

MONTAGE

NEWS FROM THE CAMPUSES OF MONASH UNIVERSITY

Waging war on diabetes

Research groups in the Department of Biochemistry at Monash are leading an international breakthrough in eradicating one of the world's most widespread and potentially serious diseases – diabetes.

Diabetes is a diet-oriented disease which primarily afflicts people who live in economically developed societies. According to the leader of one of the research teams, Dr Frank Ng: "Diabetes is a disease of affluence. When you are starving you can't be obese."

About one out of every 25 people throughout the world suffers from diabetes. The disease leads to high levels of sugar in the blood, and without treatment causes kidney failure, blindness, coma and death.

Diabetes occurs when the body loses its ability to convert sugars into energy and materials for physical growth and repair. Converting sugar in the body involves a complex chain of biochemical reactions, any one of which may go wrong. Like cancer, diabetes can have many different causes.

The sugar conversion process is controlled by the hormone 'insulin'. The two main forms of diabetes occur either because too little insulin is made (Type 1 diabetes) or because the insulin that is made loses its potency (Type 2 diabetes).

Continued on Montage 15



**Inadequate health care for Aboriginal communities (3) • Architectural award for Caulfield campus (4)
• Prestigious award for Monash academic (7) • Lifting the lid on global warming (10)
• Savant: Uncertainty on the Korean Peninsula (16)**



Virtual Metaphysics Department

Monash Gippsland campus chaplain, Judy Redmond, has established what she calls an 'on-line' chapel. The chapel is intended to

provide a computer-based forum for on-campus and distance education students and staff on a variety of religious and ethical issues.

The project coordinator for the on-line chapel has dubbed Ms Redmond the world's first 'virtual vicar'.

Open Season on Open Day

Monash Open Day was a huge success in terms of numbers of visitors – believed to be a record 55,000 across all campuses – and in imparting information to prospective students. However, as could be expected with an event of this size, not all was smooth sailing:

■ A dance troupe booked to perform at the Caulfield campus turned up just in time for its performance... at the Clayton campus.

■ One of the Open Day organisers was congratulating herself on how well the immense traffic flow at the Clayton campus had been controlled when she looked up just

in time to see two cars collide at the northern roundabout.

■ On the subject of car crashes, Monash's hard-working public affairs staff have tried for years to attract a television news crew to the university for Open Day. This year, for the first time, they succeeded.

The crew came to film a side-on car crash display intended to test the strength of car side pillars. Good visual stuff, except that the missile car would not start.

Some helpful students pushed it sufficiently to get it rolling. The resulting collision managed to inflict only a small dent in the recipient vehicle. Two more efforts at pushing the car produced further minor damage to the recipient vehicle.

Needless to say, once again Monash University Open Day did not feature on the evening TV news.

■ One observer of the helium balloon meteorological weather station asked the following question: "Meteorology? Is that under Earth Sciences?"

NOW & THEN

25 Years Ago

Student numbers: The AUC report does not envisage Monash having external students in the 1970–72 triennium, and predicts significantly fewer full-time enrolments for the degree of PhD than we predicted in our submission.

15 Years Ago

The Federation of Australian University Staff Associations (FAUSA) has reacted strongly to the proposed introduction of fees of between \$1500 and \$2500 for foreign

students at Australian universities announced in the Federal Budget.

5 Years Ago

The dramatic changes taking place in the Soviet Union and Eastern Europe demand a response from Western governments and universities, a noted Canadian Slavic scholar argues.

On a recent visit to Monash, Professor Gleb Zekulin of the University of Toronto said that the West could assist the momentum of glasnost and perestroika and turn it to advantage, but it would need to rely on the careful interpretation of university-trained scholars to do so effectively.

"It's no good sending over two or three more reporters to Eastern Europe.

Governments should be supporting and putting pressure on the universities. It's the universities which will provide the future material needed by governments to deal with the questions raised."

This Month Last Year

If Jurassic Park had a ranger, it would have to be Monash University's international dinosaur expert, Dr Patricia Vickers-Rich.

Well known for unearthing prehistoric creatures from local soil, the energetic Dr Vickers-Rich has lured a huge collection of dinosaurs to Melbourne.

The Great Russian Dinosaurs exhibit shows the authentic remains of prehistoric animals that inspired Steven Spielberg's latest blockbuster.

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History of Hawthorn

A History of Hawthorn, written by Monash University's National Centre for Australian Studies, was launched recently.

Drawing on a vast range of sources including taped interviews, published reminiscences, council minutes, local newspapers, photographs, survey statistics, and even graffiti, *A History of Hawthorn* seeks to understand how a community defines itself.

It was commissioned by the City of Hawthorn, "as a recognition and a record of the life and times of all those who have shared these four square miles up to 1993", and is the product of three years research and writing by the centre.

Early drafts were done by Dr Victoria Peel and Deborah Zion, and coordinated by John Arnold. The final work was completed by Dr Peel and Jane Yule.

Level of Aboriginal health care criticised

The Federal Government and the Australian Medical Association (AMA) have failed to deliver adequate medical services to Australia's indigenous people, according to the president of the AMA, Dr Brendan Nelson.

Speaking recently to more than 300 Monash medical students on Clayton campus, Dr Nelson said he was angry about government in-fighting which had left Aboriginal communities struggling with inadequate funding.

"One in three Aboriginal people will die before they get to the age of 65," Dr Nelson said. When compared to non-Aboriginal Australians, they are three to four times more likely to die in the first year of life and 10 times more likely to die while still young.

The specially convened forum on Aboriginal health was organised by two second-year medical students, Mr Mathew Campbell and Ms Annette Sanders.

In his speech, Dr Nelson attacked the last federal budget, saying it gave the illusion of offering an extra \$500 million to Aboriginal health, when in fact only \$64 million more had been allocated over five years.

He criticised this level of funding from a government which was condoning mortality rates in the Aboriginal community as bad as those in Mongolia, India and Haiti.

Dr Nelson was also critical of the medical community, saying that historically it had not devoted sufficient attention to

Aboriginal health. He said that even recently he was able to fill a request for doctors for Rwanda, while being hard-pressed to find doctors to go to outback Australia.

"One in three Aboriginal people will die before they get to the age of 65," Dr Nelson said. When compared to non-Aboriginal Australians, they are three to four times more likely to die in the first year of life and 10 times more likely to die while still young.

"What all these figures show is that we really need a deficit reduction strategy in Aboriginal life expectancy," Dr Nelson said.

Dr Nelson told the Monash medical students about his visit to Croker Island last year to illustrate that there were good news stories to be told amidst the gloom presented by the media. "You could see...the sense of pride and self-esteem, the control that those people had over their own lives. I came away impressed," he said.

But Dr Nelson said he was frustrated with the media during his controversial visit to Western Australia with Alexander Downer. "We were at a place called Kintore, and I was next to a well-designed septic tank attached to an Aboriginal-designed house, and I thought 'this is great', but the press weren't interested in that.

"They are far more interested in images like the man and woman of 93 and 94 respectively, both of them sick, who were living under sheets of corrugated iron with a bit of canvas."



AMA president, Dr Brendan Nelson.

Dr Nelson suggested measures to help improve the health of Aboriginals, including allowing them to control their own health budget, establishing a committee, comprising a cross-section of interests, to oversee Aboriginal health matters, and forming an agreement on Aboriginal health service delivery between the state and federal governments.

Dr Nelson also spoke of the need for non-Aboriginal Australians to make the Aboriginal cause the issue that would make or break governments, just as the environment had been the issue of the eighties.

He urged the medical students to take a role in challenging and changing the way the rest of Australia thinks about the issues, saying, "We can prioritise the issues for Australian governments, and don't ever stop believing that."

Building an architectural reputation

Monash University's new General Teaching Building on Caulfield campus has won the 1994 "new institutional building" division of the Victorian Royal Australian Institute of Architects award.

The building, designed by the architectural firm Denton Corker Marshall Pty Ltd, won the award from a field of 19 strong contenders.

Known as K block, the building was opened on 12 August by the Federal Minister for Employment, Education and Training, the Honourable Mr Simon Crean.

In their report, the judges said: "The dynamic vitality of the building is reinforced through the confident use of simple materials and restrained application of colour to individual building elements.

"The large building elements (lecture theatres etc) are expressed externally as dominating, panel-clad, sculptured masses enclosed by a simple black-stained concrete three-dimensional grid, which allows the lecture theatre forms to burst out while restraining the remainder of the functional elements."

The coordinator of the university's Physical Resources Planning Unit, Mr Roland Black, said that the building was highly significant to Caulfield because it had changed the campus's centre and direction.

The building forms the south wall of the campus and fronts onto a first-floor walkway, which links most of the campus. "It is fundamental to making the whole campus link and work," Mr Black said.

The three-storey building houses seven computer laboratories, a bistro, 12 classrooms, two large lecture theatres, a student union book shop and a large multi-purpose foyer. It is the first part of a two-stage capital development program at Caulfield.

The second stage will have close aesthetic links to the first. It will comprise a seven-level tower, which will house all the Syme departments of the Faculty of Business and Economics, as well as the Monash Mt Eliza Graduate School of Business and Government. The second stage will also be designed by Denton Corker Marshall.

The \$9.3 million cost of the building's first stage was met by the Department of Employment, Education and Training and the student union, the latter providing 30 per cent of the funding.

The second stage is expected to cost \$12 million.

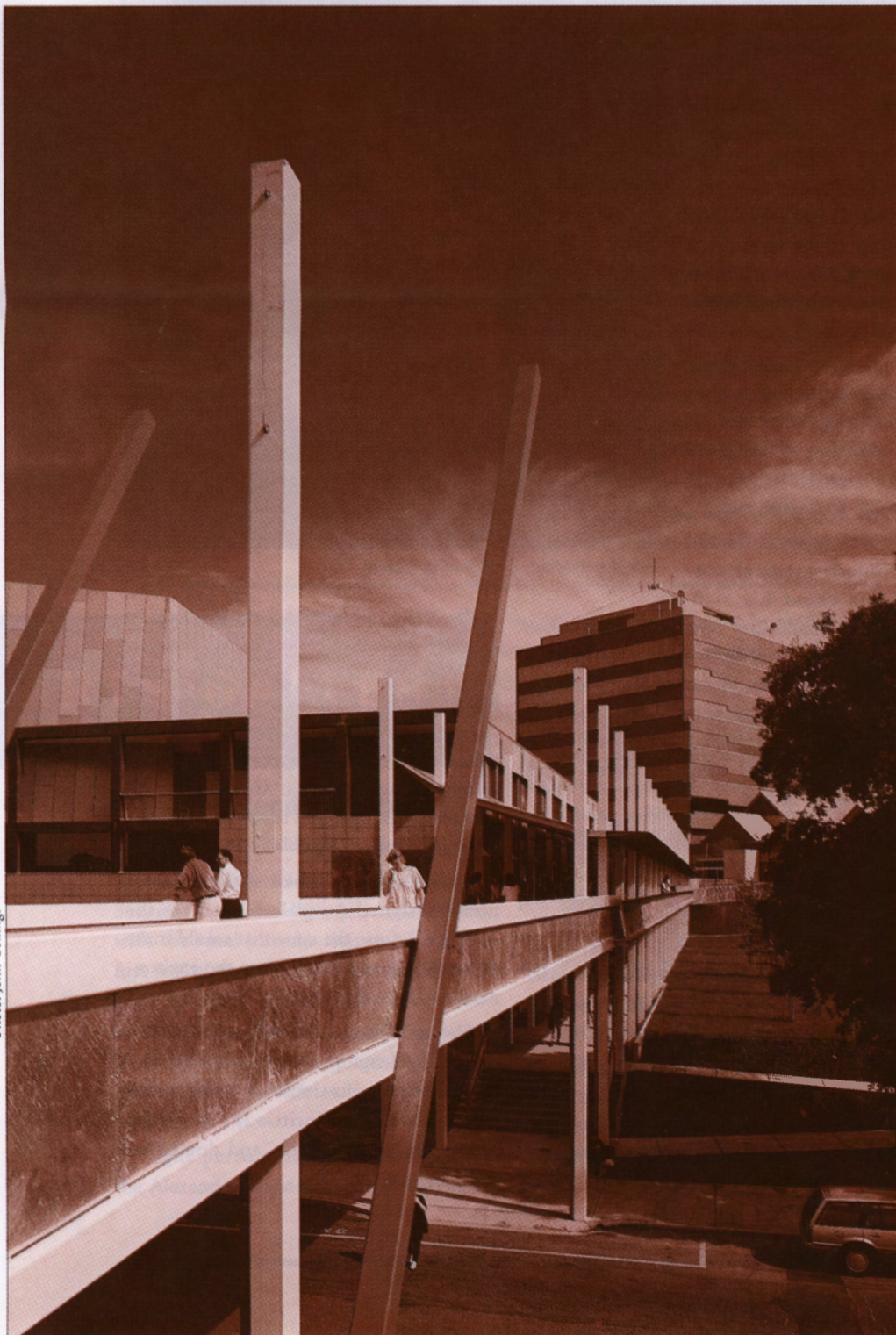


Photo: John Gollings

Inadequate Pap smears cause concern

*Are Melbourne's doctors failing their female patients?
Georgie Allen reports.*

Not enough Melbourne doctors are taking Pap smears, a study by a Monash University senior medical lecturer has found.

Dr Deidre Lewis from the university's Department of Community Medicine, and Dr Heather Mitchell, director of the Victorian Cervical Cytology Registry, also found that 21 per cent of smears collected contain an inadequate cell sample.

In a report recently published in *The Medical Journal of Australia*, Dr Lewis and Dr Mitchell said they were disappointed to find there were a significant number of doctors who took few, if any, Pap smears.

Inadequate training

The study also found that training for taking Pap smears had been inadequate and that some doctors were still confused about who should be screened and how often.

"Many women may not be screened because their local doctors are not offering screening within the context of a general consultation," the report said.

The study, which involved 179 Melbourne doctors, is the first in Australia to analyse how GPs take a smear and how different technical practices correlate with cellular content in smear results.

The presence of endocervical cells, which are needed to detect precancerous cells in the cervix, is currently the best indicator that a smear has been adequately taken.

It seems a relatively small percentage of the total GP population is performing most smears. Female doctors, who account for only 17 per cent of all general practitioners, take twice as many smears as their male colleagues.

The mean number of smears taken by a female doctor per month is 6.8, compared with 2.5 for male doctors.

Many of the male GPs interviewed felt their gender was a problem for the women attending them for a Pap smear, but patient surveys showed most women did not feel that way.

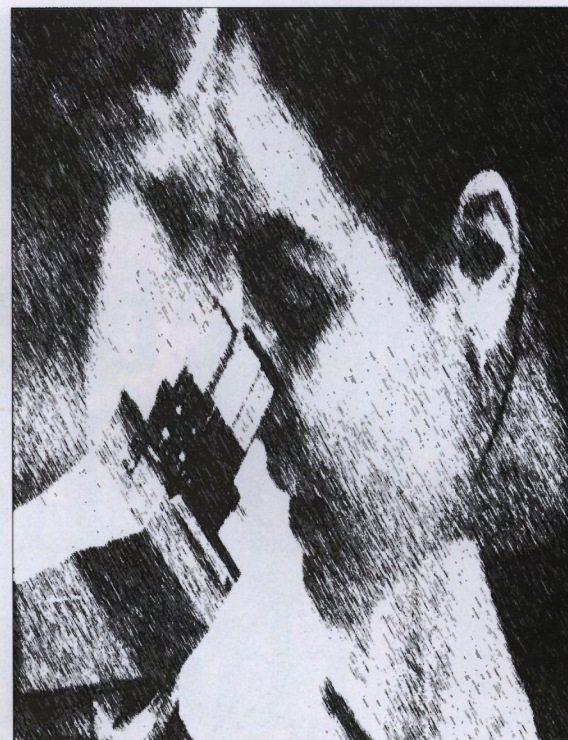
The 69 doctors who refused to participate in the study because they were "not interested, too busy, or not taking smears" were all men.

Age was also significant in the results, with doctors older than 34 years and younger than 55 years screening a broader age range of women. Doctors over 65 years of age tended not to take any smears at all.

Dr Lewis and Dr Mitchell recommend all medical undergraduate training conform to the recently published 'National policy on screening for the prevention of cancer' and allow students to practise technical skills.

"It can be difficult for students to gain clinical experience on real patients, but this could be achieved by designing life-like pelvic models."

They also recommend that further education and training in screening practices be offered to male doctors,



graduates of less than four years and greater than 20 years, and those without post-graduate qualifications.

A similar study in New Zealand found that male doctors in practice for more than 15 years and without diplomas or college affiliations were less likely to implement recommended guidelines on cervical screening.

Eighty-five per cent of the 350 women who die of cervical cancer in Australia each year have never been screened and another 12 per cent have an inadequate screening history.

It has been further estimated that 90 per cent of squamous cell cancer of the cervix could be prevented with an organised screening program. Currently only 64 per cent of Victorian women aged 20 to 69 years have regular Pap smears.

GPs ideally placed

Dr Lewis and Dr Mitchell argue that general practitioners are ideally placed to play a role in cervical screening as 90 per cent of Australian women will visit a GP at least once a year.

Dr Lewis said: "To maximise their effectiveness, GPs need to be aware of recommended and consistent guidelines for screening, to effectively encourage women to be screened, to be technically proficient in taking a Pap smear and to be diligent in interpreting and counselling women about the results."

Prevention is better – and cheaper – than cure

What can be done to reduce the incidence of falls and pedestrian accidents among Australia's elderly? A Monash study has come up with four recommendations to make old age less hazardous and less costly to the community.

Falls and pedestrian accidents account for the majority of injuries to Australia's older community. But according to a Monash academic, these injuries could be reduced by up to 30 per cent.

Injuries to older people are estimated to cost the Australian community \$4.9 billion a year.

A recently completed four-year study by the Monash University Accident Research Centre (MUARC) has found that falls and pedestrian accidents account for more than half this cost.

Results of the study are included in a book, *Injuries Among Older People*, recently published by Collins Dove.

Senior research fellow at MUARC, Dr Brian Fildes, said the study, which looked at people aged over 55 who had been hospitalised due to a fall, focused on three main areas.

The study's first aim was to determine the extent of falls and pedestrian accidents in Australia; the second was to identify who was most vulnerable to falls and pedestrian

accidents; and the third was to find a way to reduce the incidence of such accidents.

Dr Fildes said that falls by the elderly cost the community about \$2.5 billion a year. Fifty-five per cent of falls occurred in the home.

But while many falls away from the home happened near a road, only about 5 per cent of elderly pedestrian accidents involved other traffic.

The study also identified a number of characteristics associated with falls, including poor eyesight, medication, dizziness, previous falls and stroke.

More than 50 per cent of the study's subjects had had a previous fall and also suffered from poor vision, Dr Fildes explained.

"Almost half of them didn't think they needed glasses but in fact they all did. An alarming 32 per cent were actually legally blind," he said.

"Of the 53 per cent that did wear glasses, only one-third had normal visual acuity with their glasses on and the others needed their glasses replaced."

The study also found that medication was an issue. Ninety-one per cent of the study's subjects were taking at least one drug regularly and the group's average of 3.3 regular drugs was higher than normal for that age bracket. The group was over-represented in its use of minor tranquillizers, anti-depressants and Parkinson's disease drugs, suggesting that these drugs were associated with falls.

Occasional dizziness was reported by 44 per cent in the study group.

Stroke was also found to increase the risk of falls. The people in the study had an incidence of stroke six times that of the general population for that age group.

Many also had arthritis, high or low blood pressure and back problems.

According to Dr Fildes, one of the important things arising from the study was a list of more than 100 preventive measures, which are listed in the book. MUARC has identified four of these measures as the most important for injury prevention in the elderly.

Advice and education programs in the form of video tapes and brochures on how the elderly can live safely inside their own homes and as pedestrians was the main recommendation.

The second recommendation suggested making the home safer through modifications such as replacing steps with ramps, installing hand rails, minimising the number of loose rugs and making furniture and appliances safe.

The third preventive measure was for the elderly to have regular eyesight checks, improved lighting in the home, balance assessments and fitness programs.

The fourth suggestion has been made to counter what Dr Fildes says is one of the largest concerns – the widespread use of prescription drugs.

"It is impossible to tell people to stop taking their medication, as many of these are necessary for health reasons," he said.

"However, there may be cases where people are taking unnecessary drugs, which is something that the medical profession need to take on as an issue."

Dr Fildes estimates that by implementing the four top preventive measures, falls and pedestrian accidents by the elderly could be reduced by up to 30 per cent.

Injuries Among Older People, Collins Dove, rrp \$39.95.

Professor Milton Hearn from the Monash Department of Biochemistry has been awarded one of the world's most prestigious research prizes.

Fewer than 10 Australians have received an Alexander von Humboldt Senior Research Award in its 120-year history and Professor Hearn is the first Monash recipient.

Professor Hearn (pictured right) is now entitled to attend an annual meeting in Bamberg, Germany, of members of the Humboldt foundation. He says he is excited to be entering this elite group of internationally recognised researchers.

More important, Professor Hearn says, is the collaboration opportunities that the award provides.

The award allows Professor Hearn to designate a German university as his collaborator.

Prestigious award a Monash first

"One can actually set up long-term research programs which the German Government will fund," Professor Hearn said. "As a prize-winner, I am entitled to receive various established German academics, as well as very recently graduated academics."

"This was clearly a great honour for me," Professor Hearn said. "But equally I took a lot of pleasure because it's a reflection on those who work with me."

He said the award was an acknowledgment of the efforts by his "students, research staff and co-workers over the years".

Professor Hearn, who describes himself as an "orthodox academic", is very aware of what the award means for the university. "Every time one can achieve something in this way it promotes the university's reputation internationally," he said.

The award also provides Professor Hearn with the opportunity to help place Monash people in German universities.



As recipients of the prize are nominated secretly, Professor Hearn is not exactly sure how he came to be selected.

But the prize citation delivered to Professor Hearn in July said the award was for his "contributions to research and teaching" in the biomedical and biotechnological sciences.

Professor Hearn and his colleagues have been trying to understand how biological molecules interact with surfaces.

"A lot of the principles and concepts that come out of that are relevant to drug design, separation science and what makes bio-compatible polymers," he explained.

"If there's a strength in our research, it is that we have adopted a philosophy that is multidisciplinary in its attitude."

Professor Hearn came to Monash in 1986 as a professor of biochemistry and in 1988 was appointed director of the Centre for Bioprocess Technology.

He has been the senior author of more than 300 research publications and several books and he currently serves on the editorial boards of nine international journals in the fields of protein chemistry and bioseparation sciences.

The work of Professor Hearn and his research group has been recognised with a variety of international awards, including the Senior Organon Award (1980) and the Analytical Chemistry Award (1986).

The German President, Dr Roman Herzog, will present Professor Hearn with the Alexander von Humboldt Senior Research Award in Bamberg in May next year.

Putting business heads together

While Monash continues to forge links in the international arena, the university is also developing business relationships in its own backyard.

Monash University and Mt Eliza Australian Management College have formed a new entity – the Monash Mt Eliza Graduate School of Business and Government Limited.

The school, to be known as the Monash Mt Eliza Business School, is the largest management education institution in Australia and is positioned to become the leading management education institution in the Asia-Pacific region. The new school was officially launched at a series of functions in Brisbane, Sydney and Melbourne in late July.

The vice-chancellor of Monash University, Professor Mal Logan, said the school provided an excellent fit between two of Australia's leading management educators.

"The reputations of Mt Eliza and Monash in management education are second to none and this innovative new school provides the university with a clear advantage in business education," he said.

The establishment of the Monash Mt Eliza Business School follows affiliations in management education between the two institutions dating back to 1989.

The director of the Monash Mt Eliza Business School, Dr Barry Ritchie, said that the business environment was rapidly changing and that business courses had to meet that change.

Referring to the just-released Federal Government's Karpin Report, Dr Ritchie said that managers were under pressure from long hours, regular travel and results-driven limited-term appointments.

In particular, Dr Ritchie noted that cuts to middle management since the onset of the recession in 1989 had created the danger of a gap in future senior management.

"We need to be growing our own future CEOs, to provide management successors already familiar with their organisation and to sidestep the high cost of hunting for someone from outside," Dr Ritchie said.

He said this process would be facilitated by the formation of the Monash Mt Eliza Business School.

The new school has three divisions; the MBA and related awards, the Graduate

School of Government, and Executive Development Programs.

Courses offered by the school will become full fee-paying over the next few years. This is in line with the trend in post-graduate business studies.

In addition to announcing the Monash-Mt Eliza link, Dr Ritchie also launched the 1995 management development programs provided by Mt Eliza, with an expanded range of courses available along Australia's east coast.

"These courses are designed for working managers who want to enhance their business skills in intensive bursts while staying at work, and at the same time want to accumulate credits towards a recognisable business qualification they can take with them if they change their jobs or careers," Dr Ritchie said.

"There is a strong emphasis on leadership, strategic management and best practice performance," he added.

Mt Eliza has maintained a close relationship with business, industry and government since its inception in 1955 and has been accredited since 1993 to conduct graduate certificate, graduate diploma and MBA courses.

The Monash Mt Eliza Business School will continue to operate from its base in Mt Eliza, at the Best Practice Development Centre in Sydney, and in Brisbane, as well as increasingly throughout Asia.

BY DAMIEN KINGSBURY



Cluing into DNA

About 20 bodies found in Australia each year are never identified or claimed and after two years they are buried in unidentified graves.

But according to Monash's Department of Forensic Medicine, unidentified remains can be matched to relatives who may be looking for them, using deoxyribonucleic acid (DNA) technology.

By profiling the DNA of an unidentified body and cross-matching it with a blood or saliva sample from a person searching for a missing relative, the department can establish the probability of there being a relationship between the two people.

The department, located at the Coronial Services Centre in South Melbourne, has established a register that keeps a record of the DNA of all unidentified bodies in Victoria and of those people who wish to be on the register to help find a missing relative.

According to head of clinical science at the department Dr Bentley Atchison, the register is just one way in which DNA profiling is useful.

Dr Bentley said that one of the myths surrounding DNA was that it provided a 'genetic fingerprint', a term used by the commercial companies who developed the technique, when in fact individuals do not have a unique DNA profile.

DNA profiling gives an indication of the frequency of a profile in the population.

"The real power of DNA profiling is that it can exonerate a person from a crime."

Essentially, the technique involves comparing a number of DNA strands. A single piece of DNA that has been synthesised is variable in the general population to about one person in 10. However, if another independent region in the DNA chain is synthesised and you have two comparable regions, the probabilities are multiplied and that



particular DNA profile becomes less likely to occur in the population.

Dr Atchison explains: "The probability of a strand of a certain DNA type occurring in the population may be 10 per cent, or one in 10. If you take two different samples of DNA from the chain and combine them it becomes 10 per cent by 10 per cent giving a probability of one in a hundred people with that combined profile."

According to Dr Atchison, the real power of DNA profiling is that it can exonerate a person from a crime. "If there is a difference in profiles, then you can say that the sample did not come from the accused."

The department uses DNA technology to identify human remains when only part of a body has been found, or dental records and medical histories are not available.

"There have been cases where part of a human remain or a blood stain have been found. The only way to identify who it came from was to DNA-test it," he explained.

Dr Atchison, who is often called to give evidence in homicide cases, said that to

accurately identify remains he ideally needs a bodily sample from the deceased, such as a strand of hair from their comb.

Where this is not possible or where it will not hold up in court, blood samples from the people believed to be the deceased person's parents can be DNA-profiled and compared.

But while DNA profiling is currently the most advanced identification technique, Dr Atchison said that he encounters problems with the way juries assess DNA evidence.

"There have been cases in the United States where the DNA sample did not match the accused, but eyewitness accounts have led to a conviction," he said.

"In such cases the prosecution attacks the DNA testing, saying it is unreliable.

"In cases where DNA profiles match, it is a matter of the jury assessing all the evidence, not only the DNA evidence, and making a decision."

The Department of Forensic Medicine also has a commercial operation where paternity cases are disputed.

BY JULIET RYAN

Meddy mysteries uncovered

Scientists have long tried to understand the way the earth's oceans and atmosphere interact. Now, research by a Monash mathematician into a phenomenon known as a 'Meddy' is helping uncover another factor which may be important to global warming.

The Mediterranean periodically ejects into the Atlantic huge masses of hot, salty water, known as a Meddy, which circulate in the world's oceans for up to two years.

Dr Robb McDonald, of the Department of Mathematics in the Faculty of Science, says the way these Meddies work is important for scientists attempting to develop models of global climate.

The first Meddy was discovered in 1984 when oceanographers on the continental shelf off Africa's west coast found a huge body of warm, unusually salty water embedded about 1000 metres below the surface of the cooler, less saline waters of the Atlantic.

The Meddy – an enormous lens-shaped eddy of water – had been expelled from the Mediterranean Ocean months earlier and had slowly swirled its way within the Atlantic.

The Mediterranean's waters are unusually salty and warm due to past glacial periods. During such periods, when the sea level dropped the Mediterranean became an enormous hypersaline lake.

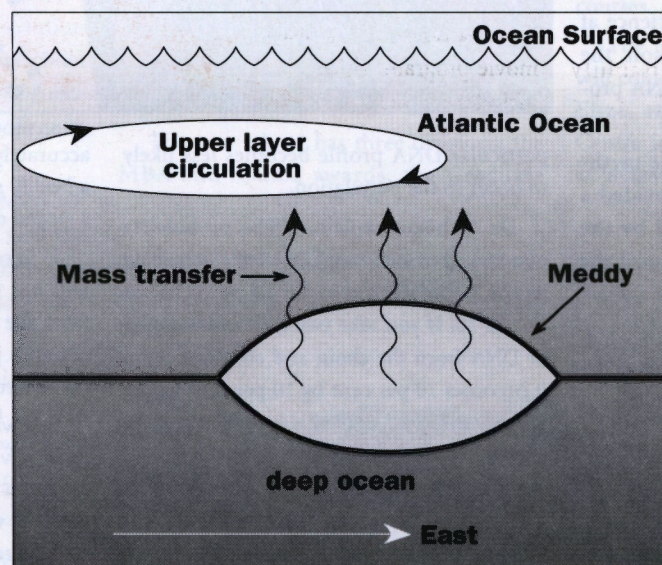
This fact, combined with the current high evaporation rates caused by large amounts of solar energy, has led to the ocean's particular characteristics.

Dr McDonald has been modelling the behaviour of Meddies – typically containing 5000 cubic kilometres of water up to 3 degrees warmer than the surrounding water – which are injected into the Atlantic several times a year.

He says that 3 degrees is a huge amount of heat to be dissipated to the surrounding ocean as a Meddy reaches equilibrium with its environment.

But Meddies exhibit a strange behaviour: instead of moving west, as might be expected for a body of water spawned by a westerly flow and given a twist by the earth's rotation, Meddies track almost due south towards the equator, along the African coast.

Dr McDonald and his colleague Dr Simon Clarke have developed mathematical models to simulate the motion of Meddies, seeking an explanation for this southward movement.



"The other characteristic of eddies is that they mix slowly with the surrounding ocean, so they erode slowly as they propagate southwards," Dr McDonald said. "The radius of the lens decreases by a few millimetres a second, because of molecular processes that cause the saltier water to diffuse outwards."

"The way the water is stratified is quite complex, so we reduced it to a simple two-layer model, representing the eddy and the surrounding water," he said. "The mix-

ing between them is simulated in terms of the eddy transferring mass to the layer above it."

The eddy itself rotates clockwise, spun by the Coriolis force, which is the twisting force induced by the earth's rotation. "If you dump more liquid into the layer above the eddy, the Coriolis force tends to spin it up as it spreads," Dr McDonald said.

Another force is now superimposed on the swirling mass of water – Rossby waves. These are large-scale waves that slowly undulate westwards through the atmosphere and ocean. In the model, the Rossby waves distort the overlying circulation into an oval shape, resulting in an unequal distribution of forces around its periphery.

"Rossby waves account for the intense boundary currents found on the eastern margins of some of the world's land masses – for example, the Gulf Stream off North America, the Agulhus Current off South Africa, and the Kuroshio Current off Japan," he said.

The net result of these forces is that the upper-layer circulation is directed predominantly to the south over the Meddy, and slowly drives the entire eddy southwards (see diagram).

The only problem with the two-layer model was that the shape of the collapsing eddy did not emerge naturally, it had to be specified. Subsequently, the pair is developing a second model, based on solutions to the non-linear equations called modons. This model permits a much higher-resolution simulation of the Meddy's behaviour and its response to small changes in the forces acting on it.

While this second model is still being refined, it is showing high promise – the computerised Meddy evolves very much like a real Meddy, and shows the same

tendency to move southwards.

Dr McDonald says the models' behaviour tends to confirm the view that the mysterious southward motion of Meddies is not a result of the surrounding oceanic circulation or of regional wind patterns – rather, Meddies are largely driven by internal forces.

This understanding of Meddies is vital for scientists attempting to develop models of global climate that accurately simulate the interaction of the oceans with the atmosphere.



Promotion takes paralympian to great heights

Mr Michael Norton is a paraplegic, but to focus on his disability would be to overlook the varied and formidable talents of this outgoing 30-year-old sportsman.

Norton competes at the highest levels of his chosen sports – skiing and wheelchair racing, and since 1985 has won a swag of medals in international competition.

Winning gold medals in the slalom and super giant slalom events at this year's winter paralympics in Lillehammer, Norway, is his most recent accomplishment.

Helping bring Norton to public attention has been Monash University's Syme Business School marketing lecturer, Mr Francis Farrelly.

Mr Farrelly, who has been friends with Norton for about 10 years, has helped acquire sponsorship and market the elite athlete's sporting and cinematic prowess.

In particular, Mr Farrelly has helped the Australian Ski Association's 'Australian skier of the year' land sponsorship deals with Bolle, Quicksilver, the Student Travel Association and the Transport Accident Commission (TAC).

Norton recently undertook an Australia-wide tour with the TAC, promoting

'Cinema Adventure', a seven-movie program which includes *On the Run*, a film that he produced in France and the Swiss Alps.

Norton produced the show to increase community awareness of the scope of activities disabled people can participate in, and to provide motivation for paraplegics undergoing rehabilitation.

Inspiration for *On the Run* came from the success of Norton's first appearance in an able-bodied action ski film, *The Deep*.

"I want my films to change attitudes towards handicapped people and to show what we can achieve," Norton said. "I hope they not only inspire and motivate handicapped people, but also help young people who may have lost a bit of focus and be taking life for granted."

"In *On the Run* I ski alongside some of the best able-bodied skiers and snowboarders in the world. We perform stunts, paraglide and heli-ski on some of the most extreme slopes around."

"Disabled people are always treated so seriously. I want the audience to see that being in a wheelchair hasn't stopped me from getting amongst the action, taking a few spills and really going off."

Part of Norton's plans for "going off" include paragliding off Mt Fuji in Japan later this year at the invitation of a Japanese television station.

Norton became a paraplegic as a result of a motorcycle accident in 1984. It was during his time in the Austin Spinal Unit that he met Mr Farrelly, who was visiting his recently paralysed brother, Bernard.

Within two years of his accident, the disabled community had labelled Norton "the fastest man on wheels" for being the fastest wheelchair sprinter over 100 metres and for his waterskiing and paragliding prowess. After four years he took up snow skiing.

As a marketer with a special interest in the disabled, Mr Farrelly saw Norton's potential to help himself and his sport through promotion, and to help other disabled people.

Mr Farrelly, who describes himself as a 'once-a-year' skier, has recently spent time overseas researching market developments in Asian countries.

The TAC's 'Rehabilitation Cinema Adventure' toured Australian university cinemas, hospitals and rehabilitation centres during August and early September.

Homelessness linked to school dropout rate

University researchers are conducting a national census to examine the extent of the growing problem of homeless school students.

Monash University sociologist Dr Chris Chamberlain and RMIT lecturer Mr David MacKenzie believe that homelessness among students in Australian schools is a major problem.

The researchers have undertaken a national census of homeless students in all Government and Catholic schools in Australia.

Although results will not be released until November, preliminary findings show there are large numbers of homeless school children across all socio-economic groups and geographical regions.

"Homelessness is the first step towards dropping out of school," Dr Chamberlain said. "Once this happens, young people are homeless and unemployed, and they can quickly become embroiled in petty crime, prostitution and drug dealing."

Homeless students are defined as those with no accommodation and living in the street or car, those with temporary accommodation and living with friends or relatives, or those in emergency accommodation such as a refuge or youth hostel.

"Homelessness is the first step towards dropping out of school," Dr Chamberlain said. "Once this happens, young people are homeless and unemployed, and they can

quickly become embroiled in petty crime, prostitution and drug dealing.

"If homeless students can be effectively assisted to remain at school, there is a much better chance of arresting their slide into chronic homelessness."

The research will provide information on the number of homeless students in schools, a profile of their main characteristics, as well as data which will help determine the extent of youth homelessness in Australia in 1994.

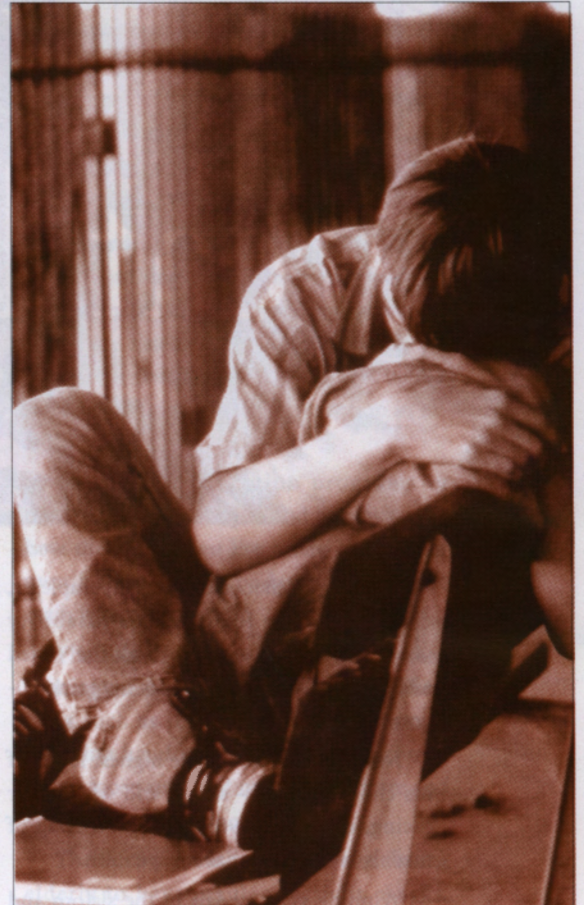
Dr Chamberlain and Mr MacKenzie have found a vast discrepancy in the way Australian schools deal with student homelessness and they are examining the successful policies to find out how and why they work.

The pair are currently travelling around the country interviewing school counsellors, teachers and deputy principals regarding the causes of and solutions for homelessness among school children.

Dr Chamberlain said schools often faced enormous problems, with only one welfare teacher and up to 60 homeless students.

"In these situations, teachers are overworked and their best efforts are largely ineffective. The school is simply overwhelmed by the problem," he said. "Many other schools have a much smaller number of homeless students, but whether they effectively assist them depends on a number of key practices."

Most schools reported that homelessness was caused by the breakdown of family relationships because of "conflicting expectations within families of non-English speaking backgrounds, physical, sexual or emotional abuse, or conflicts between



adolescents and their parents getting out of control".

Dr Chamberlain said that although homelessness was more common in communities where there is extreme poverty and high levels of unemployment, it also occurred in middle-class families in middle-class suburbs.

The project has been undertaken under the aegis of the Australian Housing and Urban Research Institute (AHURI). Both Monash University and RMIT are partners in the institute, along with CSIRO and the Queensland University of Technology.

Funding for the \$80,000 project has come from AHURI, Health and Community Services Victoria, and the Commonwealth Department of Housing and Regional Development.

Monash artist crafts a future



Neville Assad-Sallah is a Monash student and staff member with many firsts to his name.

Not only has he recently been awarded the first Colin and Cecily Rigg Award, the richest craft prize in the nation, he is also Australia's first PhD candidate in a craft.

Professor Ken Levison of the School of Art and Design, who helped supervise Mr Assad-Sallah's masters program, said the award was the "highest prize ever awarded to a craftsman in Australia".

Mr Assad-Sallah was chosen for the award, worth \$30,000, for a series of five sculptures that were inspired by his travels from Adelaide to Melbourne and across the world to the Middle East.

It was after a torrid trip back to Australia from the Middle East that Mr Assad-Sallah heard about his award.

Having faced a full body search when he stepped off the plane at Melbourne Airport, Mr Assad-Sallah arrived home to a locked house, with no keys and a ringing telephone.

"I broke the window to get inside and answer the phone," he recalled. "It was John McPhee saying 'make sure you're here for the presentation today'."

The award, judged by internationally recognised art critic Margaret Taylor, was presented by Mr McPhee, coordinating

curator of Australian Art at the National Gallery of Victoria.

The five works are now on display at the gallery – another first for the craftsman.

*"We do have to link
ourselves to the
ancient past"*

Mr Assad-Sallah said he was looking forward to returning to Beirut for six to nine months with the money he won. He wanted to think about how to educate people about the ancient arts of the Middle East.

"Because of the traumas occurring in the Middle East we don't know about the work and history there as much," he said.

"Even though we live in a contemporary existence, we do have to link ourselves to the ancient past."

The winning sculptures, which Mr Assad-Sallah describes as "very simple raw structures", are architecturally inclined.

"They are very textured pieces and very alive in terms of the durability of the materials."

'Capture vessel' is the first of the award-winning sculptures. It depicts a Gothic building with a boat form sitting inside.

'Source of life' features four arched doorways covered by a domed roof, under which lie four hand-constructed bowls. The concept behind this art piece is that the vessels could be used for bathing and enjoying life, or they could take on a different form, as bowls from which to eat and sustain life.

A three-tiered building with a bridge over its centre, from which hangs a single bowl, forms the sculpture 'Underneath the arches'.

'House' is a totally enclosed piece, which Mr Assad-Sallah says is based on a sarcophagi. This piece was done as part of Mr Assad-Sallah's masters program at Monash and is the first of the sculptures to be sold.

The fifth piece, 'Watering hole', was inspired by a trip taken by the artist from the Barossa to Melbourne.

The Colin and Cecily Rigg Award will be granted once every three years for different crafts. "Next time it could be metal," Mr Assad-Sallah said.

He said the award was good news for Australian crafts, which have "been in a lull for the past five years".

On top of his busy schedule as a PhD student and intermittent lecturer for the Monash School of Art and Design, Mr Assad-Sallah lectures for Melbourne University and for the Melbourne State College.

A natural connection

The landscape and the female figure are dominant themes in the paintings and sculpture of Wendy Stavrianos, senior lecturer in the Caulfield campus Department of Fine Arts.

Stavrianos is concerned that people have lost their links with nature and the land, and she searches for reconnection through her art.

She recently exhibited at the Luba Bilu Gallery in Greville Street, Prahran, and has a travelling exhibition, *Mantles of Darkness*, currently at the McClelland Art Gallery in Mornington. It will show until 9 October, before travelling to Canberra and Sydney early next year.

The exhibition is dedicated to Stavrianos's son, Peter, who died last year at the age of 24. She has incorporated the cables and aerials Peter used in his work with Telecom into her sculptures. "His spirit is in the show," she said.

Stavrianos is known for using the female figure as a vehicle to express the tensions in her work.

"Each female figure is encased in its mantle of meaning, acting out self-imposed rules, or caught unaware in timeless rituals of fertility, procreation, seduction and desire, these inescapable forces," she said.

Persistent images in her paintings, such as the nest, egg, the cradle and child, the womb and the vulva, celebrate the power of the woman as nurturer and gatherer.

"I feel as if I am an early woman, a gatherer. I identify with the land in the way the Aboriginal people do. I worry about the land and our lost connection to the land," she said.

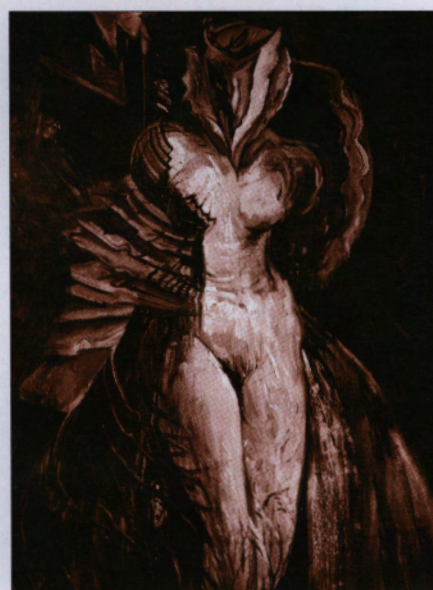
The physical environment has had a big impact on Stavrianos and her art. She talks about the "timelessness" of the Australian landscape and the "overpowering beauty of the bush, hills and rivers".

Of the time she lived in the Northern Territory, Stavrianos says: "Darwin presented me with such a wide variety of subject matter, both the tropic setting and the vast landscape, and it left me with a very strong feeling about the power of nature and its destructive force."

Stavrianos draws much inspiration from her Harcourt property where she created *Mantles of Darkness* in 1990 and 1991.

She collects materials, such as bone and wood, to incorporate into her sculpture and was overjoyed when one of her neighbours recognised the black stump in one of her paintings, from her property.

Stavrianos's first solo exhibition was held in Melbourne in 1967. Since then she



'The Night Canopy'.

has held more than 50 exhibitions around Australia and won a number of prestigious art awards.

To prepare for a show, Stavrianos spends much time drawing, sketching and thinking. She said that although she begins with an idea, her subconscious takes over and her art evolves and changes as she works.

Stavrianos teaches two days a week at Monash and spends the rest of her time on her Harcourt property in her studio that was once a shearing shed.

ARTS GALLERY

■ The Alexander Theatre

Snugglepot and Cuddlepie

The Australian Ballet's production of *Snugglepot and Cuddlepie* provides children with the ideal introduction to ballet. The first half of the program is the classic ballet story of Paquita, followed by the performance of *Snugglepot and Cuddlepie*, which perfectly captures the humour and beauty of May Gibbs' timeless stories and illustrations.

Eight performances will be held at the Alexander Theatre from 28 September

to 1 October. Bookings can be made by contacting the box office on extn 51111.

One Small Step

Peta Toppano, star of *Les Misérables* and the TV series *Fields of Fire*, is Regina, a modern Australian Cinderella. Raising two children and slaving every day at the shoe factory, she dreams of a better life. When the boss offers her a promotion it is the chance for a new beginning. However there are obstacles to overcome, including her husband, sister and wicked Italian step-mother.

In the tradition of *Shirley Valentine*, this inspirational one-woman play is a heart-warming and funny story of personal liberation.

One Small Step will be performed from 5 October. Tickets are available by contacting extn 51111.

■ Monash Gallery

Richard Dunn Selected Work 1964-1994

Richard Dunn's work has been shown in Europe, America, Asia and Australia.

He works across a variety of media, engaging in concepts of representation and abstraction, form and content, as well as modernist and historical modes of art.

The depth of Dunn's interests, in history, epistemology, music and architecture among other cultural forms, results in a body of work with wide ranging social and philosophical implications.

This exhibition is a reconfiguration of an exhibition originally mounted by Terence Maloon for the Art Gallery of New South Wales in 1993.

From Montage 1

Waging war on diabetes

One Monash research group has developed an inexpensive blood test which can predict the onset of the more serious Type 1 diabetes up to 10 years before it occurs. And another group is working on drugs to treat, and even prevent, the more common Type 2 diabetes. One of these drugs may also help slim the chronically overweight.

Type 1 diabetes is associated with damage or destruction of the cells in the pancreas where insulin is made. It is thought to be an auto-immune condition, where the body's own disease protection system begins to attack part of the body itself, in this case the pancreas. About 15 per cent of diabetics are Type 1. The current treatment is by injection with insulin, and the condition is also known as insulin-dependent diabetes.

But the vast majority of diabetics are non-insulin dependent or Type 2. Their condition can normally be managed by means of diet and exercise. Type 2 diabetes is considered a problem of ageing and typically is triggered by obesity in people over the age of 40. Their cells become insensitive to the effect of insulin, and their bodies respond by overproducing insulin.

The Biochemistry department at Monash has been interested in diabetes since the department's inception in the early 1960s. The founding department head, Professor Joe Bornstein, was the first to make the distinction between Type 1 and Type 2 diabetes.

Professor Bornstein also enticed Hong Kong-born researcher Dr Frank Ng to Monash in 1967. After more than 25 years, Dr Ng's work has led to two potential drugs to treat Type 2 diabetes. One enhances the effect of insulin to overcome cell insensitivity; the other reduces fat in the body preventing the obesity which triggers diabetes.

The drugs both emerged from painstaking work on the structure and action of human growth hormone (hGH). It had long been known that hGH had a direct impact on the level of sugar in the blood,

and Dr Ng began to believe it might play an important role in the development of Type 2 diabetes.

But hGH was unusual for a hormone, because it was such a large protein molecule. Dr Ng thought this might indicate that the molecule contained more than one area which was biologically active along the length of its protein chain.

So he split the hGH molecule and began searching among the fragments for active sites. He eventually found two small areas of great interest. The first, near one end of the protein chain, had the capacity to lower sugar levels in the blood. The second, close to the other end, acted to break down fat and prevent the body from making more. Both maintained their action independent of the hGH molecule.

The Biochemistry department at Monash has been interested in diabetes since the department's inception in the early 1960s. The founding department head, Professor Joe Bornstein, was the first to make the distinction between Type 1 and Type 2 diabetes.

In the latest series of studies, Dr Ng's group injected obese mice with the fragment that acts on fat. The result was significantly slimmer mice with none of the usual side-effects of slimming drugs.

But the impact of these protein fragments is short-lived, because they are rapidly digested in the body. Since last year, the group has been working on designing synthetic versions of the small fragments, which are longer lasting and more potent. Dr Ng says the work could result in useful drugs within two or three years.

But while Dr Ng's studies give hope to the sufferers of Type 2 diabetes, work on a cure for Type 1 diabetes is not as advanced. It will be years before the new Monash test to detect those at risk of developing Type 1 diabetes can result in an effective cure.

In the meantime the test is already being employed to study the levels of Type 1 diabetes in different cultural groups. Results

from preliminary surveys suggest that Type 1 diabetes is less frequent in many Asian countries, notably Korea, than it is in Europe and North America.

An assessment of the new test, reported in the June edition of the British medical journal *The Lancet*, showed that it correctly identified 82 per cent of those who subsequently developed Type 1 diabetes from a sample of 151 women of child-bearing age. Not one of 100 young women without diabetes gave a positive reaction to the test.

The developers of the test were Dr Merrill Rowley and Dr Ian Mackay from the Monash Centre for Molecular Biology and Medicine, and Professor Paul Zimmet from the International Diabetes Institute in Melbourne. They said the test was less costly, much easier to use and more dependable than the methods used at present. "This test brings population screening well into feasibility," Dr Rowley said.

The test detects what seems to be an early warning sign of an auto-immune attack on the pancreas; the production of antibodies to the enzyme 'glutamic acid dehydrogenase'. The researchers do not yet know if these antibodies are involved in the onset of Type 1 diabetes or are merely a byproduct.

"There is a proportion of adults who develop non insulin-dependent diabetes, on the way to insulin-dependent diabetes," Dr Rowley said. "It would be useful to know if they are on track to developing insulin-dependent diabetes, because by injecting them with insulin we can protect the remaining islet cells which leads to better control and fewer complications."

The research group led by Dr Rowley and Dr Mackay is now trying to make the diabetes test more convenient for routine laboratory analysis. It is one of three antibody-based tests for auto-immune conditions being developed by the group.

The researchers already have produced a prototype test for another auto-immune disease, primary biliary cirrhosis, a disease which causes liver failure. They are now looking for a commercial partner to help take this test to the stage where it can be used in diagnostic laboratories. The third test is a predictor for rheumatoid arthritis, which deforms and destroys joints.

Professor John McKay believes the death of North Korean president Kim Il Sung has ushered in a period of instability on the Korean Peninsula.

The Korean Peninsula after the 'Great Leader'

BY PROFESSOR JOHN MCKAY

On the morning of Saturday 9 July I was hurrying through the main railway station in Seoul when the announcement of the death of Kim Il Sung flashed onto the television screens. Within minutes, news sheets about the death, written in both Korean and English, were distributed. There was a general air of disbelief, as if the South Koreans had been affected by the North Korean propaganda saying that the 'Great Leader' was immortal.

Only days before, pictures of meetings with Jimmy Carter had shown a lively and healthy Kim Il Sung. Those eyes, which all who met him talked about, burned as brightly as ever. How could he be dead, unless someone had killed him? Perhaps a military coup was in progress.

I spent the afternoon with friends from the Korean Institute for International Studies, watching on South Korean television old newsreels, the analysis of the leader's death, and a seemingly endless number of scenarios for inter-Korean relations, now that the only leader that South Korea has known since 1945 had passed away.

The initial fears expressed by some, that North Korea would rapidly enter a period of

instability, even anarchy, seem to be unfounded. However, there are some signs that Kim Il Sung's son and designated heir is having some problems in establishing his power.

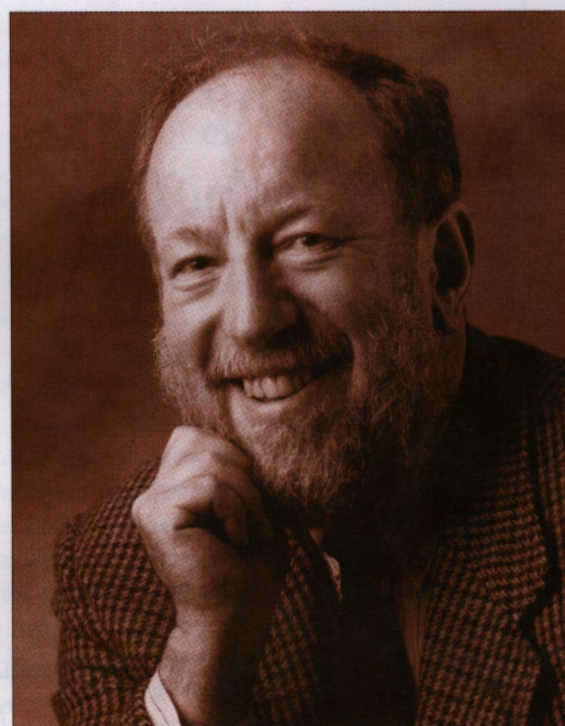
Most of the challenge seems to be originating within the immediate Kim family. Kim Il Sung's younger brother is making some claim to at least a share of power, while the second wife of the 'Great Leader' may be attempting to organise the accession of one of her own children.

In the interim it may well be that Kim Il Sung's son will occupy the more powerful posts of Secretary General of the Korean Workers' Party and Commander-in-Chief of the armed forces, allowing someone closer to his father's generation to act as President.

What is likely is that the military are vigilant for any signs of instability – a military take-over is certainly not out of the question. However, one sign of relative stability in the North was the speed with which decisions were made in talks with the United States, held on 13 August in Geneva.

The agreement reached at these talks was encouraging in a number of respects. The United States accepted that threats and sanctions would not force North Korea to abandon its nuclear program. Instead they opted for a package deal that would see the replacement of North Korea's outdated graphite reactor technology with a new generation light water reactor. For its part, North Korea seems to have recognised that in order to bring about the economic transformation it so badly needs, it must do a deal not only with the United States but also with the government in Seoul, which has for so long been dismissed as a mere puppet regime.

However, some serious problems remain. We must expect that since the nuclear card is the only one that the North has to play, Pyongyang, the North Korean capital, will seek to achieve the best deal possible. There will be several more stand-offs and periods of



renewed brinksmanship before any final agreement is reached. The United States and South Korea are both demanding 'nuclear transparency' before the package deal is implemented, and Pyongyang is still resisting this crucial requirement.

There is also the very important question of who is to pay for the technology transfer, and for the cost of supplying energy to North Korea to replace the old nuclear power plants while new facilities are being constructed.

The South Koreans are probably correct in assuming that they will have to find most of the \$US4 billion or so that will be needed. It is hardly surprising that the South is currently insisting that in order to minimise its own costs it must be a South Korean reactor design that must be chosen, although the symbolism of this might be difficult for Pyongyang to accept.

These events are of great importance for Australia. The strategic problems posed by the North Korean nuclear issue still present a major issue within the region, and any threats to the continued prosperity of South Korea are of enormous significance for our trade. The problems of the Korean Peninsula must be resolved by the Korean people themselves, but I believe that we must grasp the opportunity to play a constructive bridging role, which may well include a role in the ultimate reconstruction of North Korea and in the eventual reunification of the peninsula.

Professor John McKay is director of the Monash Asia Institute and a member of the Executive Committee of the National Korean Studies Centre.