

FACULTY FOCUS: Information Technology

Each edition in 2004 highlights the work of one of the 10 faculties



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Tiny beads aid fight to cure cancer

Materials engineering

Thousands of tiny beads implanted into the body could become the new weapon in the fight against liver cancer.

Ms Kathryn Spiers, a PhD student with Monash University's School of Physics and Materials Engineering, is manufacturing beads, called microspheres, which measure 0.02 mm in diameter, and, to the naked eye, resemble a speck of dust.

She is making two different types of microspheres – radioactive and magnetic – to treat malignant liver tumours. The novel aspect of Ms Spiers' research project is a focused magnetic field device used for heating the magnetic microspheres.

Because cancer cells are more susceptible to heat than healthy cells, increasing the temperature of the tumour is an effective way of targeting, and ultimately killing, malignant cells without damaging normal tissue.

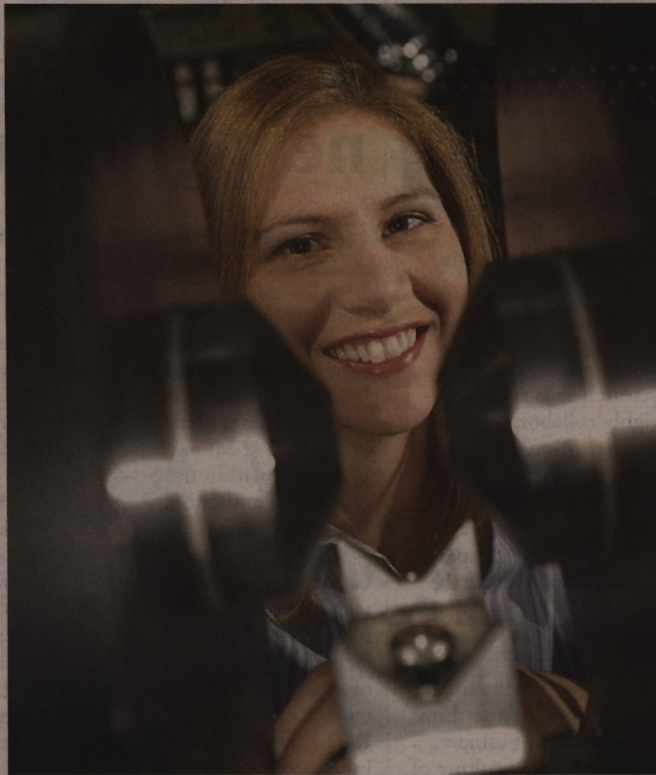
Ms Spiers said the treatment's magnetic field is localised to the area around the liver, so the patient's body is subjected only to a small, focused field, minimising the possibility of side effects.

In the past, this type of liver cancer treatment has been less specific to the area around the liver, and the patient had to receive a massive dose of

magnetic field through a large part of the body.

The new treatment involves injecting thousands of the beads via an incision into the hepatic artery – the main blood supply for the liver.

When the microspheres are injected, they are



New technology: Tiny microspheres developed by Ms Kathryn Spiers could be used to treat liver cancer with a localised magnetic field.

Photo: Melissa Di Ciero

picked up by the blood flow and eventually lodge in the malignant cells of the tumours. A magnetic field is then applied to the body to heat the magnetic microspheres, which works to damage the cancer cells.

"If successful in treating the malignant tumour, apart from the minor procedure of injection there would be no need for any further surgery," Ms Spiers said.

"Treatment itself would be finished within a week, but the microspheres would stay fixed for about one to two months before being reabsorbed into the body."

Ms Spiers said she was currently working to encase the active ingredients of the microspheres within hydroxyapatite, which is bio-compatible with human bone.

Once trials are completed over the next few years, with the help of researchers from the Peter MacCallum Cancer Centre and the Austin Hospital, Ms Spiers hopes the technology could be used in a practical clinical application to treat liver cancer.

– Ingrid Sanders

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Rich rewards for a fine romance

Fine arts

A last-minute decision to enter a painting in Australia's richest art prize, the Doug Moran National Portrait Prize, has paid off handsomely for Melbourne artist and Monash University masters student Prudence Flint.

Her entry, 'A Fine Romance #9', won the \$100,000 first prize. The winning portrait was selected from 30 finalists, narrowed down from 518 entries.

Ms Flint, who is enrolled in the Master of Fine Arts program within the Art and Design faculty at Monash's Caulfield campus, spent three months working on the painting. She says the prize money will enable her to buy, among other things, a new computer to indulge her other passion – writing.

The figurative painting is in essence a fictionalised self-portrait and part of a recent series of paintings by Ms Flint featuring women absorbed in various tasks.

"The painting is an amalgam of the two things I love – painting and writing," she said. "In a sense the portrait is about women artists and writers who have inspired me."

"The minimalistic books in the painting create a backdrop to the figure, who is completely absorbed in her laptop computer. In a patriarchal world, women find refuge in the subversive pleasure of writing and reading."

Ms Flint's academic supervisor, fine arts Associate Professor Euan Heng,



Prudence Flint, 'A Fine Romance #9' 2003, oil on linen, 102 cm x 86 cm. Courtesy of the artist.

describes her work as "not large in scale but modest, exuding a mood of quietness and contemplation – poetic, never crass or vulgar".

"Prudence is a representational figurative painter working in a conventional style but one that is not traditional or academic," he said. "Through her work, she explores 'woman' as a subject for her paintings, resulting in a content that she would

describe as 'personal interior narratives'."

The Doug Moran award is awarded biannually. The prize, sponsored by the Moran Health Care Group, was first presented in 1988 in celebration of Australia's Bicentenary. Ms Flint is the ninth winner.

– Karen Stichtenoth

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Award winner: Prudence Flint.

Photo: Simon Nicol

From the vice-chancellor's desk

One of the values formally adopted by Monash recently is excellence in research. Along with excellence in education, it forms one of the twin platforms that underpin the philosophy and justify the community's investment in leading universities everywhere. This month's column explores some of the implications of adopting this as a core value, and attempts to make a little more explicit the potential that Monash has to become a truly great international university by taking advantage of a unique set of opportunities.

Monash has been through a period of incredible growth and change. The development of the multi-campus structure has occupied a lot of time and energy. This structure is sometimes seen as an impediment to achieving international excellence in research. On the contrary, I feel that it presents some particular advantages. Research is a global enterprise, and the international links built through our campuses in Asia and Africa and our centres in Europe provide unique networking opportunities as well as the ability to become involved in research and scholarship in diverse areas of the world, responding in different ways to the challenges of globalisation in trade, demographic shifts, newly emergent diseases, security, international systems of commerce, justice and security. Moreover, understanding different cultures and religions and learning from the lessons of history are more important than ever. Our Australian campuses each provide distinct research opportunities.

The construction of the Australian Synchrotron at our Clayton campus, along with the wonderfully visionary STRIP project (Science Technology Research and Innovation Precinct), will lead to this precinct becoming a science and technology and industry hub driving the economy of Victoria and Australia.

Small and medium enterprises working in partnership with Monash researchers will grow to become the high technology manufacturing companies Australia needs to make the transition to the knowledge economy of the 21st century.

Many things will be needed to allow Monash to achieve its research potential. First and foremost are the right staff and students. We have a great start in this but need to do more. An environment that attracts



A monthly column by the vice-chancellor of Monash University, **Professor Richard Larkins**

and retains the brightest, most committed researchers is essential. We need a highly collaborative approach where traditional separation of projects along departmental and faculty lines is replaced by an approach where programs are designed to bring in the best expertise wherever it is, within or outside the university.

Funding will have to be set aside to attract, retain and develop key researchers and to provide the necessary infrastructure. Partnerships will need to be built with business and government and a new culture of increased business and government investment into research developed. The Victorian Government has shown a lead in this but more is needed.

Everyone at Monash needs to recognise the enormous potential that we have to be a major international player in research. Our location is not a disadvantage. Our size produces economies of scale, and our multi-campus structure provides particular advantages. Monash has tended to have modest and self-deprecating aspirations for the future, quite unjustified by its potential. There have been some stunning recent research and funding successes, but so much more can be achieved.

The university is ideally placed to be a really great international university driving the economy of Victoria and Australia and helping to solve some of the enormous environmental, health, humanitarian and other problems of the planet.

— Richard Larkins



Managing religious diversity: Professor Gary Bouma. **Photo: Peter Anikijenko**

UNESCO chair at Monash breaks new ground

Religion

In a first for the Southern Hemisphere, a UNESCO Chair in Intercultural and Inter-religious Relations – Asia Pacific is being established at Monash University within the School of Political and Social Inquiry.

School head Professor Gary Bouma, who will take up the chair in November, says it will facilitate the academic study of intercultural and inter-religious relations in the Asia Pacific region with a view to influencing social policy.

"The management of religious diversity in the Asia Pacific region has been one of the central issues in post-World War Two diplomacy, state building and conflict resolution," Professor Bouma said.

"While many thought the rise of secular societies would bring an end to religiously focused, defined or motivated conflict, the direct opposite has been the case. The creative and positive management of religious diversity is even more an issue today than it was in the 20th century.

"And while the Asia Pacific region provides many models of managing intercultural and inter-religious relations peacefully and productively, there remain instances where this is not the case."

Professor Bouma said the objectives of the UNESCO chair were to:

- conduct and collect scholarly research on the management of intercultural and religious diversity and the role of religion and religious figures in conflicts in the Asia Pacific region;
- publish research findings to promote scholarly understanding of intercultural and inter-religious relations and shape government policy on managing religious diversity and conflict associated with religion; and
- maintain an active and current database on the role of religion and religious figures in promoting conflict and peace in the region.

There are 12 other UNESCO chairs dealing with religion and culture, all based in the Northern Hemisphere.

— Michele Martin

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Patient assessment practice: MICA paramedic instructor Mr Jeff Allen (centre) with students Mr Glen Fairall and Mr Matt Riddle.

Funding boost for ambulance and paramedic studies

A simulation mannequin that provides paramedic students with an opportunity to practise patient assessment will soon feel quite at home in a new complex to be built at Monash's Centre for Ambulance and Paramedic Studies.

The centre, based at Peninsula campus, recently received a \$20,000 RACV Sir Edmund Herring Memorial Scholarship, which will go towards establishing the new Outdoor Road Trauma Simulation Complex at the campus.

Head of Academic Services at MUCAPS Mr Mark Chilton said the complex, expected to open next October, would include several wrecked cars that have been in different types of accidents, as well as several mannequins.

Briefly

National Stem Cell Centre rewards researchers

Monash University researchers have received half the scholarships and grants awarded by the National Stem Cell Centre this year.

Ms Kathryn Davison, from the Monash Institute of Reproduction and Development, and Ms Hadassa Lewis, from the Monash Immunology and Stem Cell Laboratory, were both awarded scholarships for their stem cell-related research projects. Mr Lincoln Stamp and Mr Kyle Upton from the Institute of Reproduction and Development and Ms Fiona Yin Ling Chan from the Department of Pathology and Immunology each received postgraduate research grant stipends.

A total of four scholarships are presented to postgraduate science students, with six research grants awarded to promote promising early-stage projects.

'Green chemistry' unique

The man who coined the term 'green chemistry', Dr Paul Anastas, visited the Clayton campus recently to attend his first committee meeting for the Monash Centre of Green Chemistry. Dr Anastas, an internationally renowned expert on sustainability in chemical manufacturing, joined the centre's advisory committee last year.

Currently director of the Green Chemistry Institute in Washington, Dr Anastas praised the innovative research being undertaken at Monash.

"The work being done here is unique. There are other countries and institutions around the world currently engaged in green chemistry, but Monash is accomplishing all the goals of industry simultaneously," he said. "It is certainly one of the world leaders in this area."

Before taking up his position in Washington, Dr Anastas spent almost five years with the White House Office of Science and Technology Policy.

US award for researcher

Dr Renea Taylor from the Monash Institute of Reproduction and Development has been honoured with a Postdoctoral Traineeship Award from the US Department of Defence for her cutting-edge research into prostate cancer.

She will use the funding of almost \$98,000 to investigate the role of cells surrounding prostate tumors to identify how these cells create a micro-environment that promotes tumour growth.

Dr Taylor has developed highly specialised techniques that allow her to study cell-to-cell interactions, revealing how neighbouring cells 'talk' to each other, especially in diseases such as prostate cancer. She said prostate cancer was the second largest cause of male cancer deaths after lung cancer.

Technology upgrade

The Commonwealth Government recently announced a funding boost of \$3 million to establish high-speed internet connections in Gippsland.

Monash University will manage the project on behalf of other university and TAFE campuses in Gippsland. The project will see new optic communications cables laid from Traralgon to Lakes Entrance.

Professor Sam Adegoju, from Gippsland's School of Applied Sciences and Engineering, said the planned technology upgrade would enable students, lecturers and researchers to gain access to information from across the country for the cost of a local call instead of paying the current long-distance fees.

"It will move our research forward both at a national and international level," he said.

New child care centre

The Monash Peninsula Children's Centre, officially opened recently at Peninsula campus by Monash chancellor Mr Jerry Ellis, provides state-of-the-art facilities for 60 babies and toddlers.

The result of collaboration between Monash University, the committee of the Monash Peninsula Children's Centre and the Faculty of Education, the centre will have an ongoing involvement with the Education faculty through its early childhood and primary education courses.

The centre, which caters to staff and students as well as the local community, also provides specially designed furniture for the children and observation booths for students and researchers.

Monash deputy vice-chancellor (resources) Ms Alison Crook said the centre represented a new benchmark in the provision of child care services.

"We take seriously the need to provide quality child care facilities for our staff and students, and we eagerly anticipate the opportunities for our early childhood and primary education students to learn through their involvement with the centre," she said.

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Biodegradable scaffolds for treatment of spinal injuries

Materials engineering

Treating damage caused by spinal injuries is not easy. But Monash postgraduate student Ms Rosalyn Jackson is tackling the problem head on, developing a new material to help regenerate spinal cord tissue.

Ms Jackson, working under the supervision of Dr John Forsyth in the School of Physics and Materials Engineering, has been developing the hydrogel, a biomedical material that can be used in clinical medicine, over the past 18 months. The jelly-type substance can be injected directly into a lesioned area of the spinal cord.

"This therapy has the benefit of encouraging tissue regeneration without the use of invasive surgery, as is common in other treatments for spinal injuries," Ms Jackson said.

Composed of a novel and highly versatile material which can be readily modified to

optimise mechanical properties, degradation rates and bio-compatibility, the hydrogel works to fill the damaged area of the spinal cord. Its bio-compatible makeup ensures there is no toxic response or reaction from living tissue, encouraging regeneration of the spinal cord.

"We are trying to fool the body into thinking the hydrogel is regular tissue, so the nerve cells will infiltrate and grow," Ms Jackson said.

"As the tissue regenerates, we want the hydrogel to slowly break down, and by careful selection of substituents, or chemical compounds in the hydrogel, we can control the speed of this effectively.

"As the implant breaks down, it releases non-harmful products that are already found in the body.

Ms Jackson describes her project – which has direct applications for one of the most elusive fields of medical research – as ambitious, but hopes her work may pave the way for future study. "I know there are thousands of scientists

and researchers working on cures for spinal cord damage, but the use of a biodegradable hydrogel for this application is a relatively unexplored area," she said.

Ms Jackson's research has been in material characterisation and development of the hydrogel. She has been collaborating with researchers from Neuroscience Victoria at the Austin Hospital who are focusing on the cellular side of the hydrogel development.

"We are just about to begin the cellular studies, which will tell us how the hydrogel will behave with cells. If this is successful, it will enable us to begin trial tests with rat models," she said.

"Of course we are working on one of the most complex areas of the body, and there are years of more research before this could even be considered for human trials."

– Ingrid Sanders

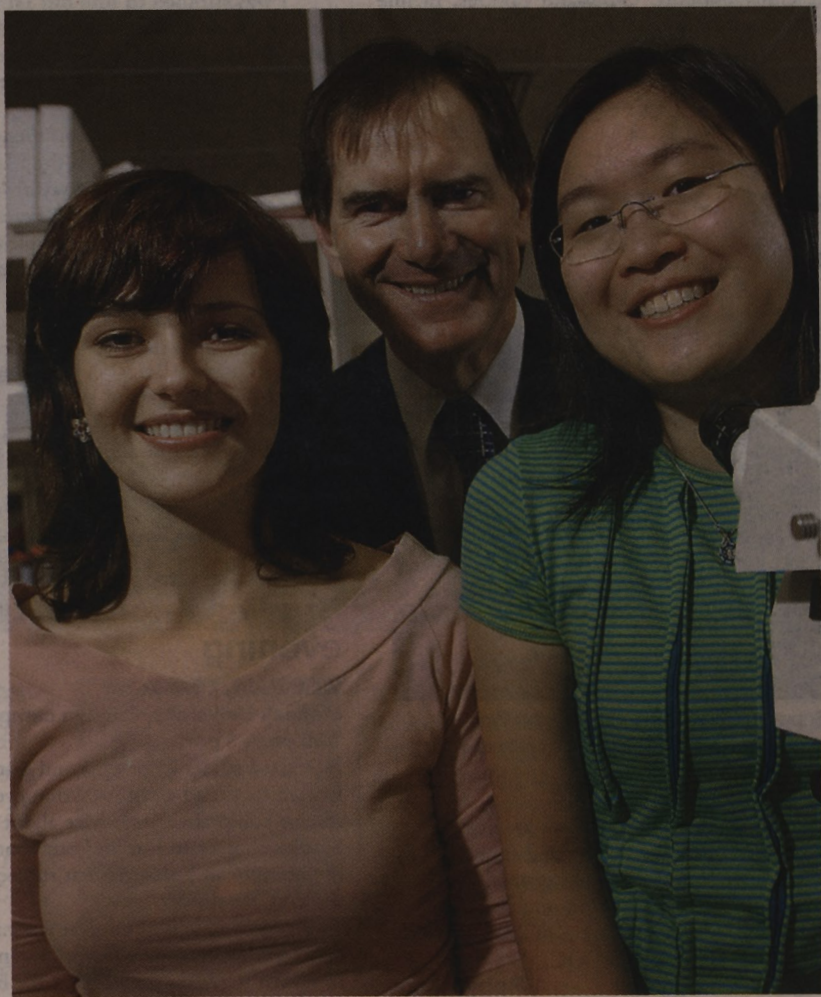
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Ambitious project: Ms Rosalyn Jackson is developing a new material to help treat spinal cord injuries.

Photo: Greg Ford



Leading the way: Kidney research team members, from left, Ms Amanda Ruth, Professor Stephen Holdsworth and Ms Rain Kwan. Photo: Melissa Di Ciero

Breakthrough close on kidney disease cure

Medicine

An effective cure for the common kidney disease glomerulonephritis is one step closer, thanks to the efforts of researchers from Monash's Department of Medicine.

The team has developed a greater understanding of causes of the disease and believes the complete answer lies in working out how immune cells damage the kidney.

Team member Dr Richard Kitching, a research assistant based at Monash Medical Centre's Inflammatory Diseases Centre, said researchers had discovered a major contributor to the development and onset of the disease in the action of T-helper immune cells, which shut down the immune response after wiping out invading organisms.

Until now, development of glomerulonephritis has been poorly understood, and the research, recently recognised with a Best Scientific Presentation Award from the Australian and New

Zealand Society of Nephrology, is a first step towards developing an effective treatment.

Dr Kitching said the disease was currently treated with non-specific, anti-inflammatory steroids – a moderately effective method with many negative side effects.

"Fully understanding glomerulonephritis is an important step in developing more effective and safer treatments for this common cause of kidney failure," Dr Kitching said.

"If we could tailor a drug that was less toxic and more specifically focused on that organ, it would assist us to develop a far more effective treatment."

Led by Professor Stephen Holdsworth, the research team also includes PhD student Ms Amanda Ruth, Bachelor of Biomedical Sciences honours student Ms Rain Kwan and research fellow Dr Michael Hickey.

– Ingrid Sanders

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Women say no to children as society fails to value mothers

Social studies

Lack of recognition of the contribution mothers make to society is an influential factor for some women who decide not to have children, a Monash research study has found.

Dr Maryanne Dever and a research team from Monash's School of Political and Social Inquiry found that most women interviewed for the study felt that the general community had an ambivalent view of motherhood. The other team members were Dr JaneMaree Maher, Dr Jennifer Curtin and Dr Andrew Singleton.

"While most women said motherhood was an important job, even if they were not planning to become mothers, they recognised mothers were not accorded high status and their contribution wasn't always valued," team leader Dr Dever said.

"For women with children, this often meant they valued their work as a crucial aspect of their identity. For women choosing not to have children, this lack of support was often mentioned in how they had decided motherhood was not for them."

The 'Families, fertility and the future:

hearing the voice of Australians' study was based on interviews with more than 100 men and women in metropolitan, regional and rural Victoria living in partnerships and alone, with children or without.

Other key findings of the study included:

- women choosing not to have children did not reflect the common image of career-driven high achievers or women who could not find partners
- women with more than three children featured strongly among those with significant and ongoing attachments to the workforce
- workplace policies and entitlements did not generally influence first birth timing or decisions about having children, but were particularly important to women choosing to have more than one child.

The study was prompted by increasing public concern over Australia's falling national birthrate, currently about 1.75 children per woman, compared to the ideal 'replacement' level of 2.1 children.

– Michele Martin

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Fertility study research team:

From left, Dr JaneMaree Maher, Dr Andrew Singleton, Dr Maryanne Dever and Dr Jennifer Curtin. Photo: Simon Nicol

Pharmacy students treat virtual patients

Pharmacy

Students in Dr Jennifer Marriott's Clinical Pharmacy unit within Monash University's Victorian College of Pharmacy are using an innovative computer program that allows them to work with and treat their own virtual patients.

The case-based assessment method, developed by Dr Marriott, is being used by about 200 third-year and 175 fourth-year Bachelor of Pharmacy students.

The program has been devised to present situations in a realistic way to enable students to be assessed on their ability to deal with real-life problem-solving situations.

"The students are treating virtual patients and need to deal with the scenario as if they were practising pharmacists," Dr Marriott said.

Each student chooses their patient from a database of 200 virtual patients.

They receive details including the patient's age, gender, smoking and allergy history, up to four pre-existing medical diagnoses and up to six medications, plus test results where appropriate, from a database with more than 150 medical diagnoses and 300 drugs – each with individualised dosage regimens.

Using the program, Dr Marriott is able to randomly assign clinical scenarios to the

patients, and the students must then 'dispense' medication, keeping in mind their patient's pre-existing conditions.

"Once the student has chosen their patient, that patient is not available to any other student and forms the basis of a unique assignment the student will complete over the final two years of the course," Dr Marriott said.

In third year, the students' patients are assigned a respiratory scenario such as hay fever or a cold and in fourth year are given a dermatological scenario, ranging from nappy rash to pressure sores.

"To complete the assignment, the student has to diagnose and determine appropriate management of the symptoms presented in the scenario," Dr Marriott said.

Since its introduction to the faculty in July, Dr Marriott said the program had been extremely well received by the students.

"The students have found the program easy to access – in fact 149 of the students had logged on and chosen their patient on the first day the program was available," she said.

"This program would be suitable for use by other disciplines as well. Once you have a bank of standard patients, it would then be simple to develop scenarios suitable for students in medicine, nursing or physiotherapy, for instance. It is a flexible, easy-to-manage



Innovation: Dr Jennifer Marriott has developed a computer program that allows pharmacy students to work with virtual patients.

Photo: Melissa Di Ciero

program that would certainly be attractive to other pharmacy schools."

The program was written by Mr Michael Calagaz and Mr Eric Goh from the Media Development Unit, Centre for Learning and Teaching Support, Gippsland campus, in line with specifications set out by Dr Marriott.

– Ingrid Sanders

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Chief Justice delivers Lucinda lecture

Law

The Chief Justice of the Victorian Supreme Court, Her Honour Marilyn Warren, recently delivered the 12th annual Lucinda Lecture at Monash University.

In this year's lecture, titled 'What Separation of Powers?', the Chief Justice stressed the importance of maintaining the separation of the three arms of government – the legislature, which makes the laws; the executive, which enacts the laws; and the judiciary, which interprets them.

"In any British-based constitutional system, there will be a touchstone – the doctrine of separation of (these) powers," she said. "The executive of the day of any modern government

under such a system must acknowledge the role of the courts in their system, both in principle and in practice.

"Similarly, history informs us that as long as the system exists, the judiciary will not go away and, when necessary, will not be silent."

Chief Justice Warren, who is also a Monash Law alumna, delivered the lecture at the university's Clayton campus.

The Lucinda lecture series is named after a steam paddle vessel of the same name. The drafting



Before the lecture: Chief Justice of the Victorian Supreme Court Her Honour Marilyn Warren, former governor general Sir Zelman Cowen and Monash Law dean Professor Arie Freiberg in the Monash Law Library.

committee of the National Australasian Convention made important revisions to the earliest drafts of the Constitution while cruising the Hawkesbury River in New South Wales aboard the Lucinda in March 1891.

The lectures, which canvass fundamental issues of Australian

constitutional law, are hosted by the Law faculty and sponsored by former governor general The Right Honourable Sir Zelman Cowen, PC AK GCMG GCVO KStJ QC.

– Robyn Anns

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European prize for London staff member

Monash's Mr Stephen Lay, soon to be awarded his PhD in medieval history, has won a prestigious international prize for his essay on today's interpretation of the Magna Charta Universitatum.

An initiative of the University of Bologna, Italy, the Magna Charta is a series of principles to guide university administration, originally agreed to in 1988 by more than 400 universities and now endorsed by more than 500 around the world.

Mr Lay received the Carmine Alfredo Romanzi Award and a cheque for 10,000 euros (about A\$20,000) during a ceremony at the University of Bologna on 18 September.

The main argument in his 30,000-word essay is that a university is an evolving institution and this must be reflected in the Magna Charta's principles.

Open to doctoral students and postdoctoral researchers in any discipline from universities all over the world, the essay competition is organised by the Observatory of the Magna Charta, which monitors implementation of the principles.

"I was stunned to find out I'd won," Mr Lay said. "The advertised date of notification had passed, and about three weeks later I received an email asking when I could come to Bologna to collect the prize."

Mr Lay, who has just commenced as an administrative officer with the Monash University London Centre, said his essay arose from his interest in university policy, particularly its international focus and development.

"For this reason I very much look forward to my work at the London centre, which is at the forefront of Monash's strategic vision for international research collaboration."

– Michele Martin

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Schools

2005 Enhancement Studies information evening

Wednesday 13 October
Monash University, Clayton campus
7.30 pm – 9 pm

Interested students, parents and teachers are invited to attend an information evening to receive comprehensive advice about Enhancement Studies choices and to find out about the benefits of choosing an Enhancement subject in lieu of a sixth VCE subject.

To register, book online at www.monash.edu.au/ps/e/events/enhancementinfoevening.htm or return the form included in the back of the *Monash University Enhancement Studies Program 2005*.

For further information, contact Ms Rachel Tod on +61 3 9905 3167 or Ms Rebecca Hillman on +61 3 9905 4241.

Scholarship applications

Students who are considering applying to Monash in 2005 should also consider applying for a scholarship. An extensive range of scholarships based on both academic merit and equity reasons are available. Applications close at 5 pm on Friday, 29 October 2004.

For more information, visit the scholarships website at www.adm.monash.edu.au/scholarships/.

Postgraduate expo

Tuesday 5 October
Melbourne Town Hall
12 noon – 7.30 pm

If you are a graduate or professional without a degree, inspire yourself at the Monash Postgraduate Expo.

Course advisers from Art and Design, Arts, Business and Economics, Education, Engineering, Information Technology, Law, Medicine, Nursing and Health Sciences, and Science will be available to help you select a course that suits your needs.

Register online or on the day. For more information or to register, visit www.monash.edu.au/postgraduate.

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Web security – a matter of convenience?



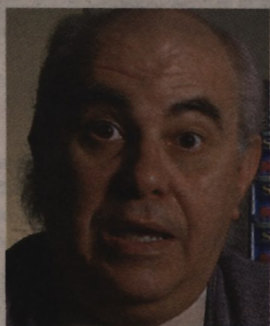
Photo: Louie Douvis, AFR

Information technology security is a hot topic at IT security conferences, in IT

professional societies

and in institutions of higher and further education. Senior lecturer and associate dean (graduate studies) in the IT faculty at Monash

CHRIS AVRAM argues that to maximise IT security we need adequately trained professionals who have a full understanding of general security issues as well as a thorough knowledge of the IT industry.



It is well understood that security reduces convenience; that convenience reduces security; and that we can buy slightly more security or convenience with a slightly higher expenditure. This is often represented as a joke – profit, security or convenience, choose any two.

Often overlooked, however, is a second hidden variable that has significant influence over the level of security achievable in a particular environment. This is the skill or, more generally, the professionalism of the people responsible for providing security.

In order to provide a safe IT infrastructure, designers, integrators and operators must understand the features of the systems being used and those available more broadly. They need to know how to operate and configure IT systems and the levels of security required – including the levels of confidentiality, integrity and the user availability required. They also need to know how to keep such systems secure. This knowledge is currently achieved and maintained through manufacturer certification.

As professionals, security practitioners also need to keep their knowledge current and need to engage in self-review. And importantly, society expects them to adhere to high ethical standards, often with more contentious ethical dilemmas than those faced by other IT professionals.

So how do we train professionals in IT security? Manufacturer certification alone is

not enough, and while a generalist degree added to certification is better, IT security professionals need a more broadbased education.

At a basic level, IT degrees should address the problem-solving, planning, organising and communication skills needed. They should also address self-review issues and develop an ongoing love of learning.

But there are some principles of security that are not covered in manufacturer certification or in general IT courses. These are core principles of security – the sorts of

“Security infrastructure should be more secure and more closely monitored than the infrastructure it protects.”

things that do not go out of date.

Let me mention one that is thousands of years old. Defence in depth is a concept you find in ancient military thinking, whereby a good security system will protect itself from attack from within – for instance, the walls surrounding Troy were not enough to protect the city.

However, while this is an age-old lesson, it is still not well understood in IT security. Indeed, during a recent online forum, discussions revolved around the need for personal computers to have personal firewalls installed. However some participants

thought they were not needed and just too inconvenient.

But no matter how good an organisation's external firewall, email and web proxy virus checker, these devices will not protect work computers from a virus-infected computer somewhere inside the firewall. It is no longer enough to ask how the virus got inside the firewall, only what do we do if one does.

There is more to the defence in depth principle though. It also requires defence against the security system being turned on those it was protecting. A good

example of this was a recent attack in which a fault in personal firewall software was used as an access point for distributing a computer virus.

This highlights the need for experienced security professionals

to have an understanding of the importance of keeping security infrastructure secure and closely monitored.

In fact, security infrastructure should be more secure and more closely monitored than the infrastructure it protects.

There are other general principles of security often missed in vendor certification. One is the principle of minimum capability.

When we deploy software or grant permissions to people and systems, we should grant only the minimum capability necessary to do the agreed task. However, this principle has been lost in the ever-

increasing capability granted to software downloaded as we visit ever more ‘functionally rich’ websites.

Programmers are often taught how to use these capabilities, rather than being taught and required to exercise the principle of minimum capability.

The issue of appropriate content, the balance between fundamental knowledge and current skills, of vendor verification versus degree programs and the balancing of short and long-term skill needs are being played out for IT in general. In relation to IT security skills, these principles and the balance chosen can have life-threatening and national significance.

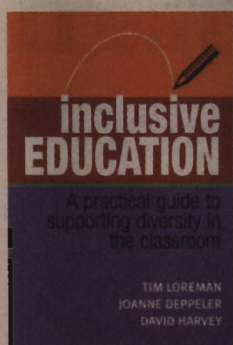
We cannot leave IT security in the hands of people who only know how to configure – even if it is configured well – the latest piece of security equipment or software. The security systems themselves may be faulty and vulnerable.

We should only leave security in the hands of people who understand the principles of security learned through a thorough study of failures in security over the millennia. These people, if professionals, will ensure they have ongoing current skills and systems knowledge.

The specification of a curriculum in IT security is a current and ongoing task – please join in.

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INPRINT



Inclusive Education

A Practical Guide to Supporting Diversity in the Classroom

By Tim Loreman, Joanne Deppeler and David Harvey

Published by Allen & Unwin
RRP: \$45

Inclusive Education is a practical guide to working with primary and secondary students who need extra attention because of disabilities or giftedness. It is aimed at classroom teachers and pre-service students rather than those who have specialist training in working with students with special needs.

The authors outline the principles behind educational diversity and inclusive policies and discuss the range of different needs teachers can expect to encounter in an inclusive classroom.

They explain the practical issues and offer strategies for managing the classroom and promoting positive social relationships. The emphasis is on ensuring students with special needs receive worthwhile educational experiences, without compromising the needs of other students in the classroom.

Joanne Deppeler is senior lecturer in special education, and David Harvey is director of the Krongold Centre, both within the Faculty of Education at Monash University. Tim Loreman formerly taught at Monash University and is now assistant professor in the Faculty of Education at Concordia University College of Alberta, Canada.

A Black Sheep

Some Episodes in His Life – Ada Cambridge

Edited by Elizabeth Morrison

Published by the Australia Defence Force Academy, Canberra

RRP: \$35.96

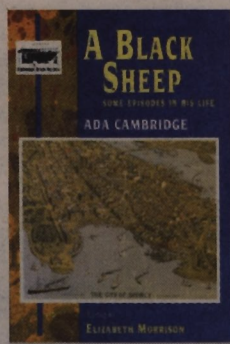
This book is the original serial version of Ada Cambridge's best-known novel, *A Marked Man*. Following the fortunes of Richard Delavel as a rebellious Oxford undergraduate in 1850s England and still a restless middle-aged family man in 1880s Sydney, the story presents his life and loves, work and leisure and beliefs and hopes against a background of constraints and opportunities in Britain and Australia.

A powerful creation of an iconoclastic character in search of personal fulfillment, *A Black Sheep* is also a complex reflection on marriage ties and social obligations and a lively evocation of late-colonial Sydney.

Serialized in the Melbourne *Age* in 1888, the book's title was changed and parts of the text rewritten for the Heinemann edition of 1890, on which all subsequent editions have until now been based.

Providing the text as Australian readers first encountered it, this Colonial Texts Series edition also has an introduction tracing the publishing history, a textual apparatus displaying variants in the later version and explanatory notes to help readers appreciate significant allusions and quotations that might not be as familiar today as they were in 1888.

Elizabeth Morrison is an honorary research associate with Monash's National Centre for Australian Studies.



Thinking Black

William Cooper and the Australian Aborigines' League

By Bain Attwood and Andrew Markus

Published by the Australian Institute of Aboriginal and Torres Strait Islander Studies
RRP: \$34.95

Thinking Black tells the story of William Cooper and the Australian Aborigines' League and their campaign for Aboriginal people's rights. Through petitions to government, letters to other campaigners and organisations and entreaties to friends and well-wishers, Cooper and the league fought a passionate struggle against dispossession, displacement and the denial of rights, particularly the right to citizenship in their own country.

Bain Attwood and Andrew Markus document the circumstances behind the most significant moments in Cooper's political career and explore the principles Cooper drew on in his campaigning, including 'Letter from an Educated Black', one of the most intriguing political testaments written by an Australian leader.

Thinking Black sheds new light on the history of what it has meant to be Aboriginal in modern Australia. It reveals the rich and varied cultural traditions, both Aboriginal and British, religious and secular, that have informed Aboriginal people's battle for justice and their vision of equality in Australia of two peoples: equal yet distinct.

Bain Attwood is associate professor of history in Monash University's School of Historical Studies and adjunct professor in the Centre for Cross-Cultural Research at the Australian National University. Andrew Markus is professor of Jewish civilisation and director of the Australian Centre for the Study of Jewish Civilisation at Monash. They have both published numerous books on Aboriginal history and Australian race relations.

If you are a member of the Monash community and have a forthcoming book, contact media@adm.monash.edu.au.

- Books featured in 'Inprint' are available or can be ordered at Monash's four on-campus bookshops.
- Caulfield +61 3 9571 3277 • Clayton +61 3 9905 3111
- Gippsland +61 3 5122 1771 • Peninsula +61 3 9783 6932
- www.monash.edu.au

Documentary artist takes residence

Documentary film maker/artist Jordan Baseman is the latest participant in the 2004 Artist/Designer in Residence Program conducted by Monash's Art and Design faculty. Mr Baseman began his appointment last month and will be in residence at the Caulfield campus until 11 November.

Originally from Pennsylvania in the US, he has lived in the UK since 1986, completing a masters in fine art in 1988 at Goldsmiths College, University of London. He is a senior lecturer in sculpture and head of the masters program in fine art at Wimbledon School of Art.

In recent years, Mr Baseman has focused on making short films, after breaking away from object-based artwork in 1998.

His contemporary portraits of people are constructed from hours of footage he has taken of his subject. "I am interested in what motivates people. My films are not about truth, but my perception of truth," he said.

While in Melbourne, Mr Baseman is spending time developing his latest film projects including a 'documentary' based on Michael Jackson impersonators sourced from a dance-off at a Melbourne nightclub.

He is also participating in higher degree and honours seminars, conducting one-on-one tutorials with students and contributing to the faculty's Arts Forum program.



Outstanding visiting academic: Mr Jordan Baseman. Photo: Greg Ford

Drawing and Bachelor of Visual Art studio coordinator Mr Kit Wise said Mr Baseman's involvement in the residential program was highly valued.

"Jordan's extensive experience as both a lecturer and practitioner across a range of art disciplines makes him an outstanding visiting academic," Mr Wise said. "In offering an 'outside voice', Jordan will provide a fresh and unencumbered approach to studio critique from the perspective of a truly international practitioner and teacher of the highest order."

– Karen Stichtenoth

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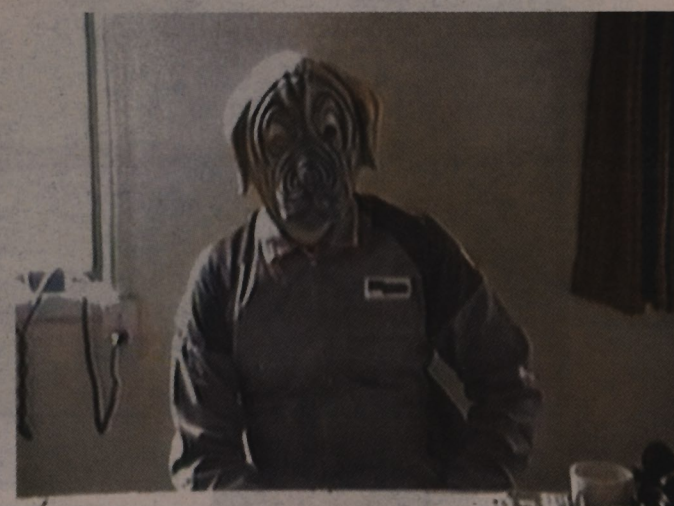
Animal instinct

Animals are the latest subject to feature in an exhibition at the Faculty Gallery at Monash University's Caulfield campus.

Instinct, presented by the Monash University Museum of Art, explores the work of contemporary artists involved with the representation of animals and who adopt or identify with the animal as a metaphor or allegory for exploring ideas of identity and humanity, creativity and the role of the artist.

Exhibition curator Ms Liza Vasiliou said *Instinct* engages with the mysterious and curious characteristics of the animal form to explore the equally uncanny and ambiguous character of the human psyche and behaviour.

"Animals possess a confounding curiosity and an instinct that remain mysterious to humans," she said. "Throughout art history, animals have been used by artists to symbolically represent human character traits, vices and virtues. Animals also figure in



Ronnie van Hout, *Sculp D. Dog*, 1999. Courtesy of the artist and Darren Knight Gallery, Sydney.

fantasy, myth and the supernatural, acting as mediators or harbingers of the future and the unseen."

The exhibition features the work of Emily Floyd, Sharon Goodwin, Irene Hanenbergh, Louise Hearman, Rebecca Ann Hobbs, Ronnie van Hout, David Noonan, Lisa Roet and Kathy Temin.

– Karen Stichtenoth

Photographic space of the maternal

The Line Between Us exhibition at Monash University's Museum of Art at Clayton campus features contemporary works by five noted women photographers from Australia and New Zealand – Donna Bailey, Pat Brassington, Anne Ferran, Anne Noble and Polixeni Papapetrou.

Curated by Kyla McFarlane, the exhibition features some 40 works exploring the maternal relationship between photographer and subject, and in doing so revealing relationships of both intimacy and distance.

"The photographs engage with the strong emotional connections and painful separations that



Anne Noble, 'Ruby's Room', #23, 2000-2002. Courtesy of the artist and Bartley Nees Gallery, Wellington.

are part of this complex relationship," Ms McFarlane said. "While several depict the playful performances of the child, others are infused with darker narratives of absence and loss."

Ms McFarlane said that while some of the artists connect directly with photography's complex history and the role of women within that history, others connect with feminist issues.

Many of the works also engage with emotive discussion surrounding photography such as censorship and debates over the way children may be represented.

"Despite their different approaches to these issues, all five artists reveal the photographic space of the maternal as a shifting, contested realm," she said.

– Karen Stichtenoth

Show notes

What: *The Line Between Us*

When: Until 23 October
Where: Monash University Museum of Art, building 55, Clayton campus
Who: For information, contact max.delany@adm.monash.edu.au
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Taking a trip down memory lane



CP Burton collection

Highlight: The Ferranti Sirius computer.

Preserving IT history: Ms Sarah Wolf (left) and Ms Judith Sheard.

Photo: Melissa Di Ciero

A compact museum in the heart of the Information Technology faculty building at Monash University's Caulfield campus provides visitors with a fascinating glimpse into the heady, rapidly evolving world of information technology.

The Monash Museum of Computing History is the brainchild of Ms Judith Sheard, museum curator and a senior lecturer at the School of Computer Science and Software Engineering at Monash.

The idea for a museum came after she attended a symposium at the school in 2001 and sat through a series of presentations by computer historian and collector Mr Max Burnet covering the history of computing and communications.

"The images of computing equipment from past decades and the accompanying stories fascinated me and highlighted both the phenomenal changes in this field and the impact on our society," Ms Sheard said.

"Conversations with younger colleagues who had not had the experience of working with superceded technologies such as punched cards and paper tape made me realise we were in danger of losing knowledge about this important part of our history unless an effort was made to preserve it."

The museum opened in October 2001 with a display of computers, computer peripherals and related equipment from the early 20th century to the present. It has been a magnet for computer buffs, school children and IT students alike.

Among the exhibits is a PDP-9 computer produced by the Digital Equipment Corporation (DEC) in the mid to late 1960s. Priced then at A\$35,000, it was one of the first small computers to have an operating system – initially based on DECtape and later on disk. Around 430 PDP-9s were sold worldwide.

The PDP-9 on display featured in the 2000 Australian movie *The Dish* as the main computer in the control room of the Parkes radio telescope that monitored NASA's Apollo 11 mission to the moon and astronaut Neil Armstrong's first steps on the lunar surface on 21 July 1969.

Other exhibits include an IBM card punch commonly used in computer centres during the 1960s and 1970s, an IBM personal computer (PC) circa 1981, and an ASR-33 Teletype produced by US firm Teletype Corporation in the early 1960s.

The IBM PC was at the forefront of the microcomputer revolution and was eagerly sought after by enthusiasts and early adopters.

The Teletype, developed for use as a terminal

for the US telex service, harks back to the early years of the mini-computer revolution when paper tape was the only storage medium.

"The museum provides an opportunity for people to see computing items that are no longer in general use and demonstrates the rapid changes that have happened with computing technology," Ms Sheard said.

"The displays of equipment effectively demonstrate how computers have become smaller and more powerful. The museum also puts computer technology into a broader context with displays of other computing devices such as slide rules, abacuses and calculators."

It is currently being revamped under the supervision of Ms Sheard and will be relocated to a larger space within the building in March 2005.

A highlight of the new space will be an installation featuring the Ferranti Sirius – the first computer purchased by the university – displayed in a typically 1950s/1960s-style office.

Other installations will feature a range of personal computers and mechanical calculators to show how they have altered over the years, as well as visual comparisons of disk storage and how this technology has changed.

Current exhibits will be revamped to more closely reflect the chronology of computing and to show how computers were used in past decades and the impact they have had on education, work, home and society in general.

The faculty's historian-in-residence Ms Sarah Wolf said an important part of

the project would be the development of an education program for primary and secondary school students and a professional development program for IT teachers.

"The new museum is about accessibility and outreach and introducing people to the university environment," she said. "The primary aim is to establish it as an experience-based centre of learning about the history and development of information technology in Australia."

Ms Wolf is writing a book on the history of Monash's IT faculty, the impetus for which was provided by the launch of the original museum. The book is due to be published early next year.

Just three decades ago, there was only one computer science subject offered at Monash. From these modest beginnings, computer science grew into a fully-fledged academic discipline under the guidance of the late Professor Chris Wallace, foundation chair of computer science at Monash.

"The book is essentially about the history of two institutions – Monash University and Chisholm Institute of Technology – and how what we now call information technology emerged as a new discipline in the higher education environment," Ms Wolf said.

At Chisholm (which merged with Monash in 1990 and became the university's Caulfield campus), teaching in computing began in the early 1960s with a single short course in electronic data processing. By the mid-1980s, there were several departments dedicated to the area.

"No-one really knows how hard the pioneers fought to have computer science education accepted in Australia. The contribution by Monash is a story of grit and determination in the face of rapidly evolving technology and the struggle for higher education funding," Ms Wolf said.

– Karen Stichtenoth

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The Monash Museum of Computing History is located at the Caulfield campus, B Block, level 5, and is open daily.



Computing magnet: Inside the Monash Museum of Computing History.
Photo: Simon Nicol

Largest business school in Australia a unique concept

Business & Economics

Monash will become home to Australia's largest business school when it introduces its new Graduate School of Business (GSB) this month.

The school has been created by the merging of the Business and Economics faculty's large suite of graduate programs.

GSB founding director Professor Owen Hughes said the new centre would offer coursework programs including the MBA

and the DBA (Doctor of Business Administration) as well as masters programs in accounting, management, marketing and international business.

"The concept is unique in that the high-ranking MBA program will sit alongside the large range of specialist masters degrees offered by the faculty," he said.

Professor Hughes said the new school would satisfy an important, growing market when it is officially unveiled to key stakeholders, including business

leaders, on 13 October. "In a departure from the traditional business school model, the Monash Graduate Business School will reside within the university," Professor Hughes said.

"Rather than competing with the university, the school will harness the vast academic resources and facilities of Monash to offer an unprecedented range of programs.

"Our scale and diversity allow an unparalleled range of study choices, with the flexibility of a variety of teaching modes in

different locations."

The Business and Economics faculty already has more than 4000 graduate students, including 300 PhD candidates.

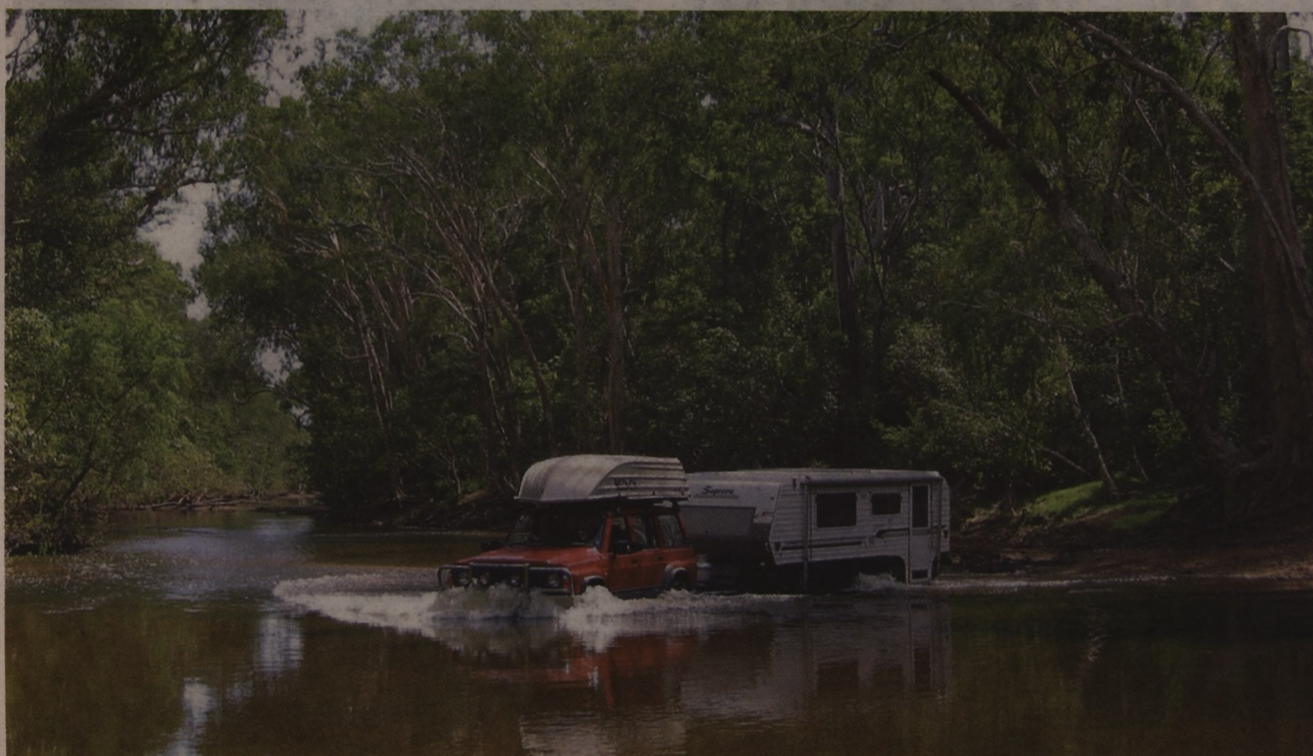
"The creation of this centre will also enhance the recognition of Monash graduate business qualifications in Australia and overseas," Professor Hughes said.

— Robyn Anns

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Founding director: Professor Owen Hughes.



Taking the plunge: Journeys may serve as a rite of passage between old ways of life and new possibilities. **Photo: AAP**

Older travellers head outback for new beginnings

Sociology

Long-term Australian outback travellers aged from their late 30s onwards are usually propelled into their journeys by a sense of something having ended, a Monash sociologist has found.

Joint research by Monash's Associate Professor Naomi White and La Trobe University's Associate Professor Peter White reveals the journeys often follow events such as death of a

partner, children leaving home or retirement.

"Many of the people we interviewed mentioned changed family circumstances as the factor prompting them to head to the outback for extended periods," Dr Naomi White said.

"For some, the death of a spouse left them feeling deeply dislocated and alone. Taking to the road was a way of grieving and distancing themselves from a way of life that had ended.

"For others, there was a sense

that marriages were drifting apart because of the demands of work and individually pursued interests and social lives. Long periods of travel with a partner was a way of rebuilding old bonds."

The research is based on conversations and interviews with 45 long-term travellers in central, northern and western outback areas of Australia via caravan, motor-home or converted bus.

All were mid-life and older Australian citizens who planned to travel for at least a year.

They fell into three main categories – parents with children, people approaching retirement, and retirees – and their prior occupations included shopkeeper, bus driver, police officer, tradesperson, and senior managerial roles in computing, teaching and nursing.

"All interviewees aged from the late 30s through to the early 50s expressed a sense of fatigue, diminished interest in, or serious dissatisfaction with, their working lives," Dr White said.

"Underlying many of the reasons people gave for undertaking their trips was an implied search for a new beginning, a need for change and a sense there was more to life than everyday routines.

"Some chose the outback because it was an environment where they could test themselves, achieve a sense of mastery over nature, experience adventure and face physical challenges."

Dr White said the sense of testing oneself in rural settings had deep roots in the Australian consciousness.

"Conquering and subduing the outback was integral to a colonisation that required the subjugation of what was seen to be an inhospitable, harsh environment," she said.

"This subjugation was supported by legend-making that idealised the Europeans who made the utopias."

"Journeys through the outback also bring to the foreground white Australia's troubled relationship with the Aboriginal population. The middle-aged group in particular spoke about how they felt their journey to the centre and north had extended their knowledge of, and sensitivity to, Aboriginal issues."

And while long-term travel as a rite of passage is commonly seen as the preserve of younger travellers, the overall accounts of most interviewees suggest their journeys also served as a rite of passage between old ways of life and new possibilities, Dr White said.

— Michele Martin

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Breaking down transplant rejection

Life sciences

A Monash University scientist who recently determined the structure of a drug widely used as an immunosuppressant in transplant operations has been awarded the 2004 Science Minister's Prize for Life Scientist of the Year.

Dr Jamie Rossjohn, who heads the university's Protein Crystallography Unit, was presented with the award in September for his work in the area of structural biology, specifically X-ray crystallography.

It was one of five awards presented as part of the Prime Minister's Prizes for Science.

Dr Rossjohn's research has contributed to knowledge in the areas of immunology, asthma, multiple sclerosis, bacterial toxins and the performance of anti-cancer drugs.

X-ray crystallography is a technology driven field of science that seeks to better understand the shape and function of proteins and other biological molecules. It requires X-ray radiation and powerful X-ray sources such as the synchrotron.

Dr Rossjohn and his team, in collaboration with Professor Jim McCluskey and his team at the University of Melbourne, used this technique to determine the structure of the immunosuppressant OKT3, used in organ transplants and auto-immune disorders, and how that interacts with its target – an essential component of the T-cells. This work was published in the Proceedings of the National Academy of Sciences.

Chronic rejection of kidney and other solid organ transplants is the major cause of graft failure in transplant recipients. A critical mechanism of rejection is the reaction of host T-cells, which recognise differences in the grafted molecules and reject the donor.

As identical donors are rarely available, most transplant recipients receive immunosuppressive drugs to prevent this response.

Dr Rossjohn's findings have identified how the drug interacts with its target, given insight into the function of a critically important component of the T-cell, and provided insight into how therapeutics can be improved to reduce rejection rates.

— Diane Squires

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Award winner: Dr Jamie Rossjohn.

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