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**The heart of
the matter:**
inside vascular
research



- Making Creative Waves
- Aceh's farming future
- Diving in: Bob Clark

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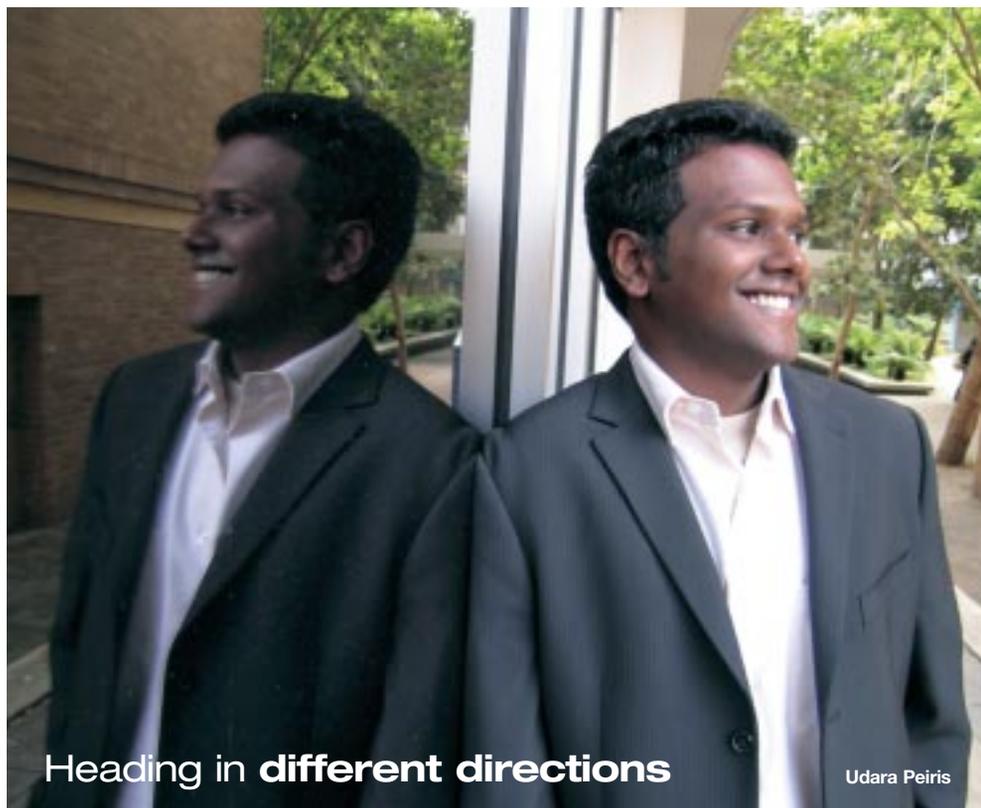
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Group of Eight



Heading in different directions

Udara Peiris

Udara Peiris, a graduate in finance and actuarial studies from the Faculty of Commerce and Economics, is one of three UNSW alumni recently awarded international scholarships. Udara, 21, has been awarded a full scholarship to the University of Oxford, where he will do a Master of Financial Economics degree followed by a doctorate at the Saïd Business School. "I am thrilled to even get there and to win a scholarship is a double honour," said Udara, who is one of only 100 students worldwide to receive a Clarendon Scholarship this year.

Two UNSW alumni have received Fulbright Scholarships. Medical graduate David Ziegler has won a Fulbright Postgraduate Alumni (WG Walker) Award and will conduct research at the Dana-Farber Cancer Institute at Harvard Medical School on the contribution of mutated cell pathways to the development of cancer. Law graduate Olivia Coldrey, who also holds an economics degree and a Master of Laws in international trade and financial law, has won the 2005 Fulbright Professional Business/Industry (Coral Sea) Award. She will conduct research on the Australian-US Free Trade Agreement at New York University's School of Law. ♦

Making cents of language

Australian export businesses now have a partner to help them address the issues of appropriate cultural awareness, intercultural communication and business language: the National Centre for Language Training (NCLT). Announced by the Federal Government last year as part of a \$113 million package of measures to support Australia's international engagement, the NCLT was launched last month by the Hon Pat Farmer, Parliamentary Secretary to the Minister for Education, Science and Training, and Vice-Chancellor Professor Mark Wainwright.

Based at UNSW, the centre operates through a consortium of national partners, including five universities: Curtin University of Technology; Griffith University; Monash University; UNSW and the University of South Australia, as well as the Australian TAFE Consortium (ATCON). The centre provides customised services including language and cultural readiness assessment; short courses in practical business language; immersion training programs for staff and management; seminars and workshops on cultural awareness; supply of business information resources; practical courses on intercultural communications and negotiations; and specialised cultural training by international experts.

The National Centre for Language Training office is located at the Australian Technology Park (ATP), the site of the former Eveleigh Railway Workshops. ♦

Performance **Paradigm**

An online journal exploring contemporary performance genres and related activities, *Performance Paradigm*, has been launched by the School of Media, Film and Theatre. "Creating an online journal allows us to reach the breadth of readers interested in this area across Europe and the States but particularly in Asia and Australia," said Dr Edward Scheer, founder and general editor of the journal.

The first issue has seen more than 300 registrations to date and includes performance and book reviews, interviews and themed articles. The theme *Live Ends. Performance in the information age* includes an interview with Stelarc by Dr Scheer and articles by a number of UNSW researchers including academic Andrew Murphie, Vice-Chancellor's post-doctoral researcher Yuji Sone and postgraduate Sam Spurr. The theme for the second issue of *Performance Paradigm* is *Japan after the 1960s: the ends of the avant-garde*. The journal was launched on 13 April. See www.performanceparadigm.net. ◆



Image from a performance review of *Alladeen*, 2004 Melbourne International Arts Festival

Half-century **milestone**

The Faculty of Commerce and Economics celebrated its 50th anniversary last month with a lunch addressed by the former CEO of Coca-Cola, Doug Daft. Mr Daft, an alumnus of the faculty and the first non-American to be the Chair and CEO of Coca-Cola's worldwide operation, spoke of his passion for learning and of the importance of international understanding. Mr Daft told the audience that working or studying abroad is essential to success in an increasingly diverse world. "International education ignites a passion for understanding other people and their perspectives," he said.

At the event the Dean, Professor Greg Whittred, outlined a new vision for the faculty. "To secure our place as the leading business faculty in the Asian region, we are about to embark on a major campaign of investment – in people, in programs and in infrastructure," he said. Professor Whittred announced plans to attract the best students and staff through a range of scholarships, in partnership with Australian business and the professions. ◆

Green house and garden

The UNSW Ecoliving Centre is running a series of sustainable urban living educational workshops, free for Randwick residents, UNSW staff and students and staff of Randwick Council. Bookings are essential. They include **Resourceful home** (Saturday 11, 18 & 25 June): discover simple household strategies for saving energy, water and money to reduce your ecological footprint and create a healthy environment; **Sustainable Gardens** (Sunday 8, 15 & 22 May): simple, practical ideas for sustainable gardening that gives back to the environment; **Bush in the city** (Sunday 12 June): mimic nature's ecological balance by creating gardens that attract native birds and bees; and **Common garden weeds** (Wednesday 25 May, evening): identify common garden weeds and learn about organic techniques for removal. More information at www.ecoliving.unsw.edu.au or 9398 8838. ◆

Preventing plagiarism: a graded response

UNSW is to introduce a unique four-level scheme for assessing plagiarism as part of a comprehensive anti-plagiarism strategy focused on education and prevention. New guidelines for faculties and schools, approved by the Academic Board, outline the issues and circumstances that should be taken into account when assessing the seriousness of an alleged incident, and the appropriate response.

The pilot program, to be trialled during second session this year, also involves the appointment of a central Student Ethics Co-ordinator as well as student ethics officers in all faculties. The similarity detection tool *Turnitin®* will be tested in several faculties and schools over the six-month trial period.

Under the new guidelines, where the plagiarism is considered to be insignificant, an informal educative response such as counselling will be sufficient. The four-level scheme will apply where plagiarism is considered significant enough to merit a formal response. An incident judged to be at the lowest level of seriousness (level one), would require an educative response only. Level four incidents would be those serious enough to warrant investigation under academic misconduct rules, with possible penalties ranging from a fine to expulsion from the University.

"While obviously a punitive response is appropriate for the most serious breaches, the major aim is to help students avoid plagiarism," said Professor Adrian Lee, Pro-Vice-Chancellor (Education and Quality Improvement). "Our approach is educative, rather than punitive. The University is committed to helping students understand the nature of plagiarism and avoid actions that may result in academic misconduct.

"Maintaining academic standards requires an adherence to ethical behaviour. The University wants to bring home to students that they are ethically bound to refrain from plagiarism in all its forms."

The pilot program was developed following an 18-month review of the existing framework for dealing with student plagiarism. It is based on international best practice as well as best practice developed both at UNSW and at other Australian universities.

Associate Deans (Education) or their equivalent will be appointed as Faculty Student Ethics Officers. The Student Ethics Co-ordinator is located in the Office of the Deputy Vice-Chancellor (Academic), Professor Robert King. A central plagiarism register will also be established.

The new guidelines are now available on the Learning Centre website (www.lc.unsw.edu.au), which will be the central point for staff and student information on academic honesty and understanding and avoiding plagiarism. Separate handbooks for staff and students will be available soon.

While it is intended that the broad principles outlined in the plagiarism guidelines will apply to all UNSW students, it is recognised that there are often separate requirements for students enrolled in research programs. The issue of research students is to receive further consideration by the Deputy Vice-Chancellor (Research), Professor Les Field, and the new Dean of Postgraduate Research, Professor Margaret Harding. ◆

Judy Brookman

For the record

One wonders how many Australians knew in 2000 that there was a more than one-in-five chance that they and their families would have to spend one of the next three years of “economic prosperity” living below the poverty line.

Professor Peter Saunders, Social Policy Research Centre – Sydney Morning Herald

The compensation was known not to be sustainable because it wasn't indexed to inflation.

Associate Professor Neil Warren of ATAX on the erosion of benefits from the post-GST personal tax cuts – The Bulletin

These are a reasonable set of uniform laws with some improvement on existing laws, but no great radical improvements.

Roy Baker, Communications Law Centre, on the prospect of uniform defamation laws – Adelaide Advertiser

If a company hired a top quality adviser, then that should show up in better shareholder returns, otherwise why would a company spend more money on getting a top quality adviser?

Professor Terry Walter, School of Banking and Finance – Australian Financial Review

Almost anyone who questions [Tasmania's Labor Government's] pro-logging predilection becomes a de facto enemy.

Natasha Cica, visiting fellow, Gilbert + Tobin Centre of Public Law – Sydney Morning Herald

If you are an up-and-coming talented manager, then having the opportunity to be in London, Hong Kong or Sri Lanka with Citibank has got to be better than hanging on at Westpac.

Professor Timothy Devinney, Centre for Corporate Change, AGSM – Australian Financial Review

It seems to be a function of rainfall and the volume of traffic.

Dr David Croft, Fowler's Gap Research Station, on the factors contributing to roadkill – Forbes Advocate

The people who did not get injured all sought professional advice, had a lot of coaching for their activity and had experience in the game... and they participated in pre-season training.

Professor Caroline Finch, Injury Risk Management Research Centre, on middle-age participation in team sports – Sydney Morning Herald

Only the darkest soul would not wish such a wonderful and amazing animal as the thylacine to be still alive.

Professor Mike Archer, Dean of Science, on the cessation of attempts to recover DNA from preserved thylacine specimens – The Bulletin

The business of sustainability By Mary O'Malley

Far from being in conflict with economics and business, the drive for a sustainable world is a practical and profitable necessity. And smart companies are realising that sustainable practices simply make good business sense.

That is the clear message of champions of sustainability who spoke at UNSW last month. Hunter Lovins, co-author of *Natural Capitalism*, and Karlson Hargroves, co-editor of *The Natural Advantage of Nations*, launched their 2005 Sustainable Business Practice Tour with a seminar hosted by the Faculty of the Built Environment and introduced by ecological economist Dr Mark Diesendorf from UNSW's Institute of Environmental Studies.

Presenting the business case for sustainability, they exploded the myth that business does not want to engage with sustainability issues. In fact, said Lovins, in a January survey of business leaders taken by the World Economic Forum (WEF), the two most important issues identified were poverty and climate change. An earlier WEF survey found that chief executive officers see a definite business case for going beyond mere compliance with environmental laws.

“Protecting the climate can actually be done at a profit, cost-effectively,” Lovins said. “And smart companies are starting to do this – not because of any law but because it makes good business sense.”

“Mark [Diesendorf] is one of the leaders in the field of ecological economics. He points out that even if you don't particularly like cuddly little creatures or pretty vistas, intact ecosystems give to our economies about 30 trillion dollars a year of worth. These ecological services in many cases underpin the ability of the rest of the economy to work at all.”

At an individual level, companies are realising there are benefits to the balance sheet. In 2000, before the advent of the Kyoto Protocol, British Petroleum announced they were going to cut their greenhouse gas emissions by 10 percent below their 1999 levels by 2010. It only took two years but it is saving them US\$650 million, Lovins said.

We can solve most of the known ecological problems through well-applied technology and new ways of thinking, but it requires the input of government

American industrial giant Du Pont has gone even further. Over the same time frame they announced a 65 percent cut in emissions in the name of increasing shareholder value. Production now is up 30 percent, emissions are down 67 percent and they are saving US\$2 billion.

ST Micro has committed to zero net emissions of CO₂ (carbon dioxide) coupled with a 40 percent increase in production. “Delivering on this promise is driving the company's innovation,” Lovins said. It has taken them from number 12 chipmaker in the world to number six.”

The Osage Iowa Industrial Municipality is another case in point. The manager there recognised that customers don't want electricity per se but the services that electricity delivers: hot showers, cold beers, the ability to run a projector. He decided to offer those services more cheaply through greater efficiency. The result was a saving of US\$1 million a year in this small town, cut electricity bills to half the state average and unemployment to half the national average because, with lower rates, more factories came to town.

“This is a program that any community anywhere in the world can implement cost effectively. Even if you don't care about CO₂, even if you don't care about the environment, if you care about building a strong local economy you will do this,” said Lovins.

In the respective books, Lovins and Hargroves maintain that we can solve most of the known ecological problems through well-applied technology and new ways of thinking. But it requires the input of government.

Lovins believes the approach to economics pioneered by people such as Mark Diesendorf will be seen in the future as revolutionary. “But it can't work without people setting policy and people setting what kind of future you want to have. The market is a very good tool for getting there but it will never give you that vision,” she said. “We have the theory. We have the technologies. Really the only interesting question is, are we going to do it?” ♦

The Lovins/Hargroves seminar was introduced by Dr Mark Diesendorf of the Institute of Environmental Studies, who is author of this month's *Last Word* column, page 16.

Rebuilding Aceh's farming future

By Louisa Wright

Jes Sammut is on a mission. He is part of a group of Australians working to restore the livelihoods of shrimp and rice farmers in post-tsunami Aceh – no minor challenge in the face of extensive sedimentation of shrimp ponds and rice paddies, contamination with salt and debris, and the heartbreaking loss of skills through the uncountable death toll.

Dr Sammut, a geographer in the School of Biological, Earth and Environmental Sciences, works in sustainable development and environmental assessment and planning. His research in Indonesia, supported by the Australian Centre for International Agricultural Research (ACIAR), focused on the restoration of degraded shrimp farms and sustainable development of aquaculture in South Sulawesi, which saw the development of techniques now directly applicable to Aceh.

Two ACIAR-funded groups – one agricultural and one aquacultural – will travel to Aceh this month to begin a train-the-trainer project, teaching Indonesian Government fisheries and agriculture staff a range of low-technology, best-practice techniques to help farmers restart their work. Medium- to long-term research and development projects will follow.

“The restoration of livelihoods is an urgent issue,” Dr Sammut said on his return from Aceh last month. “But capacity building and institutional strengthening has to be the long-term goal. The research is important but it’s a means to an end, which is community impact and community outcomes.”

The work is formidable. When the tsunami crossed the coastline on Boxing Day last year, it stripped soil from once-productive farmland, picked up domestic and industrial debris, and – as the water began to



Jes Sammut

Makeshift housing is built by shrimp farmers who are reluctant to leave the area, for which they have a strong affinity, despite the enormous damage to their ponds.

Ponds were either filled with sediment or were scoured deeply, had their walls and dykes swept away, or vanished altogether as whole stretches of coastline are now permanently under seawater

lose strength – deposited it all with salt onto rice fields, shrimp ponds and every other surface. While months of bulldozing the debris aside has revealed damaged roads and housing foundations, the task of removing contaminated sediment from food-growing areas is much more difficult. More than 30,000 hectares of shrimp and fish farms in the Banda Aceh area alone are affected and almost 200 shrimp and fish hatcheries and other infrastructure were also severely damaged.

While countless hectares were turned to wasteland on the west



Jes Sammut

A typically heavy layer of clay and silt deposited by the tsunami on rice growing areas, leaving them saline and unproductive.

coast, the Indonesian government has encouraged work to begin in areas of less extreme damage and less devastated population, in order to benefit the maximum number of survivors. Dr Sammut's March trip was to co-ordinate with other bodies including the Food and Agriculture Organization (FAO), United Nations Development Program (UNDP) and the Network of Aquaculture Centres in the Asia-Pacific (NACA). They identified the most urgent areas of need, assessed the priority of medium- and long-term projects and worked to ensure that different groups do not duplicate work but instead produce complementary outcomes.

Dr Sammut's group is addressing the brackish water aquaculture ponds, where fish and shrimp were grown. In most cases the ponds were either filled with sediment or were scoured deeply, had their walls and dykes swept away, their inlet and outlet canals filled, or vanished altogether as whole stretches of coastline are now permanently under seawater.

Pond engineering and soil remediation lessons from South Sulawesi will be immediately applicable. Techniques for sediment removal, soil testing, pond reconstruction and methods for checking the early-stage shrimp crops also exist. Harder to address is the loss of lives, taking with them the community's skills at all levels – healthcare workers, teachers, artisans. Dr Sammut sees the restoration of the skills base of Aceh as a fundamental need of the community. ♦

Jes Sammut leads multidisciplinary fisheries research teams in Indonesia and Australia that comprise soil scientists, biologists, social scientists, economists, planners, ethnographers, mapping specialists, technicians, pathologists and geographers.

Making creative waves

By Alex Clark

Over the past six weeks UNSW's Omnium research project at the College of Fine Arts has been hosting *Creative Waves*, the world's largest international online student design project. "*Creative Waves* is the first in a series of free online projects for students studying graphic design, photomedia and visual communication," Rick Bennett, co-convenor of the project, said. "More than 125 participants across 30 countries are involved, including 80 students from countries as diverse as India, Jordan, Peru, China and Slovakia.

"*Creative Waves* started with each participant taking a series of photos at exactly the same time worldwide... the photos represent who they are, where they are from and what they were doing at that time of day. The students didn't know the project's end before its beginning and we wanted to explore the potential for collaborative online creativity that challenged the traditional paradigm of individual creative processes."

The project used Omnium's unique web-based 'studio' interface that allows participants to interact in small creative teams as they respond to an unfolding design brief. Bennett, the founder of Omnium, said it was a coup to be invited by the International Council of Graphic Design Associations (Icograda) to host the

groundbreaking venture.

"I am confident that we are now doing something really important in the areas of e-learning and in particular design education," Bennett said. "Having some of the world's leading names in design education, graphic design practice and online learning research wishing to join us has given this latest Omnium venture a significance that will really make a mark worldwide. I believe that *Creative Waves* will be looked back on as a seminal example of a new future – one which others can also use as a foundation to build."

The project was co-convened by Vince Dziekan, senior lecturer in digital arts at Monash University. ♦



This series shows individual photographic responses from students around the world, having been asked to record where they were at the same specific moment in 'Time'.



This series shows individual photographic responses from *Creative Waves* students, when asked to visually record a 'Place' that best described their own location.

WEEK 3



This series shows individual graphic responses by students to visually describe the combination of 'Time & Place'. These works had to be produced by using their previous photographic submissions from weeks 1 and 2.

WEEK 4

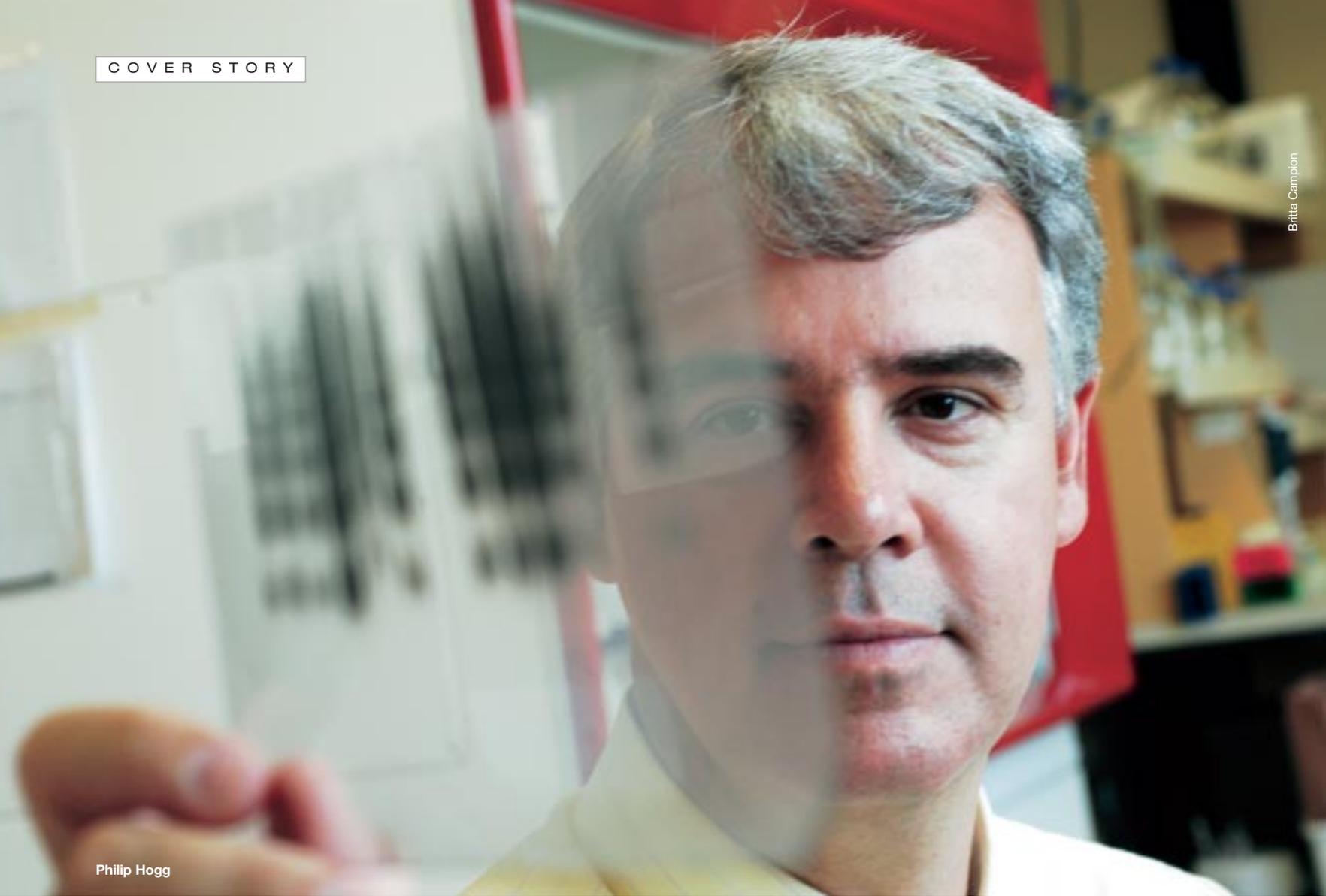


Using their graphic submissions from week 3, students began to work collaboratively within small creative teams to progress their ideas in response to the project's unfolding main brief.

WEEK 5



Continuing to work graphically to answer the main *Creative Waves* design brief, students worked in total collaboration, by swapping and sharing digital files and ideas, to produce collective team graphic responses.



Philip Hogg

The heart of the matter: inside the Centre for Vascular Research

By Susi Hamilton

The fourth floor of the Wallace Wurth Building is an unassuming space, with faded posters and labyrinthine corridors covered in linoleum. But it is here that you find some of the most highly regarded medical researchers in the country, who are members of the Centre for Vascular Research (CVR). Their focus is to shed light on major killers such as coronary heart disease, stroke and lower limb gangrene.

"I really wanted to build a research group in a hospital and university environment, rather than an institute," founder and director, Professor Colin Chesterman, said. Professor Chesterman now presides over a centre that has also grown to include laboratories at the Australian National University and Monash University, as well as St George Hospital and the original lab in the Department of Haematology at the Prince of Wales Hospital.

The Centre is gaining momentum, winning 18 of the 21 research grant applications it submitted for 2005. That figure represents an astonishing 86 percent success rate, well above the national average of 20 to 30 percent.

"The success of the CVR in funding alone shows that we are really maturing as an organisation," Professor Chesterman said. "The real story behind the grants was the number of young people who were successful. We need that fresh input, because the senior researchers are locked into program grants and don't have a lot of leeway to apply for extra funding."

A number of young researchers have come to the fore. Doctors Miles Davenport, Katharina Gaus and Brett Garner all received Career Development Awards. Dr Harry Lowe received a Viertel Clinical Investigatorship and Dr Juliana Kwok a National Heart Foundation Postdoctoral Fellowship.

"One of the clear reasons the CVR has been so successful is because of the wonderfully talented people who are a part of it," Professor Chesterman said.

Eight of the CVR's 14 research groups are based at UNSW. One, the Disulphide Switching Group, is led by Professor Philip Hogg. This group is responsible for a discovery that could become an entirely new field of research in itself. Professor Hogg and his team have discovered a new mechanism governing proteins, which can determine what they do.

One of the clear reasons the CVR has been so successful is because of the wonderfully talented people who are a part of it



“People thought that disulphide bonds held proteins together, but were otherwise inert,” says Professor Hogg. “Since the late 1990s we have shown that some disulphide bonds actually control how proteins work, rather than just hold them together.”

The process, which they dubbed disulphide switching, has been shown by the CVR to occur in four different proteins so far – but the research could have a far greater impact. “The indications are that disulphide switching may be relevant to all life forms,” Professor Hogg said.

The research has led to the development of a drug, GSAO, which inhibits tumour blood vessel formation and tumour growth (see box).

Researchers at the CVR are also working towards developing new drugs that could be used to combat cardiovascular diseases.

“My work is largely focused on atherosclerosis, the build-up of fatty deposits on the inside walls of arteries,” said biochemist Professor Roland Stocker who heads the Vascular Redox Processes Group.

For the last 20 years, Professor Stocker has been looking at oxidation reactions involving free radicals and other oxidants, and their role in health and diseases such as atherosclerosis.

“We have had a surprise finding with one drug, called Probucol, which is already used on people who have heart disease, or those who are at high risk of it,” Professor Stocker said. “We have done tests on animals which show that the drug has several protective activities unrelated to the oxidation of cholesterol. It actually has benefit on a cellular level.”

The researchers believe they have identified the key protein involved in this beneficial activity and that should provide them with the basis for developing a new, more effective drug.

Trial run may stop growth

Human safety trials of a drug that could revolutionise the treatment of certain types of tumours will get underway early next year.

GSAO, which has been developed by Professor Philip Hogg and his team at the CVR, has been shown to stop tumours from growing larger than microscopic size in pre-clinical testing. The compound works by inhibiting tumour blood vessel formation, which stops the tumour from growing and causing any more damage.

“Our research focuses on trying to turn cancer into a disease that can be managed on a life-long basis, rather than trying to find a cure,” Professor Hogg said.

In principle, this compound should be effective against all solid tumours, such as those in the breast, prostate, colon, lung and brain. GSAO derived from the concept of disulphide switching, which Professor Hogg and his team discovered in 1997.

“This protein chemistry we described happens mostly outside the cell and drugs that target this process don’t have the burden of crossing the cell membrane,” Professor Hogg said. “It is much harder to develop a drug that has to cross the membrane and find its target within the enormously complex environment of the cell.”

The Cancer Council NSW has recently given Professor Hogg significant extra funding to further his research. This follows a five-year grant of more than a million dollars from the Council that was awarded in 2000. If the human safety trials of GSAO are successful, further trials to test whether it works are planned for late 2006 in Australia and probably North America.

“There is nothing that would please me more than to do something that makes an impact on human health,” Professor Hogg said. ♦

Associate Professor Wendy Jessup, who with Associate Professor Len Kritharides leads the Macrophage Biology Group, is also interested in atherosclerosis. “Our main interest is in the cells that are accumulating cholesterol and how they are getting rid of it,” she said. “We want to find out how it works in healthy cells and then how it might go wrong in atherosclerosis.”

One of the group’s projects is focused on a protein that acts as a cholesterol ‘pump’ to remove cholesterol from the cells.

Professor Jessup hopes to characterise how these pumps work and then find out how to stimulate or block them, through the development of new drugs.

Some of the research from the CVR explores the very building blocks of life to come up with clinical applications. Professor Levon Khachigian, head of the Transcription and Gene Targeting Laboratory at the CVR, leads a team interested in gene therapy and anti-gene therapy, building on their more fundamental studies.

“Gene therapy is defined by the introduction of a given gene, which may well already be expressed at the site of interest at low levels, and just topped up,” Professor Khachigian said. “Anti-gene therapy is when you use strategies to knock down a so-called bad gene.”

Most recently his lab has had significant success in anti-gene therapy with DNA enzymes, which can be used to tackle problems such as restenosis. “These molecular tools are essentially tiny bits of DNA that we have custom-designed to find and destroy the gene of interest,” he said. “They bind to a string of genetic material which arise from the DNA, called RNA, and snip it.”

RNA is significant because it is the ‘go-between’ in the conversion of genetic code into protein, which ultimately controls cell behaviour. Professor Khachigian hopes these DNA enzymes might be used as drugs, with applications in a variety of diseases.

While his anti-gene therapeutic studies show great promise, his lab’s efforts in gene therapy are also showing potential.

“The idea we’re exploring is that gene therapy might also be used in the injured vessel wall to add back a repressor or suppressor of growth,” he says. “That should give the same result as an anti-gene therapy, depending on the growth gene being targeted or anti-growth gene being over-expressed.”

“At the end of the day, there is a fine balance between positive and negative regulatory influences in the artery wall. It is the interplay between these which we are interested in – that dictates whether or not a cell proliferates, or shrivels up and dies.”

Professor Beng Hock Chong is the leader of the Platelet and Megakaryocyte Group, which hopes to ultimately develop new ways to treat heart and blood diseases. The work concentrates on the studies of the genes that regulate stem cell differentiation to heart muscle cells and blood cells.

“I believe that one day we could inject bone marrow stem cells into someone who has had a heart attack,” Professor Chong said. “If we understood how to manipulate the genes, then you could take some stem cells, then inject those in the heart, effectively creating some new, healthy heart cells.” Professor Chong said this could eventually prevent people from having to wait for a heart transplant.

“Understanding the genes which regulate the stem cells differentiating into blood cells will give us an insight into the mechanisms of blood diseases such as leukaemia,” he said. “This could lead to the better diagnosis and treatment of these diseases.” ♦

More information about the CVR is at www.cvr.net.au.

Michael Freyne 1934–2005

Dr Michael Freyne was a distinguished academic and honorary visiting fellow in modern languages at the University of NSW. His death has robbed the French department and its students of a valuable resource, and the Voltaire Foundation of Oxford of one of the editors responsible for a major planned work on Voltaire. He had recently been appointed a research associate to work on the multi-volume edition of Voltaire's *Questions sur l'Encyclopedie*.

His splendid critical edition of Voltaire's tragedy *Hérode et Mariamne* appeared last year. It was volume 3c of the *Oeuvres Complètes* and in 1986 had won him a fellowship at the Foundation and attachment to Linacre College, Oxford.

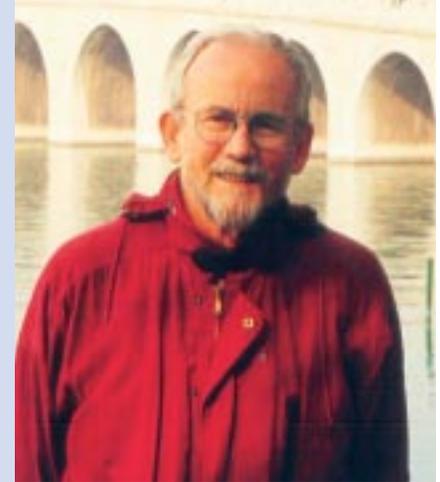
Freyne's intellectual journey began on the small family-run dairy farm in the Waikato.

In 1961, after teaching at Northcote College and Auckland Grammar, he taught at the Lycee Mixte in Amiens. This was a period of immersion in French culture and he became one of the few Australasians to obtain a Doctorat d'Etat ès-

Lettres from the Sorbonne. From there he joined the French staff of the University of Liverpool for six years before coming to UNSW in 1972. He retired from teaching, though not from research, in 1995, dividing his time between Sydney and Oxford.

The two 18th-century figures who dominated his academic interest were Fontenelle, populariser of the philosophy of mathematics and science, Isaac Newton and Leibnitz; and Voltaire, shining light of the Age of Reason, who carried Newtonian thought as far as it could go, and who called Newton "a great genius who conducted us along the path of truth". Certainly Freyne shared with these men, and with the Enlightenment philosophers generally, a healthy scepticism; a critical attitude towards any form of orthodoxy, religious or otherwise; and an intolerance of religious, political and cultural oppression.

John Golder
School of Media, Film and Theatre



Bob Bellear 1944–2005

Bob Bellear, who died in March, rose from extreme poverty to become a District Court judge and a leader of the struggle for Aboriginal justice.

One of nine siblings, Bob did not finish high school, leaving early to support his family. When he was 17 he joined the navy where he acquired several trades. As a diver, he walked in a lead-weighted suit across the floor of Sydney Harbour from South Head to North Head. He was the star footballer for his ship's team. That turned out to be a curse, because his captain kept him on that ship, one of the navy's worst for its use of lethal asbestos lagging, which led to Bob's lung cancer.

In the early 1970s, Bob and his wife Kaye would see the infamous 21 Division of the NSW police cart away paddy wagons full of their Aboriginal friends from the only two pubs in Redfern that would serve them. The charges were the famous trifecta: unseemly words, resisting arrest and assaulting police. Bob and Kaye were already in the midst of the rising struggle by young black activists. Bob was on the frontline at the Aboriginal tent embassy at Canberra in the early 1970s. He was there at the outset of the Aboriginal Medical Service, the Aboriginal Children's Service, the Aboriginal Housing Company and the Aboriginal Legal Service.

Bob went back to school to acquire his HSC and then enrolled in law at UNSW in 1974, finishing in 1978 to become our second Indigenous graduate (the first was Pat O'Shane). Bob went to the Bar, practising largely in criminal law, an area in which Aborigines were particularly in need. He also appeared in some long-running

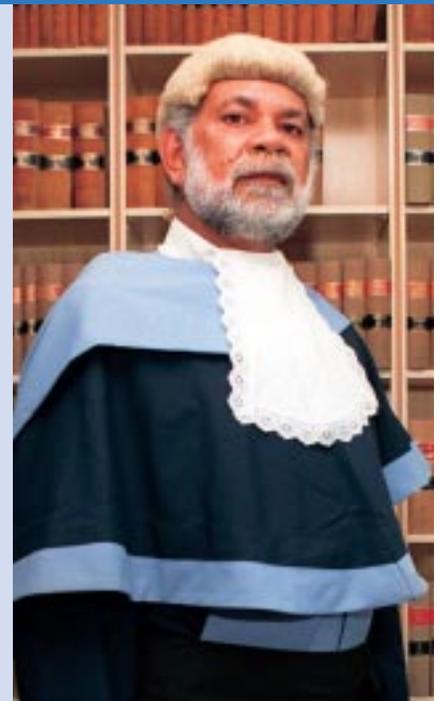
land claims, and was Counsel Assisting Hal Wooten, one of the three Royal Commissioners inquiring into black deaths in custody.

Bob became Australia's first Aboriginal judge when he was appointed to the District Court bench in 1996. He was happy to go on country circuit because he could speak to schools in country centres, and have them sit in when court was in session. He was at the forefront of a range of initiatives, and actively encouraged younger Aborigines to follow his path.

He spoke of the racist jibes he had received from fellow barristers, and from the bench itself. This wasn't all ancient history. One day in 2001, he couldn't get a taxi in Sydney, until a white man was so embarrassed that he invited Bob to share his ride. He spoke of the plain facts of massive Indigenous disadvantage, with its grossly disproportionate participation in the ranks of the imprisoned, the unemployed, the semi-literate, those crippled by terrible drug and alcohol addictions, of massive disempowerment.

He also had a unique style, an ability to connect with the experiences of common people. He famously warned a wife-beater that if he ever felt like belting a woman again, he should come and see him, and Bob would settle it behind the courthouse. He sent out a jury one Friday afternoon, and after giving the usual directions about not discussing the case with anyone, he added: "And members of the jury, go the Broncos..."

Mark Aronson and others
Faculty of Law

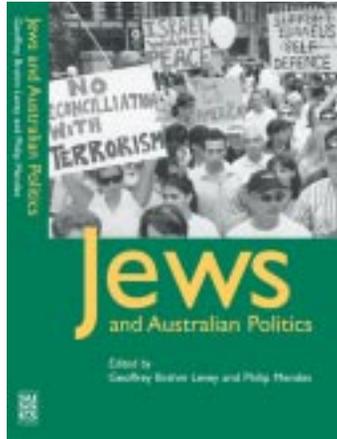


Bob Bellear after being sworn in as Australia's first Aboriginal judge

Not with one voice: Jews and Australian politics

By Louisa Wright

What community speaks with a single voice? Geoffrey Brahm Levey argues that Australian Jews are a diverse community with many different factions and perspectives. Dr Levey, head of UNSW's Jewish Studies Program, and Dr Philip Mendes from Monash University wanted to challenge the way the Jewish community is portrayed in the media and by some Jewish organisations as being monolithic and speaking with a single voice.



Work on their book, *Jews and Australian Politics*, of which they are both editors and contributors, was underway at the time of the announcement that the 2003 Sydney Peace Prize would be awarded to the prominent Palestinian figure Hanan Ashrawi. Dr Levey called the resulting fallout a predictable fiasco (and Dr Ashrawi “an innocent bystander”), since it reflected both the vying approaches of some Jewish organisations and more general features of Australian Jewish politics and attitudes in the wider community.

The media and public debate reached high pitch and focused on the tactics of Jewish organisations and lobby groups, rather than on Dr Ashrawi's worthiness for the award. “Many in the Jewish community were dismayed by the focus of the debate,” Dr Levey said. In particular, the affair highlighted the influence of the Australia/Israel & Jewish Affairs Council (AIJAC), a conservative think-tank with considerable presence and access in Canberra, which took the role of ‘spokes-organisation’. Elected representative bodies including the Executive Council of Australian Jewry and the NSW Jewish Board of Deputies were all but eclipsed.

“The Ashrawi affair saw several longstanding factors come together,” Dr Levey said. “There were the conflicting approaches of Jewish organisations, Australian Jews’ post-Holocaust sense of insecurity and reflex pro-Israelism, and non-Jewish Australia’s contrasting sense of Jewish success and influence.”

Only one chapter, however, is concerned with the Ashrawi affair. The contributors to the book themselves represent a wide range of views, in keeping with the editors’ philosophy that Australian Jews do not speak with a single voice. It is the first serious examination of Jews and Australian politics for a generation, and looks at topics such as Jews and Australian multiculturalism, Aborigines, feminism, and their political partisanship and ideologies, including a chapter by UNSW’s Emeritus Professor Sol Encel on Jews and the Australian Labor Party. ♦

Jews and Australian Politics, edited by Geoffrey Brahm Levey and Philip Mendes and published by Sussex Academic Press, will be launched by NSW Premier Bob Carr on 10 May at Gleebooks.

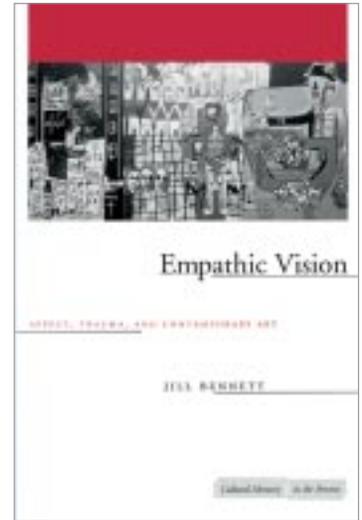
More than words: art and trauma

Artists around the world have long captured violence and trauma in their work but the events of September 11 have triggered a significant growth in trauma studies among cultural researchers.

Jill Bennett, director of the Centre for Contemporary Art and Politics and Associate Professor at COFA, adds to this body of work with her new book *Empathic Vision: Affect, Trauma and Contemporary Art*. Bennett interprets art from Columbia, Northern Ireland, post-apartheid South Africa and Indigenous Australia,

contributing to our understanding of violence and trauma.

“I’ve tried to move away from the idea that trauma art has to be really graphic,” Bennett said. “Some of the art I discuss is a lot more subtle and deals with the complexities of day-to-day experience by registering aspects of trauma that aren’t discussed in other forms of language.”



After September 11, there was this idea that everyone shared the same trauma even though some people were tucked up in bed

Bennett examined the work of well-known practitioners whose work is very experimental; in doing so she spent time in South Africa looking at the art emerging from the establishment of the Truth and Reconciliation Commission. “I worked closely with people who survived experiences of imprisonment and torture under apartheid and what is important for them is not that their experience should be represented in its detail.”

Bennett argues strongly against the idea that art can reveal the true nature of what is a very foreign experience to some people. “Hollywood packages an experience and hands it on a plate to the audience, enabling them to identify and feel sympathy for a character,” she said. “In the United States after September 11, there was this idea that everyone shared the same trauma even though some people were tucked up in bed. Art doesn’t work in that way, you can understand bits and then you can also feel frustrated as well.”

Jill Bennett co-curated a recent exhibition, *Prepossession*, a collaborative project between UNSW’s Centre for Contemporary Art and Politics and the School of Art and Design at the University of Ulster in Belfast. ♦

Alex Clark

Empathic Vision: Affect, Trauma and Contemporary Art was launched in March and is available at the UNSW Bookshop. The cover artwork is by Australian Indigenous artist Gordon Bennett whose work deals with the trauma of separation and assimilation as experienced by his family.

Building solar cities

By Mary O'Malley

Tiled solar panels woven seamlessly into the roof of a heritage building. Solar panels as shade devices on modern townhouses. Solar panels as the roof of a light-filled walkway. These are some of the innovative uses of solar power featured in a new book co-edited by Professor Deo Prasad of the Faculty of the Built Environment.

Designing with Solar Power arose from work Professor Prasad undertook for the

International Energy Agency. Fifteen experts from OECD countries were part of a team exploring building-integrated photovoltaics – combining solar photovoltaic electricity technologies with those of building construction. Several case studies of high-quality examples were collected and these now form the core of the book, which is aimed at architects and builders.

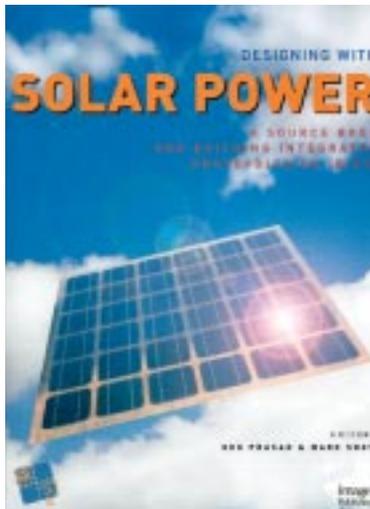
The book approaches the topic from several perspectives. “From an architect and builder’s perspective it is a cheaper building material per square metre than polished stone,” said Professor Prasad. “The fact that you get electricity is a bonus. The book shows it as an elegant architectural material.”

The book also shows how the urban application of photovoltaics provides opportunities for decentralisation and security of our energy supplies. Photovoltaics can shift power generation away from being large-scale and regionally located, reducing the cost and environmental impact of power supply.

“It is also a secure energy supply. In these days of terrorism clearly it’s a good option,” said Professor Prasad. “I have just come back from Asia where electricity ‘brown outs’ occur up to three times a day. In such an environment photovoltaics become a key source of uninterrupted power supply.

“Economically, it also makes sense. I have a view that photovoltaics has a one-day payback. Studies suggest that photovoltaics adds five to 15 percent to property value. In Sydney this translates to at least \$25,000, which can cover the cost of PV and other energy-efficient measures. Property value is money that can be realised straight away by drawing on the equity and investing elsewhere.

“No-one predicted the price of oil today would be as high as it is now, and heading higher. Options such as photovoltaics become very competitive by comparison and we have to prepare the market for their use. This book aims to do that.” ♦



Designing with Solar Power is published by Images Publishing and EarthScan and is available at UNSW Bookshop.

Jack Lang and the Australian banks

A decade-long research project which took Frank Cain through government, political and banking archives in Australia and Britain has resulted in a political history of one of the most controversial figures in New South Wales, the ‘Big Fella’ Premier Jack Lang.

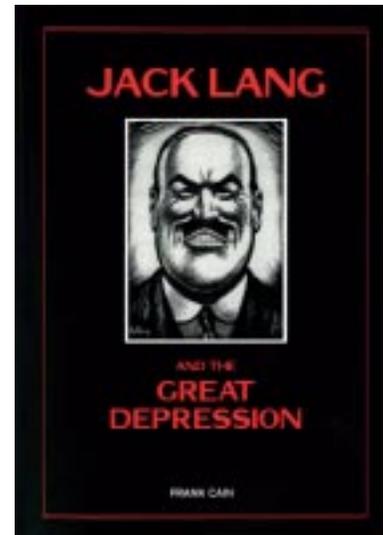
Dr Cain of the School of Humanities and Social Sciences at UNSW@ADFA has long been interested in the collapse of the NSW Government Savings Bank in March 1930 and its destructive impact on the people of NSW. Dr Cain saw the connection between the bank’s closure, the Great Depression and the Lang story in NSW, leading him to the wider history that he relates in *Jack Lang and the Great Depression*.

Australian state governments were the main providers of services, including dole payments to the unemployed, but their financial position was badly affected by changes in federal/state relations in 1910 and by the impact of the high costs of the First World War. From diminishing revenue provided from the Commonwealth and the cessation of borrowing rights, they had to fund dole payments (30 percent unemployment at the height of the Depression) and maintain loan interest payments to the Commonwealth. Lang was elected in 1930 and sought a moratorium on the interest payments in order to provide for the unemployed, but the non-Labor Government in Canberra refused and legislated to seize NSW Government money in Sydney banks. Lang responded by withdrawing government funds and running a cash economy from the NSW Treasury, paying the dole and government wages in cash.

Further federal legislation did not break the impasse. Business was suffering; the Commonwealth would have had to give way. At this point the NSW Governor, former British military officer Sir Philip Game, intervened with the unconstitutional and illegal act of dismissing the Lang Government.

Dr Cain partly explains Game’s actions in terms of a senior British military commander who is out of his depth in the colonies and resorts to his accustomed behaviour of dealing with recalcitrant corporals back home. “He put the Premier/corporal on a court-martial charge and had him dismissed with a dishonourable discharge,” Dr Cain said. Sir Philip appointed the Leader of the Opposition as acting Premier, who went on to win the subsequent election. At that point, the Commonwealth pumped money into NSW and suspended the punitive legislation, which Dr Cain suggests shows that the attack on NSW was ideological and that the Commonwealth was prepared to bankrupt NSW in the teeth of the Depression just to be rid of Lang. ♦

Louisa Wright



Jack Lang and the Great Depression is published by Australian Scholarly Press. It was launched in February by the Speaker of the Legislative Assembly, the Hon John Aquilina.



Diving in the deep end

The Centre for Quantum Computer Technology this month celebrates the fifth anniversary of its establishment. **Dan Gaffney** profiles the Centre's Director, Professor Bob Clark.

Dashing young navy recruit weds Captain's daughter, serves RAN with distinction in the Asia-Pacific and UK, raises family and lives happily ever after. It could have been a true enough synopsis except that in 1979, the young Robert Clark was at a crossroad that would change his life.

"At the age of 26, I was a Lieutenant with a young family and a well-paid job as a seaman and ship's diving officer," recalled Clark, now Scientia Professor and Director of the Australian Research Council Centre of Excellence for Quantum Computer Technology, and a Federation Fellow.

"I'd spent ten very happy years in the navy which I joined as a 15-year-old, serving in a variety of ships including mine hunters and destroyers," he said, "but having done a BSc at UNSW I also had a Commonwealth postgraduate research award in my hand to do a PhD. That was a very difficult decision. Do I leave the navy and become a student, or stay and become a full-on diving officer?"

Compounding his dilemma was the fact that Clark was literally wedded to the navy, having married the daughter of the then head of the Royal Australian Naval College, Rear Admiral John Stevens.

Having talked it through with his wife, Sally, and colleagues, he took the plunge into doctoral study. In 1981 he packed up his

family and headed to Oxford University's Clarendon Laboratory. He completed his doctorate and won a faculty appointment at Oxford as a lecturer in physics and Fellow of The Queen's College. Suddenly, the kid from rural Victoria was part of the Establishment. "It was an unbelievable feeling," Clark said. "I made up a lot of ground with that appointment. At the age of 30-odd, it set me up to do things with a great degree of independence."

He shifted his research focus to work on quantum effects in semiconductors, something that has consumed his career for the past 20 years.

"The ten years at Oxford were a wonderful time," Clark said. "I loved teaching at The Queen's College and I enjoyed the extracurricular attractions. I also kept up my amateur sporting interests, which included rowing, college rugby, village cricket and the odd game for Abingdon."

"More seriously, I had a wonderful research group there and we built a beautiful laboratory from scratch. That was where I really learnt my trade of doing scientific research at the highest level."

Returning to Australia in 1991, Clark took up the position of Professor of Experimental Physics at UNSW, where he founded and established the National Magnet Laboratory

and the Semiconductor Nanofabrication Facility. Within five years, he had achieved two pieces of national infrastructure that permitted Australians to do research every bit as good as that at Oxford and elsewhere.

"For the first time Australian scientists had the capability to fabricate sophisticated semiconductor nanostructure devices and to measure their quantum properties," Clark said. Then, in 1995, they were joined by Bruce Kane from the US, who had the brilliant idea of building a quantum computer in silicon.

"Quantum computing will offer computing power the likes of which we've never seen," Clark said. "It also affords secure communications in a way we haven't had before and in a world that's dominated by IT, computing and communications – this has enormous potential."

"In aiming to build the key building blocks of a solid state quantum computer in silicon our young researchers are doing some of the best fundamental science research this country has seen. We're shooting for a goal so complex that many believe is unattainable. With our colleagues from the University of Queensland we have already got there in optical quantum computing – mission accomplished. As for solid state quantum computing, we're not there yet but we're close and working around the clock to achieve it." ♦

By Dr John Yu AC, Chancellor

Council met on 18 April 2005.

2004 Annual Report

Council signed off the 2004 Annual Report and financial statements for submission to the Minister.

Voluntary Student Unionism

Council approved the recommendation of the Student Affairs Committee made in response to the Voluntary Student Unionism Bill. It resolved to consider the impact on the University, to give in-principle support to the continued existence of student organisations and their provision of the current suite of services, to support them in their campaign to oppose VSU and to communicate to the Australian Vice-Chancellor's Committee through the Vice-Chancellor its preference for the current system and support for the proposal to the Minister of a compromise model.

Proposal to establish a separate Postgraduate Student Association

Council heard the arguments for and against the establishment of a separate Postgraduate Student Association from the Postgraduate Board and the Student Guild

respectively. It recognised the expression of wishes by a section of the Postgraduate Student Body and the Postgraduate Board that the board as a constituent board of the Student Guild be dissolved and that a separate and independent postgraduate student organisation be reconstituted. Council asked the Vice-Chancellor and Deputy Vice-Chancellor (Academic) to advise Council on timing, process and issues of documentation.

Conflict of Interest Policy

Following much discussion at the Academic Board and elsewhere, Council approved a new Conflict of Interest Policy for Staff that can be accessed via <http://www.secretariat.unsw.edu.au/council/policy.htm>. Council was also reminded of its own responsibilities regarding disclosure of interests.

Report on Review of Grievance and Complaint Handling Policies and Procedures at UNSW

Council noted the review that had taken place in response to its request, the proposal for a University Grievance Manager and the requirement to amend a number of related policy documents to support such a role.

New External Members for Audit Committee

Council expanded the membership of Audit Committee to allow the appointment of two additional external members.

Chancellor Search

Council discussed the recommendations of the Chancellor Search Committee, which met on 11 April to consider a number of nominations from the University community. Council approved a process for selection of a new Chancellor and will consider a final recommendation in due course.

Council minutes

Council minutes and other information about Council are available to all members of the University by accessing the Secretariat Services website (www.secretariat.unsw.edu.au).

For further information on matters relating to Council or its Committees, please contact Victoria Eyles, v.eyles@unsw.edu.au, 9385 3068 or Helen Parks, h.parks@unsw.edu.au, 9385 3072.

The Chancellor is the chair of Council.

Academic Board discusses VSU 5 April 2005

The Academic Board topic at the April meeting was Voluntary Student Unionism. The President of the Academic Board welcomed the Presidents of the Student Bodies who had been invited to attend for the debate, and a number of students as observers. Ms Frances Foster-Thorpe, elected undergraduate student member of the Academic Board, presented the student issues. The Board agreed that the introduction of VSU would have a substantial deleterious impact on a range of non-academic student amenities and services which would affect community life at UNSW, and lessen opportunities for learning beyond the classroom. These include: health; legal; advocacy; childcare; UNSW Orchestra; UNSW Solar Racing Team; clubs and societies; and many other areas.

The Academic Board noted that the University was appointing an independent consultant to advise on the ways in which student services could be maintained, as far as possible, under a regime of VSU. The Board

unanimously endorsed that consultation must be ongoing between the consultant and the student organisations, including the Union, the Guild, the Post-Graduate Board, the Sports Association and the CoFA Students' Association, throughout the process; that the consultant will investigate ways of maximising the retention of current non-academic student support services and amenities; and that any model should retain majority student control of the provision of non-academic support amenities and services in recognition of the historical role that student organisations have played in ensuring services are responsive to students' needs.

We acknowledged Lieutenant Matthew Goodall, BSc, an ADFA graduate of 2000, who was one of the Australian Defence Force servicemen killed in the Nias Island helicopter crash in Indonesia. The Academic Board expressed its sympathy to Matthew's family, friends and colleagues at this difficult time.

The Board noted the overall program structures for UNSW Asia undergraduate programs in Science and Commerce.

We approved the revised Graduate Certificate in Safety Science; the First Year

course International Issues and Perspectives; amendments to the UNSW First Year Streams of Study; the co-option of an additional member, from the Learning and Teaching Unit, to the Asia Liaison Committee; and the appointment of UNSW Academic Board members to the AGSM Academic Board.

The Academic Board noted a discussion paper indicating the significant progress made on teaching and learning space, and encouraged continued innovation in future refurbishments. We commended the transformation of the Central Lecture Block as a showpiece for UNSW.

The Board recommended that Council approve: the introduction of the Graduate Certificate in Good Manufacturing Practice and the Bachelor of Optometry Bachelor of Science; and the award of a degree of Doctor of Science.

If there are issues you want me or Academic Board or its Committees to consider, or if you would like to attend a meeting, please let me know via a.dooley@unsw.edu.au or 9385 2393.

**Tony Dooley
President, Academic Board**

Christine Logan

Head of the School of Music and Music Education

An absorbing interest in music is one of my earliest memories. I listened to a lot of classical music, especially Schubert, Mozart and Beethoven from the earliest age; made attempts at playing the piano from the age of three; began studying music from the age of five and was committed to a career in music by the age of seven! I read music before I could read [words] and was very surprised to find at age five that not everyone could hear pitch precisely (perfect pitch). My childhood was highlighted by attendance at concerts by many legendary musicians, especially pianists, who visited Sydney – including Arthur Rubinstein, Ashkenazy, Lili Kraus, Arrau, Vasary, Malcolm Frager, Rudolph Firkusny, Gina Bachauer, Annie Fischer, Paul Badura-Skoda, Geoffrey Parsons, violinist Itzhak Perlman, Schwarzkopf – some of whom I had the good fortune to meet and play for. My decision to follow a career in music was very much influenced by contact with these outstanding musicians and also the influence of some excellent piano teachers – Marjorie Docherty and Elizabeth Kozma in Sydney and later Bela Siki, Konrad Wolff, Menahem Pressler and Malcolm Bilson in the US.

I was drawn to pursue a career in a university setting by a total commitment to and love for music and a desire to relate performance to scholarly study as closely as possible. I had the good fortune to be awarded a travelling scholarship to pursue doctoral study in the US. Throughout the three years of the doctoral degree program at the University of Washington and then the College-Conservatory of Music at the University of Cincinnati, I was a teaching assistant. In 1987 I was offered a full-time lecturing position at UNSW.

What do you like most about your job?

The diversity of activities, the variety of responsibilities and the continual challenges and frustrations! The students are perhaps the best part of the job and the possibility of making a difference to the development of young musicians is very rewarding.

Pet hate?

Red tape. Also insensitive musicianship and insensitive pianism in particular!

What are you reading/listening to at the moment?

I am listening to the French-Dutch pianist Germaine Thyssens-Valentin's 1957 recordings of the Nocturnes and Barcarolles of Gabriel Fauré, recently released on CD. This is work-related as I have been pursuing several research questions involving early sound recordings and I have a particular interest in French repertoire. I am reading *Camera Lucida* by Roland Barthes; although reading for pleasure is not something I find a lot of time for!

Best advice you've ever received?

Always perform with total conviction and focus every sound! [And] develop the internalised hearing of music.

What inspires you?

Music itself, particularly inspired solutions in musical interpretation. The transient quality of the way music unfolds in time is captivating and offers boundless possibilities for new interpretative solutions that take account of the implications of the composer's instructions. [Also] courage in the face of adversity.

You're hosting a dinner party and can invite three people (living or dead). Who is on your guest list?

It would be great to be able to invite some inspiring creators. Joseph Haydn because of his genius and charming personality; Leon Fleisher because of his profound musicality and lack of ego;



Alex Clark

and Rembrandt because of the luminosity of paintings and profound insight into the human psyche. However, I am happy to settle for family and friends anytime.

What does music mean to you?

One of the most magical forms of human communication, also one of the most fluid and transient of the arts.

What would you have done in another life?

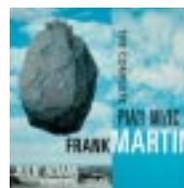
Ophthalmologist – the chance to really make a difference.

What are you good at?

Tasting and discriminating between the highest grades of chocolate.

The ideal ...

... holiday destination is Paris and provincial France (Normandy, Burgundy and Brittany) for several months. The ideal day includes research, piano playing, a good French dinner with family followed by a fine performance – either opera or recital. ♦



ABC Classics recently released a double CD, *The Music of Frank Martin*. In a period of history where the turmoil of war seemed to breed rationalism in all forms of art, Swiss composer Frank Martin represented a swing back toward spiritual values. On the second CD, Dr Logan performs the works for two pianos and piano duet with Julie Adam, a renowned Martin interpreter and teacher of several UNSW piano students.

It's easy being green: Government charged with renewing its energy policies

By Mark Diesendorf

In the March 2005 issue of *Uniken*, Shirley Scott asked why Australia has not ratified the Kyoto Protocol on reducing greenhouse gas emissions. She also pointed out that, to stabilise the atmosphere, emissions must be cut by much greater amounts than the initial Kyoto agreement provides. You may ask, "Are deep cuts in emissions really feasible?"

This question is addressed in the study, *A Clean Energy Future for Australia* (available at www.wwf.org.au). It investigates whether a 50 percent reduction in Australia's carbon dioxide (CO₂) emissions from all energy use except transport could be achieved by 2040. This target is similar to those in the UK and Denmark and is necessary, but possibly not sufficient, for stabilising CO₂ concentrations in the atmosphere at a level that is likely to be safe for future generations.

Our scenarios assume that the economy will grow 2.4 times in real terms between the starting date, 2001, and 2040, consistent with the Federal Government's

Clean energy futures are only achievable if new policies and strategies are implemented by all spheres of government

Intergenerational Report. The choice of 2040 allows sufficient time for most existing power stations and all energy-using equipment other than buildings to be phased out at the end of their operating lives and replaced with cleaner and more efficient technologies.

The study was restricted to small improvements in existing technologies. This means that there are no cheap solar electricity technologies, or hot-rock geothermal energy, or storage and transportation of renewable energy in the form of hydrogen, or capture and underground burial of CO₂ emissions from coal-fired power stations. In practice, some of these technologies may become competitive, thus making the task of meeting the target even easier. Sensible policies could assist promising technologies, for example, if smart meters and peak-load pricing were introduced, solar electricity could flourish.

The least-cost contributors to the clean energy scenarios are a host of cost-effective technologies for using energy more efficiently in the home, office and industry. The principal energy sources used are natural gas (the least polluting of the fossil fuels), biomass residues from wheat, sugar and plantation forests (but not from native forests) and wind power. All these technologies are currently cheaper than the International Energy Agency's projected costs of coal-fired electricity with capture and burial of CO₂.

The study estimates the costs of both dirty and clean energy scenarios. The economic result depends on how much low-cost efficient energy use can be implemented and on the future costs of fossil fuels. However, it seems likely that the dollar savings from implementing energy efficiency can pay for the major part of the additional costs of renewable energy.

The clean energy technologies produce more *local* jobs than conventional technologies. In particular, generating electricity from crop residues creates many new jobs in rural areas, where they are needed most, while the manufacture of wind farm components could be carried out in former coal mining and burning areas.

Clean energy futures are only achievable if new policies and strategies are implemented by all spheres of government. A key recommendation of the study is to expand the Mandatory Renewable Energy Target substantially, in order to build the capacities of the bio-energy, wind power and solar

hot water industries, in particular. In the absence of co-operation by the Federal Government, individual states could create their own mandatory targets.

Because of market failure, the huge potential for cost-effective improvements in the efficiency of energy use has to be driven by mandatory energy ratings, labelling and standards for buildings, appliances, equipment and industrial processes. An immediate ban on new conventional coal-fired power stations is also essential to ensure a genuine commitment to efficient energy use.

Another policy recommendation is to increase the prices of fossil fuels to allow for the environmental and health damage that they cause. The revenue raised could be returned to the community in the form of funding to assist the creation of the new cleaner energy industries. With enhanced energy efficiency, there is no need for energy bills to rise.

To complement the long-term (2040) national study, several short-term (2010) state studies are being published (also at www.wwf.org.au), focusing on the task of substituting a mix of energy efficiency and cleaner energy supply in the place of proposed new coal-fired power stations. Once again, the technologies are available and the economics look favourable. The challenge is to create the organisations that can deliver packages of efficient energy use and renewable energy at zero or very low total cost. Ultimately, the problem is the political power of the big greenhouse gas emitters. ♦



Dr Mark Diesendorf joined the Institute of Environmental Studies in June 2004. His work is in the interdisciplinary fields of sustainable energy, ecological economics, and practical processes for ecologically sustainable and socially just development. His chapter in the recently published *The Natural Advantage of Nations* (Earthscan, 2005) is titled *Governance of municipalities: a snapshot of sustainable development in China*.