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Uniken

The modern-day alchemist

Turning plastics into steel

New directions
in design

UNSW

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Group of Eight

Young tall poppies bloom

The outstanding achievements of five UNSW academics have been celebrated at the 2006 Young Tall Poppy Science Awards, presented last month at NSW Parliament House. The winners are Dr Stephen Wroe, Dr Adam Micolich, Dr Louisa Degenhardt, Mr Leigh Sheppard and Dr Stuart Tangye.

Established in 1998, the awards recognise young scientists between 25 and 35 who excel at research, leadership and communication. A total of 15 awards were presented by the Australian Institute of Policy & Science to winners across NSW and the ACT.

Palaeontologist Stephen Wroe, an expert on mammalian carnivore evolution, has made new findings on subjects ranging from marsupial carnivore feeding behaviour to the nesting behaviour of pterosaurs (flying reptiles). Wroe is a QEII Research Fellow and has been awarded a \$750,000 ARC grant and a \$180,000 UNSW Strategic Initiatives grant to continue his work in the School of Biological, Earth and Environmental Sciences.

Louisa Degenhardt, a senior lecturer at the National Drug and Alcohol Research Centre, has identified several important trends about drug use in Australia. She developed the national "Party Drug Initiative", which has been lauded internationally. Degenhardt has been invited to present research findings to UN agencies, international and national government advisory bodies, and the Australian Ministerial Council on Drug Strategy.

Adam Micolich is an expert in semiconductor nanoelectronics, working on nanoscale electronic devices for information technologies such as computers, play stations, mobile phones and the internet. A lecturer in the Department of Condensed Matter Physics, Micolich has been involved in several impressive discoveries including fractal conductance fluctuations in electron billiards and a new hybrid organic-inorganic superconductor material.

Leigh Sheppard, from UNSW's Centre for Materials Research in Energy Conversion, is working on an efficient way to split water into hydrogen and oxygen by using solar energy and titania – work which could see Australia become a world leader in developing pollution-free transport. Sheppard's discovery of metallic-like materials based on titanium oxide is also paving the way for the production of environmentally friendly building materials using titania coatings.

Stuart Tangye is a conjoint UNSW academic with St Vincent's Clinical School based at the Garvan Institute of Medical Research. His research could shed light on autoimmune diseases that prevent individuals from fighting pathogens such as bacteria and viruses. Tangye has been involved in several health awareness and fundraising campaigns for the Cancer Council NSW and the Centenary Institute of Cancer Medicine and Cell Biology.



Britta Campion

Pick of the bunch ... Leigh Sheppard, Stephen Wroe, Adam Micolich, Louisa Degenhardt and Stuart Tangye

Adverse findings against ABC science program on alleged scientific fraud

Media watchdog, the Australian Communications and Media Authority (ACMA), has ruled that an ABC radio program about alleged scientific fraud involving Professor Bruce Hall and the University of New South Wales, failed to comply with the ABC Code of Practice. The story, *What happens to the Whistleblowers?* was broadcast in September last year on ABC Radio National's *The Science Show*. The bulk of the program concerned four cases of alleged scientific fraud, one of which involved transplant immunology research at UNSW. A segment of the program also included views about the University's conduct in investigating the allegations and the findings of its inquiries. The ACMA found that "by failing to include comments by the University, the ABC did not make every reasonable effort to ensure that the program was balanced" and that the "ABC did not make every reasonable effort to ensure that the factual content of the program was accurate".

The everlasting world of **Martin Sharp**

An exhibition devoted to Australia's foremost pop artist, Martin Sharp, has opened at the College of Fine Arts' Ivan Dougherty Gallery. As an artist, illustrator, songwriter and filmmaker, Sharp's extensive and diverse creative output includes classic psychedelic posters, Oz magazine illustrations, and images from the world of popular culture. Curated by Nick Waterlow and Annabel Pegus, the show runs until 23 December.



Martin Sharp, *Seventeen Minutes to Four*, 1965, oil, lacquer on paper mounted on board, 135 x 185 cm, courtesy & © the artist

Sun shines on **photovoltaics research**

China's Suntech Power has announced a new collaborative research agreement with UNSW's Centre of Excellence for Advanced Silicon Photovoltaics and Photonics. The agreement, which includes a \$1.5 million contribution to the University, marks the continuation of a long and productive collaboration between the two institutions.

"Suntech's research relationship with the University of New South Wales strives to make solar power an even more attractive clean solution to the world's energy needs," said Dr Zhengrong Shi, Suntech's Chairman and CEO. "Through our unique collaboration, UNSW students and staff are involved in the complete technology development process, and we are able to transfer new solar technologies to commercial production in a relatively short time."

Dr Shi, who received his PhD from UNSW in 1992, is a specialist in crystalline silicon solar cell technology and holds 10 patents in the field. Suntech's contribution will fund the research and development of technology that increases the conversion efficiency of solar cells and decreases solar energy's cost per watt.

Suntech and UNSW have already co-developed an advanced screen-printing technology, which has been successfully piloted. The company will begin large-scale production by the end of the year. The two are currently developing technology that can produce cells with 20 percent solar conversion efficiency with pilot production planned to begin in 2007. Scientia Professor Stuart Wenham, Suntech's Chief Technology Officer and Director of the Centre of Excellence for Advanced Silicon Photovoltaics and Photonics at UNSW, will lead the research collaboration.

UNSW is the world record holder in silicon solar cell efficiency and a recognised leader in developing crystalline silicon solar cell technology. In addition to this most recent agreement, Suntech also provides funding for a number of UNSW undergraduate and postgraduate scholarships for training in the area of photovoltaic engineering.

Vice-Chancellor Professor Fred Hilmer and Dr Zhengrong Shi, Chairman of China's Suntech Power, after signing a new collaborative research agreement



Top ranking for MBA

The Financial Times (UK) 2006 table of Executive MBA programs has placed AGSM as Australia's leading business school with an international ranking of 23, an improvement of 12 places from last year. AGSM is the only Australian business school featured in the rankings.

Professor Alec Cameron, Dean of UNSW's Faculty of Business that incorporates AGSM said: "AGSM's strong result reinforces the school's long-held position as a world-class business school. We have achieved the highest ranking in Australia since the inception of this survey six years ago.

"The integration of AGSM and UNSW's Faculty of Commerce and Economics will further enhance the quality of teaching on AGSM's MBA (Executive) as two strong faculties are combined to take advantage of complementary strengths. We will continue to invest in the MBA (Executive) program to ensure that it maintains its pre-eminence."

The Financial Times' ranking of Executive MBA programs is one of the most prestigious worldwide. It evaluates programs by assessing the career progress of alumni, the school's research and intellectual outputs, and the diversity and international experience it offers.

Weeding out **stem cell tumours**

In the wake of the Senate's decision to pass the human embryo cloning legislation, another Australian research breakthrough is likely to strengthen the case for embryonic stem cell research.

UNSW academics have proven that tumours can be prevented from forming when embryonic stem cells are transplanted. "Whilst embryonic stem cells have great potential to deliver therapies for disorders, such as diabetes, a fear has been that they will form tumours because of the presence of undifferentiated cells," said Professor Bernie Tuch of the Diabetes Transplant Unit, who led the team responsible for the discovery. "Our breakthrough removes what could have been a stumbling block to this vital research."

The team has shown that placing the embryonic cells inside microcapsules made from a product of seaweed, called alginate, prevents the formation of tumours when the encapsulated cells are transplanted into laboratory animals. The researchers have also shown that the encapsulation process does not stop the embryonic cells from differentiating.

The data describing the experiments was published this month in *Transplantation*, the official journal of the International Transplantation Society.

For the record

The High Court's reasoning extends equally to any other area in which corporations are engaged. In practical terms, the power could be used to directly regulate corporations that run schools and hospitals or that control the use of water or manage land.

Professor George Williams of the Faculty of Law on the court's decision to dismiss the states' challenge to the Work Choices laws – The Age

We are either regulated and funded properly or if we're not going to be funded fully then we need to be deregulated and we need to be able to set our price structures.

Vice-Chancellor Professor Fred Hilmer on why the Federal Government needs to lift the 25 percent cap on HECS price increases – The Australian

The Stern Review finally closes a chasm that has existed for 15 years between the precautionary concerns of scientists and the cost-benefit views of many economists on the significance of climate change. Putting a price on carbon emissions is not an unfair impost on consumers; it is simply ensuring that the polluter-pays principle is adopted.

Associate Professor Tony Owen of the Centre for Energy and Environmental Markets – The Bulletin

About the last thing the ABC needs is yet more mechanisms of surveillance to pretend to control the uncontrollable linguistic and visual meanings that people take from television programs.

Professor Philip Bell of the School of Media, Film and Theatre on new editorial guidelines designed to tackle perceptions of bias at the national broadcaster – The Age

The policy sciences are alive and well within the halls of academe. We now need to ensure that the ideas of social science can exert more of an influence in the corridors of power.

Professor Peter Saunders, Director of the Social Policy Research Centre – The Australian

There's no such thing as a 'one size fits all' performance review system. It's crucial to ask if it fits with the culture, the existing procedures and systems, and the organisation's business strategy.

Dr Julie Cogin, senior lecturer in organisational behaviour at AGSM – Australian Financial Review

The battle continues for **Vietnam veterans**

The Dean of Medicine, Professor Peter Smith, has been charged with overseeing Australia's most extensive study into the health of Vietnam veterans. **By Susi Hamilton.**

Until just five years ago, Peter Smith pursued dual high-flying interests. The Dean of Medicine, who has a background in cancer research and treatment, spent more than 30 years with the Royal Australian Air Force Specialist Reserve, retiring with the rank of Wing Commander.

His twin interests made him a natural choice to chair the Scientific Advisory Committee of the Federal Government's most recent and far-reaching investigation into the health, mortality and cancer incidence of Vietnam veterans.

psychological from being in a combat zone."

However, the study found that overall, the mortality rate of Vietnam veterans is six percent lower than the general population. This is due to the so-called "healthy soldier effect", whereby those who were called for national service were fit young men who were healthier than the general population. This has a long-lasting effect on health statistics for that cohort, adds Professor Smith.

"This is the most extensive study of health outcomes for Vietnam veterans ever done, and points to a new direction in research

Those who served in Vietnam are 15 percent more likely to have had cancer than the rest of the Australian male population ... the health of veterans needs continued close monitoring.

The landmark four-year study revealed that those who served in Vietnam are 15 percent more likely to have had cancer than the rest of the Australian male population. Mortality from cancers of the head and neck was 44 percent higher.

National servicemen who went to Vietnam also showed increased risk of lung and pancreatic cancer, alcohol-related liver disease and death from external causes such as suicide and motor vehicle accidents when compared to those conscripts who stayed in Australia.

As to why veterans have had worse health outcomes, "we're not sure", answers Professor Smith. "We can't say for certain that it was Agent Orange or dioxin because we don't know individual levels of exposure. We don't know whether it was environmental, or

through database linkage." And there has been a lot of interest from the United States. "They can't do anything like it because they don't have the data sets that we have," says Professor Smith. These include "19 years of records from the cancer registries and up to 35 years for the mortality of veterans".

There are no comprehensive studies of health effects on the Vietnamese population from this era, largely due to a reluctance of the Vietnamese government to engage with such studies.

"The health of veterans needs continued close monitoring," says Professor Smith. "We also need to provide better care for military personnel, both while they are in active service and when they return. Vietnam veterans were treated poorly when they came home – we need to learn those lessons." ■

The art of **fundraising**

Jennifer Bott has taken up the position of Chief Executive of the University's fundraising arm, the UNSW Foundation. Ms Bott joins the University after seven years as the CEO of the Australia Council for the Arts.

The UNSW Foundation is responsible for driving the University's main fundraising activities, attracting philanthropic support for scholarships, capital works, research initiatives and other major projects. "The Foundation plays a significant role in supporting key activities of the University," said Professor Hilmer.

"Ms Bott's appointment signals the University's commitment to engaging even more strongly with the community, with business, and with our alumni. We are delighted to have attracted someone of her calibre to this important position," he said.

One of Australia's most prominent arts administrators and advisers, Ms Bott is a former General Manager of Musica Viva Australia and has occupied senior positions in a number of other cultural organisations. She is a member of the Australia International Cultural Council and the Commission for International Cultural Promotion, Chair of Australians for the Return of the Parthenon Marbles Committee, a trustee of Opera Australia Benevolent Fund, a life member of Musica Viva Australia and a member of Chief Executive Women.

Making **medical history**

Susi Hamilton meets UNSW medical graduate Kelvin Kong, Australia's first Aboriginal surgeon.

“When I started at UNSW, I was very isolated initially, because I was the only Indigenous medical student,” says 32-year-old Dr Kelvin Kong. “It made a great difference when I was joined by a fellow Indigenous student in third year, Tamara Mackean.”

Kong recently became the first Aboriginal surgeon in Australia when he qualified as an ear, nose and throat specialist. A conjoint academic with UNSW, he is now based at St Vincent's Hospital.

As an undergraduate Kelvin was instrumental in establishing the University's Indigenous Pre-Medical Program, with the support of the then Dean of Medicine, Professor Bruce Dowton. Thirty-five students have completed the program since its inception in 1999, and 11 Indigenous students are currently enrolled in medicine at UNSW.

“The Pre-Medical Program makes a big difference to the students,” says Dr Kong, who will speak at the upcoming program inauguration. “Sometimes it's an informal chat about what is expected of them and what uni life is like. More so, it is an opportunity to instil belief in attaining a tertiary degree. All you're doing is creating a safe environment, so that these students have the pride and the ability to do what they want to do. It is a form of cultural safety.”

It's a bit embarrassing that it's 2006 and we're talking about our first Aboriginal surgeon. I really wish I was being congratulated for being the 100th Indigenous surgeon ... it says a lot about where we are in Australia.

Kong also played a key role in setting up the Faculty's Rural Clinical School and the University-wide Aboriginal Education Program. “I have a proud affiliation with UNSW and feel it is one of the few universities to have the vision, the will and the support from staff to really encourage Indigenous students,” he says.

Rather than seeing his own achievements as an extraordinary individual feat, Dr Kong is happier giving credit to others. “Any achievement I make is purely a reflection of my immediate and extended family,” he says. “It's their reward for their belief and support in me.”

An interest in medicine runs in the family. Both Dr Kong's mother and wife are nurses, his elder twin sisters are doctors and his father, Dr Kong Cheok Seng, is a doctor and alumnus of UNSW.

Kong is outspoken about the Third World health outcomes of the Indigenous population. That helped him decide to specialise in ear, nose and throat surgery. “There are high rates of ear disease in Australia's Indigenous communities and I wanted to help address those. There's this perception that many of these health problems are in rural and remote communities, but they are just as prevalent in our urban population.

“It's a bit embarrassing that it's 2006 and we're talking about our first Aboriginal surgeon,” Kong says. “I really wish I was being congratulated for being the 100th Indigenous surgeon. It says a lot about where we are in Australia.”

As part of his duties as a registrar, Kong is also involved in outreach clinics at various Aboriginal medical service institutions. “It's wonderful to be able to give back to the community at the grassroots level. The Indigenous community really appreciate the service to their centres. Sometimes I think the fact that I'm Indigenous does make a difference to patients,” he says. “There seems to be an instant rapport. I think many of them haven't had



that rapport before and there's a sense of them being treated instead of helped.”

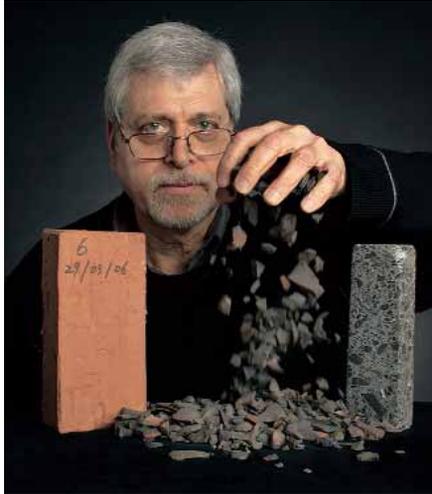
Dr Kong is also a former board member of the Australian Indigenous Doctors' Association (AIDA), and co-author of its *Healthy Futures* report, which defines best practice in the recruitment and retention of Indigenous medical students.

“The first step is engraining into Indigenous kids that there are career opportunities available to them. There is a lack of vision in this regard,” he says. “They need to hear that at a young age. There is not a single successful person who hasn't heard that.”

Dr Kong was recently nominated for his contribution to health in this year's national Indigenous awards, the Deadlys. His citation acknowledges his outstanding contribution as a national leader and his position as a role model for Aboriginal and Torres Strait Islander people. ■

Laying the foundations for a green industry

UNSW researchers have developed a strong, lightweight building material from waste fly ash found in power stations. As Susan Williamson reports, the technology has the potential to generate a thriving new “green” industry for countries such as China and India.



From ashes to bricks ... Obada Kayali with eco-friendly flash bricks that are 28 percent lighter and 24 percent stronger than comparable clay bricks

Coal-burning power plants spend millions of dollars disposing of waste fly ash, a fine powder that contains some toxic chemicals. An estimated 200 million tonnes of the by-product is generated in China each year, much of it sent to landfill.

In India about 100 million tonnes of fly ash is generated annually. And in the Middle East, where there are very few coal-fired power stations, there is an acute shortage of durable building materials because of the lack of suitable clay, aggregate and sand. Quality building materials are imported at considerable cost.

With a growing international market for high-quality building materials, Dr Obada Kayali

Fly ash comes straight out of the power station and can be fed straight into the brick manufacturing process.

and Mr Karl Shaw of the University’s Australian Defence Force Academy (UNSW@ADFA) have developed bricks and building aggregate that can be manufactured entirely from waste fly ash.

According to the researchers, their unique manufacturing method traps any harmful chemicals, creating an eco-friendly construction material that saves on construction costs and reduces generation of greenhouse gases.

Flash Bricks™ are 28 percent lighter and 24 percent stronger than comparable clay bricks while the aggregate, Flashag™, can be used to make concrete that is 22 percent lighter and

20 percent stronger than standard products. This results in lighter structures, shallower foundations, cheaper transportation and less usage of cement and steel reinforcement. The bricks also generate fewer emissions during manufacture as they take less time in the kiln to manufacture than clay bricks.

“Fly ash comes straight out of the power station and can be fed straight into the brick manufacturing process,” says Dr Kayali of the School of Aerospace, Civil and Mechanical Engineering.

“In China it is difficult to find a clay quarry or aggregate quarry close to a city. Many brick plants are idle due to lack of clay yet most power stations have some form of brick plant close by. There is growing interest in the country in reducing greenhouse gases, reducing chemical pollutants and dust emissions, and stopping the alienation of the land. Flash Bricks and Flashag overcome many of these problems,” he explains.

Neil Simpson of NewSouth Innovations (NSi), the University’s commercialisation arm, says the products have won widespread praise from structural engineers. “Because Flashag results in lightweight yet sturdy concrete, it can be used effectively in high-rises where smaller structural columns are needed to maximise floor space and in concrete bridges requiring longer spans.”

The fly ash technology has two patents and licences have been issued for the UK and US markets. NSi is seeking interest from companies wanting to develop the technology for China, Japan, South-East Asia, Europe and India. ■

Cleaning up at international awards

A system developed by UNSW researchers to remove oil from water to protect the environment, has been awarded a major innovation prize from the International Water Association.

The Extended Gravity Oil Water Separation (EGOWS) project, developed at the Water Research Laboratory in the School of Civil and Environmental Engineering, allows almost complete separation of oil from water. It produces clean water suitable for recycling and keeps spilled oil out of the environment.

NewSouth Innovations has patented the EGOWS technology internationally. In Australia, there are already more than 70 EGOWS installations in operation. The Caltex Kurnell Oil Refinery successfully uses the system to prevent any oil release to

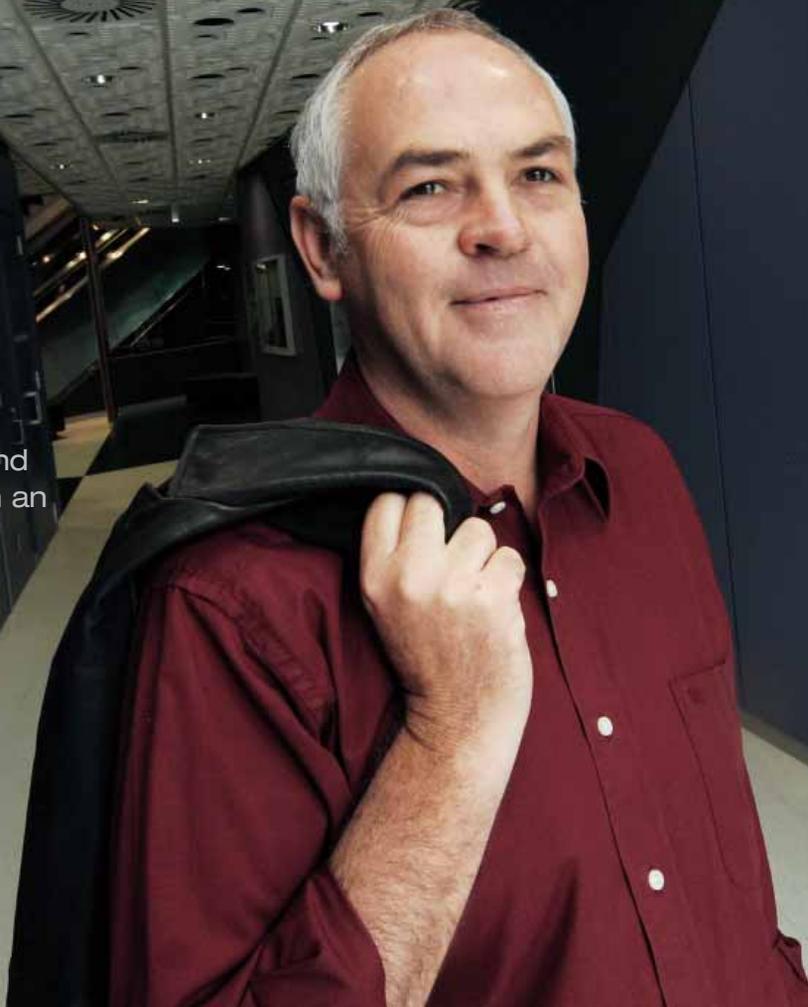
the wetlands of Botany Bay, and it was this installation that was recognised by the International Water Association as the regional (Australasia and South-East Asia) winner in the Applied Research category. The awards were presented last month in Beijing.

“EGOWS can remove oil down to below 10 parts per million, requires no power and is most useful in situations that are unattended,” says David Tolmie, who developed EGOWS with colleague Peter Stone. He added that winning the award was “satisfying at the personal level. It brings valuable publicity worldwide – endorsing the technical and commercial viability of the EGOWS concept.”

Victoria Collins

Criminal minds

The past few months have been busy for NewSouth Global Professor in Criminology, Chris Cunneen. He has successfully established the first Crime and Justice Research Network in an Australian university, fulfilling the key aim to the cross-faculty chair appointments: interdisciplinary research.
By Alex Clark.



The CJR Network, officially launched last month, takes research in criminology out of any single school or faculty, where it's commonly entrenched in universities, and encourages the development of interdisciplinary collaborative research.

"Criminology, as an area of study, is inherently interdisciplinary," says Professor Cunneen, who joined the University in March this year from the University of Sydney where he was the Director of the Institute of Criminology. "It draws on law, history, sociology, psychology, and medical sciences, so it lends itself to this approach."

He says UNSW has real strengths in criminology across a diverse range of schools, faculties and centres, but there was no way to bring people together until now. "The Network will significantly benefit crime and justice-related academic work, drawing together academics, researchers and students from across the University."

Projects already underway by members of the CJR Network include an evaluation of the Tirkandi Inaburra program, led by researchers from the Social Policy Research Centre in the Faculty of Arts and Social Sciences. The project, commissioned by the NSW Attorney-General's Department, is evaluating the community-controlled residential facility for Aboriginal boys aged between 12 and 15 years who are at risk of contact with the criminal justice system.

A collaborative research project between Network members from social work, public health and criminal

justice is investigating the pathways people with mental disorders and cognitive disabilities take through the criminal justice system. Funded by an ARC Linkage grant, this project will make recommendations on intervention to help prevent such involvement.

The CJR Network has introduced an interdisciplinary postgraduate research seminar series, which has been running throughout Session 2. A national research conference in July for crime and justice students is also being planned for 2007. "The Network has seen research students from more than four faculties undertake criminological-related topics," says Professor Cunneen, who is recognised as a leading authority on issues relating to Indigenous people and the criminal justice system.

As well as promoting interdisciplinary research within the UNSW community, the CJR Network has instigated links with external agencies. "We have already established a relationship with the NSW Judicial Commission, which will enable researchers at UNSW to access the Commission's Justice Information Research Service – this is an excellent research tool for investigating issues relating to sentencing," says Professor Cunneen. ■

The CJR Network has launched its own website to provide a public face for crime and justice study and research at UNSW: www.cjr.unsw.edu.au.

The CJR Network will significantly benefit crime and justice-related academic work, drawing together academics, researchers and students from across the University.

Plastic fantastic



Louie Douvis/fairfaxphotos

Professor Veena Sahajwalla's pioneering research using waste plastics for steel making has reached a key milestone: it's out of the lab and into an industrial-scale furnace. And the results are looking very promising, writes **Denise Knight**.

Wearing face protection gear, Veena Sahajwalla flashes a wide grin when she sees the steel-making furnace in action. "Beautiful" is how she describes the fireworks sparking off the river of molten slag. "It's so hot in there, about 1600°C ... when they open up the door it is spectacular."

And the Director of the Sustainable Materials Processing Research Program in the School of Materials Science and Engineering has good reason to be excited.

The Australian Research Council recently awarded Professor Sahajwalla a Linkage grant of \$560,000 over four years to further develop an environmentally friendly process that uses plastic waste as an alternative to coal-based carbon for electric arc furnace (EAF) steel making.

Central to that work is testing her invention in a commercial furnace, and trials are now in full swing with industry partner, steel-making giant OneSteel, at their Rooty Hill plant. Working with David Knights and Paul O'Kane, Sahajwalla and her team (she has a growing number of research students lining up to be part of the project) are giving the technology an industrial-scale work-out.

The success of the trials to date is a "career highlight", says Sahajwalla. "By adding plastic to slag under intense temperatures we have shown that carbon from plastic can successfully lead to the 'slag foaming' phenomenon, which is crucial to EAF steel making." The foam conserves energy in the manufacturing process by sitting on top of molten steel, acting as an insulating blanket.

Her research is also generating a great deal of heat. In 2005 she won a Eureka Prize for Scientific Research and earlier this year her research team was honoured with the 2006 Environment Technology Award from the Association for Iron and Steel Technology in the United States. UNSW's commercialisation arm, NewSouth Innovations, has applied for a worldwide patent for her process, which holds the promise of an environmental win-win – significantly cutting the steel industry's coal use and greenhouse gas emissions, while preventing mountains of plastic waste ending up in landfill.

Now her team is exploring the use of a wider range of waste plastics, not just common polyethylene used in shopping bags and other consumer products.

“Up to a third of the coal in these furnaces can be replaced with recycled plastics and we are aiming to increase this percentage. Not only does the plastic replace coal as a carbon source, it could also provide additional operational advantages, which we are working on.”

Carbon is an essential part of steel making, and having worked on different types of carbon that are traditionally used in EAF steel making, Professor Sahajwalla showed that the manufacturing process could be controlled through high temperature reactions. The idea of using waste plastics as a source of carbon in that process occurred to her while on sabbatical at a steel mill in Indiana in 2001.

Plastic has been used as a fuel in other technologies, such as in iron making in Japan, but this is the first time it has been used for slag foaming in EAF steel-making technology.

According to Sahajwalla, 40 percent of the world's steel production already takes place through the EAF route, which manufactures steel from scrap metal. “Steel recycling is common practice and scrap steel has become a valuable commodity because there's a technology that can accept it. My vision is that we as engineers and scientists should be actually developing technologies and processes, or enhancing existing processes that can use all kinds of waste resources. This is exciting because the possibilities are endless!”

Getting industry to take up “good science” is a key driver behind Sahajwalla's work. “I am passionate about creating concepts and solutions that might sound radical, but that is the best part as they could provide a foundation for developing novel pathways into the future.”

The collaboration with OneSteel in Australia has been particularly satisfying, she says. “There's a commitment from the most senior levels of the company to this research.”

Steel companies in the US have also expressed a lot of interest in her work. “But at this point in time I'd rather continue the research and its implementation in Australia so we can be first in the world to make this breakthrough. So it's been a great fit for us to work with OneSteel.”

And it's not just the steel industry that has been taken by Sahajwalla's application of “innovative” recycling. “I love to share my excitement about innovations with people. As a result a number of other companies have told me that if there's a way they can divert waste going to landfill, and instead send it off to become a resource for another manufacturing process, then they'd be interested, even if there's no immediate financial benefit.”

The ARC recently awarded Professor Sahajwalla and Dr Rita Khanna a Discovery grant to develop fundamental science governing the recycling of another waste material, refractory, which is a critical component in materials industries. “By converting waste into a value-added resource we are promoting sustainability of materials industries, and let's face it we all use materials, just look around you!”

Sahajwalla's “waste antenna” is clearly highly tuned. “Growing up in a place like India I didn't think of anything as waste ... we used and recycled just about everything.”

From her point of view, looking at waste plastics as a resource is “only the tip of the iceberg. There are so many other materials that should be recycled, and if we can't, then we really ought to be going back to the drawing board and developing products that can be re-used at the end of their life cycles.”

So what's ahead for this modern-day alchemist? “My team members and I are working on the ‘next’ plastic.” ■

“My vision is that we as engineers and scientists should be actually developing technologies and processes that can use all kinds of waste resources. This is exciting because the possibilities are endless.”

Architects of their own destiny



Watercube images courtesy PTW architects/arup/csccec

The spectacular transformation of China in the last decade is symbolised by its architecture. The booming cities of China are evolving at a speed which is hard to comprehend, and their skylines have seen a profusion of new architectural styles. Yet for most of the last century, Chinese architecture was largely ignored by the West, writes **Professor Xing Ruan**, in his recently published book *New China Architecture* (Periplus Editions). From the dazzling new designs of the Olympic Games venues in Beijing, to skyscrapers in Shanghai and innovative private houses at the Commune by the Great Wall, Ruan shows how Chinese architecture now demands a discourse of its own.



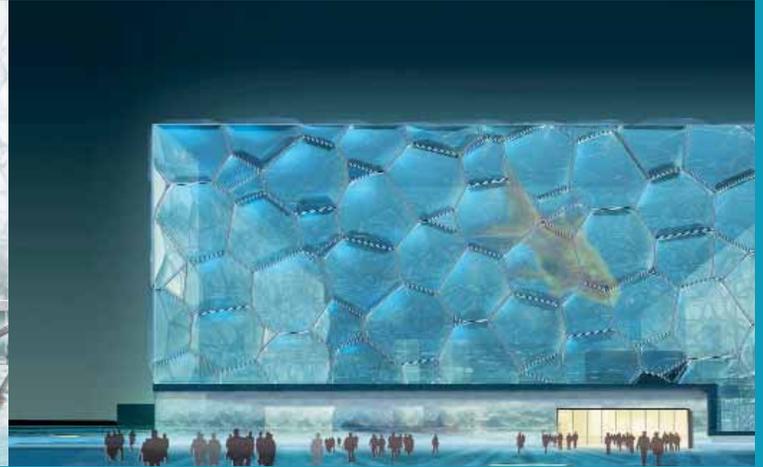
National Grand Theatre, courtesy Periplus

What motivated you to write this book now?

Photographer Patrick Bingham-Hall asked me to write a book on China's new architecture in the last decade or so, which he was planning to photograph in 2004. The call for writing such a book was appealing, for I have always felt that there has not been much Western discourse about China's architecture in the 20th century.

The situation of course has changed with the construction boom since the mid-1990s: mainstream Western architectural journals and galleries have been racing to expose new architecture in China; celebrity Western architects (including Australians) have been winning major commissions in China. The 2008 Beijing Olympic Games is one example: all the major buildings have been won by international architects. The swimming complex, the so-called Watercube, has been designed by Sydney-based architectural firm PTW and the Arup Group (Sydney office) in collaboration with China State Construction Engineering Corporation. In fact, most of the recent major public buildings and infrastructures in China have been commissioned to famed international architects and engineers.

There have been two typical responses to such architectural and urban frenzy. One, quite expectedly, is what I call an "ecstasy of glorification": after more than half-a-century's stagnation, China is now able to achieve what the West saw in the 20th century, only bigger and better. China hence is where the action is, and the 20th century cry of "Go West" should now be turned into "Go East in the Twenty-First Century", as the celebrity Dutch architect Rem Koolhaas has repeatedly reminded us. When I was invited, along with a few other architecture academics, to hold a stage conversation with Koolhaas in Amsterdam in late 2005, he



There has been an “ecstasy of glorification”: after more than half-a-century’s stagnation, China is now able to achieve what the West saw in the 20th century, only bigger and better.

went so far as to suggest that an authoritarian state is a precursor for visionary architecture because, unlike a true market economy in the West, money is not everything in China!

On the other hand, the response has been tinted with a sense of despair. The sheer quantity and speed of China’s development causes an “unbearable lightness of being” (to paraphrase Milan Kundera). It may lead to monstrous explosion and a drain of our limited resources on this planet. The tone of our newspaper articles makes us sit up: the dust from Chinese construction sites will eventually reach our shores ...

It is in this context that I thought I could offer a view – that is a combination of a sense of realism and fiction – to understand not only the buildings, but also the circumstances under which they are being produced. Of course attempts have been made to provide a historical background both within and beyond China. But this book essentially is personal: it is neither laudatory nor critical, but that of a narrative as seen by an individual and written with love and irony.

Why did you focus on these particular architects and buildings?

I decided to focus on large-scale urban projects designed by famed international architects, as well as small-scale projects designed by emerging young Chinese architects. I thought such contrast is in itself an irony: significant public projects often have been won by international architects via competitions; ambitious young Chinese architects, though tackling relatively low-key projects, are increasingly attracting the academic limelight from the West. In this scenario, Western architects want to capture something Chinese, but the Chinese clients expect them to produce something ultra modern and new; young Chinese architects aspire to avant-garde, but they often are obliged to be Chinese and yet contemporary. Indeed the Western expectation is that they should produce an architecture with a place identity. I thought I could use Mao’s art policy rhetoric, “letting a hundred flowers blossom”, at the outset to alert the reader that I provide a diverse range of projects in the book, which includes both “flowers” and “weeds”.

Are Western ideas influencing Chinese architects?

There is an interesting difference between the architects who were trained in the West and practised in the first half of the 20th century in China, and those who have trained in China and are producing works now. The earlier generation, curiously, were less concerned with cultural or place identity; their works look eclectic but they searched for a combination of fine qualities of pre-modern Chinese architecture and that of the West. I have called their works a “refined kitsch”, and have attempted to find out why the West had neglected Chinese architecture for almost a century. Now Chinese architects carry a heavy cultural

obligation, which is both self-imposed, and expected by the West, to be Chinese. It seems to be a deep dilemma between the overarching Western modernity and a cultural or place specificity.

Is the West’s exposure to China influencing its architects?

I am inclined to think so. One example is that, although symbolism has been treated with disdain in modern Western architecture, international architects these days, consciously or subconsciously, often impose symbolism and metaphorical meanings onto their Chinese projects.

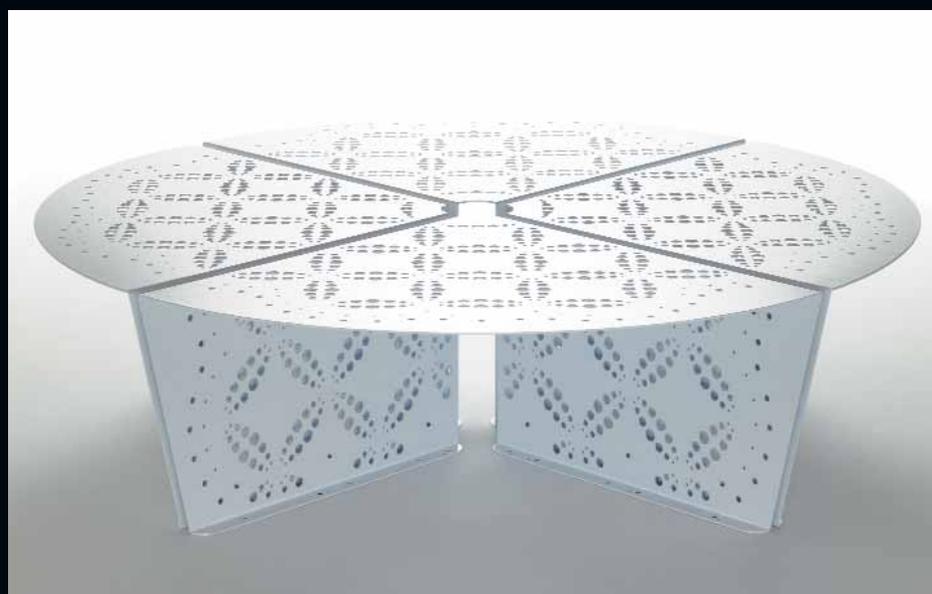
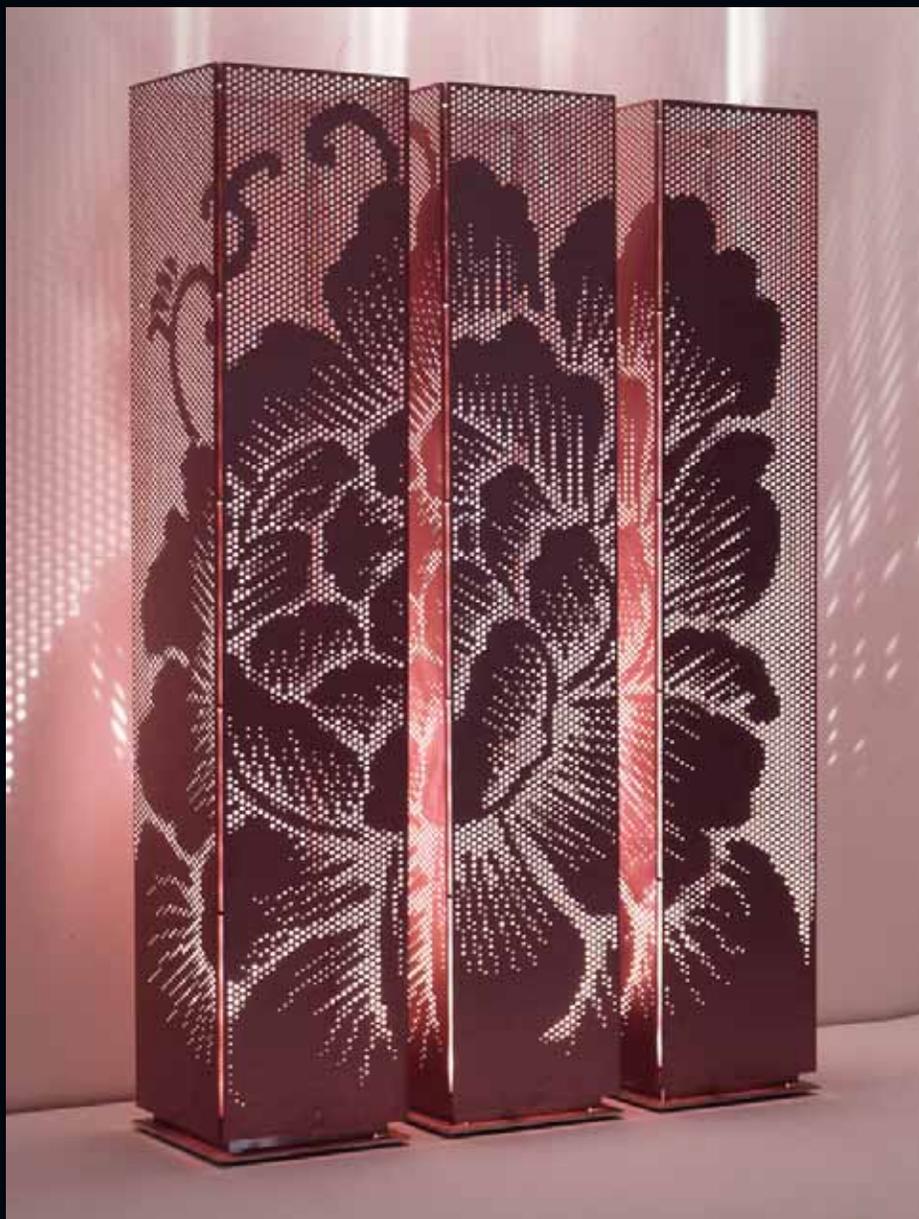
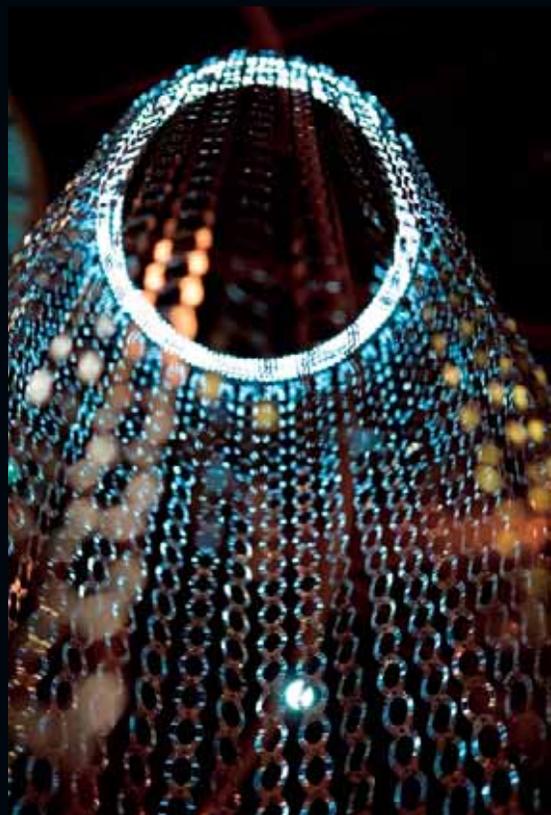
As I have discussed in the book, a figurative concept, and its materialisation in the design, has almost become a prerequisite to win any large-scale project in China. To name a few included in this book: Paul Andreu’s National Grand Theatre in Beijing has a large bubble “heaven” hovering above the “Earth” of the theatres, which, we might see as a depiction of the Chinese “cosmos”; another Chinese “cosmos” is the Shanghai Opera House by Arte Charpentier et Associes, which has a curved top and cubic square body; the Beijing International Airport by Foster and Partners, albeit sleek and high-tech, is, according to the architect, a flying “dragon”; the Jinmao Tower in Shanghai by SOM is a Chinese pagoda, so the architects argue, though it is clad with intricate metal frames and shining glass. Other figurative motifs are not overtly Chinese, but they do appear to have won the hearts of the Chinese: Zaha Hadid’s Guangzhou Opera House is comprised of “pebble stones” washed smooth by the city’s Pearl River, and the Shanghai Pudong International Airport by Paul Andreu is a “seagull” ready to spread its wings. The 2008 Beijing Olympic National Stadium by Jacques Herzog and Pierre de Meuron, perhaps the most glamorous project so far conceived, is a gigantic “bird’s nest”, and the Olympic Aquatic Centre (Watercube), designed by PTW, Arup Group and China State Construction Engineering Corporation, is a transparent crystal cell structure, although the architects have tried to argue the square plan is Chinese.

A deep question raised in the book is the problem of legibility. The issue is not so much about a public recognition of these forms as symbols and signs, but the imaginings of the good life in China after the Mao era, the materialisation of these imaginings in buildings and cities as spatial configurations, as well as discrepancies between the original meanings conceived by the designers and the actual ways in which the inhabitants read and use them. My latest book, *Allegorical Architecture*, which has just been published (University of Hawaii Press), deals with this issue more explicitly from the vantage point of non-architect designed human habitat. ■

Xing Ruan is a professor of architecture in the Faculty of the Built Environment. He spoke to **Dan Gaffney**.

A light touch

UNSW is home to some of Australia's finest emerging designers. Rina Bernabei, a senior lecturer in the industrial design program, and design partner Kelly Freeman, a sessional teacher, recently won a Bombay Sapphire Design Discovery Award for their aluminium *Brodie* table (pictured bottom left). It is part of a series of work inspired by the beauty and detail of embroidery and lacework. Their other designs include *Leaf* lighting and the *Peony* floor light. Adjunct senior lecturer Ruth McDermott's *Gloink* light (pictured below) created with Bettina Easton, was also selected as an award finalist. ■



An eye for **design**

Judith O'Callaghan, program head of interior architecture at UNSW, has an eye for spotting fresh talent. She tells **Barbara Messer** why more Australian designers are enjoying success on a global stage.

When Judith O'Callaghan was working at the National Gallery of Victoria (NGV) as a curator, a young student named Marc Newson came in to present his jewellery designs. She was immediately struck by his talent. "He had a real presence about him, and a sense of purpose," she says. "Marc was majoring in jewellery, but he was already exploring other aspects of design. That's the advantage of design education in Australia – there are many opportunities to broaden your skills."

Sure enough, Newson went on to become one of the world's most successful industrial designers, famous for designing everything from furniture and coat hangers to bicycles and airlines. He's just one example of many talented Australian designers who have risen to fame on the global stage.

O'Callaghan has witnessed many of these success stories, first as curator of decorative arts at the NGV in the 1980s, and later as senior curator of contemporary design at the Powerhouse Museum, a position she held for 11 years.

Today, O'Callaghan is a senior lecturer and program head of interior architecture in the Faculty of the Built Environment. She believes many people underestimate the quality of Australian design, from architecture and interior design to visual communications.

"Fifty years ago there were some outstanding Australian designers who were picked up internationally, but they were few and far between and most had to leave the country to achieve success. These days there's a greater sense of fluidity across borders in terms of communicating and accessing designs. This allows Australians to engage in the international design scene more easily and effectively."

The quality of Australian design in bygone eras is often overlooked, says O'Callaghan, who specialises in design since the 1950s. "People thought the '50s were a desert of creative activity in relation to design, but that was completely wrong. Just as there were great sculptures, paintings, architecture and literary works produced at that time, there was also exciting and innovative design."

She rattles off a list including furniture designer Grant Featherston, graphic and industrial designer Gordon Andrews, interior designer Marion Hall Best, and more contemporary successes such as interior designers Iain Halliday and the University's own award-winning designer Rina Bernabei. One of the reasons more Australian designers are flourishing internationally, according to O'Callaghan, is the freedom they're allowed in the early stages of their careers.

"In Europe, young designers enter a kind of 'system' or follow certain paths, whereas a large number of Australian designers are left to find their own way. It can be incredibly challenging. They're not necessarily picked up by a huge manufacturer as they are in Europe. Nevertheless by taking charge of the total design and production process young Australian designers are getting their work out into the public realm, both here and overseas."

In the past, Australian architects and interior designers were heavily influenced by trends in the US and Scandinavia. Today, technology is the biggest influence on design processes and aesthetics. "New technologies are having a major impact on design – not only in terms of the design process, but in the kinds of highly sophisticated materials that are now being produced. Environmentally sensitive design has to be the first priority for designers today. It's there that we see some of the most inventive and creative work emerging," she says.

Throughout her career, O'Callaghan has attempted to make design more accessible to the broader public. One of her biggest achievements was establishing Sydney Design Week in 1996 with Ross Muller, who was then editing the "Domain" section of *The Sydney Morning Herald*. Together, the



pair aimed to establish an annual showcase for contemporary design in order to help more people understand what design really is.

"People question whether a design piece in a shop or in a home is something they should be looking at on a podium. But just like a painting, a design embodies ideas. If it's a good idea and is well resolved, it can elicit the same kind of response as any other creative work. Design is not art, but there's an intellectual element that should be appreciated."

O'Callaghan says the growing popularity of design is reflected in the number of students enrolled in interior architecture at UNSW. Ten years ago, only a handful of students were studying the discipline. Today, it's the Faculty's second largest program.

"Design is all embracing. It begins with the built environment and extends to the finer details of the lived experience. I teach the history of architecture and design, but within that I endeavour to give a broader understanding of why things look the way they do," she says. ■

Made in **Australia**

The next generation of designers and architects are showcasing their work in the Faculty of the Built Environment's 2006 graduan exhibition. From inspiring architecture to the celebration of the great outdoors, the final-year student projects demonstrate what is possible in our built environment. Exhibitions are currently being held for landscape architecture, architecture, science architecture, industrial design, interior architecture, and planning. For more details, dates and locations check www.fbe.unsw.edu.au/events/.

Exporting policy expertise

Throughout the Asia-Pacific region, UNSW academics are taking a leading role in providing high-level policy advice, research and training to governments, international agencies and aid organisations. As part of an international series, *Uniken* is featuring a selection of these projects which cover a broad range of fields including health, education, energy and governance.



Walking the talk ... Deo Prasad applied sustainable development principles to his family home in Sydney

Putting more energy into renewables

By Dan Gaffney.

The Director of UNSW's Centre for a Sustainable Built Environment and an adviser to governments and international policy bodies such as the United Nations Environment Program, Deo Prasad has written and shaped much of the milestone literature about sustainable buildings over the past 30 years.

He was recently honoured by the Royal Australian Institute of Architects with the 2006 Neville Quarry Architectural Education Prize. The citation singles out his work in design and research, especially in the context of sustainability.

"Western countries like Australia pay lip-service to ecologically sustainable development and 'whole-of-government approaches' to planning greener buildings and cities, but frankly, there's more talk than action," Professor Prasad says.

He points to the Federal Government's response to planning and securing Australia's long-term energy future as a case in point. "Australia is in the middle of a long boom in mineral prices and there has been no better time than now to invest seriously in renewable energy sources such as solar power. Instead, we are following the lead of the US by saying that we will continue to rely on coal power while developing plans to go nuclear.

"In my experience, Asia-Pacific countries such as China and Thailand are doing far more than we are. Even small nations like Bhutan, are committing resources to ensure that economic and social development isn't put on a collision course with the environment."

Prasad, who is also the Asia-Pacific Director of the International Solar Energy Society, is currently working with the Bhutanese government on the design of a "green" parliament house that will serve as an example of sustainable building. "With the support of the UN's Environment Program (UNEP), I am advising on the design so that it retains important cultural and heritage values while being sustainable in terms of materials, cooling, energy and water use. The parliament project is really a way for the government and industry people to get their heads around a whole suite of indicators that are important for sustainable buildings."

While sustainable development has become a buzz word in government planning documents, Prasad says the term is really about achieving harmony. "At its core, the concept of sustainability is about enabling us to achieve our potential as people, while protecting and

enhancing the Earth's life support systems," he says. "This idea of achieving a balance between human action and the environment is very familiar in many non-Western countries where I run training and advisory programs."

Harmony was a central theme in a seminar on sustainable development led by Prasad last month in Shanghai, China. Attended by senior economists, engineers and policy analysts from some 30 countries in the region, the three-day program led delegates through ways to address development and planning issues in their own communities.

"We took time out to visit the garden city of Wuxi, just north of Shanghai, which has ambitions to be a showcase of informed development and planning. Local government and housing developers there are very keen on taking up an accreditation program that I am working on with UNEP.

This idea of achieving a balance between human action and the environment is very familiar in many non-Western countries where I run training and advisory programs.

"It's similar to the Green Star rating system here in Australia that evaluates the environmental design and performance of buildings based on criteria such as energy and water efficiency, quality of indoor environments and resource conservation," Prasad explains.

However, his proposed system would apply to entire developments, which can number as many as 20,000 houses, "so there's an opportunity to make large-scale positive impacts".

Thailand is another country that is starting to take positive green policy advice from UNEP, according to Prasad. "The Thai government has taken the decision to cut excise taxes on electric and hybrid cars by as much as 75 percent to promote the use of fuel-saving automobiles.

"I can't see Australian governments taking this kind of courageous policy step – unfortunately, they are too beholden to the petroleum industry and car lobby, which know they can defeat green initiatives by threatening potential job losses in a government-held seat." ■

Building the **Olympic dream**

The Beijing Olympic Committee is utilising a risk management system developed by UNSW and Australian company Multiplex Facilities Management for its Sydney Olympic construction program.

Professor Martin Loosemore from the University's Building Construction Management Program spent four years working with Multiplex to jointly develop the safety program called the Risk and Opportunity Management System (ROMS). The approach behind the system draws on lessons learnt during the construction of the main stadium for the highly successful Sydney Olympic Games.

The Beijing Olympic Games Organising Committee (BOCOG) was asked to report on risk management during the construction of the Games sites – the first time a host nation was required to undertake such a study by the International Olympic Committee.

“BOCOG commissioned a joint research project with UNSW and Tsinghua University, funded by China's Ministry of Science and Technology, for our team to develop a program for the 2008 Games. This system has been based on ROMS and has now been put in place,” says Professor Loosemore.

“The Olympic project has led to ongoing research collaborations between Tsinghua and the Faculty of the Built Environment. For example, we successfully obtained an ARC international Linkage

People are often an organisation's most important source of information about risks and its most important asset in managing them.

grant last year to develop our research agenda further.”

What Professor Loosemore's research with Multiplex found is that safety and risk management on construction sites is exponentially improved by collaboration between unions, government and the building industry. Such was the case during the construction of the Sydney Olympic facilities, which were completed on time, within budget and set new standards for managing safety, industrial and environmental risks.

“People are often an organisation's most important source of information about risks and its most important asset in managing them,” Loosemore says. “Collaboration is the key that allows people's risk information to be utilised in the most effective way.”

The ROMS program, which received an International Innovation Award from the UK's Chartered Institute of Building, is currently being developed into the world's first multimedia risk and opportunity management system (see www.cell-media.com/ROMS). Professor Loosemore's research findings are outlined in a new book, *Risk Management in Projects*, which he co-authored with John Rafferty, Charlie Reilly and David Higgon. It was launched earlier this month by the NSW Minister for Industrial Relations, John Della Bosca, and is strongly supported by Unions NSW.

“In the book we cite global political, social, regulatory and economic trends and business practices, which fuel risk aversion and stifle creativity. We argue that this creates an excessive focus on the downside of risk and an insidious culture of risk transfer which threatens the most vulnerable in our society and reduces productivity to the lowest common denominator.”

Martin Loosemore is FBE's Associate Dean (Research).



newsPIX

Water purifier-to-go

Zimbabwe-born UNSW industrial design graduate Julie Frost has created a multifunctional water transportation, purification, storage and dispensing unit designed to reduce disease among villagers in her home country.

Her design, Mvura (water), answers the need for a household purifier to collect water from any source. Holding 15 litres, the vessel utilises the simple technique of pasteurisation using solar heat. Dirty, salty well water is heated to 65°C within two hours, killing all harmful bacteria.

Julie's work has been recognised with a bronze medal at this year's Australia Design Awards. The judges said her project was “broad thinking and intelligent; a solution that works to remedy what is an everyday, life-threatening situation in developing nations”.

Safety first: better protection for women refugees



In most refugee situations, women and girls are at risk of rape and other forms of sexual and gender-based violence. UNSW's Centre for Refugee Research has spent the past five years researching the problem in refugee camps in Kenya, Thailand, Ethiopia and Sri Lanka, funded by an ARC Linkage grant. The Centre has also advocated for the international community to provide better protection for this vulnerable group – last month they achieved the seemingly impossible. By **Alex Clark**.

Denise Knight

During the annual meeting of the United Nation's refugee agency (UNHCR) in Geneva last month, the 122 member-governments unanimously supported an amendment that expands current international refugee law to better protect women at risk. This "conclusion" was first proposed and drafted by the research team from the University's Centre for Refugee Research.

The Centre's Director, Dr Eileen Pittaway (pictured), and Senior Research Associate, Linda Bartolomei, have spent long periods in refugee camps around the world working to develop more effective policy to improve conditions for women and children.

"Many refugee women and girls experience multiple traumatic events – in situations of conflict, during flight, and in countries of first and subsequent asylum," says Pittaway.

She believes resource shortages and ineffective processes are responsible for the failure of the international protection system to adequately respond to the needs of this vulnerable group. Such failures can lead to further incidences of violence, exploitation, sexual abuse and even death.

"Women at risk can suffer from health issues such as HIV/AIDS and other sexually transmitted diseases, unwanted pregnancy, genital mutilation and sexual torture," Pittaway says. "A lack of safe access to adequate food and basic necessities for refugee women and their children pose additional risk factors."

Each year, governments pass a number of amendments that become part of "soft" international law and help UNHCR and governments to interpret and implement the refugee Conventions. The change to the *Women and Girls at Risk* provisions was one of only two passed this year, marking a milestone in the Centre's work, which has been

acknowledged publicly by both the Australian government and UNHCR.

The team has been requested to implement a trial of a new risk assessment tool, developed by Pittaway and Bartolomei, in Africa and South-East Asia. "The current *Women and Girls at Risk* program identifies refugees who are at extreme risk and aims to fast-track their removal to one of seven developed countries that have adopted the program," Pittaway explains. However, research conducted by the Centre found the program was falling well short of its promises. The attitudes of some decision makers who don't perceive rape to be

Many refugee women and girls experience multiple traumatic events – in situations of conflict, during flight, and in countries of first and subsequent asylum.

sufficient grounds for special protection, along with a culture of distrust around refugees' stories contributed to its failure, says Pittaway.

"The Centre has continued to develop improved tools to overcome these shortcomings and ensure that refugee women are key partners in the development and implementation of an effective response system. Improving methods of identification, assessment and monitoring of risks are the best preventative strategies."

With funding from member-governments including Australia, implementation of the Centre's Risk Assessment Tool and Response Mechanism will begin in January next year, starting in some of the worst refugee camps in the world. Pittaway and Bartolomei will work with UNHCR staff on the implementation strategy. ■

Weaving a stronger **social fabric**

Professor Richard Hugman has been working with the Vietnamese government and UNICEF to establish a professional social work system in the country, writes **Victoria Collins**.

The trafficking of children, “barefoot social workers” and health education: the social issues facing Vietnam seem light years away from those we deal with in Australia. “Which only makes it more important that the Vietnamese government establishes a social work system that is specific to its country’s needs,” says Richard Hugman, Head of UNSW’s School of Social Work.

“After unification of the country in 1975 it was thought that professional social work was not necessary,” he explains.

That situation continued until Vietnam began to move to a market economy in the mid-1980s. Since then the government has started to recognise a need for a state-sponsored social work system, with the necessary training provided through universities.

Since the mid-1990s two universities have included a social work component in existing degrees, and since 2004 they have run four-year undergraduate social work degrees. Eleven universities are now scheduled to teach the discipline.

For the last two years Professor Hugman has been working with the Vietnamese government and UNICEF to identify how the social issues in Vietnam can best be addressed by professional social work. He is also looking at how to utilise the resources that already exist at a grassroots level.

“I don’t tell the Vietnamese government what to do,” Hugman says. “They have already decided they want to make changes to their social work and have some idea of the system that they are heading towards. I talk to them about best practice, what other countries are doing, and how to make the most of what is already happening.”

Interestingly, many of the issues that Vietnam is experiencing are similar to those seen in Western countries as social work developed 100 years ago.

“They are dealing with problems caused by the pressure that industrialisation puts on families and communities. Societies struggle to look after children or people with severe disabilities for example, and change rapidly at the same time,” Hugman explains.

“Vietnam also has some social issues that are quite different from those seen at any time in Australia. These include the trafficking of children and young women, and the types of dangerous work situations from which children need to be protected. There are also issues that aren’t normally a concern for social work, although their ramifications are. These include things like road safety, because of the way in which whole families have to travel on one small motorcycle.”

The push to create a role for social work initially came from the people in Vietnam who have some



I don’t tell the Vietnamese government what to do. They have already decided they want to make changes to their social work and have some idea of the system that they are heading towards. I talk to them about best practice and how to make the most of what is already happening.

social work training, either from before the war, from recent overseas training or from the courses now offered at the country’s universities. There has also been encouragement from NGOs and international organisations such as UNICEF.

“There is already a lot of grassroots activity going on that looks to me like an emerging form of social work and that is definitely something that can be utilised as they establish a more formal structure,” Hugman says.

This work primarily revolves around a group known as the “barefoot social workers” – people with a small amount of social work training who are working at a paraprofessional level often providing intensive, direct intervention for families living in their area.

“These workers are all women of good standing in their local community,” Hugman says. “Because of the role that they are already playing we have advised the government to look at a system that uses these paraprofessionals, supervised by professionals.”

The next step in Hugman’s project is a further series of visits to Vietnam. “We need to do more detailed work to turn last year’s report into a firm strategy and work on how it can begin to be implemented,” he says.

“Without wanting to sound too melodramatic, this is among the most important work that I have ever done. The Vietnamese government wants to make changes and the ramifications of those changes will impact on many thousands of people, over many years.” ■

Throughout the year *Uniken* has been profiling the winners of the 2005 Vice-Chancellor's Awards for Teaching Excellence. In the final issue for the year we talk to Associate Professor Jacquelyn Cranney from the School of Psychology and Richard Buckland from the School of Computer Science and Engineering.

Show me the evidence

Associate Professor Jacquelyn Cranney is one of eight Australian academics to be awarded an inaugural Associate Fellowship with the Carrick Institute for Learning and Teaching in Higher Education.

The Fellowships, worth \$90,000, are aimed at enabling academics to pursue new initiatives in teaching over a period of 12 months. Cranney, who has been dedicated to improving the student experience at UNSW for the past decade, was awarded the Fellowship for her latest project, "Sustainable and evidence-based learning and teaching approaches to the undergraduate psychology curriculum".

"I believe in an evidence-based approach to learning and teaching," explains Professor Cranney from the School of Psychology. "More importantly, we need to minimise 'reinventing the wheel' with regard to creating high-quality undergraduate curriculum and teaching resources."

Cranney has played a leading role in the development and implementation of new policy, procedures and structures for learning and teaching at the school, faculty and university level. In recognition of her work in developing UNSW's Guidelines for Postgraduate Research, Cranney was awarded a NSW Public Service Management Course Scholarship, a Faculty of Life Sciences Teaching Award, and a UNSW Innovative Teaching and Educational Technology Fellowship.

We need to minimise "reinventing the wheel" with regard to creating high-quality undergraduate curriculum and teaching resources.

She was awarded a Vice-Chancellor's Award for Teaching Excellence this year and was a finalist, with Sue Morris, in the 2005 Australian Awards for University Teaching for their innovative work in improving UNSW's first-year psychology program.

Professor Cranney will use the Fellowship to build curriculum templates that are compatible with Australian and international professional standards, and that reflect educationally and psychologically sound principles. "I am also hoping to establish a process for the selection and sharing of learning and teaching materials that are explicitly associated with the templates, and to facilitate the creation and adoption of evidence-based learning and teaching strategies in psychology."

Dan Gaffney

By popular demand

Making students want to learn is one of the most important parts of teaching for Richard Buckland, a senior lecturer in the School of Computer Science and Engineering. His success has earned him a Vice-Chancellor's Award for Teaching Excellence.

Richard teaches computer science to first-year students, and cryptography and security to third-year students in the Faculty of Engineering. "Even though I work them very hard, I don't believe in just pushing a whole lot of facts into students' heads because if they are not willing to participate in the process of learning then they won't learn."

At their best, universities transform and expand the minds of their students ... our teaching plays a key role in this.

Having had a "terrible" education himself, Richard has a strong commitment to making learning enjoyable. "Discovering math was really fun for me," says Richard. "I was good at mathematics at school but it became tedious. So I vowed that I would show students the pleasure of learning instead of it being boring and a chore."

Richard studied economics at Macquarie University then worked as an actuary for a number of years before going back to university to start a PhD in mathematics and computer science. During this time he started giving voluntary talks at local schools, an experience that not only helped him learn how to become a more effective teacher, but also made him realise that teaching was what he wanted to do. After obtaining a certificate in higher education teaching, he started at UNSW in 1997 "just before the IT boom".

"I am a bit of a luddite," Richard confesses, when asked whether he makes use of the latest technology in his teaching. "I don't use new technology just for the sake of using it. I prefer face-to-face lectures and a much more interactive way of teaching." This approach involves students being able to contribute to the course materials during and after lectures. "The students can make changes to my lecture notes as we go," he says, "which gives them a sense of ownership of them."

Richard has won a string of teaching awards over the past couple of years. In 2004 he received the Engineering Faculty Teaching Award thanks to his students rallying together to support his nomination. Earlier this year he won a national Carrick Institute Award "for inspirational teaching in computer science that rekindles students' childhood love of learning and communicates the joy of creative and rigorous thinking".

"Supporting and encouraging teaching is extremely important," he says. "At their best, universities transform and expand the minds of their students. Our teaching plays a key role in this. I am delighted to be part of a university which actively supports and encourages excellence in teaching."

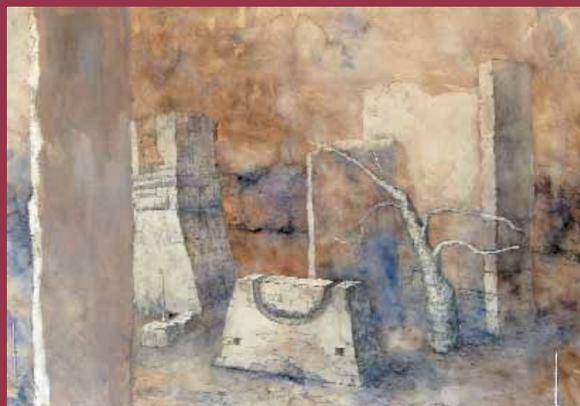
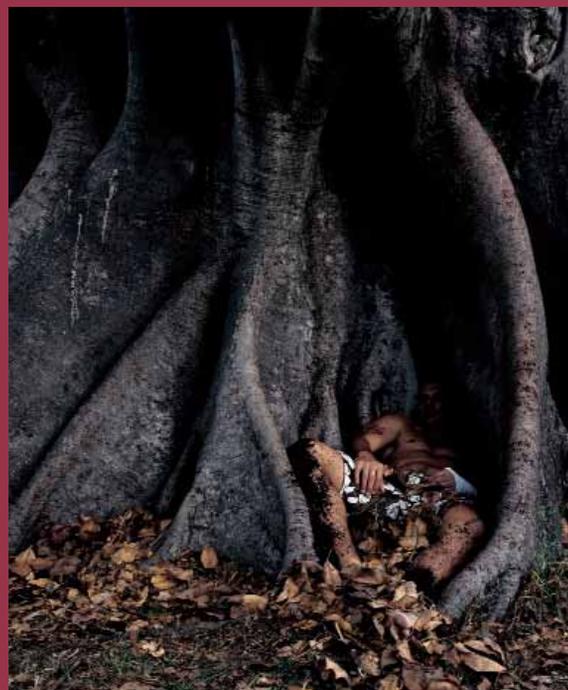
Susan Williamson

The winners of the 2006 Vice-Chancellor's Awards for Teaching Excellence will be announced in early December.

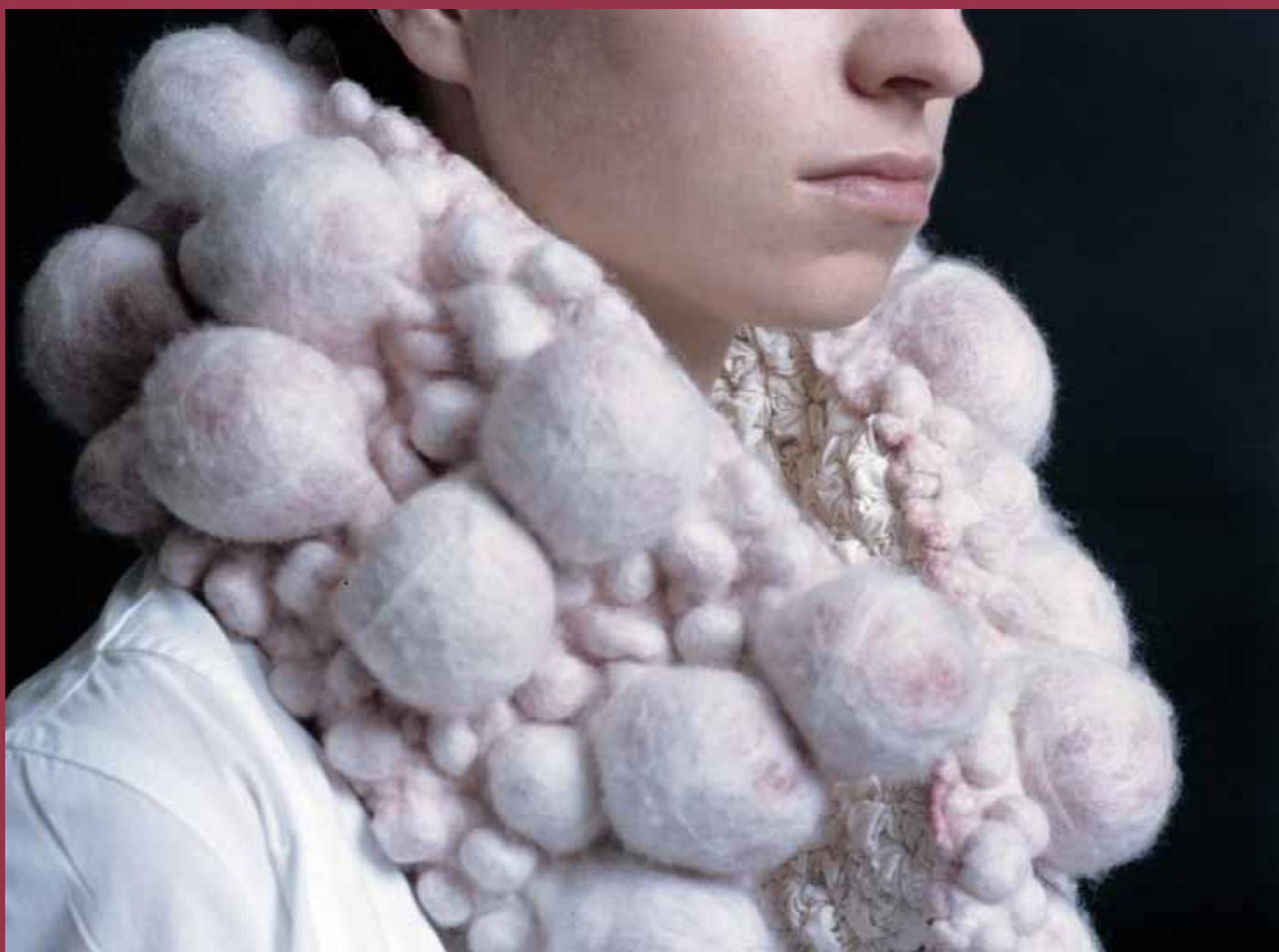
Tomorrow's art today

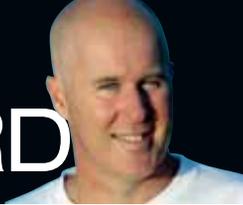
The creativity of more than 300 graduating students from the College of Fine Arts is being showcased at the COFA Annual 2006. Work featured in the exhibition includes painting, drawing, sculpture, printmaking, graphics, ceramics, jewellery, textiles, photography and new media. "It is a rite of passage for tomorrow's leading artists, designers, critics, administrators, and teachers," says Associate Professor Joanna Mendelsohn, coordinator of this year's exhibition.

COFA Annual runs from 29 November – 12 December. For the first time the exhibition can also be viewed online at <http://showcase.cofa.unsw.edu.au/annual06> ■



Clockwise from top left: Peter Nelson, *The farm tree flies, or dies with the box, from the long walk*; James Richards, *Les Arbres*; Shannon Cheung, *Cocoon* (photo: Julia Charles). Images courtesy of the artists.





Selling hot air

Compared to the impact of Al Gore's film and the Stern report into the economics of climate change, scientists have often been unsuccessful in getting their work out to the world, says **Matthew England**.

There's been a big shift in the politics of climate change in the past few months. Actually, it seems to have happened in the past few weeks. Only a few years ago, mentioning "Kyoto" could damn an election campaign. The word was synonymous with job cuts and a depressed economy. Today, climate change is emerging as one of the biggest issues on the political agenda.

Not surprisingly, the change in political rhetoric has largely been driven by opinion polls, although it is interesting to reflect on what has swayed public sentiment. There seems to have been a number of key factors affecting the national psyche. Foremost among these are a film, a report and the drought.

Climate change was brought to the big screen in Al Gore's landmark documentary *An Inconvenient Truth*. The film was a spectacular tour of some of the latest findings in climate science. Gore and his team did their homework and got it right. Some labelled the film "sensational", but it had to be, as some of the impacts of climate change are nothing less.

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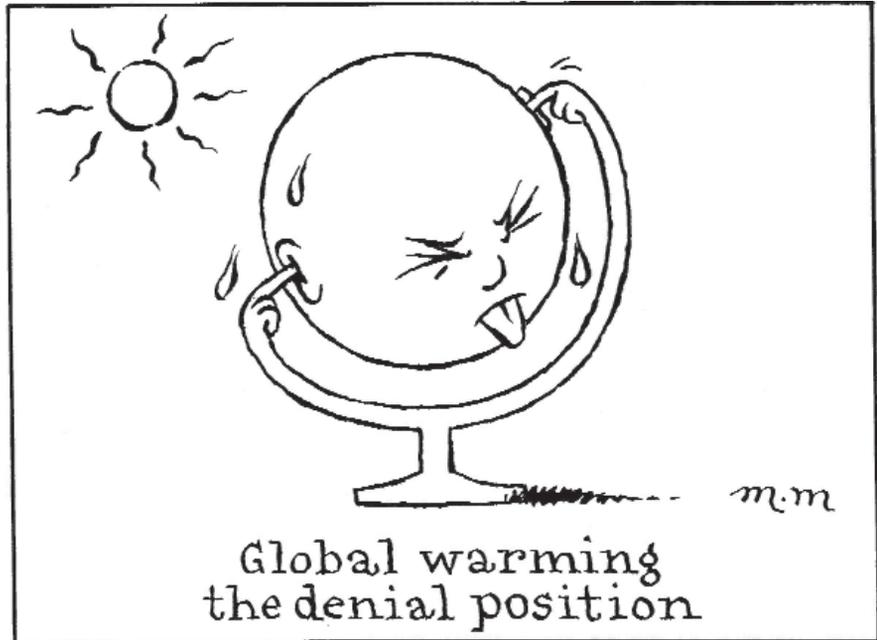
Then the British government released Sir Nicholas Stern's seminal report on the economics of climate change. The Stern report specifically estimates the costs of action, and inaction, in regard to reducing greenhouse gas emissions.

The bottom line of the report: the eventual economic burden of doing nothing will far outweigh the costs of addressing the problem now. How much more? Probably around five-fold, but perhaps as high as twenty-fold, depending on how the world's climate system responds to our as yet unchecked greenhouse gas experiment. There could be surprises in store – surprises are a feature of nonlinear systems.

Against these two highly publicised accounts of the possible consequences of climate change, Australians have witnessed the impacts of a prolonged drought. No news is complete these days without images of drying riverbeds, depleted dams and the early arrival of the bushfire season with forecasts of worse to come. Ironically, the prolonged drought may well be symptomatic of natural multi-decadal variability, although scientists agree that such dry spells are rendered more severe by today's warmer air temperatures.

Yet despite the headlines generated by Gore, Stern and the drought, the work of climate scientists can sometimes appear marginalised. Climate scientists often find their work challenged by all manner of people, from political leaders and fossil fuel proponents to the person on the street. Never mind that the findings have been worked through the rigorous and sometimes drawn out peer-review process.

If the results have significant implications such as rising sea levels, increased cyclone intensity, bleached coral reefs, and prolonged



Matthew Martin, *The Times* (UK)

droughts, the anti-climate science brigade will dismiss the work as "scaremongering"; part of a global conspiracy to exaggerate the impacts of climate change to secure more funding (presumably to do yet more scaremongering). Ironically, the emergence of consensus views on climate change should ultimately mean an increase in funding to address the problem, not study it.

For a long time now, the media have also given a skewed account of the science. While the scientific literature abounds in debate about the effects of climate change and climate variability, no paper can be found that questions the fundamental warming capabilities of greenhouse gases. Yet the mainstream press thrives on debate, and so bizarre theories from unqualified yet self-appointed experts often appear as the counter-argument to that of a scientist.

So who can you trust to tell you where the planet's climate system is headed? Anyone from the fossil fuel industry has a clear conflict of interest. So too those with majority shareholdings in a renewable energy company – although they at least can quote from the scientific literature for their story. Politicians are best qualified to debate policy matters, and hopefully this is based on solid science.

The only objective view on the science of climate change has to come from the practising scientists, and it has to appear first in the pages of specialised refereed journals. This claim at first seems laden with academic snobbery, but it isn't: the peer-review process is the cornerstone of any bona fide field of science.

Of course, the higher-impact findings must also appear in other forms of the media. Climate scientists have to engage more actively in getting their message across to policy makers, industry and the community. Against the impact of Gore's film and the Stern report, we have been spectacularly unsuccessful in telling our science to the world (though arguably this is symptomatic of the hijacking that has often occurred in this debate).

The field of climate science is apolitical: we don't advocate policy change or energy solutions; we simply look at the physics and dynamics of the Earth's climate system. The science can appear political because a climatologist might argue that CO₂ concentrations in excess of 500 parts per million are dangerous. But this statement, when derived purely from science, is objective. It's just that its implications are political. ■

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