captures shock wave phenomena – anything from explosive blasts and bursting balloons to the supersonic flows around jet aircraft models and bullets – and the resulting images are both informative and beautiful.

Like more traditional art forms the visualisations feature elements of symmetry, pattern, contrast and shading, often with a unique kaleidoscopic quality.

> **"What you see is created by nature, I just provide the palette."**

The aesthetic appeal of flow visualisations has been recognised for centuries – Leonardo da Vinci sketched swirling water flows in his scientific notebooks – but their artistic elements have only been formally documented in the last 20 years, and mostly by art historians rather than by the scientists who created them.

Harald, whose artistic images have featured in exhibitions and selected scientific publications internationally, takes on the roles of both artist and fluid dynamicist when photographing his scientific experiments.

"Artists transform an abstract idea into something visible. I do the same by recording, in a split second in time, a phenomenon or an object that's normally invisible to the naked eye," says Harald.

Created in his lab at ADFA, the images are captured using optical systems of mirrors, lenses, filters and other hardware that make the shock waves visible. The waves are typically created in test facilities such as a shock tube or a supersonic wind tunnel, and carefully arranged filters in the optical system are responsible for the colourful display of the flow fields.

"The process itself selects the colours depending on how much the observed phenomenon modifies the light beam that I send through it. What you see is created by nature, I just provide the palette," he states.

Harald believes the images are not only scientific records but also provide an accessible art form that requires no interpretation by the viewer.

"A scientist may value them as a record of quantitative data, but they can also be viewed by the layman simply as a beautiful image," he says.

According to Harald, the images being acknowledged as an art form depends on future artists and scientists taking advantage of flow visualisation's unique potential.

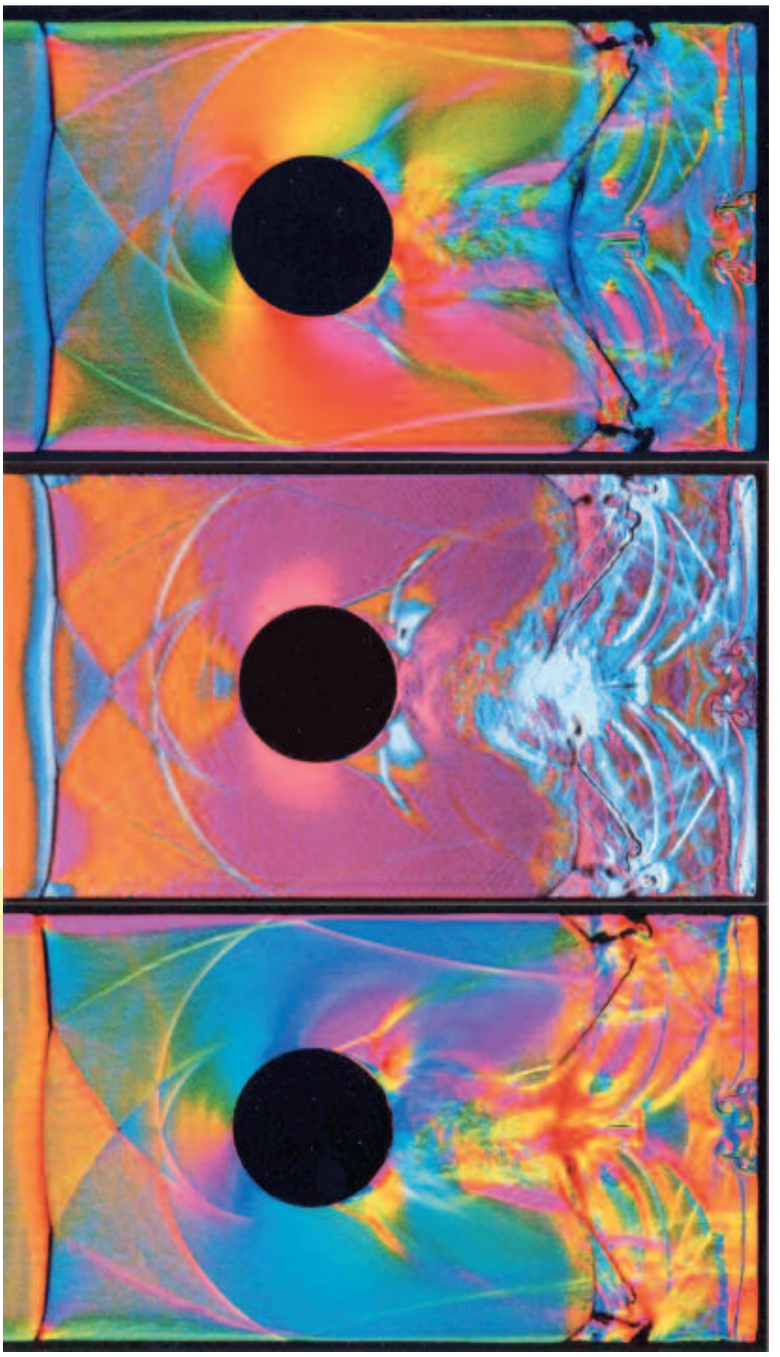


Photo courtesy of Harald Klein

Harald Kleine uses different colours to display the same shock wave in different ways.

"Flow visualisation systems are more than just ordinary scientific instruments, they provide a window on a part of nature that can't normally be observed. Scientists can use their expertise to deliberately create images that are also art and not merely scientific records," he explains.

"This is a way to put science in a more exciting and accessible form. As they say, 'a picture paints a thousand words' and observing the patterns generated by a flow can, for many people, be far more interesting and even more informative than looking at a scientific equation." ■

To see more on this story go to UNSW TV www.youtube.com/unsw

Renaissance artist's virtual rebirth

Michelangelo's 600-year-old techniques have provided inspiration for the production of holograms with a human touch. By **Fran Strachan**

He hammered and chiselled a 19-foot marble block into the heroic figure of *David* and spent four physically torturous years painting the Sistine Chapel ceiling, but centuries after his death, how would Michelangelo feel about his artistic techniques providing the inspiration for 3D digital imagery?

"I needed to know the answer to that before I started – I had to feel sure that he'd be pleased otherwise I wouldn't have done it," says Dr Paula Dawson thoughtfully.

"I think every artist would be happy for someone to continue on with their work regardless of the medium, the greatest compliment is to be a source of inspiration to other people."

Paula, internationally recognised hologram artist and COFA lecturer, is referring to her current research, *The Modelling Light Project*.

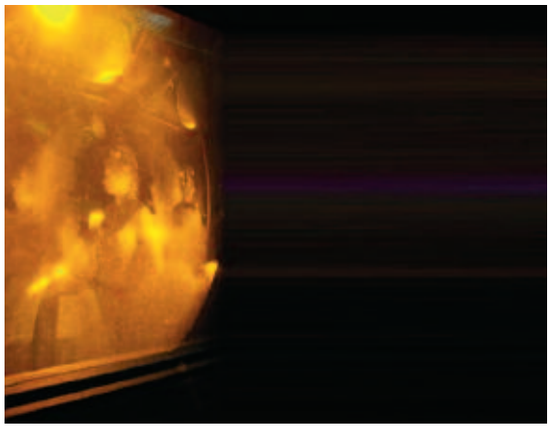
By studying Michelangelo's sculptures in Europe and accessing his preliminary sketches in the Louvre, Paula will develop a computer interface capable of creating 3D digital content for holograms. Users of the software will be able to manipulate virtual tools to directly handcraft subjects, mark by mark, analogous to Michelangelo's drawing, painting and sculpture practice.

An information archive based on laser scans of Michelangelo's sculptures developed by Stanford University and the University of Washington will assist Paula with her project.

"I'm studying Michelangelo because he used a similar approach to defining the figure both in 2D and 3D imagery and his modelling style transfers well to holography," she says.

This is not the first time Paula has drawn on traditional techniques to extend her holographic practice. Over the past 20 years Paula has studied the Masters, including Giotto, Masaccio and Leonardo da Vinci and applied their technical approaches to hologram creation.

Paula's research is timely. It's predicted that in 10 years time both TV and film will be three dimensional but the increase in the development of 3D display systems, like stereo computer screens and holographic video, is yet to be matched by advancements in editing and creating 3D content.



(L-R): *Luminous Presence*, 2007. Courtesy of Paula Dawson.
Mirror Mirror, bronze with embossed hologram 35x150cm, 2004. Courtesy of Paula Dawson. Paula Dawson. Photo: Susan Trent, Gasbag Media.
Hohlraum (detail) 50x60cm laser transmission hologram, 2003. Courtesy of Paula Dawson. Paula Dawson and Graeme Murphy. Photo: Anthony Browell, courtesy of COFA.

"I had to feel sure that he'd be pleased otherwise I wouldn't have done it."

"Most digital content software is laborious, time-intensive and results in bland, homogenous surfaces in holograms," says Paula.

"My aim is to use texture, light and shade to re-create the fundamental essence of a person – what we call in the virtual-reality world, presence," she says.

Paula's innovative use of a touch-sensitive tool, the PHANTOM, will help achieve this humanistic rendering of subjects by allowing the fluent manipulation of digital surfaces.

The cantilevered mechanical arm, purchased with a $56,000 UNSW Major Equipment Grant, can record mark-making by registering gestures from fine finger movement to full-arm rotation, against the simulated resistance of materials.

Similar to drawing in the air with a sparkler, the PHANTOM will allow virtual drawing, painting and sculpting in space while simultaneously registering each individual mark, its spatial location, shape and colour.

"Artists need tools to help express what's on their mind. Michelangelo used every tool he picked up to convey to viewers what it is to be human. I hope to achieve the same result with the PHANTOM," says Paula.

"Michelangelo drew softly with charcoal so that it looked incredibly soft and tonal, and then he created sculptures that were very well defined while other parts were lumpy and coarse. It's the contrast between fine and thick marks in a drawing or sculpture that capture the essence of a person."

One of the innovative features of the new software will be the space of the 3D display possessing the materiality of stone that can be excavated and chiselled with virtual tools. Light, shade and colour can be also be applied selectively, as with painting.

The expressive potential but computational simplicity of these scenes will enable them to be produced and exported quickly to computers and holographic displays.

Paula predicts that it will take four years for *The Modelling Light Project* to reach completion, but believes it will be of international benefit to designers and artists who will turn to Australian expertise and technology for the composition of major hologram projects.

"Perhaps I'm channelling Michelangelo!" she exclaims. "I just hope my research keeps his way of imaging humans alive, not just through observation but by people participating and engaging with it." ■

By **Prue Vines**

The trial of depression

Students entering law school feel better about themselves than most of the population do: it's a high point in their lives. However, many of them are heading for a profession in which depression is commonplace.

The statistics should make you sit up: the incidence of depression is four times higher among lawyers than the general population; one in four lawyers suffers from elevated psychological distress; lawyers consistently rank first in surveys on the rate of depression compared with other professionals; a much higher proportion of lawyers commit suicide than the general population – in fact, one study says that 11 percent of lawyers contemplate suicide every month; 15 percent of lawyers meet the criteria of alcoholism; and substance abuse dominates 80 percent of complaints against the Australian legal profession.

Depression can happen to anybody. It's not limited to the weak or those with a genetic predisposition; it's society-wide.

We know from extensive research that lawyers become depressed as a by-product of the professional life they lead. Any lawyer can find themselves suddenly subject to it, given a particular set of circumstances, to which many (if not most) lawyers are frequently exposed: a culture of competitiveness where very long hours in a tough, combative environment are the norm and fear of failure is common.

Pessimism is also part of the territory: legal work often involves warding off what will go wrong. Then there's the edict that a lawyer must follow a client's instructions, even if those instructions contradict that lawyer's better judgement. This cultivates learned helplessness.

Lawyers are often idealists, attracted to joining a noble profession. Many become increasingly disillusioned by the ethical dilemmas and commercial imperatives posed by their work.

Lawyers also tend to be perfectionists, often linked to obsession and anxiety, both of which are fertile ground for depression.

A 2007 *Australian Financial Review* survey showed that 45 percent – nearly half – of young lawyers are considering quitting their job. This may not mean leaving the legal profession, but rather, moving to what they see as a better work-life and/or ethical balance.

So, the problem is real and entrenched. As with most such problems, fixing this one requires equally strong initiatives that directly and practically tackle the negative aspects of work culture that cultivate it. To borrow from artist Jenny Holzer: *to change a culture quickly, use what is dominant in it*.

Changing the perception that depression only happens to the "soft", or is only given credence by non-competitive people is critical.

We need to "name and fame" some of the widely admired lawyers who cultivate resilience to and/or have overcome depression by maintaining ethical practice, pride in their profession and work-life balance. We need to emphasise how they make time for family, health, culture and friends and how this fuels their professional success.

We need the profession's most senior people to lead an ongoing effort, in word and deed, to replace with more balanced behaviour, the trend of working excessively long hours at the expense of health and social wellbeing.

UNSW Law School already has in place mentoring and support programs for students in their first year. Our programs warn students about the dangers of depression and seek to build resilience against them.

As a natural progression we are similarly seeking to do this with practising lawyers, in partnership with the profession and mental wellness experts. We've said ongoing and varied effort is required: this could add to the momentum.

We aim to develop workshops to help senior partners take the lead in creating the right work environment for their colleagues. The workshops might tackle lawyers' attrition: human resources strategies need to cultivate resilience, beginning with clerkships and continuing through professional life.

Another workshop might address the impact of depression on legal practice: for example wrong advice being given or matters not being dealt with properly might create legal liability or other problems for a firm. Recognising these possibilities, in a culture that accepts that depression can happen to anyone, will make it possible for firms to intervene early and effectively to help both the lawyer and the firm.

The workshops will be developed in close consultation with firms and in partnership with UNSW's Black Dog Institute and the Tristan Jepson Memorial Fund.

The Tristan Jepson Memorial Fund was established by Marie and George Jepson following the 2004 suicide of their son Tristan, who was an alumnus. The Fund aims to build effective models of support for mental wellbeing in legal education and the legal profession. UNSW hosts the Fund's annual lecture, which this year will present the results of new research into lawyers, law students and depression – findings that law students, lawyers and firms alike ignore at their peril. ■

Professor Prue Vines is the Director of First Year Law Studies and Co-Director of the Private Law Research & Policy Group.

2008 Tristan Jepson Memorial Lecture
6pm, Thursday 18 September
For more information or to register go to www.law.unsw.edu.au/news_and_events.