

# MONTAGE

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## NEWS AND VIEWS FROM MONASH UNIVERSITY

# A brave new cashless world

**B**anks could lose their traditional hold over issuing money and controlling the payments system as Australia fast-tracks towards a cashless 'cyber economy', according to a major Monash report.

The report claims that technologies such as smart cards and digital cash will pave the way for private companies, outside the existing regulatory payments system, to issue electronic money.

"Will Microsoft's 'money' be worth the same as IBM's, and will there be exchange rates between the two that might depend on their current share prices?" asks the report, 'Smart Cards and the Future of Your Money'.

Smart cards are credit card-sized plastic cards with a programmable microprocessor inside that can receive and transmit information. In this case the card stores value (money) which can be exchanged for goods and services and is known as a Stored Value Card (SVC).

According to director of Monash's Centre for Electronic Commerce and report co-author Ms Jo-anne Fisher, consumers need to be aware that stored value on smart cards is only as secure as the balance sheet of the card's issuer.

"If the issuer goes bankrupt, consumers could lose the value stored on their cards," she said.

She said banks needed to lead the introduction of SVCs to maintain their position as the issuers of the most secure form of money.

"But they won't rush to replace existing magnetic strip cards with smart cards because of the enormous investment already made into magnetic strip technology."

Four stored value schemes are currently being trialled in Australia. Two are run by international card companies Visa and MasterCard (with cards issued through the banks), one is run by QuickLink, a consortium of private companies, and one by Transcard, also a private organisation.

But while Australia may be leading the world towards a global cashless society, Ms Fisher said existing business and consumer rights legislation was not keeping pace.

"The introduction of stored value cards will have profound implications for consumers, businesses, financial institutions and many government agencies," she said.

"It is important that these groups understand the implications and prepare for the changes."

Research has found that consumers believe the major advantage of stored value over currency is increased security of money, with value on lost or stolen cards able to be refunded.

But Ms Fisher warned that in the trials currently under way in Australia, smart cards did not necessarily require a Personal Identification Number (PIN) or a signature to identify their owner, so stored value could be as anonymous and insecure as cash.

The advantage of not being able to identify the owner of stored value cards is that transactions cannot be tracked to an individual and privacy is largely protected.

In schemes where the card holder was identified (as with debit and credit cards), it would be possible for an individual's movements, activities and spending habits to be tracked in greater detail than ever before.

Ms Fisher said that this information could potentially be exploited by government agencies, the organisation that collects the data, or any other organisation prepared to buy it.

"The possibility that such information could be used without the knowledge of the consumer is increased when schemes are run by private organisations operating outside existing regulations."

And, although privacy is a major consideration, consumers were prepared to trade off some degree of privacy for security.

The report also raised the possibility that as a new form of money, smart cards could lead to new ways of committing money-related crimes. These included:

### Money laundering

Stored value is highly invisible (unlike notes and travellers cheques that have serial numbers, and bank accounts that can only be opened by registered authorities) and highly transportable, making it difficult for police to track money flows.

And, if cards can have multiple currencies and large values loaded onto them (there are currently no laws limiting the value that can be loaded onto a card) and if value can be transferred from person to person (rather than through a terminal), they would be very attractive to those who want to move criminal money, undetected, across national boundaries.

"Carrying a plastic card is a lot more convenient than carrying a bag full of cash," Ms Fisher said.

### Tax evasion

Currency is used extensively in the underground economy and in other illegal activities to evade taxes. Stored value, which can

*Continued on Montage 2*





### It's hard work being a vandal

This is not a story we are proud of, but it does say something about the place. Ford Motor Company's Smartlock system to deter car theft had been considered failsafe for almost four years. In June this year, the *Geelong Advertiser* reported that the only known theft of a car with Smartlock had been from the Monash University car park. With due scholarly calculation, the system had been removed and taken to a locksmith, where a key was made. The thieves returned later in the day to steal the car.

### One for the road

And you thought you had an eye for excellence? *The Master Builder Victoria* journal has reported that the new three-level car park on Clayton campus is a winner in civil infrastructure excellence. It recognised that the car park fulfilled the design brief to be functional and not overwhelm or undermine the aesthetic appeal of the campus environment. Most people parking their cars are probably too concerned with finding a spot and getting to their lecture on time to notice the "innovative design features of stainless steel balustrades, post-tensioned concrete slabs and the gold Southern Cross motif against the brilliant blue of the car park facade".

### Out of time, out of place

The Monash Asia Institute seems to be having out-of-mind experiences of late. The Public Affairs Unit recently received the following information: "The next issue of the Monash Asia Institute Newsletter will be published in May 1996 and will report on the period May through August 1996. The deadline for copy will be 2 September 1996." And if you can understand that, then take heed of their instructions: "Be specific about the dates of your activities – please state at least the month the event occurred."

## NOW & THEN

### 25 Years Ago

To whom it may concern

Could you please send me information on Monash University. I am only a punk from Form 2 in a High School but in the near future I hope to go to Monash as a medical student.

Why not Melbourne or La Trobe? Those two universities are incomparable to Monash which is "the most controversial university in Australia", to quote one of your patriotic science students.

Monash never fails to fascinate me. Its beautiful "space-age" faculty buildings. Its conscientious happy-go-lucky students. I simply can't wait to get there. Monash is like some sort of paradise.

### 15 Years Ago

Progressive cuts in funding over the next three years will add to the pressures the University is already experiencing, says the Vice-Chancellor, Professor Ray Martin.

Commenting on the newly-released Commonwealth Tertiary Education Commission Report for the 1982–84 Triennium, Professor Martin said that the proposed reductions continue the steady erosion – averaging about one per cent per year – that has been imposed on the University since 1976.

### 5 Years Ago

A total ban on smoking now applies in all university buildings and vehicles. University Council approved the new policy, effective from 30 September, after considering staff attitudes and recent court rulings on the effects of passive smoking.

The policy replaces the partial ban on smoking, introduced at Clayton campus in July 1990. A total ban already was in place at all campuses of Chisholm Institute before the merger.

### This Month Last Year

What started as a student investigation of an unusual patient has led a researcher from Monash's Box Hill Department of Medicine to a discovery that could help prevent heart disease and strokes.

Dr Shaun Jackson has detected a previously unknown molecule in the blood which plays a central role in the overall control of clotting.

The work could lead to more effective drugs which could regulate clotting and refine treatment for clotting-related conditions, the leading causes of death in the developed world.

## A brave new cashless world

From Montage 1

be as anonymous as currency, could make this type of activity significantly simpler.

### Counterfeiting

If organised crime invested its resources to develop a way to counterfeit value on smart cards, it would be almost impossible to detect. Scheme operators would need to invest in sophisticated encryption technology to overcome attempts to counterfeit value on SVCs.

Currently, banks and financial institutions cooperate with authorities in reporting suspicious transactions and providing information about people under investigation. These regulations do not, however, relate to private organisations that implement SVC schemes.

Ms Fisher said that consumers would be unlikely to adopt smart cards unless the advantages clearly outweighed the disadvantages.

Advantages for consumers included the possibility of secure money, the ability to buy things from a distance, eliminating the need to carry a wallet full of small change,

quicker service at shops through not needing to wait for change, and the possibility of recovering lost money.

Disadvantages included a potential loss of privacy, having to adapt to new technology, the possibility of new fees, and inconvenience due to different cards, terminals and schemes.

BY GEORGIE ALLEN

## MONTAGE

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# Mission to save endangered wallaby

A wildlife conservation team that includes Monash researchers is mounting a special rescue mission to capture a male of the near-extinct Victorian brush-tailed rock wallaby.

The researchers, who plan to start their search later this month at one of the few remaining colonies in East Gippsland, need to find the male to start an innovative captive breeding program.

The male will join four females already at Healesville Sanctuary. The females were rescued from threatened sites and moved to the centre to form the nucleus of a captive breeding group.

The program, led by Monash University's Department of Anatomy, aims to accelerate the species' reproductive rate using a technique known as cross-fostering.

It is part of a joint project with the Victorian Department of Conservation and Natural Resources, Melbourne University and Healesville Sanctuary to save the critically endangered species.

Fewer than 40 Victorian brush-tailed rock wallabies remain in Victoria at only a few sites in East Gippsland's Snowy River region and in remote parts of the Grampians.

Monash researcher Dr David Taggart said the genetically unique Victorian brush-tailed rock wallaby species, which once numbered several hundred thousand, had become so rare and elusive that it was now nicknamed 'The Shadow'.



"Urgent action is needed to rapidly reverse the declining population or it is likely to become extinct within the next few years," he said.

Using the cross-fostering technique, the researchers expect to boost the rock wallabies' reproductive rate from one to four offspring annually.

The method involves using surrogate females from a related species to rear the brush-tailed rock wallaby pouch young. This enables the female to cycle again and produce further young.

Predator baiting programs have also been introduced at two sites – one along the Snowy River in East Gippsland and the other in the Grampians – each with small colonies of around eight to 10 animals.

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*The method involves using surrogate females from a related species to rear the brush-tailed rock wallaby pouch young.*

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Dr Taggart said the baiting program should help these small, surviving colonies grow and allow for the successful reintroduction of the captive-bred animals.

The brush-tailed rock wallaby's population has declined rapidly since European settlement, initially as a result of demand for pelts from the fur industry.

"But their numbers have continued to plummet because of predation by foxes, feral cats, wild dogs and even the native tiger quoll," Dr Taggart said.



Dr Taggart with an elusive brush-tailed rock wallaby.

While effective in keeping foxes and feral cats at bay, the baiting programs are costly and labour intensive.

"In the Grampians alone, more than 180 poison baits a week have been laid along 45 kilometres of tracks surrounding the colony since January this year. And weekly bait takes can be as high as 65 per cent."

The future of the baiting program is also uncertain – the main source of State Government funding expires in June next year.

At least \$250,000 is required to maintain the baiting programs, implement the breeding strategy, assist with animal maintenance and build a specialised breeding facility at Healesville.

Prospective sponsors can contact Healesville Sanctuary's animal management curator on (059) 62 4022.

BY BRENDA HARKNESS



# The education web we weave

Australian universities should stop thinking of hi-tech delivery of education as a futuristic vision and start preparing to use it to offer courses internationally, according to Monash pro vice-chancellor Professor Leo West.

He warned that Australian institutions would become obsolete in an advanced culture of cyber learning unless they kept pace with new communications media.

Professor West, who has coordinated the development of Monash's international programs in recent years, said that North American and European universities were getting ready to offer courses in Asia using advanced computer and pay-TV technology.

And private companies were even further ahead, with more than 200 multinationals already offering tertiary courses for their staff over the Internet or their intranets.

"Trans-national education using the new communications technologies is set to explode," Professor West said.

For the first time we were entering an era in which communications media – such as satellite TV, CD-ROMs, video conferencing and the Internet – had advanced to a stage where they could rival traditional lectures and tutorials.

"Old-fashioned technology such as closed-circuit TV was never really suited to education because it wasn't interactive, but new technologies are. With recent advances in computer, telephone and satellite networks, we can deliver classes to large numbers of students while still dealing personally with individuals.

"If Australian universities don't take advantage of these advances to meet the huge demand for tertiary courses in Asia, we will lose ground to the North American and European universities and the private institutions that are preparing to do so," he said.

Media companies were also beginning to compete with universities by securing accreditation for degrees which they

offered in direct competition with traditional universities.

"These private providers are developing programs in cooperation with existing universities, but a newer trend emerging in the US and Europe is for them to develop their own stand-alone programs. Both developments constitute a real threat to traditional universities."

The US pay-TV provider and information conglomerate Jones International has established the Mind Extension University – a virtual university which is already using its cable and satellite networks to offer undergraduate and masters degrees from 21 accredited US colleges and universities.

"The traditional university classroom will not disappear, but the new technologies offer alternative modes of learning and delivery of education which we are only now beginning to confront.

"For universities to assume that their traditions and capital investment in physical resources will ensure their future as educational providers is dangerously simplistic," Professor West said.

Earlier this month he delivered the opening address at a conference titled 'The internationalisation of education: New technologies, new futures', to commemorate the fiftieth anniversary of the Fulbright program.

He said the value of this year's Fulbright symposium, which was hosted by Monash, was that it had brought together the "technophiles, the technosceptics and the techno-practitioners" for three days of timely debate and discussion.

"The technophiles can only see the potential, the technosceptics can only see the difficulties and the techno-practitioners



have practical experience of what's involved in linking countries with this technology."

He said Monash was already working with European and US institutions and the OECD to develop ways of safeguarding the quality of courses that used electronic delivery, but he highlighted several other equality and cultural issues that needed to be addressed.

"A student doing a Monash degree via communications technology should face equivalent entrance standards and assessment procedures and have access to similar facilities as a student completing the same course at any Australian campus," he said.

And universities would also need to consider different cultural styles of teaching and learning, how the technology would affect pedagogy, and the international relevance of current curricula.

"If somebody in China is doing a Monash Bachelor of Business (Accounting) degree for example, should they have to study Australian tax law?"

But he believed once these issues were resolved, Asian governments could provide the technological infrastructure to allow their students to use off-shore providers without travelling overseas.

"For Australian universities, which are coming to rely more and more on large numbers of fee-paying students from the region, the implications are profound."

BY GARY SPINK



# Chasing storms

**H**arald Richter's tornado-chasing experiences could have been taken straight from the blockbuster movie *Twister*.

Mr Richter, a meteorologist and PhD candidate in Monash's Department of Mathematics, came face-to-face with an F4 tornado – the second most powerful type of tornado – in June last year. And just like the stars of the movie, he was forced to outrun the violent storm.

Mr Richter has been fascinated with tornadoes since early childhood.

And last year an opportunity came up that he couldn't miss. He discovered that the National Severe Storms Laboratory in Oklahoma, US, was conducting a storm-chasing field experiment, and he decided to join the team.

Mr Richter said that like in the movie, storm chasers drove their own vehicles and used simple communication devices including a mobile phone and scanner to communicate with the local meteorological office and other storm chasers.

"Storm chasers drive around the country looking for severe thunder storms which have the capacity to produce extraordinary weather such as very large hailstones, strong winds and, in extreme cases, tornadoes," he explained.

"The US weather service evens trains 'storm spotters', which it considers vital as part of its early warning system."

Mr Richter was especially lucky during his storm-chasing stint, witnessing two F4 tornadoes in one day.

"It was a bit like playing Tattsлото for the first time and winning the jackpot," he said. "F4s are very rare and here I was on my first

storm-chasing expedition, experiencing one of the strongest tornadoes that many of the veteran storm chasers had ever seen."

But instead of him and his companions chasing the tornadoes, one chased them. "The tornado was travelling at about 50 to 60 kilometres an hour, which you should normally be able to outrun in a car.

"But with a tornado comes strong wind and hail, often the size of golf balls, which can hinder your progress."

At the time, Mr Richter and his two companions thought they had out-run the tornado, only to realise that the highway they were travelling on curved back into the path of the tornado.

"There was a car about a hundred metres behind us and I kept waiting for its headlights to disappear," Mr Richter said. "While I could see them, I knew we were safe."

Mr Richter, and the car behind him, escaped the tornado but he warned other storm chasers not to chase tornadoes without some knowledge of tornadoes and severe storms.

"If you have sufficient knowledge of storms, what to look for and how to predict danger, you minimise the risk," he said. "It is not that dangerous if you know what you are doing."

Tornadoes are most frequent in the southern plains of North America stretching north in a corridor from Texas. The area produces two contrasting types of air – the best conditions for producing severe storms and tornadoes.

"The maximum contrast you can have between two air masses is warm, moist air underneath cold, dry air and when this constellation of air masses exists, the atmosphere has a lot of energy to play with," he explained.

"And it is often around Texas and Oklahoma that the biggest differences in air masses on earth are produced, due to the location of warm oceans such as the Gulf of Mexico combined with large arctic land masses like Canada."

According to Mr Richter, storm chasers' attraction to the hunt is frequently not scientific, with some having little meteorological expertise, although many do know quite a bit about meteorology.



"And after the success of the movie *Twister*, the number of less knowledgeable chasers has increased," he said.

"Most storm chasers have a fascination with the violent, uncontrollable nature of severe storms and tornadoes and are lured by the idea of things beyond their reach."

He admitted that this was part of his own motivation for storm chasing but that his background – a lifetime of reading on the subject and a masters degree on tornado-like vortices from the University of Munich in Germany – played a big part.

"From a scientific perspective, field experiments give a better insight into tornadoes – when they form, how they progress, and what their life cycle is – which leads to more accurate predictions for the occurrence of severe storms and tornadoes.

"The more you know about something, the more likely it is that you can anticipate its behaviour."

Mr Richter returned to Texas at the beginning of this year to work on a documentary for German TV. While he didn't see any more tornadoes, he did speak to some of the people who had been hit by the F4s.

"One man told us about one of his horses which was found, in two halves, two miles across the other side of town," Mr Richter said.

"A few people had moved away from the area, but the ones that remained were fairly philosophical about the risk. The likelihood that a tornado of the proportions we saw would hit one particular spot is small because tornadoes are not much more than half a kilometre wide and have a life span of often less than 15 minutes."

While his PhD is not directly related to tornadoes, Mr Richter would like to continue postdoctoral investigations into the 'twister' phenomenon.

By JULIET RYAN





# Making the most of the Mekong

**U**rgent demand for infrastructure, industry and services in Southeast Asia's growing Mekong subregion is opening up billion-dollar business opportunities.

After years of war and isolation, the subregion is developing rapidly to become the new Asian focus for business and investment, according to Monash University research associate Mr Bob Stensholt.

Asian Development Bank figures show that total gross domestic product (GDP) for the Mekong subregion was \$US184 billion in 1994, with per capita income ranging from \$US2450 (Thailand) to \$US225 (Myanmar, formerly Burma).

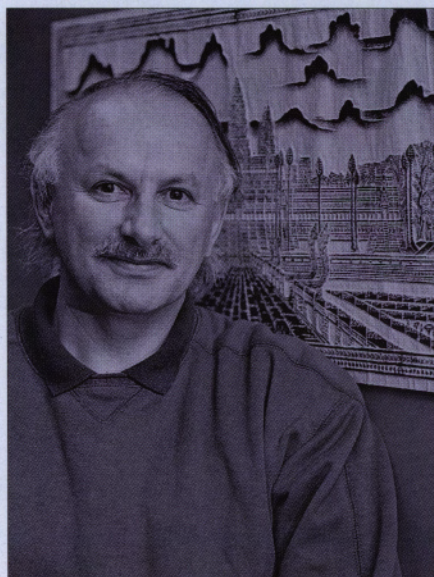
The subregion, which includes Cambodia, Laos, Myanmar, Thailand, Vietnam and the Yunnan Province of China, spans 2.3 million square kilometres and has a population of more than 230 million.

Mr Stensholt, who is on research leave at the Monash Asia Institute from his position as AusAID's assistant director-general, said growth rates had averaged about 6 per cent per annum during the past few years, led by the Yunnan Province which last year recorded a growth rate of about 13 per cent.

"If good growth continues, along with the predicted population increase of 2 per cent a year, the GDP of the Mekong subregion will be around \$US850 billion in 2010 with the average income of its 314 million people more than \$US2700 – at least triple what it was in 1994," he said.

Major infrastructure projects under way or proposed within the region include fibre-optic cable links, construction of the north-south and east-west roads, upgrading of existing railway systems and the development of new ones, and hydropower development on the Mekong river.

Since the 1991 Paris Peace Accord paved the way for the subregion's re-opening, several multi-country cooperative arrangements have emerged to look at trade,



investment, tourism, environment, agriculture and education in the subregion.

Mr Stensholt said that cooperation was the key to ensuring the successful management of the multibillion dollar projects under way or planned for the subregion.

"Cross-border management is critical to guide the subregion's growth and development and to provide some degree of certainty to existing and prospective investors – including Australians," he said.

Mismanagement of the major projects, according to Mr Stensholt, could aggravate the 'uneven' development which has characterised the subregion's evolution, and could impose serious social, economic and environmental costs on the less developed countries.

One of the biggest dilemmas posed by the subregion's rapid development is the handling of the Mekong river, known as the area's lifeblood.

There are plans to dam at least 20 sites along the river for major hydropower development. Water diversion between river basins, especially in the more arid zone of northeast Thailand, has also been proposed for flood control and irrigation.

But Mr Stensholt argues there may be a better case for building dams on the river's tributaries for power, flood control and irrigation, rather than damming the river itself.

"There is no doubt that hydropower development will provide relatively cheap, renewable energy, as well as foreign exchange for poorer countries such as Laos," he said.

"But, for instance, there is a risk that the 14 dams that China has proposed for the Lancang (Upper Mekong) will have a significant downstream impact on people's livelihoods as well as affecting the fragile ecology of the Tonle Sap lake, the lungs of the Mekong river system."

Mr Stensholt said the subregion's uneven development was a result of its diversity as well as its history of isolation and conflict.

He said that dealing with the inequalities created in the move towards open and market-based economies within the subregion was vexing planners and people within each of the six countries.

"The huge difference in income between urban and rural Thais, for example, is becoming obvious in other countries, especially Vietnam," he said.

The Monash Asia Institute and Development Studies Centre recently hosted a top-level 'think-tank' to look at the opportunities and constraints posed by the subregion's rapid development. The conference brought together senior government officials, representatives from Australian and Japanese aid and development agencies, prospective investors and international banks to form cooperative links for sustainable development.

The Asian Development Bank also used the event to profile nearly 100 projects planned and approved for the subregion and in need of private or public investment.

BY BRENDA HARKNESS



# A medieval mystery from the Wakefield Master

A medieval mystery popular in 15th-century England will be performed as a 'music drama' in modern English in Melbourne this month.

Dr Alan Dilnot from Monash's English department has translated *The Second Shepherd's Play* from medieval to modern English, and Mr Greg Hurworth from the Education department has composed music to accompany it.

Well-known in literary circles as an outstanding example of medieval drama, *The Second Shepherd's Play* was based on the nativity narrative in the second chapter of Luke in the New Testament of the Bible.

It was written as part of a cycle of religious plays, performed in the wool town of Wakefield in Yorkshire, England, in the Middle Ages, about the creation of the world and Jesus' life.

The researchers said depictions of the end of the world and Judgement Day were particularly popular in cycle plays. "They always picked the most exciting events from the Bible. And they were especially fond of the nativity story."

Dr Dilnot said almost all drama from this period had a religious message. "If secular plays existed at this time, then very few have survived."

The anonymous dramatist, who has come to be known as the Wakefield Master, wrote five of the 24 plays in the Wakefield cycle of plays, around the year 1425. They were performed regularly at festival times until the Reformation of 1520, after which such plays were "frowned upon" because of their association with the old religion.

In a sense the play has many authors, since it was often revised after being performed each year.

"I guess we're just continuing the tradition and updating the play for modern audiences," Dr Dilnot said.

He said the translation was conservative, retaining the play's nine-line stanza and internal rhyming.

"We have attempted to preserve the work's farcical sense of humour, rich symbolism and doctrine."



Dr Dilnot and Mr Hurworth have adapted a medieval mystery for a modern audience.

Mr Hurworth said it was challenging to write music for a modern audience to suit a play written in England in the Middle Ages whose action takes place in the Middle East two thousand years ago.

*The Second Shepherd's Play* was written to include medieval carols, but the music was not found with the play when it came to light in the early 19th century.

According to the researchers, the modern version of the play, *The Shepherd's Nowell*, will appeal not just to those interested in medieval literature or biblical stories. "It is highly entertaining, with a lot of humour and a mystery that is resolved at the end of the story."

It also includes universal themes, such as people's dissatisfaction with their lives, bickering between friends and spouses, taxation problems and politics.

The play is structured around the concept of 'fallen' and 'risen' mankind. The first half is set in medieval England where a 'rogue' steals a sheep from three shepherds. In the second half, the same characters are in the Middle East at the time Jesus is born.

According to the researchers, the two distinct halves are united. "There is a symbolic relationship between the stolen sheep

and Jesus as the lamb of God. In this way, the two parts of the play mirror each other."

Unlike many plays of the time, *The Second Shepherd's Play* had a rare "knock-about" quality, a sense of farce and comedy.

"Religion and laughter were not often combined, but the Wakefield Master got away with it."

*The Shepherd's Nowell* will be performed at the George Jenkins Theatre at Monash's Peninsula campus on 26 October; at St Paul's Cathedral in Melbourne's city centre on 7 December; at the performing arts centre at St George's Uniting Church, St Kilda on 8 December; and at St Aidan's Church in North Balwyn on 14 December.

Music will be performed by a music chamber orchestra made up of music students from Monash's Peninsula School of Education and musicians from the local community, accompanied by the Victorian State Children's Choir and a chorus from St John's School in Frankston.

Tickets are available at the door, or by calling (03) 9905 2126 or (03) 9546 9101.

By GEORGIE ALLEN



# Software solves the 3-D puzzle

*Award-winning 3-D measurement technology can test wrinkle cream, measure the volume of a breast and improve robot vision. Tim Thwaites reports.*

A Monash invention for automatic measurement of the three-dimensional shape of objects has won a major engineering award for excellence.

The system has wide commercial application, from robot vision to medical diagnosis, and is being considered for production by an Australian manufacturer.

The system measures and generates computer images of three-dimensional objects quickly and accurately without needing to come into contact with the objects themselves. It has been used in several research projects, performing tasks ranging from inspecting turbine blades to measuring the rate of milk production in the human breast.

"It's very simple, low cost and has no moving parts," said the developer, Associate Professor Kim Ng of the Department of Electrical and Computer Systems Engineering. He estimates the system could

be produced and sold for about a quarter the cost of similar systems.

In the past couple of decades, a proliferation of devices – such as CAT scanners and nuclear magnetic resonance imagers – have been developed that allow doctors and materials scientists to look inside bodies and objects and construct images of internal structure. However, external imaging did not receive nearly as much attention because it did not seem to be as necessary. But according to Dr Ng, accurate and fast 3D measurement is more difficult than first thought.

His solution is based on the simple principle of triangulation – that if you know two angles of a triangle and the length of the baseline between them, you can work out the other dimensions. It is possible, for instance, to project a narrow beam of light onto a surface from one angle, and use a camera at another angle to record the point

at which the beam of light hits the surface. Then, knowing the angles and the distance between the light projector and the camera, you can work out where, relative to them, the point is. If this is done over a grid pattern of thousands of points, a three-dimensional shape of the object is plotted.

But there were several ways of making the process more efficient, and that's just what Dr Ng and his research team set out to achieve three years ago. Instead of projecting points of light onto the surface of the object, the researchers projected planes or stripes of light. In this way, rather than analysing thousands of individual images of different points of light, they collected one image with stripes of light and used a computer to work out the coordinates of many points along each stripe, building up a three-dimensional image as they went.

*Given the previous lack of interest in measuring external shape, Dr Ng said the range of uses to which the technology has been put is astounding.*

It was useful for research purposes, but it was not fast or accurate enough for the demands of routine industrial or medical use. The group then received a grant of \$1.15 million from a research and development syndicate formed by the university's company, Montech. The grant allowed refinement of the core technology into a much more sophisticated instrument.

"We started by investigating all the factors limiting the system's performance," Dr Ng said. And he insisted that as far as





possible all hardware should be inexpensive off-the-shelf equipment, so that the cost of the finished product would not restrict its general application. As it has turned out, much of the advanced development of the system has involved clever software rather than costly equipment.

For instance, the software can now integrate measurements taken at up to eight different viewpoints. Whereas in the past only a three-dimensional surface seen from one viewpoint could be measured – a view in two-and-a-half dimensions as Dr Ng called it – now a complete three-dimensional image of an object can be constructed. This can be done using several different systems placed around the object, but it can also be achieved more inexpensively, although not quite as fast, by using one system and rotating the object for different views.

Many applications depend on some sort of measurement comparison, either of two versions of the same object or of the one object at different times. To allow exact measurements and comparisons to take place, the system must be accurately calibrated before measurements are taken.

In the past, calibration was done manually. A calibration frame with a set of target points was set up in place of the shape to be measured. The operator then used a cursor to locate the target points on the camera image, and a computer program used the known position of target points on the frame to match the image with reality (and thus calibrate the system).

These days calibration is done automatically. The points on the target frame or cube have been replaced by light emitting diodes which can be switched on one at a time by a controller in the projector. The system automatically registers where the light is in the camera image and a program adjusts the calibration against these known points. "It's much more accurate," Dr Ng said. "Manual calibration was subject to operator error."

And, as equipment and software become more sophisticated, so the number of points which can be measured has increased, and hence the accuracy has improved. The upgraded system began with 128 points measured across 64 stripes, or about 8000 points. The latest version can handle up to 256 stripes with 512 points across, giving a three-dimensional image with up to 128,000 points in each view. And the system does this at 10,000 points

per second with an accuracy of 1 in 7500 in the field of view.

Given the previous lack of interest in measuring external shape, Dr Ng said the range of uses to which the technology has been put is astounding. A cosmetic company, for instance, has used the system to test the efficacy of a new wrinkle cream. About a thousand silicone casts of facial wrinkles taken before and after cream use were sent to Melbourne to be measured. The resultant images were compared, and it turned out the cream had the desired effect. More importantly, the consultants who did the testing found the Monash system easy to use.

At the University of Western Australia, Associate Professor Peter Hartmann leads a team of biochemists investigating the factors which can influence human milk production – the frequency at which the baby feeds, daily rhythms, hormones, or the amount of milk taken at each feed.

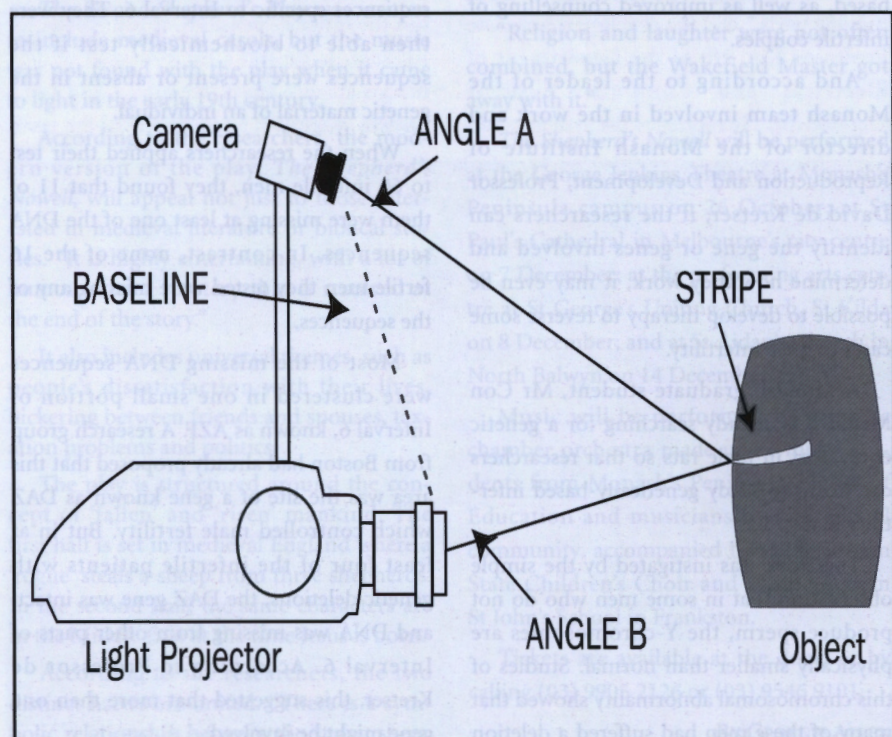
The simplest way of estimating milk production is to measure the increase in the volume of the breast over time after each feed – but that is easier said than done. The researchers tried several methods, the most uncomfortable of which involved measuring the amount of water displaced when the breast was immersed in a full bowl. Not only is the Monash shape measurement system more convenient and accurate than immersion, but the work has opened up the possibility that the system can be adapted for similar clinical uses.

But not all the applications have been medical. The system has been used in a West Australian study of soil erosion by wind. The amount of stubble left in broad acre fields after harvesting and ploughing governs how susceptible to erosion the fine soil is. The Monash system can measure the amount of plant matter and the soil surface profile, both of which give an indication of the likelihood of erosion.

*The software can now integrate measurements taken at up to eight different viewpoints.*

The giant American electrical and aerospace company General Electric considered using the system in the manufacture of turbine blades. The idea was to inspect a profile of the blade in order to direct final machining to the desired shape. And the company demonstrated the feasibility of the system, although they did not take it any further.

Clearly, the system can be adapted to recognise shapes at different orientations, with one company evaluating the system to design computer vision systems to control the actions of robotic machines.





# The how and Y of male infertility

*Breakthrough Monash research may lead to a cure for genetically-based male infertility.*

*Tim Thwaites reports.*

A joint Monash-Los Angeles research team has helped identify a genetic basis for infertility in a significant number of affected men.

The work shows that in more than one sixth of infertile men, tiny segments of genetic material are missing from a particular area of the human Y-chromosome. (The Y is a relatively short chromosome found only in males. It contains some of the genes which determine and control the development of male features.) Typically, about one in 25 men show some form of reduced fertility.

The findings should lead to the development of a test to determine if the cause of infertility in a particular man is genetically based, as well as improved counselling of infertile couples.

And according to the leader of the Monash team involved in the work and director of the Monash Institute of Reproduction and Development, Professor David de Kretser, if the researchers can identify the gene or genes involved and determine how they work, it may even be possible to develop therapy to reverse some cases of male infertility.

A Monash graduate student, Mr Con Mallidis, is already searching for a genetic equivalent in male rats so that researchers can begin to study genetically-based infertility in detail.

The work was instigated by the simple observation that in some men who do not produce sperm, the Y-chromosomes are physically smaller than normal. Studies of this chromosomal abnormality showed that many of these men had suffered a deletion

of genetic material from a specific segment of the Y-chromosome known as Interval 6.

The research is an early example of the value of the international Human Genome Project – a multibillion dollar enterprise, based in the US, to determine the precise genetic and biochemical structure of all the human chromosomes.

As part of the human genome project, a preliminary genetic map of the Y-chromosome has been published. This map details a series of DNA sequences normally present in Interval 6. The infertility researchers – from the Institute of Reproduction and Development, Prince Henry's Institute of Medical Research and Drew University in Los Angeles – selected 26 of these sequences specific to Interval 6. They were then able to biochemically test if the sequences were present or absent in the genetic material of an individual.

When the researchers applied their test to 60 infertile men, they found that 11 of them were missing at least one of the DNA sequences. In contrast, none of the 16 fertile men they tested were missing any of the sequences.

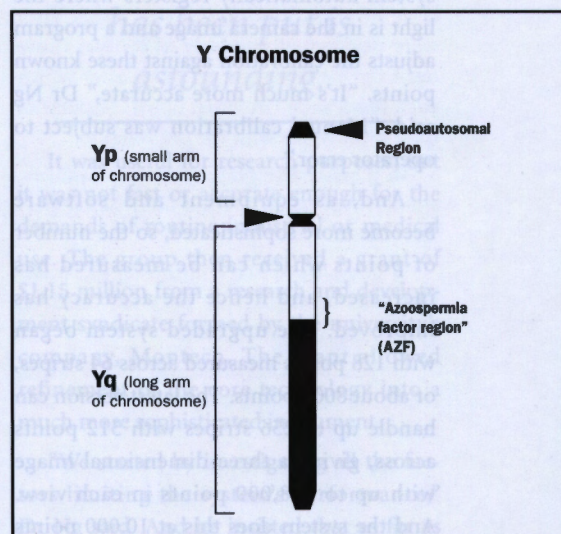
Most of the missing DNA sequences were clustered in one small portion of Interval 6, known as AZF. A research group from Boston had already proposed that this area was the site of a gene known as DAZ which controlled male fertility. But in at least four of the infertile patients with genetic deletions, the DAZ gene was intact, and DNA was missing from other parts of Interval 6. According to Professor de Kretser, this suggested that more than one gene might be involved.

The work was carried out in conjunction with the Reproductive Medicine Clinic at the Monash Medical Centre and the Monash In-Vitro Fertilisation Program, so the research team had access to infertile men with a known clinical history. The researchers knew, for instance, that 50 of the infertile men they tested produced no sperm at all, but that the other 10 had a low, but detectable, sperm count.

In the past, very few of these men would have passed on their genetic abnormality because they would not have had offspring. But Professor de Kretser said that for some reason these small genetic deletions in Interval 6 arose anew in one male in every couple of hundred in each generation.

It is possible to assist genetically-infertile men with low sperm count to have children by direct injection of sperm into an egg. But Professor de Kretser said that if a couple chose to do this, the genetic infertility would be passed on to any male child.

The function of the DAZ gene in Interval 6 is still unknown but it may encode for a protein in the testis involved in sperm development or function. And depending on the specific role the DAZ gene plays, Professor de Kretser said, it may be possible to make a protein to compensate for it.





# Losing faith in the church

The traditional sectarian values of the Seventh-day Adventist Church may be causing members to leave the faith, according to a Monash University academic.

Dr Harry Ballis, from the university's Gippsland School of Humanities and Social Sciences, has spent eight years studying the departure of Seventh-day Adventist clergy from the church in Australia and New Zealand.

"In both those countries, the church has lost about 40 per cent of its current pastor numbers in the time I have been studying the issue," Dr Ballis said.

"And the fallout has been consistent throughout the denomination. The Adventist education system has lost about 230 teachers and an estimated 8000 to 10,000 church members."

In sociological terms, Dr Ballis said the problems were indicative of an organisation struggling to cope with changing times.

"Here was an organisation that was a sect on the verge of becoming an accepted, mainstream denomination," he said. "But many in management and some members perceived that the transition would jettison the church's sectarian values."

He believes that the establishment had worked against the "noisy people" who appeared to be destabilising the traditional sectarian values in order to get rid of them.

Of particular interest to Dr Ballis was the role wives had played in the decision of many Seventh-day Adventist pastors to leave the clergy in recent years.

"During an informal discussion with one former pastor and his wife, she said I should interview wives because she believed that an account focusing exclusively on the narratives of the husbands would be one-sided and incomplete," he explained.

He found that not only had ex-pastors been feeling pressure from church management prior to exiting but that their wives had also borne the brunt of that pressure in a "very real way".

"The contribution of ex-pastors' wives in the exiting process has, for the most part, been overlooked in research, and what references there are to them depict the wives' contributions in negative terms," he said. "They focus predominantly on non-supportive, non-cooperative wives who were opposed to their husbands' work."

In his own research, however, Dr Ballis found that wives were playing a key role, in a supportive and positive way, in their husbands' decision to leave the church.

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*The establishment had worked against the "noisy people" who appeared to be destabilising the traditional sectarian values in order to get rid of them.*

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"Firstly, I noticed that the decision to exit the clergy was a joint one," he said. "Secondly, a quite illuminating finding was that the closer the relationship between the partners, the more the concerns of his work were being transferred to her."

According to Dr Ballis, the wives he had spoken to had been very supportive of their husbands' careers but had become disillusioned with the church's treatment of their spouses.

"Most of the partners were initially able to cope with their husbands' concerns. The husband would come home, share his



problems with her, and she would listen and comfort him."

But Dr Ballis explained that there came a point when the wives had become increasingly fed up and began to hurt in a very direct way.

"They eventually got the idea that the organisation did not care for its workers, and in particular for their husbands," he said.

"On the one hand their husbands were devoting time and energy to the organisation but they felt that those in management, in positions of authority, were continually 'kicking their husbands around'."

"So when the decision came to exit, the wife was very involved because she, and often the family, had been affected by his problems."

Dr Ballis said that while the pastors' wives were becoming increasingly fed up with the treatment their husbands received, they didn't "get on the soapbox" or campaign for change – they just "stored up the hurts" for crunch time.

By JULIET RYAN



# Risky business

Stephen Taylor has spent a lot of time recently planning for Christmas 1997, but his thoughts have had more to do with business than pleasure.

For the senior vice-president of finance at Paramount Pictures, Christmas and the US summer holidays are the peak periods for 'putting bums on seats'. Every wrong prediction his company makes about what will attract viewers can cost up to \$US100 million.

"Making money from movies isn't as simple as picking a script that's 'flavour of the month'. You have to know what the flavour of the month is going to be in two years time," Mr Taylor said.

"You can't just churn out films on the spot like they were cans of soup. Production is time-consuming, and you have to coordinate your schedule around when the actors and producers you want are available."

Mr Taylor comes to Melbourne this month courtesy of the Monash Syme Distinguished Visitor Program, sponsored jointly by the university and the Australian Society of Certified Practising Accountants.

He will be one of the keynote speakers at the ASCPA's state congress in Melbourne, where he will provide an insight into how a global multibillion dollar business succeeds in an environment of continually rising financial risks and how it plans to adapt to a future of unprecedented technological change.

The issue is very topical for Australian investors, with several of this country's cinema chains and production houses recently spreading their ownership via the stock exchange to fund future projects and expansion.

Mr Taylor said seeking private and public investment partnerships had become a common industry strategy, not only to raise funds but also to manage the public financial risk.

He said that despite hype surrounding the box office profits of 'blockbuster' films like *Independence Day* (which grossed more than \$US150 million in its first week of US release), investors in today's industry faced greater risks than ever before.



Paramount Pictures is one of Hollywood's most successful studios, but even with the most meticulous risk assessment, only 30 per cent of their films make money.

"In the past, this wasn't so much of a problem because you could make films relatively cheaply, but there's no such thing as a B-grade movie these days," Mr Taylor said.

With production costs now commonly falling into the \$US70 million to \$US100 million range, the financial risk of producing a flop is too great for a studio to be a sole investor.

But despite the huge investment needed and the difficulty in picking 'winners', Mr Taylor remains cautiously optimistic about the impact of pay-TV.

"At the moment, we make 80 per cent of our revenue from 20 per cent of the world's population. Pay-TV is going to open up substantial new markets for us," he said.

As well as broadening the worldwide audience, the new entertainment technology will mean that studios won't have to rely on box office takings and video sales as their only income sources.

"As pay-TV spreads, studios' film libraries become more and more valuable.

We can relicense the rights to a film every time a new country adopts the medium."

The technology revolution has also encouraged the studios to diversify beyond their traditional production roles and look for investment opportunities in the delivery of films to audiences.

"When Rupert Murdoch established Foxtel, he gained his own pay-TV company with unlimited access to the library of his own film studio (20th Century Fox). He was the first to set up a global plan, and the other studios are starting to follow his example."

But would the pursuit of pay-TV markets signal the death of cinema?

"I honestly don't know," Mr Taylor said. "Hopefully there is room for both. Video was once seen as a threat to cinema, but as it turned out it spawned new interest in films."

"Going out to the cinema remains a unique experience – it's a social event. I don't know that my son will want to give that up to stay at home to watch films with his parents."

BY GARY SPINK



# The human face of computing

Professor Cliff Bellamy has spent more than three decades extolling the benefits of computers, but at the end of his academic career he names personal relationships as his fondest Monash memories.

On the eve of his retirement, *Montage* asked the dean of Australia's first Faculty of Computing and Information Technology to nominate a highlight of his 33 years of teaching and research at the university.

"The answer would have to be the collaboration and interaction with many outstanding colleagues and students, and the privilege of working in an environment where you can end the day feeling that you might have done something useful," he said.

It seems the feeling is mutual. At his farewell function last month, Professor Bellamy's official retirement gift (an Arthur Boyd print) was flanked by a large table covered in presents from grateful students.

It was a fitting tribute to the academic who could get excited by major advances in communications technology, yet remain adamant that it would never completely replace face-to-face teaching.

"People should remember that a significant part of university education should be concerned with socialisation – people learning to work together so that their talents can be used effectively to the advantage of the community which supports them," Professor Bellamy said.

But his relationship with students didn't go untested during his career.

He recalled returning from study leave in 1970 to find that the then federal defence minister Mr Malcolm Fraser had pressured Monash into opening up its computer resources for defence department research.

The Monash Computer Centre had the only computer in Australia able to run such programs.

"Because of Vietnam, the student population was sensitive to the university associating itself with any organisation that had anything to do with war. So they

decided to occupy the Computer Centre."

Professor Bellamy managed to short-circuit the planned invasion by informing the young protesters about the centre's carbon dioxide fire prevention system, how it could be triggered by large groups of smokers, and its potential to render people unconscious in 20 seconds.

The students changed their minds and decided to occupy the Careers and Appointments office instead.

Deputy vice-chancellor Professor Peter Darvall said that Professor Bellamy was "always worth listening to".

"Cliff is a natural leader who is always fair and reasonable, and one of the most broad-minded, broadly capable people I know," Professor Darvall said.

He paid tribute to Professor Bellamy's achievements as dean and his role in developing the university's computer centre, Computer Science department, and the CIT faculty and, outside of Monash, his involvement in the formation of the Victorian Tertiary Admissions Centre.

An example of his broad capabilities is the fact that he was the only member of his faculty with no formal training or qualifications in computing – which Professor Bellamy attributes to Monash's readiness to pioneer the development of new academic fields.

"I was very privileged to have been able to work during a time of rapid discovery in a new and developing area of technology."

Professor Bellamy completed a PhD in Engineering at the University of Sydney before coming to Monash's Mathematics department as a senior lecturer in 1963, where his responsibilities included operat-



*Professor Cliff Bellamy was presented with an Arthur Boyd print at his farewell function last month.*

ing the university's first computer. The following year he became director of the Monash Computer Centre, a position he held until 1990.

He taught computing to staff, research students and professionals working in industry and commerce before there were any undergraduate courses.

In those early days, the most difficult people to teach were the academic staff.

"Getting professors and senior lecturers to change their ways and adapt to computers was challenging," Professor Bellamy said.

But despite the early difficulties, he believed Monash should be proud that it had been a leader in computer education from a time when computers occupied entire rooms and were only used for straight scientific calculations to an era where powerful information technology can be found in devices as small as a fingernail and computers run the telecommunications systems of modern countries.

"I've achieved a little, but together we've achieved a lot," he said.

Head of the Business Systems department Professor Rob Willis will be acting dean until a new dean is appointed.

BY JULIET RYAN AND GARY SPINK



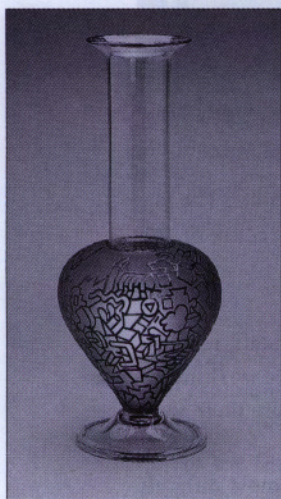
# Through the looking glass

**T**ony Hanning has become an internationally renowned artist by scratching bits of glass. Or so he would have us believe.

A man of intense passions and fierce beliefs, Hanning is surprisingly reluctant to attach too much significance to his glass pieces, preferring to call them decorative rather than meaningful.

Hanning, a masters student in Monash University's College of Art and Design, also prefers not to have his work over-analysed by others. "As soon as people start dissecting it, it's ruined."

Instead, he attaches meaning to the light that gives glass much of its beauty.



"The light gives the viewer a sense of 'being there', as opposed to a painting or photograph where the viewer can only get a sense of what the light was like at the time the work was created," he said.

"Glass has the ability to carry the viewer into a situation where light is manipulated so convincingly that it imparts atmosphere."

"The truth is that I scratch bits of glass ... it's precious because the glass carries light while other works of art only reflect it."

Senior lecturer in art and design and former president of Australian Association of Glass Artists (Ausglass) Bronwyn Hughes, however, believes Hanning's work is charged with meaning. His earlier pieces may be described as decorative, she said, but his latest pieces contain strong images that tell a powerful story.

"They may mean different things to different people, but there is meaning and a strong social comment."

Hughes described Hanning's work as "meticulous, graphic, very strong and getting stronger".

And it's hard to imagine that a man who lobbies newspapers to save a local forest, has learned sign language to communicate with the deaf, and stops his car to look at a

bird's nest by the side of the road would not use his art to make a point.

In an exhibition at the Distelfink Gallery in Armadale this month, Hanning is exhibiting a number of pieces that could be said to contain a social message.

One piece has an image of a beautiful woman looking through a window. On closer inspection, the viewer realises there is a gun hidden in a cupboard next to her.

"It's not just about violence," Hanning said, "it's about the potential for violence, about violence that is hidden in beauty."

Hanning is known to some as the 'grandfather of glass', having worked as a glass artist almost since the movement began in Australia in the late 1970s.

He has spoken at many Ausglass conferences, written articles about trends in glass art and is currently completing a masters thesis that challenges traditional views on the development of the glass movement.

"It's like he is always trying to teach us something," Hughes said, "and his main message is to take the pretension out of art."

"If he were a Democrat, I'd say he was trying to 'keep the bastards honest'."

Hanning believes the small number of glass artists in Australia has led to many receiving undeserved recognition and agrees with American glass artist Dick Marquis that: "The intrinsic beauty of glass ensures a success that should in no way be attributed to the skills of the operator."

"Glass has a natural beauty that no artist has a right to claim," Hanning stated.

He began his career as a painter, training at the Gippsland School of Art in the early 1970s, and became the youngest-ever gallery director when he was appointed director of the Latrobe Valley Arts Centre at age 22.

He said one of his greatest influences was training at the Gippsland school, which had a reputation as one of the most radical art schools in Australia at the time.

"The whole emphasis was on challenging things - nothing was taken for granted. For example we never had life drawing - it was considered perverse to have a woman take her clothes off in front of a classroom

full of dressed people who stare at her as if she were some sort of de-sexed object.

"It taught me always to question and challenge, something I am still doing today. But it doesn't make you very popular."

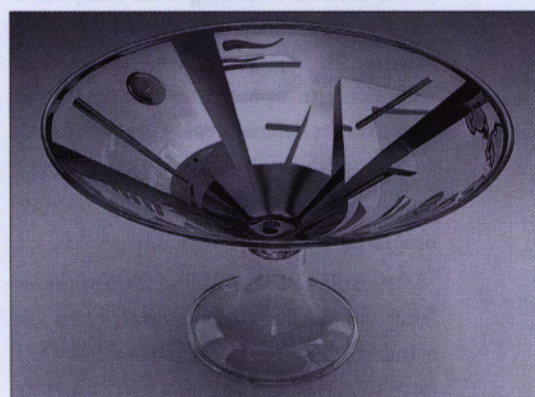
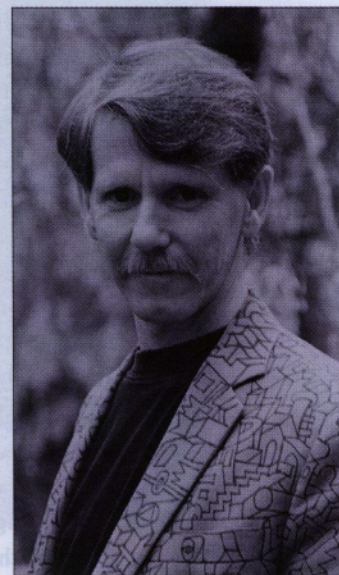
Hanning became interested in glass when, 16 years ago, he started working with a friend, Nick Mount, who was blowing glass. Mount, now a renowned artist, blew the glass and Hanning applied the images by cutting back through various levels of coloured glass.

The partnership proved very successful with the pair establishing the Budgerie Glass studio in 1982.

Hanning has retained his association with Mount over the years, and worked with him to make the vessels being exhibited at the Distelfink Gallery. The pieces have dark glass layered over light glass. Hanning engraved the glass, cutting back through the layers with a sandblaster. Some pieces were also rolled through 24-carat gold leaf to create a soft-bronzed glow.

Hanning's work is represented in every major Australian gallery and has been exhibited in New Zealand, Japan, China and America. He exhibits regularly at Distelfink, where he gave his first show in 1982.

BY GEORGIE ALLEN



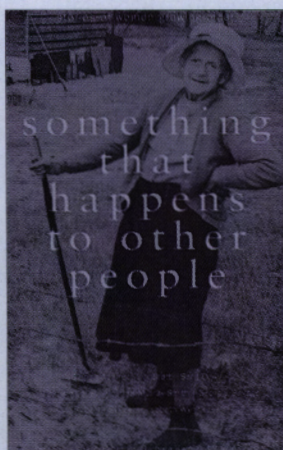


### Something That Happens to Other People

Edited by Susan Feldman, Barbara Kamler and Ilana Snyder

Published by Vintage

RRP \$17.95



This book includes eight stories, written by Australian women, which challenge traditional views of the experience of growing old. As a collection, the stories offer only one certainty: ageing is something that happens to us all.

The stories, a mixture of fiction and essays, offer moments in women's lives that disturb and unsettle, but also comfort and inspire. And while they do not ignore that ageing involves loss of loved ones, health and sometimes mind, they are singular in asserting that such loss is not self-defining.

"The beauty of the book lies in the range in which these women have responded to the complexities, the challenges and the fears associated with growing older," co-editor Dr Ilana Snyder said.

"A running theme is the connection between mothers and daughters. A lot of the writers talk about their relationships with their mothers and how they learned to face the future.

"There is warmth, tenderness and sadness, but there is also optimism," she said.

The stories come from some of Australia's best-known women writers, including Elizabeth Jolley, Roberta Sykes and Georgia Savage.

Ilana Snyder is a senior lecturer in Language Education at Monash University.

### Headhunting and the Social Imagination in Southeast Asia

Edited by Janet Hoskins

Published by Stanford University Press

RRP \$26.95

Taking heads from human victims and bringing them home to be ritually consecrated was a practice once widespread throughout Southeast Asia.

This is the first book to bring together comparative material on headhunting in a number of Southeast Asian societies. It examines the cultural context in which such practices occurred and relates them to colonial history, violence and ritual.

Janet Hoskins is a professor of Anthropology at Monash University.

### Out of the Shadows: Contemporary German Feminism

By Silke Beinssen-Hesse and Kate Rigby

Published by Melbourne University Press

RRP \$14.95

*Out of the Shadows* puts current German feminist thought into its historical perspective and relates it to international feminism.

The authors explore many issues concerning German feminists, including feminine aesthetics, theology and ethics, women's social and political responsibilities, and feminist critiques of enlightenment.

Silke Beinssen-Hesse is a lecturer in German and Kate Rigby a lecturer in German Studies at Monash University.

### Literature, Culture and Society

By Andrew Milner

Published by Allen and Unwin

RRP \$24.95

This book reinstates the centrality of literature to cultural studies. It makes a determined attempt to re-establish the con-

nections between literary studies, cultural studies and sociology.

Arguing against literary humanism on the one hand and sociological relativism on the other, this book is both an introduction to and an intervention in the major contemporary debates concerning the literary canon and its non-literary 'other'.

Andrew Milner is an associate professor in the Centre for Comparative Literature and Cultural Studies at Monash.

### Leadership

By James Sarros and Oleh Butchatsky

Published by Harper Business

RRP \$24.95

*Leadership* is an in-depth study of Australia's most successful and respected chief executives.

It documents their views on questions such as whether leadership is an innate quality or a learned skill, whether education and family upbringing influence the style of leaders and whether leadership differs from management.

Also included is a new model of leadership known as 'breakthrough leadership'.

James Sarros is an associate professor in Business Management at Monash.

### Novel to Film: An Introduction to the Theory of Adaptation

By Brian McFarlane

Published by Oxford University Press

RRP \$34.95

This book outlines a systematic agenda for comparing the rendering of the same set of events in two media. It also looks at how the novel's verbal concepts are transposed onto the screen's audiovisual moving images.

The book refers specifically to five novel/film case studies: *The Scarlet Letter*, *Great Expectations*, *Daisy Miller*, *Cape Fear* and *Random Harvest*.

Brian McFarlane is an associate professor of English at Monash.

All books in this column can be purchased in the Monash University Bookshop, Clayton campus.

## Hong Kong: the golden gateway to China?

From Montage 16

are a definite possibility. Even if it was conceded that the medium to long-term prospects for China are as astounding as so many pundits have been asserting in recent years, this would not be grounds for overlooking the dangers of interim crises. And even those longer-term prospects should not be taken for granted. China remains beset by daunting challenges and its ballyhooed rise to superpower status is often overblown. If it

stumbles, the concussive effect on Hong Kong, in particular, could be severe.

None of this should be taken as deprecating the remarkable economic potential of Hong Kong and much of China if things go well. It is simply intended as sobering advice not to be seduced by superficial market appraisals or wondrously extrapolated statistical curves. Hong Kong is, as Bill Overholt of BT Hong Kong puts it, "the point at

which the tectonic plates of China and the West most closely engage". That makes it the golden gate. It also means that its fortunes are built on a major fault-line, leaving them vulnerable to earthquakes and certainly to tremors. It has long been an abode of the nimble-witted and nimble-footed. Those qualities will certainly be necessary in the years ahead. Australians seeking to do business there will have to cultivate them to a high degree.



# Hong Kong: the golden gateway to China?

*Monash business lecturer Dr Paul Monk takes a look at post-1997 Hong Kong and warns that the transition to Chinese rule may not be as smooth as some would have us believe.*

Last year, a year in which Australian exports to Hong Kong grew by 18 per cent, the Hong Kong Economic and Trade Office was created in Sydney. In the last week of September this year, the Hong Kong Trade Development Council and new Hong Kong Economic and Trade Office, together with the Hong Kong Coalition of Service Industries, held a business forum in Sydney and Melbourne titled 'Hong Kong/Australia: Building a New Pacific Partnership'.

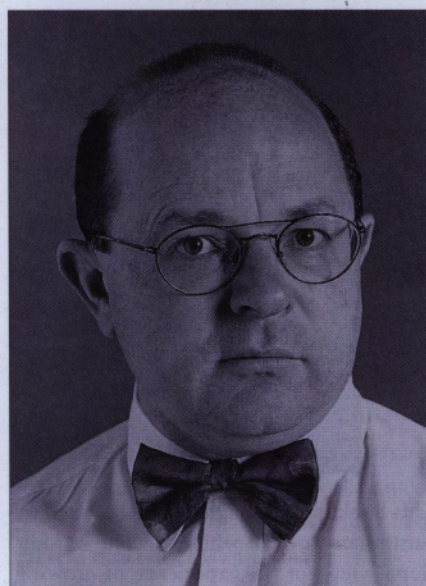
The forum was a promotional one in which the virtues and attractions of Hong Kong were advertised. The message, according to Governor Chris Patten's letter to the forum, was that "Hong Kong is the golden gateway to China". As we rapidly approach the return of Hong Kong to Chinese sovereignty in July next year, the critical question is: Will the golden promise of Hong Kong be spoiled by its return to Chinese rule?

This question has been so much debated since 1984 that it is becoming difficult to avoid cliché in commenting further on it. Yet from a business point of view, the question remains critical. For some time now, fear of annoying China or of creating panic among investors seems to have led many of Hong Kong's promoters to assert that nothing can go wrong, that the transition will be as smooth as silk. Those who suggest otherwise, starting with Governor Patten, are attacked by Beijing as saboteurs and Sinophobes. This sort of rhetoric simply will not do from a hardheaded business point of view. Hong Kong is, indeed, the golden gateway to China and has played a tremendous role in the rapid economic

development of China since 1979. It is very important that the much-vaunted Chinese market of "1.2 billion consumers" be put – and kept – in sober perspective.

Things *could* go wrong in Hong Kong after July next year and they could go wrong in China itself in the years ahead. There is a need to distinguish between the desire, widely or even universally shared, that things *not* go wrong and the possibility that they might nevertheless do so. The reason it is possible to assert with any confidence at all that things will not go wrong is that, since 1979, all the indicators of economic growth for Hong Kong have been very healthy indeed. By the early 1990s, Hong Kong business figures were declaring that they had done something which Britain could never have done – colonised another province of China. They meant Guangdong, of course, to which nearly all of Hong Kong's manufacturing industry has been transferred.

The synergy between China's growth and Hong Kong's boom since 1979 has been highly dynamic. But that synergistic dynamism has pivoted on Hong Kong's autonomy from China. Let there be no doubt, Hong Kong could not have become what it is had it been under Chinese rule before 1979, or indeed since 1979. It has been offered a high degree of autonomy since July 1997 for this very reason. Those with a stake in the "golden gateway to China" must realise that this fact – not gross statistical indicators of economic growth in China and Hong Kong – is the future of Hong Kong. It is the ball in the game. It is what to keep your eye on. The dissolution of the Legislative Council has



been promised. The United Democrats and independent activists have been declared *personae non grata* by Beijing. The Court of Final Appeal will be beholden to a political culture in Beijing addicted to arbitrariness and prone to power struggles. The flow of economic information, including sceptical and even damning reports about developments in China, vital to the effective functioning of capital markets, is something Beijing wants to censor. It will find this difficult, but its attempts could be damaging and have political reverberations in Hong Kong, which may spiral into crisis. These are very much non-trivial considerations and investors should heed them, not succumb to public relations promos.

Apart from the uncertainties regarding Hong Kong's internal affairs from next year, there are grounds also for uncertainty about the investment climate in China itself. It is seldom stressed that China remains a hard place to make money and an easy place to lose it. There are grounds for believing that, the economic reform efforts of Vice Premier Zhu Rongji notwithstanding, China is vulnerable to a major banking and property market crisis. So far, the reformers have been able to keep the growth going and the process of change in tolerable equilibrium, but no-one should underestimate the colossal strain the whole transformation is placing on China's physical, social, institutional and political infrastructure. Crisis and consequent upheaval

*Continued on Montage 14*