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MONTAGE

NEWS AND VIEWS FROM MONASH UNIVERSITY

Courts fail children on mental health

The Children's Court rarely takes mental health issues into account although they are significant in at least one quarter of child protection cases, according to a recent Monash report.

The report's author, social work lecturer Ms Rosemary Martyn, said magistrates did not have access to the necessary information to factor mental health concerns into their decisions about child placement.

Ms Martyn said mental health issues affecting parents in child abuse cases ranged from schizophrenia, a history of psychotic episodes and personality disorders to psychological problems arising from substance abuse.

She based her report, 'Is Child Protection a Mental Health Issue?', on three months' observation of cases in the Children's Court and analysis of court records.

In 25 out of 92 cases, Ms Martyn identified mental health problems as one of the major reasons for protective concerns about children. And yet mental health experts presented evidence in only two of the cases.

"Overall there were negligible references to specialist mental health information, and the expertise of mental health social workers was absent in both court reports and court appearances."

In one case, a schizophrenic mother of a neglected and malnourished two-year-old had not complied with court orders to use support services and join parenting programs. The court responded by ordering that the mother persist with the programs, without any discussion or information provided about schizophrenia or the impact it may have on the mother's parenting ability.

But Ms Martyn was reluctant to lay too much blame at the feet of the magistrates. "There is a tendency to criticise courts for not acting quickly enough, but you have to consider the way the adversarial system works.

"Magistrates can make decisions based only on the evidence provided and they cannot force parents to undertake psychological assessment," she said.

"The difficulty lies in translating welfare concerns to a legal framework. Child abuse issues are often ambiguous and don't fall neatly into the guidelines set by the legal system."

Some of the magistrates Ms Martyn interviewed thought an inquisitorial system may be more effective, allowing them to ask for certain information to be made available.

One magistrate reported: "I was powerless to obtain the material and information that I really needed."

Others felt that the evidence they relied on to make decisions was not helpful, and that child protection workers did not have the necessary skills to adequately assess mental health concerns.

Ms Martyn believes the solution lies in a more cooperative system, which would allow mental health workers to operate closely with child protection workers when cases needed to go to court.

Continued on Montage 2

Spike

Pull over, driver

The Victorian College of Pharmacy newsletter has reported: "After many years, and many kilometres, the wheels have finally fallen off the Tea Trolley: it has been declared unroadworthy and will be withdrawn from service. The decision to withdraw the Tea Trolley service was taken by the Management Committee after being advised by the caterers that its current low level of patronage made it uneconomic to continue. The usefulness of the Tea Trolley was also questioned at the research retreat in 1994 where it was held that it militated against the collegiality that could be generated from more staff gathering in staff rooms for morning and afternoon tea." It would seem the allure of the cafe latte is too strong for Lipton.

Give me home where the buffalo dance ...

And the prize for the most original activity at the mid-year orientation for international students goes to the Texas Rangers Boot-Scooters, who provided the instruction for the typically Australian tradition of line-dancing.

Closer encounters

One of the more bizarre topics discussed at a recent public lecture held at a Monash venue entitled 'Abduction to the 9th Planet' was 'Visits of other ET beings on Earth: Human abductions, tissue implants, immune system problems and experiments'. According to the promo, "there have been sightings of about 200 different races of ET beings, which are at a similar evolutionary level to humans (not advanced at all)". We were wondering how on earth the lecturer would know if the 'audience' were there voluntarily or if they had been whisked away from some intra-terrestrial location.

NOW & THEN

25 Years Ago

For five days and nights round the 1.6 mile ring road of the Monash campus ten school boys pushed an old hospital bed.

The rain, wind, cold and 20 aching feet were worth it, according to the students, because they broke the world bed push record. The boys covered 604 miles beating the old record – from the Guinness Book of Records – by 193 miles.

15 Years Ago

So – another year of memorial lectures and 'violent confrontations' has passed.

The much heralded visit of the British Prime Minister Mrs Margaret Thatcher passed virtually without incident.

Police estimated the number of demonstrators at 350. The *London Times* South East Asian correspondent put it at 200. Local scribes settled for 800.

5 Years Ago

A Monash researcher has produced a radical – perhaps definitive – explanation of the design and purpose of Stonehenge as well as other great prehistoric monuments.

Dr Neil Thomas says prehistoric circles in Europe and Ireland were built to observe the annual cycles of the Sun and the Moon, and functioned as giant calendars.

In his PhD thesis, he has described a pre-Celtic culture which had a sophisticated grasp of mathematical concepts usually credited to civilisations several thousand years younger.

This month last year

The study of a woman with a rare brain disorder has revealed a system in the brain which researchers believe subconsciously approves human action.

The two Monash psychologists and their Italian colleague said the approval system showed that the brain processed visual information according to predetermined rules.

The subject of the study – an Italian woman – has one of only 10 reported cases of a condition known as simultanagnosia. Her central vision is only aware of one object at a time, even when there are two or more in her view.

Courts fail children on mental health

From Montage 1

"Child protection is not currently seen as a partnership between professional groups, including the court, which would allow for greater cooperation. This would mean child abuse could be seen in a broader context than the current socio-legal system allows."

She said magistrates were influenced by an overriding community ideology that children belonged with their parents.

"The community is still ambivalent about children being removed and is not generally supportive of courts and protection workers when they remove children from their parents."

Ms Martyn said the rights of the parents often took up more time in a case than the protective concerns of the child. And while many parents agreed in court to report to parenting programs and allow authorities regular access to the child, those with mental health problems would often not follow through.

"Courts spend a long time negotiating a compromise in the belief that a child should remain with its parent, but they are often not informed that a mental health problem can make it difficult for that parent to keep their end of the bargain.

"Also, courts are fault-based, and magistrates are reluctant to make a decision based on the likelihood of a parent abusing its child – even if that parent has had several other children removed because of long-standing and continuing mental problems."

BY GEORGIE ALLEN

MONTAGE
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Setting sights on space-age software

Monash software engineers and CSIRO are using leading-edge object technology to reverse engineer and upgrade observatory software for the Australia Telescope National Facility.

Head of Monash's Department of Software Development Professor Heinz Schmidt, who is leading the Monash team, said the researchers would rewrite the facility's 'legacy' software system with a new generation of software based on object technology.

Object technology has changed the face of software design from the traditional legacy software systems developed in the mid-1970s and is increasingly being used to upgrade computer systems.

"These new object systems are technically superior to the old legacy systems, providing more open and accessible networks in which objects (software components) can effectively communicate or inter-operate to perform basic tasks as well as highly specialised functions," Professor Schmidt said.

The CSIRO enlisted the Monash team, which includes co-researchers Dr A. S. Sajeev, Mr Damien Watkins and several PhD students, for its expertise in object technology and reverse engineering.

According to Professor Schmidt, reverse engineering is essentially a bottom-up software design process in which the old or existing software system is broken down and its software components rewritten one at a time.

The process enables a mission-critical distributed environment such as the observatory to continue functioning while software components are redesigned, validated, integrated or replaced. This requires highly fault-tolerant software components.

"A key part of the re-engineering process involves identifying or rediscovering the objects within the existing software system. These objects are then rebuilt into a new system that is more flexible and has enhanced capabilities," he said.

International scientists, including those at NASA, use the facility's powerful radio telescopes to study the universe and research the evolution of stars and galaxies.

The transition to object technology involves a radical shift away from the typical monolithic legacy software architecture to software systems based on dynamically changing clusters of collaborating objects.

Professor Schmidt said it was expected that the software systems of the future would operate as 'agents', which would be made up 'societies' of very small, intercooperating objects. These objects would be able to travel the network and 'dock' to larger server objects, where they would be able to find, exchange, condense, update and retrieve data.

Another key benefit of moving to an object-oriented system, according to Professor Schmidt, was the substantial increase in the lifespan of software systems.

"Once the transition is complete, organisations can modify their software, continually adding new technologies on demand without the need to shut down any major functions or operations," he said.

"By using the reverse engineering process, organisations can avoid the expense and inconvenience of shutting down their software systems during the transition."

Reverse engineering works in three stages. The first stage identifies the object components of the existing systems, which can be recycled or transposed into the new system. The second stage breaks them free from the monolithic legacy structure. The third stage integrates these components into an open software system with interfaces – often described as the glue – that provide for the improved overall system accessibility, functionality and maintainability.

In the telescope project, the Monash researchers plan to implement a CORBA (Common Object Request Broker Architecture) compliant system. CORBA is one of the two world standards for defining interfaces currently competing for international prominence.

CORBA is commonly referred to as the 'middle ware' that creates a common standard for receiving and activating messages within a network. "In effect the CORBA platform becomes the backbone for communication within a software system," Professor Schmidt said.

The Monash team's expertise in object technology and reverse engineering stems from its involvement in several major research projects specialising in object technology.

The team was also recently awarded an Australian Research Council grant for a joint research initiative with Newcastle University to study advanced areas of re-engineering.

And the Monash Software department hosted the Asia Pacific leg of the annual international TOOLS Conference in Melbourne recently, which brought together Australian and international experts who are shaping the future of object technology.

By Brenda Harkness

Logan's legacy

On the eve of his retirement, Professor Mal Logan speaks to Gary Spink about his 10 years at the helm of Monash and his predictions for the future of tertiary education.

What were your main goals when you took over as Monash's vice-chancellor in 1987?

ML: I wanted Monash scholarship to be recognised as being of the highest possible quality. This has been demonstrated recently by our success in the quality reviews and by our admittance to the 'group of eight' top research universities.

I also wanted to improve access to the university and we've achieved this through programs such as Open Learning, a wider choice of courses and through our expanded international operations.

Our greater student diversity is a measure of this improvement. Apart from the increase in international students, we now admit many more students through special programs.

This has opened Monash's doors to more students from disadvantaged backgrounds, although this probably hasn't gone as far as I would have liked.

What is the most significant difference between higher education today and when you took on the role of VC?

ML: Universities are now involved in mass higher education. That's a welcome change because it's provided access for many more young Australians.

The second major difference is the cultural and structural change that has made institutions more outward looking and responsive to market forces. At Monash, this is reflected in a greater diversity in our research, courses and students.

We now talk and interact in ways we never did before with schools, business and foreign governments. We have absolutely torn down the 'ivory tower'.

It could be argued that today's students are conservative, and have become less interested in being agents for change.

ML: Students do seem to have found it difficult to have got on to big issues over the last 10 years. There really hasn't been concerted student action on anything very much, even on the recent increases to HECS.

You almost sound disappointed.

ML: I think students have played an important role in the past – the Vietnam period is the most obvious example – and I believe strongly in an active student organisation.

At Monash we have 42,000 students spread over six campuses, and potentially they are a very powerful voice if the various campus student bodies unite to comment publicly on issues of public concern.

What are the most important changes you have overseen at Monash?

ML: I'd put Open Learning at the top of the list. I'd also rate very highly the work we have done recently on using information technology in education.

Thirdly, I'd nominate the way we've developed interfaces with outside groups, and the community resource we've become in fields such as the arts.

And I hope we've made Monash a caring institution. I'd like to think that staff have confidence in how the university has tried to create the best environment for their teaching and research, and I hope that students recognise the extra attention we have placed on teaching.

I'm also pleased that we have kept a Koorie research centre and MOSA going for the last 10 years. These demonstrate the university's recognition of the first inhabitants of the land, and I put a lot of value in that.

And of course our internationalisation program has been important, but I wouldn't necessarily rank it as the highest achievement of the past decade.

It's probably the one that Monash has become best known for.

ML: Yes, but I'm more pleased about the other things that internationalisation has allowed us to achieve. It has been an agent for the cultural change inside the university – an understanding that we are in a wider world and that we have to understand it and participate in it.

Nevertheless, internationalisation continues to provide enormous opportunities for Australian education, and there is not the slightest doubt that we need to keep that momentum running inside Monash.

The only thing that can destroy it is a developing perception in Asia, which has resurfaced in recent times, about Australia being ethnically an uncomfortable place to be in.

That carries an enormous threat to Australian education, and for the first time in 10 years I'm genuinely worried about that perception.

Why is the work we're doing with information technology in education so important?

ML: With the development of new communications technologies such as interactive pay-TV and the Internet, universities are on the verge of an unprecedented era of change. Truly great universities must continue to adapt to the new technologies.

Some people argue that universities have existed for 900 years in their current form and that there is no reason to change. I agree that we must not divert from the pursuit of truth, intellectual freedom, and the highest levels of scholarship, but the point is that technological change is inevitable.

Students once learned about the latest academic theories second or third hand. They can now surf the Net to hear and see them directly, and don't need to rely on the physical resources of a campus library.

The way universities deliver courses will change fundamentally over the next decade. Banking, communications, law and other services have become global processes, so it's inevitable that the same thing will happen in the 'knowledge industry'.

The danger is that universities, with huge capital investments and outdated cultures, will respond too slowly to the new opportunities.

Presumably Asia's rapid economic growth will accelerate the process?

ML: No doubt. There are Asian economies where the per capita income is doubling every seven years – never before in history have we had growth like that.

Education is needed to underpin that growth, but you would have to build a new campus every year to keep up with the enormous demand.

There has to be an alternative way of delivering education, and electronic information technology is one.

I know there are difficulties, but I also know that some big US media companies are seriously looking at using their interactive services for mass education.

Universities in North America and Europe also recognise that the global university is just around the corner and are positioning themselves for it.

Monash is ideally placed to take the lead, and it would be tragic if we didn't. This technology removes any geographical advantage we had over universities in other parts of the world.

There is a huge range of factors that we need to consider, such as understanding the different cultures in which we will be teaching, and the differences in how students learn.

But I see all of this as the next stage in internationalisation.

Has Monash grasped that it is on the cusp of such a significant development?

ML: No, it hasn't. But the good thing about Monash is the willingness that staff have developed to engage in change.

Because of our staff loyalty and the competitive culture we've introduced, people are willing to respond to new opportunities and seize initiatives. That is probably Monash's greatest characteristic.

I'd like to see all staff sit in Berwick's new lecture theatre and take a look at how it works. I've done it, and it's a great experience. The interactive video facilities we have there are world class.

What other major changes does tertiary education face in the next decade?

ML: There has to be a cultural change in the way we interact with the corporate sector. Government funding will continue to be cut, and I don't think you can raise enough money from student fees, so the only alternative is to raise more from the corporate sector.

The problem is Australia's corporate sector isn't used to giving like they do in the US. Our companies don't receive the same prestige and public recognition for being good corporate citizens.

So it seems to me that universities will have to invite people to take shares in corporatised entities within universities.

A lot of our research is oriented towards immediate and practical outcomes, and I believe these activities could be put together in packages that would attract, and provide a return on, investment.

Obviously you would have to closely monitor this so there wasn't any commercial threat to intellectual freedom, but I think there are parts of Monash that could respond to this.

Universities could also become vital resources for regional development by helping local companies develop the competitive advantage they need to survive in an increasingly international marketplace.

What's been your toughest job over the last 10 years?

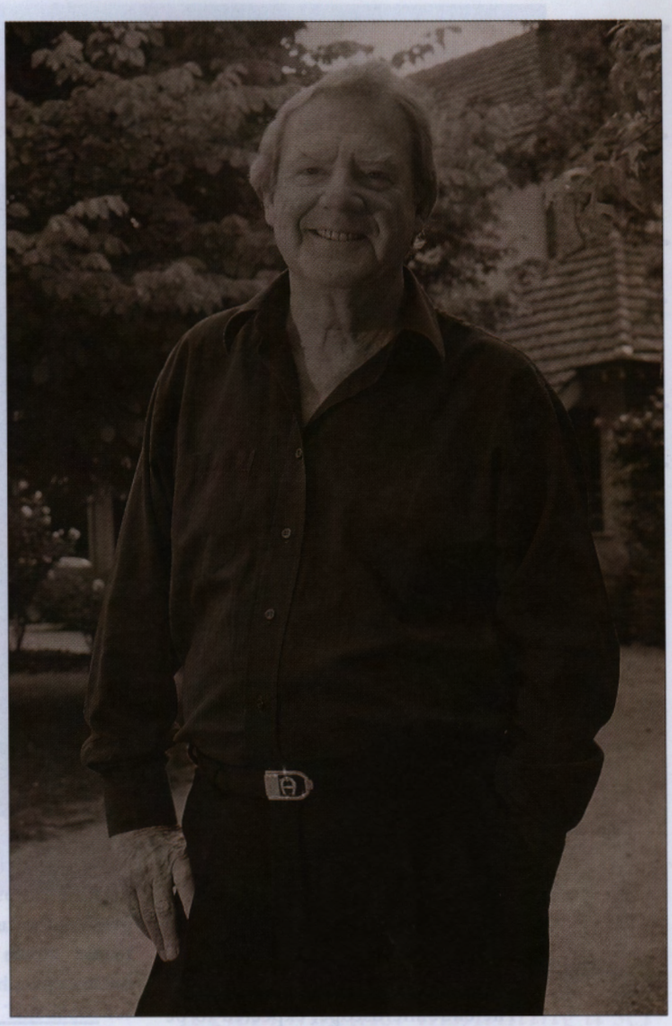
ML: The mergers, without question.

I think we did it very well, and much of the credit is due to the deans, the Monash Council and the chief executives at our colleague institutions.

We developed a high level of trust between Monash and the colleague institutions, and this made the mergers possible and successful. They were done properly and decently, and we've created a better institution overall and improved the quality of what each individual institution offered.

Is there anything you would have liked to achieve, but didn't?

ML: My biggest regret is that we haven't been as successful as I would have liked in appointing and promoting women.



With the exception of my adviser Elizabeth Anderson, we have never had a woman in the senior administration, and we only have one female dean.

What are your plans after Monash?

ML: I may do some work for other universities, advising them on their international activities, and I'm pleased that the Monash Council has asked me to continue to chair the board of Open Learning.

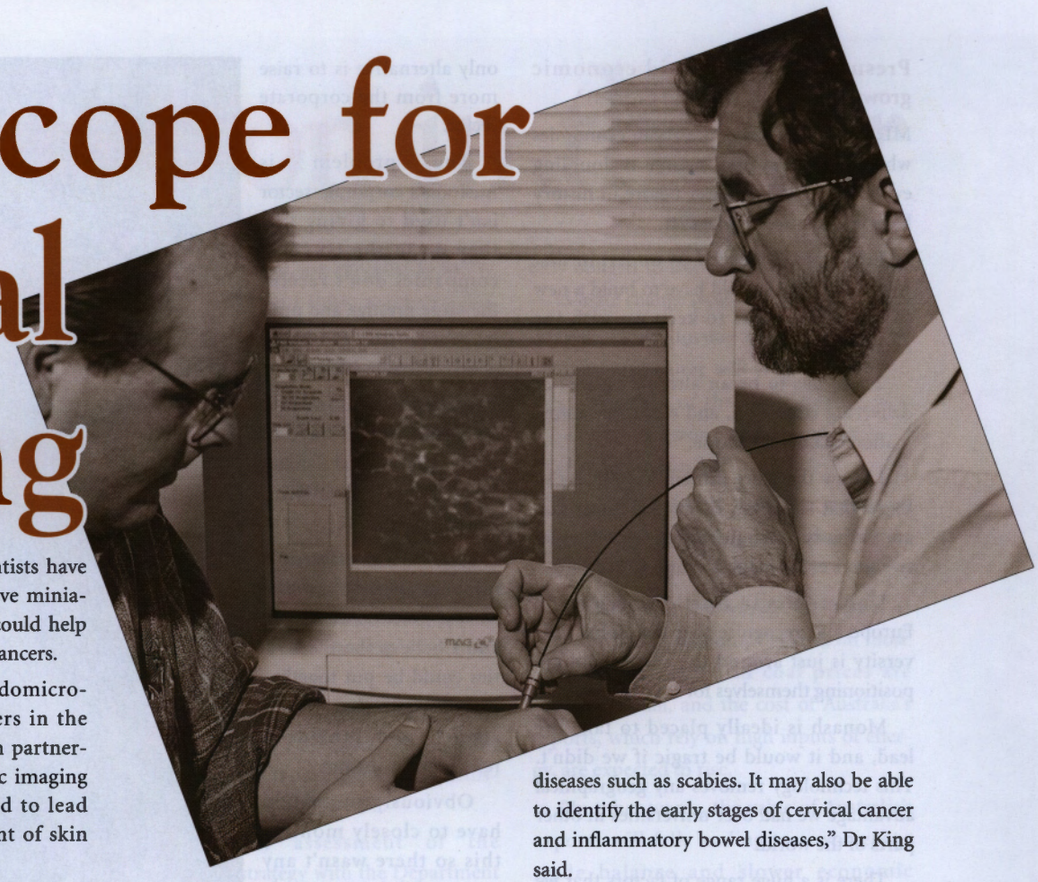
Toni and I will continue to live in Melbourne, but we'd like to spend about four months a year at our house in France, in the hills near Nice.

I would also like to spend some time writing about the role of local communities in a globalised world, and how education will develop in the Asia Pacific region through the use of information technology.

What about a book on your life in Provence?

ML: A book with observations about that part of the world is a good idea, and that's in the back of my mind.

New scope for medical imaging



Monash University scientists have developed an innovative miniature microscope that could help with the early detection of some cancers.

The fibre optic confocal endomicroscope, developed by researchers in the Department of Pharmacology in partnership with Dandenong fibre optic imaging company Optiscan, is expected to lead to early diagnosis and treatment of skin cancers.

Monash pharmacologist and researcher Associate Professor Roger King said the endoscope provided for non-invasive examination of skin tissue up to a depth of one millimetre.

The endomicroscope, expected to be commercially available within the next few years, could replace biopsy procedures, the conventional way of examining tissue.

Dr King said the non-invasive endomicroscope used a single point of light, emerging from the fibre tip, which could be focused to a point under the surface of the tissue sample.

"The returning light from this point is picked up by the fibre. A two-dimensional image is then built up by scanning the single point of light in a pattern similar to that of a television screen," he explained. "It enables sub-surface microscopic imaging inside the body for the first time."

Three-dimensional images can also be 'built up' by scanning the sample area at different levels.

While the technology is still in its trial stages, it has been tested on the skin in hairless mice, with favourable results. It has also been used to study how blood pressure drugs affect animals.

Dr King said that currently patients with potentially cancerous lesions of skin and some other tissue had to endure often painful biopsy procedures. A biopsy involves the cutting and removal of body tissue, which is then examined under a microscope.

The non-invasive endomicroscope enables sub-surface microscopic imaging inside the body for the first time.

"Apart from the possibility of some amount of pain and discomfort accompanying a biopsy, it is an invasive procedure and leaves the patient exposed to a greater risk of infection," Dr King said.

As well as being a diagnostic tool, the endomicroscope had potential to provide patients with immediate results from their medical tests. With conventional biopsies, patients sometimes have to wait several days for results.

"Other potential medical applications include examining damage received by burns sufferers and assessing infectious diseases such as scabies. It may also be able to identify the early stages of cervical cancer and inflammatory bowel diseases," Dr King said.

"As well it has industrial applications in areas that require three-dimensional monitoring of silicon chips."

Dr King has been involved in developing the miniature microscope for almost seven years.

He started work on the project in partnership with Monash PhD student Peter Delaney, who won an Australian Postgraduate Research Industry Award. Dr Delaney is now managing director of Optiscan, the company started specifically to develop the endomicroscope.

A fibre optic benchtop confocal microscope developed by Dr King has been commercially available worldwide for several years. But this was too bulky to allow imaging inside the body.

"The endomicroscope is less bulky and more flexible than a traditional confocal microscope," he explained. "It will give us the opportunity to examine parts of the body such as the back that cannot fit under a conventional microscope."

The prototype of the new endomicroscope was designed about two years ago and is currently being refined. "The smaller it is the better, and the optic fibres provide us with the technology to minaturise it."

By Juliet Ryan and Brenda Harkness

Automated justice

A leading Australian criminal law expert has called for new legislation in Victoria to cope with the growing incidence of on-the-spot fines.

Professor Richard Fox, of Monash University's Law School, said a comprehensive legal framework was needed to define the class of offences designated as infringements and to clarify the scope of enforcement, prosecution and penalties.

His call follows a first-ever study, funded by the Criminology Research Council, to examine the extent and use of on-the-spot fines in Victoria.

Professor Fox analysed statistics kept by police, 120 Victorian municipalities and other government agencies to profile the trends and issues arising from the rapid growth of high-tech automatic detection, such as speed and red light cameras, and fine-processing methods.

Continued expansion of on-the-spot fines, facilitated by new detection and processing technologies, raise serious questions about fairness and surveillance.

On-the-spot fines have become the most common way of punishing offenders for a range of mostly minor offences, including parking, speeding, drink driving and litter infringements.

The Monash study indicates that more than 1000 offences are dealt with by on-the-spot fines in areas such as road safety, health, environment, animal control, and some areas of business reporting.

"About 88 per cent of offences are now dealt with as on-the-spot fines, with more than 2.3 million infringement notices issued in Victoria during 1990–91," Professor Fox said.

And while on-the-spot fines served as an important means of social control and diversion from court, their development within the criminal justice system had been ad hoc, he said.

"Currently in Victoria there are about 18 separate Acts which permit the issue of notices by a range of authorities, including police, municipal officers and other government departments."

And although this method of fining was originally developed to keep offenders charged with minor offences out of the court system, it has been expanded to take in more serious offences. These include some traffic offences, in which offenders face more severe punitive measures such as the automatic loss or suspension of driving licences and the recording of a conviction.

In South Australia, on-the-spot fines now cover minor drug offences such as possession of cannabis, although this form of penalty has been rejected by the Victorian Government. And in other jurisdictions, on-the-spot fines have also been considered for offences such as public drunkenness and shoplifting.

Professor Fox said continued expansion of on-the-spot fines, facilitated by new detection and processing technologies, raised serious questions about fairness and surveillance.

"There is an increased risk that the system will be driven by revenue rather than crime control considerations," he said.

The Victorian data also shows that local government authorities, rather than the police, are the main issuers of infringement notices, having given out more than half (56 per cent) of those issued in 1990–91. Most were for parking offences.

Professor Fox said local government authorities had recently sought wider powers to issue on-the-spot fines for traffic offences committed in their areas and to use speed cameras and other detection equipment. So far these moves have been strongly resisted by police.

But he believes that given the greater interest in and use of detection technologies, the Victorian Government should move to clarify who should be empowered to issue on-the-spot fines.

"The existing pieces of legislation need to be consolidated into either a single Contraventions Act or an Infringements Act, which would establish which crimes they should apply to, the penalties and the consequences for non-payment, and who should have access to the technology."

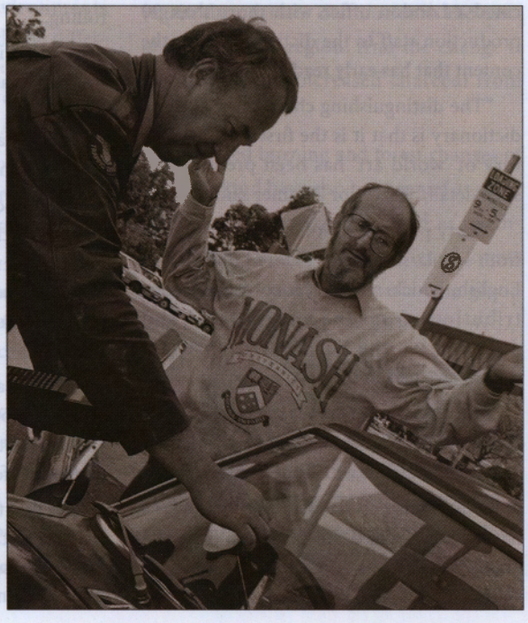
Professor Fox said on-the-spot fines had generated only moderate debate compared with debate relating to serious crime.

"But its increase has produced a vision of an automated and depersonalised criminal justice system in a society where surveillance is becoming more common – something many people find disturbing."

Victoria was examined in the study because it has led the way in Australia with technological innovations and offender-processing systems. It now plans to introduce new detection mechanisms for toll roads.

BY BRENDA HARKNESS

Criminal Justice on the spot: Infringement Penalties in Victoria is published by the Australian Institute of Criminology. RRP $30. For details, telephone (06) 260 9256.



The lexicon of world art

Jenny Zimmer agrees that a publisher would have to be crazy to take on a project like Macmillan's *The Dictionary of Art*, but says the work has given the world one of its most significant records of art history.

The Monash professor of fine art managed the Australian and New Zealand aspects of the 34-volume publication, which was the culmination of 16 years' work by more than 6700 leading scholars in 120 countries.

"I don't think we'll ever see a work like this produced again," she said. "Publishers these days aren't keen to set aside $60 million for any project, no matter how significant it is."

The huge production cost of the work, which was touted at its recent Australian launch as the most comprehensive history of world art ever conceived, is reflected in the dictionary's $11,500 price tag.

But the cost hasn't deterred strong global sales of the first print run, with university libraries included among the best customers.

"Most Australian universities have ordered at least one set," said Professor Zimmer. "And yes, Monash has ordered a couple."

While it's easy to be overwhelmed by the sheer size of the project (Macmillan dedicated a London office with more than 90 production staff to the dictionary), it is the content that has early readers most excited.

"The distinguishing characteristic of the dictionary is that it is the first time the history of 'world art' has been presented in such detail," Professor Zimmer said.

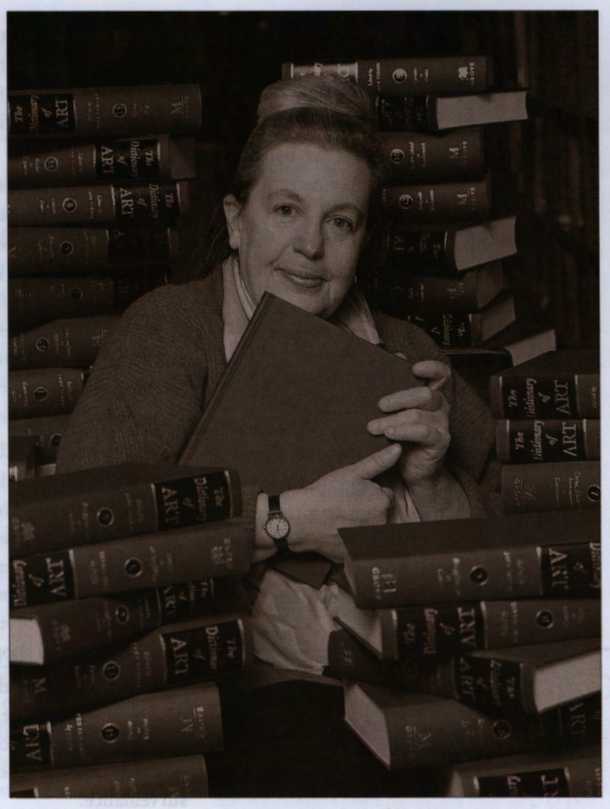
"Forty per cent of it has been translated from scholarship never before published in English, which means it incorporates contributions from the entire world and doesn't have the Eurocentric thrust it might have had in the past."

The dictionary covers visual arts of every civilisation, but does so within the cultural context in which they were created.

"Since postmodernism, art historians have contextualised their research with reference to all sorts of diverse strands surrounding the arts, ranging from materials and methods to the cities and countries where the work was produced," Professor Zimmer said.

"This is a dramatic change from the much more narrow definition of art historical study we used 15 years ago."

The resulting volumes detail every art medium from painting, sculpture, drawing and architecture to the decorative arts, industrial and graphic design, photography, performance art and multimedia.



And the 41,000 articles don't just cover styles and movements, but also extend to biographies of artists, theorists, critics, patrons and major collectors.

To make sure *The Dictionary of Art* wasn't dated by its lengthy production time, Macmillan allowed authors to revise their work virtually until the presses started rolling.

And while it would be easier to keep the publication updated if produced on CD-ROM, Professor Zimmer said the project began before the escalation of the electronic medium.

"Even today, issues surrounding the cost of reproducing images in electronic media have never really been sorted with museums, so there are no current plans to take the dictionary beyond book form," she said.

Her occasional involvement with the dictionary began a decade ago, and eventually led to the management role she has performed for several years.

She had the sometimes daunting task of liaising with the 160 arts scholars from Australia and New Zealand who contributed entries to the dictionary and organising a symposium of international scholars at the National Gallery of Victoria to celebrate the publication's Australian release.

Professor Zimmer believes her appointment reflects the publisher's aims to produce a truly global perspective of art.

"During my 30 years of teaching art history at a tertiary level, I've been enthusiastic about the arts of the world rather than the European-oriented art history that has been the focus in Australian universities until quite recently."

She was concentrating on Pacific and Aboriginal cultures back in the mid-70s – long before it was mainstream in Australian universities – and found that art students were inspired from sources outside Western cultures.

"The dictionary interested me because it was attempting to broaden the same horizons, but on a scale that had not been attempted before."

By Gary Spink

Ancient seabed discovery rewrites human history

Monash geographers have found indications that Australia may have been occupied by humans 200,000 years ago – about 150,000 years earlier than previously thought.

Pollen researcher Dr Sander van der Kaars and postgraduate student Ms Xuan Wang have discovered that a core of ancient sediment from eastern Indonesia contained Australian pollen and charcoal.

Carried across the ocean by wind and currents, the particles reveal a dramatic change in vegetation and a region-wide increase in charcoal – both indicators of human habitation – about 190,000 years ago.

The work supports the recent announcement that stone tools and rock art found at Jimnium in the Kimberleys may be as much as 176,000 years old.

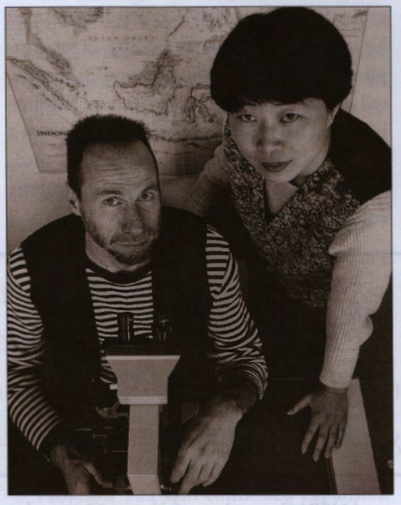
Dr van der Kaars said that although he knew his work was convincing, he did not think his revised dating of Australian human habitation would be accepted in archaeological circles until there was proof of human artefacts.

He said it was impossible to tell from his work whether the human inhabitants were *homo sapiens* or at an earlier stage of evolution, but that they would have had to travel to Australia by boat or raft, indicating a certain level of intelligence.

The ancient sediment was from a nine-metre deep cylindrical sample taken from just below the seabed which showed sediment from 300,000 to 2000 years ago.

Cores are a standard feature of oceanographic surveys. They represent a time sequence of deposition – the deeper the sediment material, the older it is.

After they are retrieved, the cores are carefully stored in lengths of about one metre. For pollen work, Dr van der Kaars said, a sample of about three cubic centimetres was enough to type the vegetation at any level or age. The pollen grains are



extracted, concentrated by chemical techniques, and identified under the microscope.

Studying ancient pollen provides a wealth of information. The changes in forest species over time, recorded in the pollen they shed, can be used to construct past climates and ocean conditions and currents.

Different groups of vegetation types are characteristic of different environments and regions. It is possible to tell the difference, for instance, between pollen which originated in the Indonesian archipelago and pollen which blew in from Australia.

Dating the cores is crucial to Dr van der Kaars' work – and that is where Ms Xuan-Wang, an expert in chemical analysis, comes in.

The cores generally span several hundred thousand years. The top 40,000 years or so can be dated using radio-carbon techniques using the decay of the radioactive forms of carbon as a clock. For the complete time span recorded in the marine cores, ages are provided by the ratio of different stable isotypes of oxygen incorporated in the shells of planktonic *Foraminifera.*

Ms Xuan analyses the charcoal or elemental carbon content of the cores. This information can be used to obtain an idea of the extent of vegetation burning at a particular time, as well as the different kinds of vegetation, such as forests, sedges and grasses. Each vegetation type incorporates a unique mix of different stable isotypes of carbon. In this way, analysis of the charcoal can give a broad picture of what vegetation is being burned.

In other recent work, the researchers have found strong evidence that changes in land-use about 37,000 years ago in eastern Indonesia and northern Australia – and probably associated with human migration – were much more widespread.

This new data, from an analysis of fossil pollen from the Banda Sea between West Irian and Sulawesi in eastern Indonesia, shows the vegetation in that area and in north-western Australia changed significantly at the time. For instance, a prominent group of tropical hardwoods, the Dipterocarps, almost disappeared, never to regain their former dominance in the eastern Indonesian region. And the change is associated with increased charcoal from burning.

Increased burning and forest changes of a similar kind have also been found at other sites in the region, as far afield as north-east Queensland. But there, different forests species, particularly Araucaria (the group that includes the hoop pine), are involved.

Dr van der Kaars, who has become a noted pollen analyst in the past decade, is one of the university's inaugural Logan Fellows. He has been appointed a research fellow in the Department of Geography and Environmental Science, and the fellowship will help fund his research for the next three years at a rate of up to $20,000 a year.

Information technology:

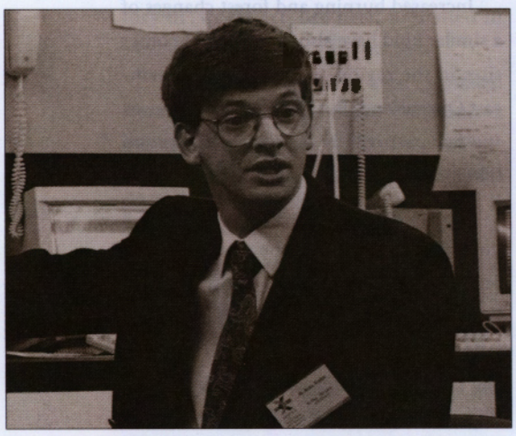
A Monash-based research group is making multimedia dreams come true. Tim Thwaites reports.

Imagine entering the staff room for a cup of tea on your morning break. At the other end of the room a colleague is reading the morning paper. She looks up and greets you. You exchange small talk about last night's cricket before getting into a more serious discussion about laboratory equipment. The scene is all quite normal – except that she is actually sitting at another worksite, 20 kilometres away.

With the latest improvements in video conferencing, such a virtual staff room is becoming technically feasible. What it would require is a screen the size of a wall in each of two staff rooms. Onto each screen would be projected a life-size picture of the other staff room. But the speed of data transfer between the two sites would have to be so quick that movement seemed natural, not jerky, and sound synchronised with it. It's all possible. It just has to be made practical.

And that is what the Advanced Network Systems Performance and Applications Group (ANSPAG) at Monash University is all about – making the promise of combining multimedia with the information superhighway come true.

In practical terms, this involves pushing enormous amounts of information around computer networks at high speeds. And the two areas of application on which the group is working are video-on-demand and high quality video conferencing. "Our suppliers, many of whom are from California, tell us our applications are pushing the limits of available technology," the group's deputy director, Dr Bruce Tonkin said. "They constantly need to upgrade their equipment for us."



Dr Bruce Tonkin.

"Our suppliers tell us our applications are pushing the limits of available technology … They constantly need to upgrade their equipment for us."

ANSPAG consists of about 10 people, working in at least five different areas. These include research into the two applications, testing network communication products, looking at new ways of monitoring electronic traffic, and trying to simplify the interaction between computers and people. The group is a joint venture of Telstra, Siemens and Monash University, and coordinates the Research Data Network Cooperative Research Centre which has two other parts managed from ANU in Canberra and the Queensland University of Technology in Brisbane.

ANSPAG business manager Will Morton said the group had already notched up some notable successes. For instance, working with other groups at Monash, ANSPAG was involved in the development of a system capable of compressing and distributing high quality video across a network. The technology, which is marketed worldwide by Siemens, is an important part of making video-on-demand possible. At present ANSPAG is conducting a trial of one of Australia's first video-on-demand systems, known as McIVER (Multicampus Interactive Video Education Resource).

As far as video conferencing goes, the group demonstrated its expertise by establishing a link between its Monash laboratory and the recent Interact, 96 multimedia conference at the Melbourne Exhibition Centre. Visitors to the conference could test for themselves how far the technology had come – no appreciable delay between voice and picture, and a loss of the jerkiness associated with current forms of conferencing. Video-on-demand was available over the link as well.

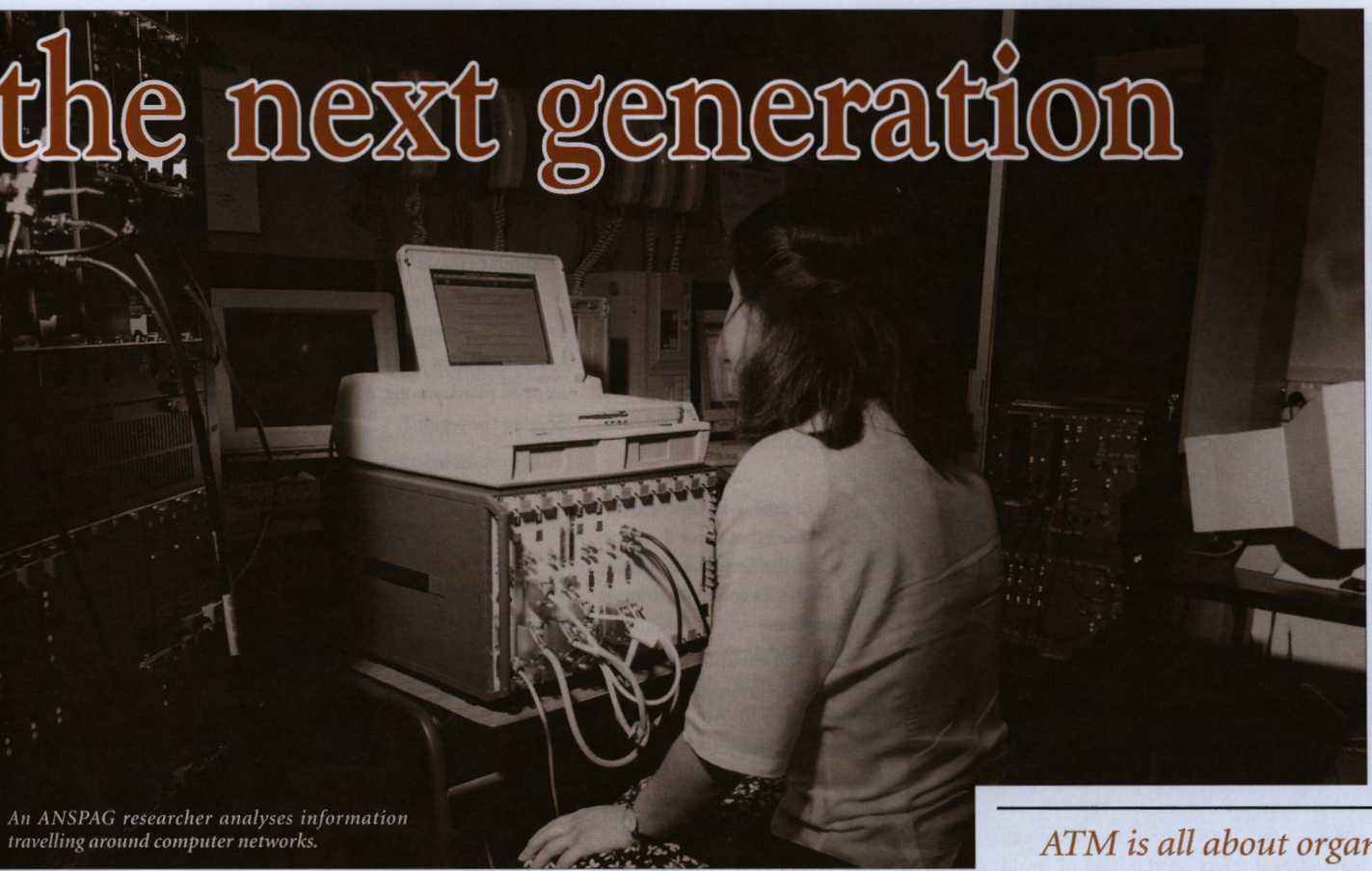
Dr Tonkin said ANSPAG was trying to combine the best features of two different approaches. One approach focused on making the best possible use of the existing digital (ISDN) technology. The limited capacity for transmission meant the video component tended to be stilted and the voices delayed by at least half a second, but this was offset by adding other useful features to make the system work, such as clearer voice transmission. The second approach was to make the picture more natural by using modern high speed transfer technology.

Part of the solution to transmitting mixed media, such as sound and video, was the use of a new set of technologies for moving information around networks, known as ATM (asynchronous transfer mode). ATM is all about organising packets of information to travel around the network in a more logical manner instituting a set of road rules to control the information traffic.

Traditionally, all the packets of information travelling along the same channel – be it wire, optical fibre or microwave – simply proceeded in the order in which they entered the channel. But some forms of information, such as those associated with vision, are naturally processed by humans at a much higher rate than other forms, such as sound. In the traditional (synchronous) modes of transfer, however, all packets were treated equally, meaning those that needed to travel faster could be held up by slower moving information.

One way of coping with this problem was to give each kind of information its own exclusive pathway, but that was not an efficient use of the capacity or bandwidth of the information channels connecting two points. ATM manages the packets themselves to give video packets preference

the next generation



An ANSPAG researcher analyses information travelling around computer networks.

– because they have to be immediate – over packets containing sound information, which in turn have preference over packets containing data.

With its McIVER system, ANSPAG is using ATM technology to provide video-on-demand at Monash University over a variety of networks connecting three campuses. Computer terminals in the libraries on the Clayton, Berwick and Caulfield campuses are linked to a video server in the ANSPAG laboratory by means of optical fibre, microwave and Telstra's experimental broadband network respectively. But these links are not just one way – they are interactive.

They allow students to call up a video, and then operate it remotely, like a tape, playing, rewinding and fast-forwarding. And the same video can be reviewed individually by several students at several terminals at the same time. The system is already being used by 120 visual arts students studying documentary film. Through it the students have access to 12 hours of film.

The heart of the video-on-demand system is its server – a computer with access to a series of discs in parallel. The videos themselves are not stored on any one disc, but 'striped' between all of them – bits of any one video are distributed in an ordered way between all of the discs. This allows for faster access than on one disc, because the heads of all the discs can act in concert.

Dr Tonkin said that systems similar to McIVER could be installed into businesses right now and be used to provide an array of training material. Strangely enough, he said, the biggest impediment was copyright. "The film and video industry has not yet come to terms with on-line access to video."

Video-on-demand at a company and even at a university is circumscribed. There is a limit to the number of viewers and a finite amount of video material to be requested and watched. Even so, the amount of information to be stored is large – about 1000 megabytes for each hour of video. At present ANSPAG is studying the most efficient ways of scaling up the McIVER system, whether it be lots of small servers, a few large servers, or a system which relies on having the most requested items loaded on the server discs with less frequently requested material in a secondary storage system elsewhere. As the technology stands at the moment, it is clearly not cost-effective to construct a full-scale open-ended video-on-demand system from which millions of telephone subscribers could choose thousands of videos. It would need too much storage space.

ATM is all about organising packets of information to travel around the network in a more logical manner instituting a set of road rules to control the information traffic.

As the information providers gear up for a future using ATM to distribute information in multiple media, new equipment is being developed to cope with the demands.

And it is important, particularly when dealing with networks, that such computer technology meet the latest standards regarding compatibility. That is why ANSPAG has developed a network testbed, into which equipment can be plugged and its capacity to interoperate with the other technology in a communications network can be measured. The group hires out its expertise in such testing to companies developing network communications.

APEC tension in the air

Inequalities between the obligations of developed and developing countries to reduce greenhouse gases could undermine the international goal of cutting emissions, according to Australian APEC Study Centre chairman Alan Oxley.

Professor Oxley said the Framework Convention on Climate Change, adopted at the 1992 UN Conference on Environment and Development in Rio de Janeiro, had fundamental flaws that could not only jeopardise the reduction of greenhouse gases but also retard growth in key economies.

In July this year, the parties to the framework met in Geneva to review their commitment to the reduction of greenhouse gases.

"The Australian Bureau of Agriculture and Resource Economics (ABARE) has estimated that the Convention will have an insignificant effect on the level of world greenhouse gas emissions," Professor Oxley explained.

"The reason is that non-OECD countries, which are not required to cut greenhouse gas emissions, are expected to be the major generators of those gases over the next 25 years."

Under the terms of the Convention, the burden of cutting greenhouse emissions back to 1990 levels by the year 2000 applies only to industrialised – or OECD – countries and the 'transition' economies of Eastern Europe.

And according to Professor Oxley, it will be the OECD countries that carry the extra burden of providing the financial resources to enable the non-OECD countries to meet their policy obligations.

"The economic and environmental consequences of only one group of countries taking action to reduce greenhouse emissions are far-reaching," he said.

In a joint assessment of the Convention's strategy with the Department of Foreign Affairs and Trade in Canberra in 1995, ABARE stated that over the next 25 years, emissions from non-OECD countries would greatly outstrip the reductions envisaged by OECD countries under the UN strategy, with developing countries only obliged to implement general policies on climate change issues.

"ABARE has further estimated that the proposed measures will retard growth in key economies of the APEC region and impede plans among APEC economies to develop the region."

He predicted that Australia would be one of the most severely affected countries under the Convention's plans.

"Australia is the world's largest coal exporter and its economy depends on those export dollars. World coal prices are expected to fall, and the cost of Australia's exports, which rely on high inputs of energy, are expected to rise.

"In other words, the value of Australia's exports will fall, leading to a worsening trade balance and slower economic growth."

While European countries are the strongest backers of the Convention, their policymakers remain concerned that it will have a negative impact on the competitiveness of their industries.

"Some European countries are contemplating trade sanctions against those who do not restrict emissions," Professor Oxley said. "This would be highly contentious and cause international tension."

He believed that pressure was also mounting from environmental groups to use coercive trade measures against countries not abiding by international environmental treaties.

Professor Oxley said these problems could be resolved but that unless the international community questioned the imbalance among members of the treaty, there would be little change.

"The rational approach would be either to broaden the obligations to reduce emissions to all major greenhouse gas emitters or use economic strategies to ensure the reductions are achieved equitably and efficiently," he concluded.

By Juliet Ryan

The country road to the information superhighway

The entire Maffra community is about to go surfing – on the Net that is.

A telecommunications project being undertaken by Monash's Gippsland School of Computing and Information Technology will give agricultural producers and industry in the area instant access to information relevant to the region's needs.

Connection to the Internet would not only enable the area's dairy farmers to access the latest news on market prices, suppliers and weather but also allow them to share regional information.

And according to C&IT lecturer Ms Kim Styles, the local community is 100 per cent behind the project.

"A group from the Maffra region approached the university for advice when it became obvious that many residents felt left behind in the information technology race," she said. "And the project grew from there."

Students from the Gippsland School of Business first conducted surveys to determine the level of technology use in the region. Once individual and community needs were assessed and recommendations made, the School of Computing and Information Technology became involved.

The initial brief was to provide a cost-effective, regional-wide computer network, establishing the infrastructure to link the area's 800-plus farmers or producers to the information superhighway.

Connection to the Internet would not only enable the area's dairy farmers to access the latest news on market prices, suppliers and weather but also allow them to share regional information.

And local suppliers, such as wool, milk and beef cooperatives and Southern Rural Water, would be able to set up web pages.

"The only farming group in Maffra with a web site at the moment is the Herd Improvement Cooperative," Ms Styles said. "This project will give both farmers and local industry a chance to develop their own web sites, with the whole community reaping the rewards.

"The project will allow the community to address environmental issues such as land care and salinity."

One of the main concerns of the steering committee, which was developed to oversee the project, was the charge currently being incurred by local Internet users. The town does not have an Internet service provider (ISP), so users may pay a long-distance or STD rate.

"The first part of the project will be to develop a file server to act as a community cooperative ISP, which would mean users dialling in will be charged a local call rate," Ms Styles said.

The next step would be to educate the local community on the benefits of using the Internet and how they can maximise their opportunities.

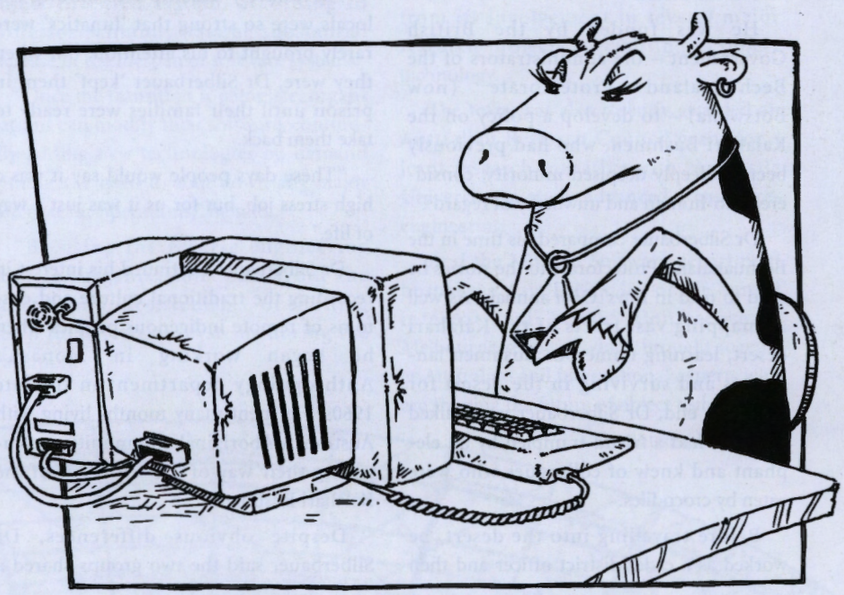
"While many Maffra residents own a computer, they use them mostly for invoicing and recording bills," she explained.

Several levels of computer and Internet training would occur, including in the early stages both a trial group of novice users and a special support group to act as trouble shooters for people who got stuck or confused.

"The project is a very positive step for the Maffra community – it will enable locals to see themselves as technically competent while keeping up-to-date with world information," she said.

"And the project will have implications further afield, providing other small agricultural communities with a benchmarking model for joining the information superhighway."

By Juliet Ryan



The adventures of George Silberbauer

When the Kalahari Bushmen first saw George Silberbauer driving towards them, they hid in a thorn bush to safely observe the big pale man approaching in the belly of a wild animal.

They had never seen a white person before, let alone a truck, and were both apprehensive and intrigued by the scene.

It was a significant occasion for Dr Silberbauer too. He had been driving through the previously uncharted Kalahari desert for some months in search of the elusive Bushmen and was beginning to wonder if he would ever find them.

The South African-born anthropologist, who is retiring next month after 30 years at Monash University, lived with the Bushmen from the mid-50s to mid-60s, learning their language, social customs and political structures.

Dr Silberbauer said it took about 18 months for the Kalahari Bushmen to accept him. "At first they thought me a singularly stupid man, as I was not able to talk to them or do most things required to survive in the desert."

He was funded by the British Government – the administrators of the Bechuanaland Protectorate (now Botswana) – to develop a policy on the Kalahari Bushmen, who had previously been "a deeply despised minority, considered sub-human and unworthy of regard".

Dr Silberbauer compared his time in the Bechuanaland Protectorate to the stories he used to read in *Boys' Own* annuals. As well as mapping vast tracts of the Kalahari desert, learning numerous Bushmen languages and surviving in the desert for weeks on end, Dr Silberbauer was stalked by lions, had a friend trampled by an elephant and knew of colleagues who were eaten by crocodiles.

Before travelling into the desert, he worked as a cadet district officer and then

district commissioner of the Ngamiland, Kasane and Ghanzi districts, as one of only 22 people running the country.

According to Dr Silberbauer, his duties were diverse. "I had to do everything from administering the district and fixing bridges after floods to acting as Keeper of Lunatics."

Fortunately kinship ties among the locals were so strong that 'lunatics' were rarely brought to his attention, but when they were, Dr Silberbauer 'kept' them in prison until their families were ready to take them back.

"These days people would say it was a high stress job, but for us it was just a way of life."

Dr Silberbauer continued his interest in recording the traditional culture and customs of remote indigenous peoples when he began working in Monash's Anthropology department in the late 1960s. He spent many months living with Australian Aboriginal communities, comparing their way of life with that of the Kalahari Bushmen.

Despite obvious differences, Dr Silberbauer said the two groups shared a fundamental knowledge about the environment, as well as an ingenuity in relating to one another and in identifying and making use of natural resources.

"They understand the social importance of natural resources and personal relationships with the environment."

For a man whose job and life have always been deeply entwined, it is not surprising that a personal crisis more than a decade later inspired a new direction in Dr Silberbauer's research interests.

In the 1983 Ash Wednesday fires, while on a trip to South Africa, his Upper Beaconsfield home was razed along with the homes of many neighbours and friends.

His subsequent feelings of survivor guilt and his observation of the aberrant behaviour of other survivors sparked an interest in the social behaviour of groups who had experienced disaster.

"We have traditionally paid attention to financial, logistical and practical problems," he said. "The real nature of disaster is the social dislocation and transformation of people's behaviour.

"I read numerous books, trawled through libraries and spoke to psychologists, but I couldn't find any explanation for why people were behaving in ways so different from the ordinary."

Dr Silberbauer's area of expertise could now be described as 'the anthropology of disasters', and typically it extends beyond his nine to five work. He is heavily involved in the CFA, the State Disaster Rehabilitation Committee and the Australian Emergency Management Institute.

Dr Silberbauer may be retiring from Monash this year but his work in disaster management will continue.

By Georgie Allen

A Family Romance: The Deakins at home

By John Rickard

Published by Melbourne University Press

RRP $24.95

A Family Romance is the story of the family of Alfred Deakin, Australia's first prime minister. It explores the complex web of relationships between Alfred, his wife Pattie, and his sister Catherine.

It is a story told with the character of a novel, but one which poses questions about the nature of biography. Can a biographer bring to life the emotional world of such a family, or must that territory be conceded to the novelist?

In this book, John Rickard evokes the life of a middle-class Australian family at the turn of the century and reveals the story behind the public achievements of a great man.

John Rickard is a professor in Monash University's National Centre for Australian Studies.

From Prehistory To Politics: John Mulvaney, the humanities and the public intellectual

Edited by Tim Bonyhady and Tom Griffiths

Published by Melbourne University Press

RRP $29.95

Who are public intellectuals? Why do they matter? What is the difference between an academic and an intellectual?

In *From Prehistory to Politics*, a group of Australia's great thinkers, including Monash historian Dr Bain Attwood, explore these issues through the life of John Mulvaney.

One of Australia's foremost prehistorians, Mulvaney made a major contribution to debate and policy on world heritage, archaeological and conservation practice, the function and operation of museums and the relevance of the humanities.

He was a major campaigner for the preservation of the Franklin River in the early 1980s, and has been an influential member of the Australian Heritage Commission as well as one of the most important advocates of the National Museum of Australia.

This book seeks to explore, through the example of John Mulvaney's work, the obligations of the academic world to the public world.

Australian Writers: Henry Handel Richardson

By Michael Ackland

Published by Oxford University Press

RRP $19.95

Henry Handel Richardson is one of Australia's major novelists – and one of its most elusive. An expatriate for most of her life, she worked hard to maintain her privacy, and concealed her personal views behind an impartial authorial style.

This book includes an overview of her life and discusses all her fictional works. It examines her involvement with the sexual politics of the time and looks at contemporary theories of gender.

Michael Ackland places Richardson's work within a tradition of European thought, while also showing why she is of central importance to Australian and women's studies.

Michael Ackland is a senior lecturer in English at Monash.

The End Of Capitalism (as we knew it): A feminist critique of political economy

By J.K.Gibson-Graham

Published by Blackwell Publishers

RRP $37.95

The End Of Capitalism argues that it is not the economic discourse of the right but the socialist and Marxist traditions that have portrayed capitalism as large, powerful, active, victorious and capable of conferring identity and meaning.

J. K. Gibson-Graham believes that for left politics this has meant the continual deferral of anticapitalist initiatives of economic innovation, since these would presumably have little chance of success in a predominantly capitalist economy.

She explores the possibility of more enlivening modes of economic thought and action, outside and beyond the theory and practice of capitalist reproduction, drawing on feminist post-structuralist theories of subjectivity and the body, and on antiessentialist aspects of Marxism.

J. K. Gibson-Graham is a senior lecturer in Monash's Department of Geography and Environmental Science.

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

Health in the developing world – who cares?

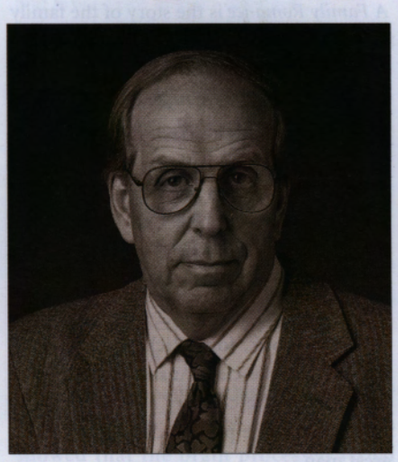
From Montage 16

community for six months before starting medical school can be a deeply moving experience.

Two third-year students spent a month with the prostitutes in the slums of Calcutta. A Sri Lankan medical student studied the prevention of HIV transmission among commercial sex workers and their clients in Sri Lanka, using his youthfulness as a passport to localities in which angels feared to tread, and hence contributing significantly to the development of that country's AIDS prevention strategies. Another medical student is currently studying Aboriginal perceptions of their health in the Northern Territory. Students have been visiting the Population and Community Development Association in Thailand for their clinical electives for a number of years, and among other things they learn to perform the 'no scalpel' vasectomy procedure. Recently we have started to send relatively large numbers of third-year students to Indonesia, where their first clinical instruction is in the insertion and removal of Norplant. Other students have gone to Vietnam to look at quinacrine tubal occlusion, and to China to study family planning programs.

My hope for the future would be that the medical schools of all developed countries would take a long, hard look at their curricula, to see how they could be adapted to meet the ever-growing health challenges of the developing world. In Australia, the government is seeking drastic cuts in the medical student intake on the grounds that the country is already over-supplied with doctors. This is both selfish and short-sighted. We may have too many doctors trained in Western ways, but we have hardly begun to produce the graduates who will be qualified to tackle the primary health care problems of our 300,000 Aboriginals, or who could lend a hand in South-East Asia. The time has come to turn the tables. Western medicine now needs the help of developing countries to give our future doctors the practical training they need in primary health care if they are to tackle the real health challenges that face the world as we enter the 21st century.

Health in the developing world – who cares?



In the 1996 Andrew Oration to Monash medical graduates, Professor Roger Short argued that too many doctors were being trained to work in Western health systems while health problems in developing countries were set to spiral out of control. An edited version of his speech follows.

As all developed countries move inexorably towards zero population growth, or even population decline, the age structure of the population will change from pyramidal to columnar, with ever-increasing numbers of elderly pensioners living off the economy rather than contributing to it.

They have the affluence to pay for expensive palliative care, such as cancer chemotherapy and organ transplants or replacements. Most of their lifetime's expenditure on health will occur in the last few years of their lives, to buy themselves a little extra time at a great cost.

It has even been cynically suggested that the moribund economies of developed countries could be rejuvenated by making cigarettes available free of charge to all teenagers. The resultant reduction in life expectancy would mean that there would be enormous savings on pensions, freeing up capital for investment in the economy. Perhaps this is not so very far removed from Aldous Huxley's *Brave New World* concept of 'soma', a drug for the elderly which was extremely pleasurable to use, but which also shortened life expectancy.

The underlying point is that we now know enough about the epidemiology of disease to exert a significant influence not only on our life expectancy, but also on the mode of our exit. Julius Caesar's fond hope that his death might be unexpected is in stark contrast to the growing desire in developed countries to legitimise some form of voluntary euthanasia. If the gradual senescence is to be our destiny, economic incentives will see the growth of gerontology as the pre-eminent medical speciality of the developed world.

This scenario is in stark contrast to the situation in developing countries. Many of them are now entering the most explosive phase of their population growth, with numbers expected to double or even treble within a lifetime.

The health challenges that these nations face are those that developed countries overcame around the turn of the last century. In industrialised countries today, the average lifetime risk for a woman dying of pregnancy-related causes is between one in 4000 and one in 10,000, whereas in developing countries the risk is between one in 15 and one in 50. This is the widest disparity in all statistics of public health. Rates of infant and childhood mortality are also unacceptably high in developing countries, and sadly they are on the increase in some countries in sub-Saharan Africa as a result of the spread of HIV infection and AIDS in the female population, and its vertical transmission to infants. The World Bank estimated that in 1990, the median age at death in Nigeria and Pakistan was only seven years, a reflection of excessive infant and childhood mortality.

Most of the growth in the world's population in the coming century will occur in developing countries. The ever-diminishing availability of arable land per capita, and of water with which to irrigate it, may soon impose finite limits to population growth in many regions of the world. Poverty and malnutrition will stalk those who lag behind in the race for economic development. Even today, the World Bank estimates that over one billion people live in absolute poverty, and 600 million are on the borders of starvation.

How does this grim scenario relate to the undergraduate training of medical students? In the past, the medical curriculum was designed to meet the needs of the developed world, but that must surely change. It might have been acceptable in the 1950s when twice as many people lived in developing countries, but by the year 2025, more than five times as many people will live in developing countries. That is where the greatest health challenges of the future lie. This year, I administered a questionnaire to our 149 first-year students in the first week of term. I asked them what they wanted to do when they qualified. Although the majority wanted to become specialists and a minority to go into general practice, 42 per cent expressed a wish to work in developing countries, and 13 per cent to work in Aboriginal health. Altruism is alive and well in the medical student body.

In order to reinforce this altruistic streak in our medical students, they should be encouraged to visit developing countries in their vacations at every opportunity; here they can gain hands-on clinical experience with the real health problems that beset the vast majority of mankind. From my own personal experience, I know that a first-year student given the chance to teach oral rehydration therapy to Bangladeshi women, in their own language, can save lives; living with an Australian Aboriginal

Continued on Montage 15