Flu cure in sight

Scientists at Monash University’s Victorian College of Pharmacy have synthesized a potent new drug that may cure and prevent influenza.

The drug has already been tested successfully on ferrets, a species highly susceptible to human influenza viruses. The British pharmaceutical company Glaxo and its Australian partner, Biota Holdings, plan to trial the drug in human volunteers later this year.

The breakthrough came when a research team at the College of Pharmacy, led by Dr Mark von Itzstein, discovered a compound that prevents the virus spreading by locking it inside infected cells.

The antiviral compound has been described by Professor Peter Andrews, of the University of Queensland’s Centre for Drug Design and Development, as "a breakthrough rivalling the discovery of penicillin."

Conventional vaccines used to prime the immune system to recognise the latest forms of the virus become useless as soon as new forms of influenza emerge. The challenge for the team was to design a compound that neutralises all forms of the flu virus.

In 1983, a pocket-like feature - consistent in each new form of influenza - was identified by Dr Colman and Dr Varghese of the csiRo's Division of Biomolecular Engineering.

Dr von Itzstein’s team has custom-designed a compound that jams itself tightly into the pocket.

The compound is the result of a 15-year research project that has involved more than 20 researchers from csiRo, Australian National University and Glaxo.

Research liftout: full story

Facing winter with a facelift

Gloomy winter mornings will be a touch brighter for Clayton commuters thanks to the efforts of eight Monash students who took part in a community art project to give Huntingdale Railway Station a facelift.

Monash staff and students, who make up a large proportion of the station’s users, will enjoy the familiar landmarks depicted in the new murals. The group’s work features the Notting Hill Pub, union nights, and the Clayton campus student newspaper Lot’s Wife.

Local secondary school students and project organisers have also contributed to the artwork.

New city office for Monash

The Monash University Foundation has acquired a 14-storey office building in the heart of Melbourne’s CBD at a cost of $10 million.

To be known as Monash Central, the Collins Street tower will become the university’s new city headquarters in August following the expiration of the lease on the present Monash City Centre, at the corner of Flinders Lane and Exhibition Street.

Monash Central is next door to the Melbourne Club, opposite the Regent Hotel, and within a few minutes walk of Parliament and major business houses.

The Monash University Foundation is a trust that operates for the benefit of the university.

The foundation has purchased the building from Westpac Properties at a time when the CBD market is at one of its lowest points.

Monash intends to use four of the floors itself – the remaining floors are already leased and the rent returns will provide a steady source of income.

The university’s general manager, Mr Peter Wade, says the new development will not only be a good investment move by the university but also provide more space than the already overcrowded operation in Exhibition Street.

The Open Learning Agency of Australia, which already occupies one and a half floors of the university’s Exhibition Street building, will also move into the new Monash Central complex.

Apart from the Open Learning HQ, the university uses its city headquarters for seminars and lectures, as well as offices for city-based staff and corporate-related activities.

The new Monash Central complex was previously known as the Standard Chartered Bank Building.

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**25 YEARS AGO**

Some things never change... To make room for more student places, the Main Library will be transferring part of its stock to the Law School. The reorganisation of books, dismantling of shelves, carpet repairs, as well as a shut-down of air-conditioning makes it necessary to close the library from 23 to 27 May. The librarian regrets the inevitable inconvenience to users.

**15 YEARS AGO**

The first record on the new Robert Blackwood Hall label, which features pianist Brian Chapman, is now available for $6.99.

- Following a recent trip to Turkey, Associate Professor Arthur Williams of the Department of Mechanical Engineering wrote: "My first talk had to be cancelled because a professor was shot by a student the previous day. On the day of the talk, the university buildings were 'occupied' by extreme left wing students, one of whom also shot one (I believe falsely). My second talk was also cancelled at several hours notice as the engineering buildings were 'occupied' by extreme right wing students who were manoeuvring that they were unable to study because of these disturbances caused by the extreme left wing students. I do not think this occupation resulted in any shootings, but the Rector closed the entire university for a week thereafter."

**5 YEARS AGO**

In a series of public lectures titled 'Becoming better parents and teachers,' Associate Professor Maurice Batson, of the Faculty of Education, said: "Seventy-five per cent of families fight before breakfast," the cure of the earth is a good parent;" praise is the enemy of children;" and, "you can't overpower a power-drunk child."

For teachers he had this to say: "In 1987, more than 200 teachers had been on sick-leave for more than a year due to classroom stress," and "teaching is 80 per cent student-controlled 20 per cent teaching."

**NOW & THEN**

Graduate salaries continue to ride out the recession, according to a recent survey conducted by the Course and Careers Centre. The Australia-wide survey found the average 1991 graduate salaries had increased by between 1.4 per cent ($400) and 9.4 per cent ($2700) over the 1990 figures.

TakIng counsel from Council

Australia is governed by a group of elected representatives – so too is Monash.

**But who are the politicians of the university?** In an occasional series of personality profiles, Montage will introduce the university's decision makers.

Many people equate the role of university chancellor with that of a company director. In fact, the role is that of a diplomat, spokesperson, or figurehead.

Monash's chancellor and chairman of Council, Mr Bill Rogers, who took on the job 15 months ago, describes his job as a titular role, saying that he is more like a state governor than anything else.

Mr Rogers' links with Monash go back to 1956. As a young solicitor, he assisted in the legal work for the acquisition of the Clayton campus site, and the establishment of the university. His firm in the 1960s has since amalgamated to form Arthur Robinson and Hedderwicks, which still act as the university's solicitors.

On 21 March this year, Mr Rogers retired from his position as partner of the firm. He says this will give him more time to devote to Monash. But despite his retirement, a formidable list of commitments still beckons. He is chairman of Woodside Petroleum, the AMP Society's Australian Board of Advice, and Monash's nominations committee. He holds other directorships including membership of ACP, Principal Board, BUP, and National Paper Division.

One of the most important issues in the coming year, says Mr Rogers, will be the way universities deal with the VCE. He also believes universities will have to come to terms with their changing roles.

"I think Melbourne University is lobbying very hard to become more of a postgraduate, research-based university," he said. "Obviously there's a lot of money associated with research, and so these are fiscal as well as educational reasons for trying to attract those activities. But whether one university should try to attract that kind of work at the expense of another is a difficult question."

Monash's push into the Asian market is a move that Mr Rogers finds exciting. He says that in the Asian community, Australian degrees are probably worth more in gaining terms than a local university degree. "Degrees from Monash are highly sought after, particularly in Malaysia, Singapore and Hong Kong," he said.

At last year's Singapore graduates, the chancellor, along with other university dignitaries, enjoyed dinner with graduates following the ceremony.

"The students seemed overwhelmed that we sat with them, and so grateful that the university was holding a graduation ceremony in their country," he said. "It was a very rewarding experience."

Travelling to other countries, however, takes up a small portion of the chancellor's time. His major task is chairing the eight council meetings a year. "Often Council meetings resemble lengthy sittings of parliament," he said. "Although we aren't quite as orderly. Although Mr Rogers likens his position to that of a state governor, he has no sacking authority or power of veto over Council.

Thirty-five stories about Melbourne's central business district is where the 67-year-old chancellor spends most of his time. His plush but compact office overlooks Spencer Street. When he needs to catch a 'life-size train set'. The variety comes and go as frequently as he is invited to official functions.

"I probably only go to about a third of the functions I've been invited to," he says. "I've got dinner on Saturday night, a Monash function on Monday, and another on Friday. If I got two nights in a week at home I'm thankful. I don't really chase parties."
Clayton’s driving force

Staff and students alike have probably already met Jim, Reg, Fred, Bill, Ray, Andy, Alan, Bill, Graham, Wally, Mike, Les, Rod, Henry and John.

Members of the 15-strong transport group on Clayton campus are the drivers of shuttle buses around Clayton, intercampus and security bus services, mail runs, course services and VIP transportation, to name a few of their daily duties.

The men also shift office furniture, set up examination tables and chairs, deliver examination papers, remove furniture, and maintain a fleet of 20 cars, four vans and one truck.

Acting transport co-ordinator Mr Reg Townsand believes the drivers are a vital part of the university operations. “The shuttle bus services give us a high profile around the campuses but this is only part of our daily routine,” Mr Townsand said. “We are involved in a lot of activities that help things run smoothly.”

Transport co-ordinator Mr Jim McDonald, a veteran of 20 years service at Monash, is off work as a result of ill-health.

Button joins Monash

Former senator and minister for industry, technology and commerce John Button (above) has been appointed a professorial fellow at Monash University.

Professor Button will take up his position at Monash in June following his recent retirement from politics.

Professor Button will play a vital role in Monash’s well-established alliances with the commercial sector and will work with senior academics in the David Syme Faculty of Business to build mutual cooperation between the university and key businesses.

He will also play an integral part in the university’s expansion in Asian markets, and his high profile political past will provide a wealth of expertise in this area.

Monash’s vice-chancellor Professor Mal Logan, described the appointment as “tremendously exciting”.

“The second point is that a strong working relationship with business enables many of the university’s high achievements in the area of research to be fully developed, hopefully so the extent of contributing to a better standard of living for Australians,” Professor Button entered federal politics in 1974 and became industrial minister in the first Hawke Government in 1983.

School leaver intake up

Preliminary estimates of 1993 higher education enrolments in Australia show commencements by school leavers have increased 3 per cent over 1992 figures. This increase has been reflected in Monash University enrolments.

Announcing the preliminary estimates, the Minister for Employment, Education and Training, Mr Kim Bradby, said: “The majority of institutions have taken a responsible approach. They recognise the importance of providing opportunities for school leavers to go on to higher education.

“The increase in school leaver enrolments shows a healthy reversal of the decline experienced in 1992,” he said.

Since 1988 the number of students in higher education has increased by about 40 per cent. More than 580,000 students are enrolled in Australian universities.

Other details to emerge from the preliminary estimates include:

- 69,000 school leavers have enrolled in tertiary education nationally;
- enrolments increased in most states, the largest being 5.5 per cent in both Victoria and Queensland;
- total enrolments are likely to reach 583,000, a 4 per cent increase on 1992;
- females make up 54 per cent of total enrolments;
- higher education postgraduate enrolments have increased by 14 per cent.
No writers' block in the East

Myrna Kostash, visitor to the Department of German Studies and Rare Books, travelled extensively in Eastern Europe from 1984 to 1988. Her aim was to meet the writers of her generation — the sixties — to find out what motivated them to speak against their oppressive regimes, and what causes their thoughts and ideas have taken since then. As Myrna describes here, what she found not only shocked her, but also set the massive changes of the early 1990s in a new perspective.

"Meeting the writers I admired involved a series of shocks for me because I had several assumptions about them and my generation. I knew that because I'd felt this incredible solidarity with them in their struggle with Soviet imperialism, that they would have felt the same for us in our struggle against the Vietnam War and capitalism. But they didn't feel this at all. They didn't understand what our grievance was against capitalism." said Myrna.

"Another shock came when the romantic notion that we had about writers in the East was shattered. Western writers had revered writers in the East because they were seen to be the martyrs of their nations, tribunes of the people and held in high esteem within their own culture. Indeed, quite the opposite situation seemed to exist: writers were expected to make pronouncements and be prophetic, something they actually did. I envied the position of the writer in the West, who could live a private life. We envied each other's positions as writers.

"I was asked what I thought of the immorality that the Eastern writers did. In Czechoslovakia some were imprisoned, but this wasn't the norm. Mostly, writers were restricted in what they could find. For them this 'punishment' was an almost a gift because they were left to write in peace."

"They could then share their writing among a small group of appreciative friends and have nothing to do with 'fame.' It was almost like they formed their own parallel world to the official one. They got their poems and books published and they put up political fights, and held illegal rock concerts in the country. They almost ignored what the official world was doing.

"For them the parallel culture was where they could live as honest human beings. If they had tried to make a career in official literature, they would have been hopelessly compromised."

"Some of them had been sexy hippies in the West. They didn't want to change things. They were not revolutionaries, they just wanted to be free to think and express their ideas."

"It was also a shock to discover the antipathy of the Eastern bloc people with each other. For example, a lot of Polish people felt contempt for the Czechs because they felt they had never defended themselves. The Poles on the other hand were in a perpetual state of uprising."

"For me, what has always been a general Slavic identity and culture turned out to have many warring identities within it. When things began to fall apart after 1989, especially in Yugoslavia, I can't say it was totally surprising."

"One of the prevailing ideas I came across in the 1980s was that the individual country had once belonged to a greater European culture. The Eastern writers felt that the Soviet empire was responsible for kidnapping them from the strength of this united culture. This explains why each country has found its own way back to Europe since the collapse of the Soviet Union. In Slovenia, for example, declared its independence and tried to rejoin Europe through its connections with Austria.

"At the last time I was in Ukraine in 1988, nobody had any idea that things would change in the way they did. It wasn't until the end of the 1980s that the changes happened. The people realised how bad they had come to rely on being able to hate the Soviet Union. Suddenly, when it collapsed, the 'bogeyman' was no more and they were left with the realisation of all the work that needed to be done. Schools, hospitals, roads, finances, water, communications and just about everything else was, and to a large extent still is, in a state of disrepair. The work that needs to be done is colossal."
Engineers don't just build bridges — they also design and develop replacement parts for the human body.

First-year materials engineering students at Monash University were introduced to the field of biomaterials (the use of non-biological materials for medical devices intended to interact with biological systems) at a lecture featuring Mr Boneparte.

Mr Boneparte, on loan from the Therapeutic Devices Branch of the Department of Health in Canberra, demonstrates the many advances that have been made thanks to the ingenuity of engineers.

According to senior lecturer Dr Mary Gani, almost every part of the body, with the exception of the brain, can be augmented to some degree by surgery and the use of prostheses (devices that replace a body limb, organ or tissue).

Implants are widely used in many areas of surgery. They can be used to replace a part of the anatomy that has been damaged, diseased or worn, such as arthritic joints, heart valves, corneas and breasts; to correct congenital abnormalities, such as spinal curvature or blockage of the ventricles in the brain; to help the healing process, for example by using plates, rods and nails for fractured bones; and to improve the function of an organ such as an irreparably beating heart.

It is the responsibility of materials engineers working in the multibillion dollar biomaterials industry to develop 'replacement parts' that will function in the most hostile environment known to engineers — the human body.

As Dr Gani explains, the body has specific mechanisms for rejection. It is only in the last 40 years that the use of artificial materials to repair the loss of function in various parts of the body has become widespread. More than 50 prosthetic devices are now in use and as many as 40 different materials have been found to be suitable.

However, these advances follow thousands of years of investigation. The first recorded use of biomaterials in surgery was 4000 years ago when an Egyptian surgeon was credited with using stitches to repair wounds. The Egyptians also used copper plates to heal shall wounds. This may have been a dangerous practice as it is now known that copper corrodes in the body, producing toxic copper ions.

One of the more novel attempts was the use of ants' pincers to suture internal wounds in India about 3000 years ago. This cannot have been a pleasant experience, although the ants were not only able to repair the wound, they also helped the healing process by cleaning the wound with their sharp pincers.

More recent prosthetic materials include stainless steel, aluminum, carbon and glass ceramics.

Susan Harrison
Award-winning and enterprising businesswoman for academic and general staff are just two of the big issues Ms Susan Harrison and her team in Personnel Services are facing in the 1990s.

As director of Personnel Services, which now has about 40 people working in areas such as administration, employer relations, staff development and equal opportunity, Ms Harrison is responsible for developing and implementing personnel policies.

Ms Harrison regards human resource policy and programs as an integral part of the university's development.

"Policies must be closely linked to strategic plans and supported by line and personnel managers if they are to be effective," she said. "Our policies focus on quality customer service, productivity, employee involvement, team work and workforce flexibility."

Good human resource management is a vital element in the success of any organisation, Ms Harrison said.

At present, Personnel Services is negotiating with general staff unions to adopt a simple salary classification structure. This has involved converting 200 job classifications into just 10 levels, but Ms Harrison is confident the result will be worthwhile.

"This reclassification will break down artificial boundaries and lead to a more flexible system within which people will be able to plan, develop and change their careers," she explained.

Ms Harrison holds an arts degree from Monash. After working in private industry for several years, she returned to the Clayton campus to work in the staff branch. It seems her efforts must have been appreciated.

"When I rang for a reference 10 years later — after leaving the university to raise a family, manage an antique shop, and run a charter yacht in Queensland — she was promptly offered a position, which has led to her recent appointment as director.

"During her most recent 1-year stint at Monash, Ms Harrison has seen many significant changes. She said the 1990s are proving to be particularly challenging, especially in relation to handling complex human resource matters in the multibillion dollar environment of a large-scale multicampus university.

"As one of the university's few senior female administrators, Ms Harrison is understandably keen to see more women achieve higher levels of management."

"Many women do not apply for senior jobs because they do not feel confident. From my informal mentor programs are important if women are going to start to move through the ranks," she said.

"Personnel Services recently held an information session for women academic staff members on preparing for promotion. The speakers were senior academic women who talked about their own experiences.

"Ms Harrison is also keen to see the introduction of more extensive job-related training for general staff."

"By acquiring new skills, staff can enhance their career paths. Our task is to have in place policies that enable the university to attract the right staff.

"It is also my responsibility to ensure that sound personnel policies are developed and motivate staff so that they can participate actively in the directions being taken by the university. It is also up to individuals to invest in their own careers."

In addition to special training programs, Personnel Services is examining its own levels of service. "We are continually working to improve our service and administrative procedures. It is necessary to understand and anticipate the expectations and needs of our customers."

Personnel Services has recently moved towards a faculty-based emphasis:

"Previously, staff were responsible for looking after a particular type of role across all faculties. Now, staff are appointed to a specific faculty or department. The move has led to a greater understanding of the unique culture and requirements within each faculty, and has been very well accepted," Ms Harrison and the Personnel Services team are based in the Science and Technology Park on Blackburn Road. Equal Opportunity may be found on the first floor of the Gallery building, Clayton campus.

Local flower industry set to bloom
Australia's cut flower export industry is set to flourish as a result of genetic manipulation techniques developed by the new International Floriculture Cooperative Research Centre (IFCRC)

Monash University's Centre for Agricultural Biotechnology is one of 10 partners in the IFCRC, the Monash centre is largely responsible for developing techniques to control flower colour, biotechnological development, longevity, and gene transfer.

"Once these variables become controllable, flowers can be supplied during non-growing periods in the northern hemisphere, delivery will be possible soon after the flowers are harvested, and the local industry will be able to cater to the desires of the Asian market."

The executive director of the university's Australian Agriculture Research Unit, Mr Michael O'Keefe, said one of Japan's largest hotel operators often purchased carnations for weddings from Australia, but the colour of the flowers had "just right".

"Our genetic manipulation techniques will mean that the flower industry will soon be like the fashion business in that we will have designer flowers," Mr O'Keefe said.

The university's School of Marketing is also involved in the IFCRC, and is responsible for developing commercial strategies to maximise the returns from the international marketplace.

At present, 10 per cent of Australia's cut flower industry, worth about $1250 million annually, comes from export sales. Industry sources believe exports will expand by 28 per cent each year.

The IFCRC has been granted $18 million over five years to develop genetic manipulation techniques for flowers.
Most are called centres, others have been christened institutes, units or facilities. Whatever the designation, all provide a focus for university research into a special area. At Monash, this can range from telecommunications to timber, from language to leadership, from accidents to aerospace. Starting this month, Montage will present an occasional look into the workings of these hubs, nubs and nodes. Where better to begin than one of our latest centres of attention?

The Institute, opened in March by former senator John Button, will conduct important research into male infertility, sex, cancer diagnosis, women’s medical problems, and the development of new-born babies.

Its members include Professor Alan Tannock, well known for his work in reproductive technology; Professor David de Kretser, a (soon-to-be) expert on male infertility; and Professor David Healy, who is noted for his research into the regulation of bleeding in menstrual cycles.

Institute director Professor de Kretser says the institute will create an environment in which researchers will be able to combine their skills. "No individual working in biological sciences has all the resources and skills at their fingertips to solve a biomedical problem."

The institute's location at Monash Medical Centre is also ideally suited to translate into health care discoveries in the institute and overseas pertaining to male and female reproductive systems, and developments in perinatal and neonatal care.

Early detection of ovarian cancer

The discovery of a new sex hormone has led to the development of a clinical test that can detect the occurrence of ovarian cancer two years before its presence becomes apparent.

A team from the institute and Prince Henry’s Institute of Medical Research discovered the hormone, inhibin. It is the first new sex hormone to be discovered in 20 years, and is found in the ovaries of normal women.

According to Professor David Healy, of the Institute of Reproduction and Development, and Professor Henry J. Turner, of the Institute of Medical Research, the measurement of inhibin levels in the blood may indicate a woman is at risk from cancer of the ovaries.

"Although we cannot determine yet who is at risk from ovarian cancer, once the cancer is clinically suspected and surgically removed, we can use a blood test for inhibin to detect any possible recurrence," Professor Healy explained.

"This new method not only helps doctors take early steps but it gives the patient some peace of mind."

The test uses samples from 10 of the 50 years of developing ovarian cancer.

What price a baby's life?

Significant improvements in the survival prospects of premature babies have raised many questions about the cost of medical interventions.

In Victoria, even extremely low birthweight babies below 1000 grams now have about a 40 per cent chance of survival. "Not only are more of these babies surviving but also fewer of the survivors are suffering disabilities," Professor Yu said.

"Tackling into account their ability to contribute to the community, the cost of their treatment works out at around $1000 per quality life-year gained. The equivalent costs are significantly higher for organ transplantation programs, such as bone marrow (two times higher), kidney (three times), heart (five times), and liver (eight times)."

"The cost per 10-year gain of cosmetic bypass surgery is 26 times higher, and coronary care 40 times."

"While 100 per cent of these babies go on to live a life without severe disability, survivors of other high-cost, high-technology care programs have a poorer prognosis and a poorer quality of life."

"If we set aside our responsibility to parents and their newborn babies and consider the issue from a purely economic point of view, the price of saving a baby's life is small and extremely cost-effective."

Sleeping through a serious study

Sleeping children are helping Monash scientists discover possible contributing factors towards common paediatric problems such as developmental difficulties, i.e. school performance, and growth disorders.

Over a period of one night or afternoon, infants and children are carefully monitored while asleep in a special set-up laboratory in the university's Department of Paediatrics at Monash Medical Centre.

The lab uses the latest research opportunity to follow parameters, such as electrical activity of brain waves, rapid eye movements, air movement through the nose and mouth, and the activity of muscles around the neck, says Associate Professor Michael Adesman, of the university's Institute of Reproduction and Development.

The sleep laboratory consists of a child's bedroom on one side of a partition and an array of recording devices into which the subject is connected via a web of electrodes on the other.

"A lot of problems occur during sleep, such as snoring, which is caused by narrowing of the airways. Snoring can cause a disruptive sleep pattern, and may indicate a more severe problem called obstructive sleep apnoea (OSA). Studies overseas suggest OSA is a bigger problem than once thought. A baby who fails to thrive in the first year may be suffering from the problem. It also can cause crankiness in children and affect their performance at school," Professor Adesman says.

"If OSA is diagnosed, sufferers usually respond to a nasal dilator or adenoidectomy."

The sleep lab is also used to gather information in the fight against snoring. "One of the possible causes of OSA is thought to be obstruction. So in the laboratory we are looking at babies' arousal and how it is affected by different stages of sleep."
Reducing the burden of paralysing injuries

Influenza has cost more lives this century than any other virus disease. Now, a potent new drug synthesised by Monash researchers may render this killer virus harmless.

Scientists at Monash University’s Victorian College of Pharmacy have synthesised a potent new drug that may cure and prevent all new and existing forms of the influenza virus.

In laboratory tests conducted by the British pharmaceutical company Glaxo, the Australian drug has been shown to completely protect ferrets, a species highly susceptible to human influenza viruses, against infection.

Glaxo and its Australian partner, Biota Holdings, plan to trial the drug on human volunteers later this year.

Designed and synthesised by Dr Mark von Itzstein’s team at the Victorian College of Pharmacy, the compound is the result of a 15-year research project that has also involved scientists from CSIRO, the Australian National University (ANU) and Glaxo.

Biota Holdings is a small Melbourne-based company that began funding research by Dr von Itzstein in 1986. Biota had previously acquired from CSIRO the intellectual rights to a molecular element that slices through the sialic acid molecule based on nature’s own design.

The influenza virus is notorious for changing the face it shows to the human immune system. It mutates frequently, changing either one or both of its two surface proteins — sialidase and haemagglutinin — so that the natural immunity induced by previous variants of the virus no longer protects against infection.

The immune system must develop a specific response for each new variant of the virus. For the same reason, conventional vaccines that prime the immune system to recognise the latest forms of the virus become useless as soon as new forms of the virus emerge.

Dr Colman and Dr Laver recognised that while the influenza virus makes frequent changes to its sialidase enzyme, certain elements of its structure must remain constant across all variants. If, for example, the virus lost the vital element that slices through the sialic acid bonds, it would be permanently trapped on the surface of the infected host cell, halting its replication cycle.

The influenza virus uses this property that Biota acquired from CSIRO in 1986. Biota provided the coordinates for this pocket in 1983 in which it identified a pocket-like feature within the sialidase enzyme that never changed.

The pocket, now known to be the enzyme’s active site, fits around the individual molecules of sialic acid glues, and cuts through them to release the virus from the host cell’s surface.

In 1986, the data obtained by Dr von Itzstein decided not to wait for improved analogue to that fit into the pocket and bind more strongly than natural sialic acid. Indeed, if the compound was to work at the very low concentrations demanded of a human drug, it would need to have at least a million-fold competitive advantage over native sialic acid.

They reasoned that if nature had designed the pocket to accommodate molecules of sialic acid, it was logical to experiment with molecules of the same basic shape as sialic acid.

They reasoned that if nature had designed the pocket to accommodate molecules of sialic acid, it was logical to experiment with molecules of the same basic shape as sialic acid.

The concept of inhibiting influenza sialidase had been around for more than 20 years, but no influenza inhibitor had ever been reported to be inhibitors.

Continued on Research Monash 4
Battling for woodland survival

More than 200 years of human interference has altered the delicate balance between Australian native species and their environment. Now, a study by a Monash biologist of the food chains of small birds and mammals is helping to explain why they are in decline.

Small native birds like warblers, robins and wrens are in drastic decline throughout Victoria’s fragmented ironbark-box woodlands.

The most obvious reason for this decline is loss of habitat — some 90 per cent of the state's woodland has been cleared for agriculture. But, even in what remains, more than 50 species of small birds (known as passerines) continue to become rarer.

Mr Barry Traill, a PhD student in the Department of Ecology and Evolutionary Biology, has been observing a war in the woodlands — a struggle for living room and resources. The struggle involves not only native birds, but also native mammals like the brush-tailed phascogale and the squirrel glider.

The conflict is ancient, and pre-European times had produced a dynamic balance of power in which no species or group of species could gain more than a temporary advantage.

But 200 years of human interference in this woodland has produced a power struggle that is far from balanced. While virtually all species have declined numerically, some have been more easily advantaged and now dominate the struggle for what remains.

Mr Traill began his PhD, supervised by Mr Alun Jones, by studying the contest between the sugar glider and their close cousin, the squirrel glider. The squirrel glider, Petaurus norfolcensis, has become rare, especially in Victoria, while the sugar glider, Petaurus breviceps, is still fairly common. The two species are so closely related that they will interbreed in captivity.

Competing for food

“Competition theory predicts that they should be partitioning resources in some way,” Mr Traill says. “Squirrel gliders are larger and require a greater food input than sugar gliders.”

“In normal seasons, there is a complete overlap in resources. In years with poor rainfall, however, squirrel glider numbers are concentrated on the few remaining flowering trees, leaving sugar gliders relegated to what I assume are less profitable resources like acacia gum and insects.”

The larger squirrel glider tends to dominate on the best areas at all times with the sugar glider making do with the limited resources available,” Mr Traill says. “Work indicates that the squirrel glider is more dependent on areas with good winter nectar sources.

“In poor flowering seasons, the sugar glider can’t compete for the best resources and so survives by going for other carbohydrates, including lehrs (the sugary wax shells exuded by sap-sucking insects).”

“Like the yellow-bellied glider, the squirrel glider will also make cuts in the bark of tree trunks and work their way up the tree trunk. The squirrel glider can thrive, it dominates the sugar glider, but sugar gliders can survive in a greater range of habitats.”

The balance of power in the woodlands has been tipped, Mr Traill believes. Some species have specifically stripped the ironbark-box woodlands of mature trees containing hollows in which the gliders nest.

Mr Traill put artificial nestboxes in an area of woodland, but designed them with an entrance that allowed access only to the smaller squirrel glider. But, even in Victoria’s ironbark-box woodland as most of the trees are now no older than 80 years.

The scarcity has led the two gliders and other animals to compete for the few available hollows.

Squirrel and sugar gliders are in less obvious competition with nectar feeding birds and insects. They are sustained by the same nectar-rich eucalypt flowers prized by beekeepers. Much of Australia’s best honey comes from hives in the ironbark-box woodlands.

A eucalypt forest and the plants in its understorey offer several sources of energy-rich carbohydrates. Nectar, gum exudates and lehrs may be exploited by several dozen insect species, 25 bird species and four mammal species — the two gliders, the brush-tailed phascogale, and the yellow-footed antechinus (a marsupial mouse).

How nectar, the most prized resource, is divided up between the competing groups of nocturnal mammals and day-active birds and insects is unknown. Nobody has studied nectar flow rates in ironbark woodlands.

Australia’s banksia heathlands, birds and banksias have struck up a mutually beneficial relationship in which the birds provide pollination services in return for nectar. Maximum nectar flow coincides with the main periods of feeding activity in birds, in mid-morning and late afternoon.

When extending his studies to birds, Mr Traill found that a lone competitor in competition of aggressive honeyeaters rule the fragmented woodlands, to the extent that they almost exclude the smaller passerines that birdwatchers lump under the affectionate title of dickybirds.

Fuscous honeyeaters (Lichenostomus melanops) and yellow-tailed honeyeaters (L. melanops) aggressively exclude dickybirds like thornbills (Queensland to western Victoria. Increasingly it is being dominated by one or two species of honeyeater which could be having a big effect on the range and distribution of some rare species.”

One of the rarest birds of the ironbark-box woodlands is the regent honeyeater. Only about 1000 of thesenomadic species, found mainly in Victoria, remain. Other species such as the crested bellbird, southern white-faced, grey-crowned babbler and brown-throated honeyeater have not been able to establish their own territories because the ironbarks are the most prolific nectar producers.

The dickybirds are then confined to ridges where the vegetation is relatively sparse. Occasionally honeyeaters can be found in these areas, but Mr Traill suspects they are immature birds that have not been able to establish their own territories in the face of aggression from their own and closely related species.

“Mr Traill put artificial nestboxes in an area of woodland, but designed them with an entrance that allowed access only to the smaller squirrel glider.”

WINTER ESCAPE

In winters when flowering is particularly poor, the honeyeaters abandon the woodlands, leaving them for the dickybirds. When winter finishes in August, the honeyeaters are quick to return and evict the dickybird intruders.

The former boundaries between honeyeater and dickybird territories are re-established. The honeyeaters defend the gullies and ironbark-dominated ridges because the ironbarks are the most prolific nectar producers.

“Like the bell miner, they will attempt to drive all other species, including large ground-feeding birds like choughs and magpies. Despite their common name, these honeyeaters feed mainly on insects for much of the year because nectar is abundant only during the main flush of eucalypt flowering in winter.”

My study emphasises that Australian ecosystems are quite different from those in the northern hemisphere,” Mr Traill says. “This forest type is now fragmented, having once covered an enormous swath from southern Queensland to western Victoria. Increasingly it is being dominated by one or two species of honeyeater which could be having a big effect on the range and distribution of some rare species.”

Mr Traill suspects the behaviour may have begun when the ancestors of Australia’s honeyeaters were almost exclusively nectarivorous. As the honeyeaters diversified and some became more insectivorous, they may have found their aggressive behaviour. This may have then further evolved as a defence of nectar sources and a useful method of excluding a wide range of insectivorous birds.

Mr Traill says honeyeaters are also aggressive towards other members of their own species. Fuscous and yellow-tailed honeyeaters form semi-colonial social groups in which monogamous pairs claim discrete core territories, with groups of pairs banding together to exclude intruders.

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“Other passerines that birdwatchers Jump under the affectionate title of dickybirds,” Mr Traill says. “This forest type is now fragmented, having once covered an enormous swath from southern Queensland to western Victoria. Increasingly it is being dominated by one or two species of honeyeater which could be having a big effect on the range and distribution of some rare species.”

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Nature is wreaking revenge on agriculture because the loss of insectivorous dickybirds, along with insect-hunting birds that also use hollows in old trees for shelter, leads to insect plagues that reduce the productivity of farmland and contribute to the problem of eucalypt dieback.
Blocking the nerve killer

Head and spinal injuries have massive physical, emotional and monetary costs to the community each year. A discovery by Monash scientists of a drug that reduces neuronal damage means these costs are set to be radically reduced.

Luck played a big part in how tibalosine, one of the world's most promising compounds for minimising neuronal death after stroke or injury, was identified by two Monash scientists.

In the late 1980s, medical researchers discovered that in the hours and days after a severe spinal or head injury, much neuronal damage results from a series of biochemical events that cause healthy nerves to be lethally overstimulated. Ever since this discovery, medical researchers have been searching for drugs to block the lethal cascade, sparing healthy neurons to minimise brain damage.

In 1989, two Australian scientists working in different fields stopped to chat in an Austin Hospital corridor. Their chance meeting led to Professor Bevan Jarrott and Dr Phil Beart moving to the Department of Pharmacology at Monash University to pursue their research into tibalosine, a novel NMDA antagonist (see box).

Professor Jarrott had studied tibalosine for a different reason five years before the fateful chat. He had investigated the drug's variable properties, with limited results.

When Dr Beart stopped Professor Jarrott in the corridor at the Austin Hospital, Dr Beart had not heard of tibalosine. He wanted to know if Professor Jarrott had any tibalosine, which is an NMDA antagonist. He needed it to test his idea that it could be labelled with radioactive iodine-125. The iodine-125-labeled tibalosine could tag the NMDA receptors, allowing different regions of the brain to be visualised - a technique known as autoradiography.

The iodine-125 experiment worked. Dr Beart had developed an analytical method for mapping NMDA receptors in the brain and a new assay technique for studying potential NMDA antagonists. But with a chemist's memory and eye for detail, Professor Jarrott noted that the structures of parts of its architecture with tibalosine, the drug he had discarded as an anti-hyper- sensitive five years earlier, might tibalosine also be an NMDA antagonist?

He gave Dr Beart some tibalosine to test in his new assay technique. His hunch was correct - tibalosine proved to be a unique NMDA antagonist.

Tibalosine is made by a small Belgian drug company, Continental Pharma, which has been bought by Searle, the pharmaceutical arm of the chemical multinational Monsanto.

When Dr Beart had been supplied with tibalosine for his original experiments, Professor Jarrott had signed a standard agreement with Continental Pharma that gave the company the first option to exploit any discoveries from his research. He wrote to the company for permission to present the new findings to conferences.

"They got very excited about the possibility of patenting tibalosine as a potential neuroprotective drug." Professor Jarrott said.

The company filed a use patent to protect the original discovery. In consultation with the Australian researchers, they identified 20 related compounds, variants on the basic structure of tibalosine, that could be tested to see if any might be a more potent NMDA-antagonist than tibalosine itself.

As expected, these compounds varied in potency, with some working better than the original form of tibalosine. By comparing the structural differences between these variants, Professor Jarrott and Dr Beart were able to home in on those elements of the structure that contributed most to potency as an NMDA antagonist.

The Monash researchers had a rapid screening technique, and a drug that promised to be a potent neuroprotector. But they didn't really understand how tibalosine interacted precisely with the NMDA receptor to prevent the neurons from being overstimulated.

In 1992, Dr Beart took study leave to work at the Royal Danish School of Pharmacy in Copenhagen, where he was investigating excitotoxic drugs using cultured nerves. Among the drugs that kill or injure nerve cells by acting through the NMDA receptor is the hallucinogen PCP, or so-called 'angel dust'. The Danes had found that nerve cells exposed to excitotoxic levels of glutamate begin to synthesise to nitric oxide. The stressed nerve cell is unable to send its potentially lethal signal to its neighbours.

High doses of amphetamine in laboratory animals cause the destruction of a special class of neurons in the striatum that secrete a natural calming agent called dopamine - the loss of these neurons is responsible for Parkinson's disease in human beings.

If laboratory animals are given several injections of tibalosine and then subsequently exposed to normally-kid­node doses of amphetamine, they exhibit minimal behavioural effects and loss of dopamine-secreting neurons in the striatum. In the Parkinsonian mouse model, NMDA receptors appear to be localised on the dopamine neurons, which could explain why tibalosine is so good at protecting the dopamine cell bodies.

The Monash researchers also found that tibalosine works exclusively on one part of the NMDA receptor, the so-called polyamine site.

The NMDA receptor was originally identified as the site where L-glutamate, one of the main excitatory neurotransmitters, binds to the neuro­

But the NMDA receptor's repertoire of activities extends beyond this simple one-to-one interaction. Indeed, the human brain's enormous flexibility origi­nates at the level of individual receptors, where different modulators, working in concert through different components of the same receptor, orchestrate complex and specific behaviour in the nerve.

Some drugs produce unwelcome side effects because they block the entire receptor, producing pronounced behavioural stimulation.

Professor Jarrott and Dr Beart believe that tibalosine works exclusively through the polyamine site - a modula­

This means that the nerve continues to function almost normally while tibalosine remains bound to the polyamine site, protecting it by a non-competitive mechanism against glutamate's toxic effects.

"Non-competitive antagonists that produce therapeutic benefits with no behavioural side effects are of great interest to pharmaceutical companies," Professor Jarrott said.

Three thousand Australians suffer head injuries every year that result in some degree of brain damage. Another 37,000 people fall victim to strokes. Others suffer paralysis from injuries to the neck and spinal cord.

The NMDA receptor has also been implicated in several other diseases of the central nervous system, including parkinson's disease, Huntington's disease and epilepsy. The Monash researchers hope tibalosine may prove useful in preventing or treating these diseases.

Ideally, such drugs will be adminis­tered by ambulance officers to anybody who has suffered a stroke or head injury. These drugs could also have positive effects if administered up to 12 hours later.

But Professor Jarrott says testing tibalosine in humans poses formidable challenges. The brain is relatively inacce­ssible for study, and the conse­quences of stroke or head injury are so variable in nature and severity that it will be difficult to show quantitatively that tibalosine has done its job in ameliorat­ing nerve cell death.

Dr Beart has applied for a grant from the Victorian Health Promotion Foundation to establish a tissue culture labora­tory so that tibalosine's ability to protect nerve cells exposed to injury or chemical insult can be evaluated.

Professor Jarrott and Dr Beart also plan to work with the Department of Chemistry at Monash to synthesise new variants of tibalosine and structurally related compounds that may be even more potent. They have established a theoretical design project with Dr Margaret Wong of Swinburne University.

What is the NMDA receptor?

The NMDA receptor is a specialised protein that mediates communication between nerve cells. Present in virtually every nerve cell in the brain, NMDA receptors can be thought of as a channel through the membrane of the neuron that is shut or opened in response to levels of various biochemical signals from other neurons.

Among these signalling compounds is the amino acid glutamate, a potent neurotransmitter that opens the gate, allowing a pulse of sodium ions to flow into the cell, activating the nerve. However, high concentrations of glutamate released by nerve cells can jam open the NMDA channels of a neighbouring neuron by discharging magnesium ions and allowing sodium and calcium ions to enter and depolarise the nerve. A sustained depolarisation results in depletion of energy reserves. The neuron then dies.

Nerve cells release glutamate when they are deprived of oxygen by the blockage or rupture of a blood vessel, or when they suffer physical injury. The glutamate released by a cell can kill its neighbours, as these cells die, they in turn may overstimulate and kill adjacent cells, causing a wave of damage to radiate from the epicentre of the injury.
Creatively recycling waste

The multitude of new materials developed in the 20th century has resulted for some in what futurologist Alvin Toffler termed 'shock of the new'. But some are less shocked than others. One Monash lecturer is turning 20th-century waste into art.

'Beautiful', 'artistic' and 'impractical' are words not commonly used to describe the plastic that goes into milk cartons. But in the hands of sculptor Mr Dan Wollmering, who has created several new works from a recycled form of this ubiquitous 20th-century substance, such a description fits.

Mr Wollmering, who lectures at Monash's School of Art on Gippsland campus, has chosen Syntal, a dark, solid material whose chief constituent is polyvinyl chloride from recycled milk containers, for his most recent works because of its sculpting qualities.

'I find Syntal quite exciting because contemporary sculpture, as a branch of contemporary art, is looking for new materials,' he says. 'Mr Wollmering says that while the idea shapes the choice of material, the chosen materials also shape his idea. This was particularly true for recycled plastic because it has limitations as well as exciting possibilities.

Syntal was originally developed as a wood substitute. When it is extruded in semi-molten form, different dyes are used to shape it as it emerges. It cools to a hard, dark grey or black colour with a texture not unlike that of wood or stone. When it is worked in a lathe, it can resemble stone or wood as well as exciting possibilities.

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Beating the flu blues

From Research Monash

The compound's level of activity, however, was still not high enough to be used as a human anti-influenza drug. Dr von Itzstein's team had made a promising start, but now needed to refine the design of the compound so that it would work.

"Once we knew we could do it, the field opened right up. If we could make a more potent in-vitro inhibitor, we could expect in principle that it should translate to in vivo activity," Dr von Itzstein says.

By 1987, the CSIRO researchers had further refined the crystal coordinates, opening the way for Dr von Itzstein to alter the basic shape of the sialic acid template to improve its binding activity.

The preliminary experiments had used a basic template molecule called 2-deoxy sialic acid. In 1988, Dr von Itzstein decided to vary the template itself, by inserting an amino group into its ring structure. The task of synthesising the 4-amino analogue based on the sialic acid template was given to group member Dr Wen-Yang Wu. The result was at least 10,000 times more active than any of its 2-deoxy sialic acid predecessors, a huge gain in binding activity.

"Even as the new compound was being tested in rodents in the UK, Dr von Itzstein sent the new variant synthesised by Dr Wu. This compound had a guanosine 5'-monophosphate attached to it, a first in the field of post-industrial plastic.

The variant proved to be a puzzle. The computer predicted that the 4-guanosine sialic acid analogue should be more active than the 4-amino compound, but when it was tested it was virtually non-active. Even the team's biochemists, activity seemed to vary wildly.

It was indeed an improvement, being about 1 million times more active than native sialic acid, but its activity seemed unaffected binding.

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New centre declares science is golden

School-aged children will rediscover their innate desire to investigate, observe, and experiment if an ambitious project being undertaken by Dr Pat Vickers-Rich of the Department of Ecology and Evolutionary Biology is successful.

With the encouragement and financial support of the university, Dr Vickers-Rich has begun work on the project, which she hopes will enhance the way science is taught in Victoria's schools. Such a transformation would also ultimately alter the way science is perceived in the community.

Dr Vickers-Rich has become one of Australia's most visible scientists through her work on dinosaurs with husband Tom Rich, at the University of Victoria, British Columbia. She has introduced thousands of Australians of all ages to the joy of scientific inquiry and discovery through the spectacular dinosaur fossils found at Dinosaur Cove.

Dinosaur fossils have instant appeal, and palaeontology will feature prominently in the new Monash Science Centre, now under development in the former Bushell's tea and coffee factory in Normandy Road, Clayton.

Dr Vickers-Rich, who studied palaeontology at the University of California and Columbia University, is modelling the new centre on a famous Californian prototype - the Lawrence Hall of Science, on the Berkeley Campus of the University of California.

Dr Vickers-Rich suspects that by the time most Australians have left school, they have lost or dulled the insatiable curiosity that drove them to learn in their first few years of life. Learning has become a chore.

Something about the way science is taught - or not taught - in the early school years results in the atrophying of such intrinsically human traits as the desire to inquire and observe, and the urge to experiment and invent.

To blame teachers is to ignore the roots of the problem, which includes a teaching system that undervalues science and a chronic lack of resources for teaching science in primary schools. Dr Vickers-Rich wants to use the new Monash Science Centre to enhance the way science is taught - or more accurately, learned - in primary and early secondary schools.

Many people reject science because they consider it to be a cold, joyless, dehumanising enterprise.

She believes that if schools can engender and sustain an interest in science through these critical early years of learning, more students will be encouraged to take science subjects in high school. The Victorian Certificate of Education and pursue careers in science. For those who do not wish to pursue careers in science, a simple understanding of how it works and how it affects their lives is still important.

According to Dr Vickers-Rich, the answer does not lie in pursuing science as a career, but in teaching science in a way that makes it more relevant and engaging for students.

"We're trying to demystify the scientific process to let people look at the world in a more analytical way," Dr Vickers-Rich says.

The centre has established a Dinosaur Club, and despite the name, it caters for a wide range of scientific interests. The club publishes regular newsletters which contain articles on excursions, field trips and evening lectures for students, parents and the general public.

"There are many connections between science, the arts, economics and business," Dr Vickers-Rich said. "We want to show in our centre how science is addressing some of the really big problems in life, like overpopulation, which certainly involve scientific innovations, and environmental issues and the environment. The university has expertise in all these areas."

Dr Vickers-Rich says that while the university grant covers salaries and some facilities at the centre, it is seeking a further $70,000 in funding from sponsors to help instal classroom partitions and transfer the planetarium.

"We're trying to get the students involved in the research. It is not going to be a public relations exercise where we just tell people what we do," Dr Vickers-Rich says.

Many children who will eventually pursue careers in science are trying to get the students involved in the research. For those who do not wish to pursue science as a career, a simple understanding of how it works and how it affects their lives is still important.

"People think there is a right and a wrong answer to everything, because this is the way we have been taught," she said. "Science challenges this idea. It gives the best available explanation of the circumstances, but it's a process of continual discovery, exploration and questioning.

"We're trying to teach people what science is about, that it's something you can do yourself by the way you observe and the way you interpret what you observe. We are trying to demystify the scientific process and give people the tools to look at the world in a more analytical way."

Dr Vickers-Rich says that, contrary to the ivory tower and coffee factory in Normanby Road, Clayton.

Dr Vickers-Rich and her husband opened a new window on Australian prehistory with their Dinosaur Cove Discoveries. Their fossil finds led them to suggest that when prehistoric Victoria lay close to the South Pole 110 million years ago, dwarfed dinosaurs strolled active during the frigid, five-month near-darkness of the sub-Antarctic winter, suggesting that some were warm-blooded.

This first science activity kit, Dinosaur of Darkness, contains teaching materials that explain how the fossils from Dinosaur Cove have been interpreted. The kit contains a fossilised leg bone from one chicken-sized bipedal dinosaur for comparison with one from a similarly sized modern chicken - giving kids something they know to compare with the fossils.

Eventually, the science centre will have five classrooms, including a computer room where students will be able to gain access to international scientific databases. Another room has been set aside for a new-dosed planetarium, which will be transferred from the university's Caulfield campus, hopefully in July.

In time, the centre will have its own library that will be a showpiece of what is available in science education for primary and lower secondary science.

"Science is golden in its early years of development, the new Monash Science Centre has already helped rekindle students' interest in science," MS Jenny Monaghan (left) and Dr Pat Vickers-Rich use dinosaur print casts in their schools program.

" Science is golden in its early years of development, the new Monash Science Centre has already helped rekindle students' interest in science."
A dual award

Dual winners of the 1992 Dodds Memorial Award are mechanical engineering students Mr Richard Arrows and Mr Ayhan Boz.

The award recognises scholastic achievement, potential as a practitioner, and insight and understanding of mechanical engineering in Australia.

Representatives of Clyde Babcock-Hitachi presented the award.

Pictured below (from left) are Clyde Babcock-Hitachi representatives Mr Ken Thompson and Mr Ray Austin; head of Mechanical Engineering; Professor Bill Melbourne; and Dodds Memorial Award winners Mr Richard Arrows and Mr Ayhan Boz.

Accounting for demand

To cater to increasing demand for offshore postgraduate courses, the School of Accounting has extended its Singapore-based program to include a Master of Business (Accounting).

The two-year course, offered in conjunction with the Singapore Institute of Management (SIM), emphasises strategic accounting and management issues.

SIM is the leading management organisation in Singapore in terms of its membership size, range of programs, and services offered, as well as the quality of its management development programs.

According to Associate Professor Dr Claudio Romano, the school aims to be one of the most well-known education providers in Asia.

"There are plans to establish similar courses in Hong Kong and Kuala Lumpur by the end of the year," Dr Romano said.

Aussie Greek to Chinese

Students taking Australian studies in China will probably be better able to make use of our colloquialisms than native Australians now that they have the English-Chinese Dictionary of Australianisms as a reference.

The dictionary, edited by Mr Neil Courtney (above), lecturer in English at Monash University, and Professor Wang Guo-fu of Suzhou University in China, is designed to make Australian studies easier for Chinese students, who often struggle with the many idiosyncrasies in Australian culture and literature.

According to Mr Courtney, the dictionary flowed from the surge of interest in all things Australian over the past decade in China.

"Australian studies courses are appearing all over China," he said. "The dictionary will help those students reading such classics as Henry Lawson, Banjo Paterson and Patrick White, who are studded with words unique to the Australian language."

It was important to the editors of the dictionary that vulgar words and phrases, including those with racist overtones, were not omitted.

As such, that four-letter euphemism for excrement, a pissing-tube is a tube-like device used in Australian army camps as a urinal?

Greenhouse under scrutiny

The effect of global warming on the energy producing regions of the Latrobe and Hunter valleys were discussed at a conference held at Gippsland recently. The conference attracted speakers from around Victoria, including business leaders, conservation groups, union representatives, the media, academics and energy industry experts.

Conference organiser Dr Sharon Pfieller, of the Monash Centre for Environmental Science at Gippsland, said the conference was a great success. "It discussed the greenhouse effect from the socioeconomic perspective, and the policies dealing with potential global warming will have in regions like the Latrobe and Hunter valleys," Dr Pfieller said.

"Energy production forms the backbone of the Latrobe and Hunter valley communities' economic livelihood. Global warming and how this is combated will have serious implications on these regions."

Dr Pfieller said the conference explored the possibilities and limitations of reducing greenhouse gas emissions and proposed strategies for community response to change.

By providing the forum for interdisciplinary discussion, the conference will help in the development of solutions," Dr Pfieller said.

A feature of the conference was a 20-minute presentation that headed each major session and concluded with a workshop discussion. Tapes of the workshop will be used to prepare a report of the major conclusions reached during the conference.

The conference, Greenhouse and the Energy Region, was co-hosted by the Centre for Environmental Science at Gippsland and the Australian Institute for Energy.

Lecturing up a constitutional storm

The topic may not have been examinable, but law students packed the new Monash South 1 lecture theatre to hear Professor George Winterton of the University of New South Wales introduce the Lucinda lecture series.

The series, named after the SS Lucinda, the steamship on which the Australian constitution was drafted in 1891, has been developed by Associate Professor H.P. Lee of the Faculty of Law. The series is designed to highlight the changing role of the Australian constitution, which will celebrate its centenary on 1 January 2001.

Professor Winterton's timely address, explored the current debate, explored the issue of the Australian crown, its creation and demise.

Special guest at the lecture was former governor-general, Sir Zelman Cowen.

The Law Book Company is providing financial assistance for the lecture program, and will also publish a special centenary volume of lectures from the series.

Evaluating healthy

Options appraisal was the topic of discussion at the National Centre for Health Program Evaluation's recent two-day intensive workshop.

Director of the York Health Economic Consortium from the University of York in England, Mr Ron Akehurst, was the keynote speaker at the workshop, which was attended by senior Commonwealth and State health executives, hospital administrators, clinicians and economists.

Options appraisal, a technique for applying economic and financial appraisal principles, has been widely adopted by managers and clinicians to guide major strategic developments in health and other services.

The National Centre for Health Program Evaluation, which was established in mid-1990 by a grant from the National Health and Medical Research Council's Public Health Research and Development Committee, is based in the Faculty of Economic Commerce and Management at Monash University.

WHO grants $400,000

The World Health Organization (WHO) Special Program in Human Reproduction has given the department of Obstetrics and Gynaecology $400,000 to investigate the causes of abnormal menstrual bleeding in patients using injectable contraceptives.

The principal investigator in the project is Monash senior lecturer Dr Peter Rogers. The three-year project will be conducted in collaboration with the Prince Henry's Institute of Medical Research.

PEOPLE
Music of the spheres

"An ambitious and fundamental study of ergonomics" is how one critic described the latest book of the Department of Music, Professor Margaret Kartomi.

On concepts and classifications of musical instruments explores how scholars in China, India, Sri Lanka, Tibet, Java, Ancient Greece, the Arab world and Europe classify musical instruments and instrument ensembles. Professor Kartomi looks beyond the perfect classification system and focuses on the process of classifying used in various historical periods and cultural contexts.

The Australian Journal of Music Education described Professor Kartomi's work as "a delightful study of the sociology of culture. In her analysis of the relationship between cultures and classification, she links the status of musical instruments and their hierarchy in classification systems with social facts including religion, military power, priestly groups, and ethnicity.

Learning the language of life

Traditionally the domain of school teachers, linguists has become an integral part of the world of quicksilver telecommunications and speedy transportation.

Australia's multinational population and global business interests have meant that many languages are now linked to this study. To help us come to terms with the rise of quicksilver telecommunications and global business interests have meant that the Arab world and Europe classify musical study. To help us come to terms with the rise of quicksilver telecommunications and global business interests have meant that the study has gained a new appreciation.

In other parts of the Monash department or within the associated Centre for Cultural Astronomy, studies on euphemisms, the grammar of the Aboriginal language, and the Robert Blackwood Hall Box office on ext 75 3991.

"Foreign language classes generally present only the how of language facts, not the insights that would allow students to understand the why of its characteristics," Dr Paul says.

"Yet it is these aspects of a language that determine some of the restrictions in its use and structure or which point to generalisations leading to a more efficient acquisition of the language." Dr Paul says.

The book, which also touches on body language, would be a handy addition to any school library, says Dr Paul.

In other parts of the Monash department, researchers are examining communication in English between non-native English speakers in Melbourne's workplaces. With non-native English speakers making up 40 per cent of the workforce in the manufacturing sector, communication between different non-English-speaking groups (notably between people from European and South-East Asian backgrounds) is becoming the norm in many workplaces.

Most of the problems the research team has encountered are not due to vocabulary, pronunciation or grammar, but rather to the differing expectations of how particular acts such as promises, apologies, complaints or requests are expressed and conversations organised.

Data for the research have been compiled from audio recordings of spontaneous communication in four factories, two offices and the catering department of a large institution, by way of a taped microphone worn by a volunteer. Videos of meetings and employee participation groups have also been recorded - in total, about 184 hours of sound.

In far, the research has shown that people of central European, southern Asian and some southern European origin are likely to hold the floor for longer periods and more often than those of South-East Asian descent.

This is largely due to cultural values. For instance, in some cultures it is more polite to water down something unpleasant by giving detailed explanations. In others, a person will keep apologising until they receive an appropriate response. Some ethnic groups have more tolerance for silence and small-talk than others.

Linguistics is not taught in Australian schools, but some of the issues it is concerned with are not new to people entering university.

Linguistics is the systematic study of language. It is concerned with how and why languages change, the relation between language and society, how children acquire other languages, how people acquire a new language, and why communication may be successful or not.

Other research projects conducted by the department or within the associated National Language and Literacy Institute of Australia's Language and Society Centre include studies on euphemisms, the grammar of the Aboriginal language, and the differences between how men and women use language, varieties of English used in South-East Asia, and why some ethnic groups maintain their language longer than others in Australia.

Robert Blackwood Hall

The Monash and Melbourne university-church societies will present 'Music from the New World and Beyond' on Saturday 23 May at 8 pm. The societies will perform Bernstein's Chichester Psalms, and works by Copland, Barber and Dvořák.

Admission: Adults $6; Concession $4. For further information and tickets, contact the Robert Blackwood Hall Box Office on ext 75 3991.

Visual Artist Ari Apati, with accompaniment from Newmam Depdhar will perform classical vocal music from India in a luncheon concert on Monday 24 May at 1.15 pm.

The Monash University Concert Band and Big Band will perform a selection of contemporary, symphonic and swing highlights at the Music Department Exam Concert. Ensembles from Box Hill College of TAFE will also feature at the concert on Saturday 29 May. Admission: Adults $10; Concession $7; Monash and Box Hill students $5.

The Paul Grabowski Trio will perform original compositions by Paul Grabowski in the contemporary jazz style at a luncheon concert on Monday 21 May at 1.15 pm.

Alexander and George Jenkins theatres

The Garden of Granddaughters, by Stephen Seewell, is the newest production to be held at the Alexander and George Jenkins theatres.

This deeply emotional and whimsical play centres on a family with a spasm of emotion and humour.

As a world-renowned Australian conductor, and his wife, Morty, swoop back into Melbourne unannounced to tend to their three daughters and young grandchildren.

They find their daughters' lives overgrown with disorder, hope choked by disappointment, romance rotted by reality. Thankfully, their grandchildren seem to be budding with promise. Before they leave again, Max and Morty gently nurture their family with love and understanding, repriming a few family secrets in the process.

The Garden of Granddaughters will run from 18 to 22 May at the Alexander Theatre on Clayton campus, and from 27 to 29 May at the George Jenkins Theatre on Frankston campus. For bookings, contact ext 75 3992.

Australian Centre for Contemporary Art

The Australian Centre for Contemporary Art's (ACCA) most recent exhibition, Essential Fragments, will appear throughout 1993.

The exhibition, which will be presented in stages and feature the work of a variety of artists, will explore different interpretations of sexuality and sensuality through visual and written media.

The current exhibit in the series, Inhabit Me (Like a Memory), is a selection of works by Neil Emmerson, and will be displayed from Wednesday 26 May to Sunday 27 June.

A series of public lectures about sexual politics in art will be held at the Australian Centre for Contemporary Art in May and June. The first, 'The rape - facialised body: Black hole, reading the phallic machine,' will be presented by Ms Anne Marsi of the university's Visual Arts department on Thursday 27 May at 7 pm.

Ted Gott will present a lecture titled 'Anything but gay: Surrealism and homophobia' on Tuesday 15 June at 7 pm.

'Sticky labels: New contexts for lesbian and gay art practice' will examine issues raised through various components of ACCA's 1993 exhibition programs that have dealt with notions of lesbian and gay sexuality. It will question the systems of a gay, lesbian or queer aesthetic and address the relationships between visual art practice, representation within popular culture and social activism. It will be presented on Tuesday 22 June at 7 pm. Tickets $5 (concession $3).

The lectures coincide with an exhibition of works by prominent gay artist Mathews Jones. Poof! The Last Word in Queer Art questions whether the sudden explosion of interest in gay and lesbian artists' work heralds the emergence of a new realm of politicised queer expression. It also explores whether queer artists will find a voice in the 'general culture' with anything other than the novelty value of the marginalised writer.

Exhibition dates are from Wednesday 26 May to Sunday 27 June. For further information about the lectures or exhibitions, contact 650 3438.

Galleria

Towards Identity is the result of a five-year project by Melbourne artist Victor Mairner to be exhibited at the Galleria Gallery during May.

The 12 large-format paintings present a series of unrelated narratives and include images of flying figures, a hand imprint, the spiral of a mine shaft, sexual poses, excerpts from landscape paintings and traditional Aboriginal scree.

Mairner-artist discusses and confronts his ongoing interest in sociocultural and environmental themes in these works. The influence of his trips to Riversleigh, an outback cattle station in north-west Queensland, is most obvious in the paintings selected for this exhibition.

The exhibition runs from 20 May to 3 July. For further information, contact ext 75 3935.

In the Grottos, a 1991 acrylic on canvas, is one of 12 Victor Mairner works to be exhibited at the Monash Gallery until July.
Monash engineers are helping to extend the lifespan of Morell Bridge across the Yarra River.

Concrete slabs measuring up to three metres have fallen off the bridge at Anderson Street, metal rods are protruding from its underside, and several sections have rusted. The most damaged section is under the arch closest to the South Eastern Arterial, where part of the reinforcing steel has rusted right through.

Professor Cherry says the problems have occurred because salt and air have penetrated the concrete and have rusted the reinforcement.

"In modern reinforced concrete construction it is possible to protect the reinforcing steel from corrosion by using impermeable concretes of sufficient thickness. Of course in 1899 this sort of technology was not available," he said.

Professor Cherry says the rusted reinforcing bars have expanded and exerted so much pressure that the concrete has cracked. With the use of an electrolysis process called cathodic protection, the Monash team has been investigating the application of cathodic protection to reinforce structural sections for some years, with great success.

The Anderson Street crossing was the first reinforced concrete bridge in Victoria. It was built by the firm Monash and Anderson, whose principal was Sir John Monash.

Concrete under the northern section of the bridge has fallen away, revealing rusted steel reinforcement sections.

Rapid repair means no rusting on one's oars

Monash engineers are helping to extend the lifespan of Morell Bridge across the Yarra River.

Concrete slabs measuring up to three metres have fallen off the bridge at Anderson Street, metal rods are protruding from its underside, and several sections have rusted. The most damaged section is under the arch closest to the South Eastern Arterial, where part of the reinforcing steel has rusted right through.

The Engineering faculty's associate dean of research and development, Associate Professor Brian Cherry, says that if the bridge's condition had been ignored, authorities would have been forced to limit its use.

Engineers have emphasised that despite the obvious corrosion problems, the bridge does not yet pose any safety threats to motorists or to boats using the Yarra.

When construction of the Anderson Street bridge was completed in 1899, its life expectancy was 50 years. Now, nearly 100 years later, Monash engineers are playing a major role in developing techniques to arrest the degradation.

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Professor Cherry says the rusted reinforcing bars have expanded and exerted so much pressure that the concrete has cracked. With the use of an electrolysis process called cathodic protection, the firm contracted by Melbourne City Council to restore the bridge is confident that the degradation can be stopped.

A Monash team, which has been investigating the application of cathodic protection to reinforce structural sections for some years, will be working with Remedial Engineering Group to look at what actually happens in the heart of the concrete structure when an electric current is passed through the steel.

The cathodic protection process involves inserting electrodes through the pedestrian walkway into the land-fill section under the road. The electrodes will direct a low-voltage electric current through the soil and concrete into the reinforcement. The flow of current will suppress the dissolution process of the metal reinforcement and at the same time ensure the impermeability of the concrete that protected the reinforcement during the earlier years of its life.

Such is the simplicity of the process that installation of the system will close the bridge for no more than about 10 hours at night.

Monash has also been developing monitoring techniques that quickly determine whether the cathodic protection process is working properly. Without the technique, engineers would need to wait about 20 years before the structure's condition could be assessed.

Professor Cherry says that the principles of cathodic protection were established more than 200 years ago. It is believed that the first cathodic protection system seen in Australia involved protecting iron nails in the hulls of Royal Navy ships at the end of the 18th century.

Despite the age of the technology, it has never been used in the form proposed for the bridge.

As a result of preliminary studies, Professor Cherry is confident the crossing will survive another 100 years. He also believes the restoration will provide a technique that will play a major role in maintaining Melbourne's heritage.

The Anderson Street crossing was the first reinforced concrete bridge in Victoria. It was built by the firm Monash and Anderson, whose principal was Sir John Monash.

Concrete under the northern section of the bridge has fallen away, revealing rusted steel reinforcement sections.
Taking a worldly look at the globe

by Paul James

These processes of globalisation are now affecting every area of our lives, from the ways we interact with people, buy food and function in everyday life to the form of the nation-state and the way we create our identity in that setting.

Paul Keating argues that Australia must turn away from its traditional allies in England and the US in order to assert the country's independence. Contradictorily however, he asserts the need for Australia to integrate with the latest superpower - Asia. What we are doing is simply subordinating ourselves to another "great and powerful friend", Japan.

The dominant idea permeating the rhetoric of globalisation is that we have to connect ourselves to the powerful economies of the world, otherwise we will not survive. Economic rationalists are pushing an idea of a single, layered connection, one that occurs mostly through business people and state delegations. They emphasise monetary return, efficiency and progress at the cost of most other things, including quality of life.

Nevertheless, globalisation does have a number of positive features. First, it tends to penetrate the various strata of society and integrate the process of contact across the various levels of integration between people - levels that range from associations within the local community to those held across the globe. In other words, it brings us into contact with new people and new cultures.

The national boundary is better conceived as a continuum in the complex processes of the various levels of integration between people - levels that range from associations within the local community to those held across the globe. In other words, it brings us into contact with new people and new cultures.

The globalisation of culture holds many promises. These processes cover many aspects. They include the breakdown of boundaries, the deregulation of economies, and the constant movement of people. These processes of globalisation are now affecting every area of our lives, from the ways we interact with people, buy food and function in everyday life to the form of the nation-state and the way we create our identity in that setting.

These processes cover many aspects. They include the way in which the mode of production is organised with transnational corporations moving around the globe, exploiting zones of cheap labour or other comparative advantage. Nestle sets up its plant in Clayton and then, within a rationalisation decision, closes down the factory and 2000 workers lose their jobs. As the process has been working across the car industry, too has it resulted in the general decimation of manufacturing in Australia.

Communication, news broadcasting, film-making and sports telecasting have become globalised in their own right. Now more than ever we find that every aspect of our social lives has become connected by these globalisation processes. Perhaps more than 70 per cent of commodities sold in our supermarkets come from outside Australia.

Globalisation refers to the way in which the over the last century the globe has been linked on new levels across the car industry, so too has it resulted in the general decimation of manufacturing in Australia. A parallel gulf has been created between the First and the Third worlds, and this is not withstanding the remarkable growth of some of the Asian economies. At the same time, a parallel gulf has opened up within the economies of the late-capitalist countries in both the West and Asia.

In Australia, the divide is becoming obvious. While senior executives have received a 49 per cent rise in pay over the past eight years, workers who are in the board have fallen. Worse still, in 1992, more than 300,000 people were classified as long-term unemployed. The retrenching of 547,000 Australian during 1992 was not to just be a product of the recession, but the recession was just a local phenomenon. They join what is becoming an internal under-class of socially redundant people.

Increasingly, the most powerful corporations, groups and individuals in our community are those who are able to operate at the interregional and global level. It is these individuals and corporations who are best able to move, communicate and influence networks of power beyond the immediate local; it is they who are afforded the most prestige and cultural capital, even in the local context. Economic and political manipulation for global power has meant that it has become progressively harder to sustain the rich complexity of local or regional cultures.

It has become progressively harder to sustain the rich complexity of local or regional cultures.
Celebrating Australia’s many faces

The Union foyer on Clayton campus came alive with music and costumes when Monash celebrated Multicultural Week last month. Students danced, sang, and paraded their national costumes at the colourful opening.

The Pro Vice-Chancellor of International Programs and Development, Professor Leo West, was guest of honour at the ceremony, which set the pattern for a week of international exhibitions, movies, seminars, and demonstrations.

‘Faces of Australia’ was the theme for the activities, organised by the Monash University International Students’ Service.