

# MONTAGE

NEWS FROM THE CAMPUSES OF MONASH UNIVERSITY

Volume 2 Issue 7

August 1991

## RESEARCH

### LIFTOUT INSIDE

## Academic pay rise awarded

The Federal Government has acted swiftly to fund an academic salary increase worth more than \$100 million.

Cabinet announced its decision late last month – on the day after the Industrial Relations Commission (IRC) handed down a decision granting Australia's 28,000 academics a long-awaited pay rise.

The decision comes almost two years after academic unions first sought increases under the commission's structural efficiency principle.

The commission awarded increases ranging from 12 to 16 per cent as part of a new academic award. The increases will be phased in, with about 80 per cent of the rise applying from 23 July and the remainder to be introduced in 12 months.

From 1992, a professor's salary will increase by about \$8000. At the other end of the scale, tutors will get increases ranging from \$4000 to \$6000.

However, academic unions have questioned the Government's figures, which included increments. They say the overall increase is about nine per cent now, with a further 2.5 per cent to be granted later.

The general secretary of the Federated Australian University Staff Association (FAUSA), Ms Di Zetlin, said the IRC's decision had put academics back in the game by restoring relativities.

"We are really viewing it as a first step back. It was a very long time to wait for one step, given 20 years of decline, but we have got to start somewhere," she said. The Government's information about the new pay scales had been "fairly seriously misleading".

The general secretary of the Union of Australian College Academics, Mr Grahame McCulloch, said the decision was generally a very good one, al-

though the extent of the increase had been exaggerated.

"I would simply say that the rises are not as great as claimed by the Government and the employers," he said. "It is my expectation that we will seek another 4.5 per cent between now and the end of the year."

The president of the Staff Association of Monash University (a branch of FAUSA), Dr Frank Burden, said the association was satisfied with the rises but disappointed at the time it took.

"We are still concerned about the under-funding of universities, which affects general working conditions," Dr Burden said. "Although the Government has granted these salary increases, it is still not funding students at the proper level." He said it was too soon to predict the effect of the salary increases on academic morale.

Announcing the Cabinet decision, the Minister for Higher Education and Employment Services, Mr Peter Baldwin, claimed salaries would rise up to 20 per cent over time. The full cost of the decision was estimated at \$119 million in 1991-2, rising to more than \$200 million in 1998-9.

He hoped the decision would help to remedy the predicted academic staff shortfall in Australia. He believed the salary increases would boost morale among academics and help alleviate some of the stresses being felt by the higher education system.

## INSIDE RESEARCH

- Throwing money out the window?
- Fathoming submerged shorelines
- Striking drugs from plant roots

## Tuning to an open wavelength



Talking head: Arts student Peta Spring records an interview with the Vice-Chancellor, Professor Mal Logan, in the studios of student radio 3MU. The interview was broadcast on a special FM radio frequency on Open Day.

## Students return home to graduate

Malaysia's Minister for Education has described Monash as "one of the world's great universities".

A speech by the minister was delivered to the recent Monash graduation ceremony in Kuala Lumpur of 95 Malaysian students. It was the university's first graduation held outside Victoria.

The Minister, Datuk Dr Haji Sulaiman Daud, said Monash had developed an in-depth knowledge of the Malaysian culture and commercial environment. He said this not only facilitated the integration of Malaysian students into the university community, but also was being used by Australian businesses seeking to create ties with Malaysia.

The Malaysian minister thanked Monash for staging the ceremony in Kuala Lumpur so that families and friends of the graduates could be present. More than 700 people attended the event at a Kuala Lumpur hotel. The Chancellor of Monash University, Sir George Lush, presided.

Guest of honour was the Raja of Perlis, who is also a former King of Malaysia. His daughter Melanie Putra graduated BA.

Despite the strained relations at government level between Australia and Malaysia at the time, the Monash visit also involved three Malaysian Cabinet ministers, the Lord Mayor of Kuala Lumpur and the present King of Malaysia.

While in Kuala Lumpur the Vice-Chancellor, Professor Mal Logan, attended meetings with Monash's two twinning partners in Malaysia – Sunway College and the Malaysian Strategic Consultancy. He spoke at education seminars and was featured prominently in the local press.

### The new academic pay scales

	Old rates	New rates	From 23 July 1992
Professor	\$67,812	\$72,000	\$76,000
Associate Professor	\$57,493	\$63,000	from \$59,000 to \$65,000
Senior Lecturer	from \$43,984 to \$51,015	from \$47,500 to \$55,000	from \$49,000 to \$56,500
Junior Lecturer	from \$33,163 to \$43,096	from \$38,500 to \$46,000	from \$40,000 to \$47,500
Tutor	from \$24,197 to \$32,762	from \$24,600 to \$36,700	from \$28,000 to \$38,000

Note: Rates listed are salary ranges. Classifications may change in title.

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# AROUND THE CAMPI

## CLAYTON

Mr Russell Gibbs, a part-time PhD student in the Department of Materials Engineering, together with colleagues L. D. McKewen and B. Gore at BHP's Melbourne Research Laboratories, recently won the prestigious Michael Tenebaum Prize for the best paper presented at the 1990 ISS-AIME conference in Cincinnati, Ohio.

The paper, entitled 'A mathematical model to calculate force, temperature and final properties during the rolling of structural sections', includes parts of Mr Gibbs' PhD work, jointly supervised by Associate Professor Brendon Parker in materials engineering and Dr Alan Brownrigg at BHP.

In a presentation in the main library last month, the Swiss Consul General, Mr Leo Renggli, donated a collection of Swiss books to Monash.

The 33 books are all by Swiss fiction writers, with many prominent writers featuring in the collection. The books are all in German.

Pro Helvetia, the part of the Swiss Government responsible for organising the donation, has donated books to Monash in the past.

The main library already has an established collection and this donation will extend it significantly.

Associate Professor Walter Veit, of the Department of German Studies and Slavic Studies, also donated a microfiche catalogue of the German National Library.



Dr Craig Robert Smith (left) has won the Ciba-Geigy prize for the top final year student in the Faculty of Medicine.

He was presented with the Ciba Collection of medical illustrations by the chemical supply company's representative Mr Jack Hilton (right). They are pictured with one of the collection's volumes with illustrations by Dr Frank Netter.

Dr Smith is also the recipient of the Sophie Davis Memorial Prize for the student who obtains the highest aggregate marks in the MBBS degree with honours. His record includes 15 high distinctions, two distinctions and two credits.

A world authority in muscle energetics, Professor Colin Gibbs, has been appointed to a Personal Chair in Physiology in the Faculty of Medicine. Professor Gibbs took up his appointment on 1 July this year.

He graduated BSc with first class honours from the University of Sydney in 1960 and completed his MSc at the same university in 1961. In 1964 he was admitted to the degree of Doctor of Philosophy.

Professor Gibbs began his academic career in 1962 as a senior demonstrator in the Department of Pharmacology at the University of Sydney. From 1964 to 1966 he was an overseas research fellow of the National Heart Foundation of Australia at UCLA. He was appointed as a lecturer in the Department of Physiology at Monash in 1967, and later promoted to senior lecturer (1968) and reader (1974).

At UCLA, Professor Gibbs acquired an interest in muscle energetics and learnt the technique of making muscle heat measurements. While his major interest has always been in cardiac muscle, he has worked with all major muscle types and was the first scientist to make heat measurements from mammalian cardiac, skeletal and smooth muscle.

Professor Gibbs' research interests now encompass the clinical problems presented by tissue transplants, chemotherapy-induced cardiac failure and the energetic consequences of cardiac hypertrophy.

Professor Gibbs has published extensively in his field, spoken at major international conferences and served on the editorial boards of major cardiovascular journals.



The Monash merger is having effects in the sporting arena as well as in the academic arena. Pictured above is the newly formed Monash University Gryphons football club, located at the Caulfield campus.

The team, which began its season in April this year with a victory, are

playing G grade in the Victorian Amateur Football Association.

The line-up of authors at a recent Monash book launch might have given the impression that publishing was about to experience an education-led recovery.

Four books produced from the School Decision Making and Management Centre, in the Faculty of Education, were launched. They were *School Based Decision Making and Management* (Falmer Press), edited by Dr Judith Chapman; *Democracy and Bureaucracy: Tensions in the Provision of Public Education* (Falmer Press), edited by Dr Chapman and Mr Jeffrey Dunstan; *Improving the Quality of Australian Schools* (ACER), edited by Dr Chapman, Dr Lawrence Angus, Associate Professor Gerald Burke and Mr Vernon Wilkinson; and *Leadership in Catholic Education* (Spectrum Press), edited by Mr John McMahon, Ms Helga Neidhart, Dr Chapman and Dr Angus.

## CAULFIELD

Dr John Miller (right) has been appointed a Monash Professorial Fellow.

He will continue as head of the School of Management of the Faculty of Business.

Dr Miller was Foundation Dean of the David Syme Business School from 1974 to 1981 and recently returned to Monash following appointments as Director of Consumer Affairs, Assistant Director-General, Transport Victoria and as a managing partner and chairman of Pannell Kerr Forster, Chartered Accountants. He completed his PhD at Monash in 1983.



The authors are (above, from left) Associate Professor Burke, Mr Dunstan, Dr Chapman, Mr Wilkinson, Ms Neidhart and Dr Angus.

## MONTAGE

Montage is published by the Public Affairs Office, first floor, Gallery Building, Monash University, Wellington Road, Clayton.

Editor: Greg Williams  
Phone (03) 565 2085 Fax (03) 565 2097  
Photos: Brian Carr, Richard Crompton

Proudly produced by Monash University Publishing and Advertising, room A1.26D, Caulfield campus using Macintosh® desktop publishing equipment.

Montage body text in New Baskerville 9 pt.  
Research Monash body text in Century Old Style 9 pt.

Imageset by Pageset, 4 Palmer Court, Mount Waverley.

Printed by Camten Graphics, 15 Neutron Place, Rowville.

Registered by Australia Post: Publication no. VBG0435.



## Uni innovation attracts crowds at science show



Young science buffs gather around a Monash presenter at the Faculty of Education's display.

## Monash wins praise in higher education survey

Monash has been listed among the 'best buys' in Australian undergraduate higher education by an authoritative new survey.

In a new book, *The Independent Monthly Good Universities Guide*, Monash scores highly in a comparison of Australia's 54 higher education institutions. The university was nominated as one of the country's top nine institutions, rated according to key indicators.

Monash is praised for its "excellent services, both academic and cultural" and is described as "big, expansionary, highly regarded and well reviewed."

The university has an exceptionally wide range of courses according to the book's authors, education consultant and commentator Dean Ashenden, and educationalist Sandra Milligan.

"The Clayton campus offers a conventional first degree which has high prestige with less dreary courses than many elsewhere," they write. "Clayton is one of the biggest and busiest campuses in the country, and offers one of the broadest undergraduate programs."

The guide looks at the breadth and depth of undergraduate courses offered and how well the institutions perform in graduate starting salaries, staff to student ratios, research quality and library facilities. The guide compares cut-off scores, opportunities for adults and others without Year 12 scores and student characteristics.

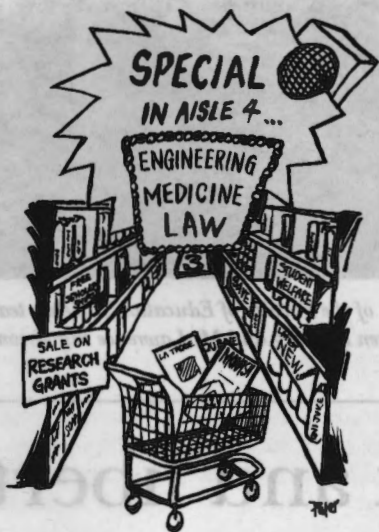
All faculties except Science scored five star ratings for offering courses which were hard to get into (students' scores would need to be in the top 10 per cent). Science scored four stars (scores in the top 20 per cent).

Caulfield and Frankston campuses rated particularly well in graduate starting salaries. On staff to student ratios, the guide says Clayton campus leads, but other campuses still were satisfactory.

"Monash does well on starting salaries and student to staff ratios, and has good student services - everything from a highly regarded housing service to shops and child-care," the guide says.

The university's big research reputation is noted: "Plenty of opportunities to continue on into a research career. Eight per cent of Monash students are doing a higher degree by research. That's high."

"It has a reputation for being entrepreneurial, and it earns more from overseas fee-paying students than any other Australian university. It attracts a lot



of research money from industry, and is very strong on research overall."

The guide says each of the Monash campuses has won high praise from visiting expert review panels in engineering, law, teacher education and accountancy.

"Few, if any, institutions can have emerged so well from the four discipline reviews," it says. "Some discipline reviews have been warm in their praise of Monash, and others have been less critical of Monash courses than of rival programs in the other high-status universities."

The guide highlights the disparity between the high status and often low performance of the established universities.

The high-status universities, with their considerable success in research and the best libraries in the country, had generally average or worse student to staff ratios, poor to middling graduate starting salaries and poor student and graduate evaluations.

"The universities which students most want to enter often do a poor job of teaching them," the guide says. "It is hard to avoid the conclusion that the immense resources of these institutions are poured into research at the expense of teaching."

The guide is on sale at the University Bookshop, Clayton campus, other bookshops, or contact Mandarin Australia on 646 6716.

The Great Australian Science Show last month was dominated by Monash's innovative exhibits, including a walk-in womb, the latest industrial design computer software, computerised teaching programs for doctors and its solar car.

Five faculties - Science, Computing and Information Technology, Medicine, Engineering and Education - participated in the show, which attracted more than 25,000 people to the World Congress Centre during the July school holidays.

Monash presented the show's largest and most diverse exhibition, offering visitors everything from a fitness assessment to their image on computer disc.

The exhibit which attracted the most media and public interest was the walk-in womb developed by the Department of Physiology. More than 8500 people, including the Premier, Mrs Kirner, visited the womb, which featured recordings of foetal and maternal heartbeats and other special effects.

Such was its success that Dr Chris Browne, one of the exhibit's initiators, has received requests from interstate teaching institutions and exhibitors, keen to display the womb at forthcoming shows.

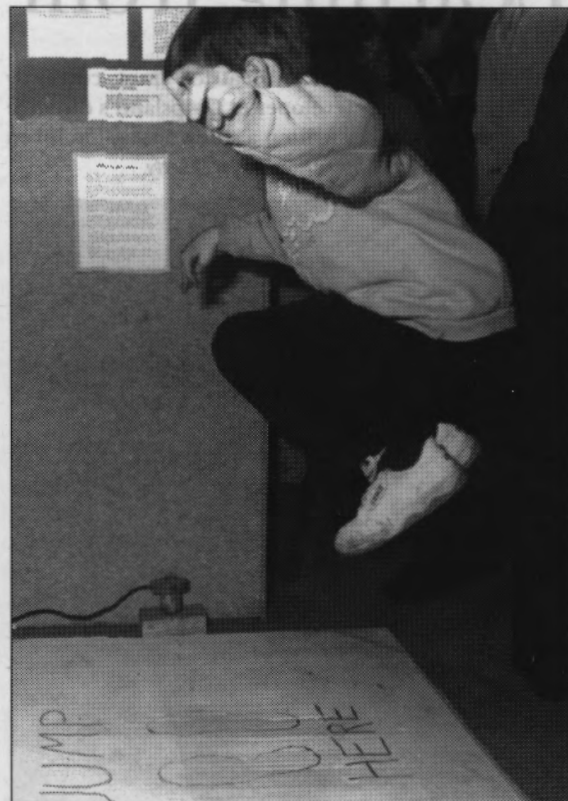
Another exhibit which drew crowds and prompted many questions was a 21st century doctor's surgery presented by the Department of Community Medicine. This exhibit demonstrated the latest in computer-aided learning for medical practitioners.

The simple scientific experiments demonstrated by Faculty of Education students were popular, particularly among younger visitors. Many children (and some parents) vied to work out the correct answer to scientific puzzlers using candles, plasticine, balloons and ingenuity.

The inaugural Great Australian Science Show, organised by The Australian Science Network, drew together many of Australia's science-based corporations, researchers and educational institutions.

The show included an extensive program of lectures and demonstrations by high-calibre speakers, including Monash representatives, Professors David de Kretser, Barry Hart, Robert Porter and Roger Short. Topics ranged from research in reproduction to the properties of water.

Most teaching institutions were represented, including Melbourne University, La Trobe University, Royal Melbourne Institute of Technology, Deakin University, Australian National University and the University of South Queensland. Other exhibitors were BHP, CSIRO, Australian Institute of Marine Science, State Forensic Laboratories, Victoria Police, Energy Victoria, Questacon and OTC Limited. The Monash exhibition was coordinated by the Communications Department.



One of the 'high-impact' Monash displays at the Great Australian Science Show. It was prepared by the Department of Earth Sciences.



# Science teaching review finds low job satisfaction

While Australians are being urged to build a clever country, there are still limited opportunities for science teachers to improve the quality of their teaching.

Science teachers feel that their work is held in very low regard and if they had a choice, many of them would not go into science teaching again.

These are some of the findings of a comprehensive review of science teaching in Australia, conducted by the Faculty of Education. The faculty last year was awarded a \$180,000 grant from the Commonwealth Department of Employment, Education and Training to develop a strategy for enhancing the professional development opportunities of science teachers.

The Science Education Professional Development Project, based in Monash's Education Faculty, is due to present the Commonwealth Government with its proposals later this month.

Mr Lawrence Ingvarson and Mr John Loughran, of the Faculty of Education, and Mr Warren Fineberg and Ms Jenni Livingston, of the Ministry of Education, conducted interviews throughout Australia with science teachers, representatives of state and territory education systems, and science teacher associations.

The interviews covered areas such as attitudes to work, sense of career, views on what helps and hinders science teachers in their jobs, professional development, and teacher evaluation.

"We found a low morale amongst science teachers," Mr Lawrence Ingvarson said. "Science teachers are not well paid and do not have very attractive career structures."

Other findings were that very few science teachers thought of themselves as scientists, they rarely ever met and interacted with practising scientists in universities, and 90 per cent had had no more than two days of in-service training over the past two years.

Members of the project now are working on ways to improve incentives and rewards for being a classroom teacher and to improve methods of professional development.

"We are trying to make teaching more attractive by saying that teaching needs to be more like a profession in terms of incentives and recognition for quality of practice, and in terms of professional development," Mr Ingvarson said.

"Because of financial problems, the state systems are not putting money into professional development

for science teachers - they are doing less and less. The opportunities for science teachers to keep up to date with their science are poor and the opportunities for keeping up to date with changes in teaching methods are also poor."

Project member Mr John Loughran said this has a lot to do with motivation. "It does not appear as though they are expected or encouraged to keep up to date with their field of study, much to the chagrin of the science teachers," he said.

The group is looking at ways to improve the process of becoming an advanced skills teacher. They believe that standards for science teaching need to be set by the science teachers themselves, as in other professions.

"Our strategy is to strengthen the science teacher organisations to make them more like professional

associations that set standards and evaluate their member's practice," Mr Ingvarson said.

As well as improving professional development opportunities, teachers needed more rewards and career recognition. Award restructuring provided an opportunity for bringing this about.

"As it stands, the only way to get a sense of promotion is by leaving teaching or entering into the administrative side of it. So, paradoxically, the only way of rewarding good teachers is to make them teach less," he said. "We are trying to create a career based on higher status and rewards for being a better classroom teacher."

The group also wants to set up a system in which science teachers are paid to provide information for classroom case studies. This would be a self-funding, ongoing activity of a professional organisation.

Another part of the project has been to develop materials and ideas for teachers to use together to promote learning in the workplace.

"A lot more professional development should also be available in schools. Schools need to break down the isolation of the teachers on the job," Mr Ingvarson said.

"Our proposals are trying to help teaching grow as a profession by taking more responsibility in setting standards and introducing systems for evaluating and rewarding good practice."



Members of the Faculty of Education's science teaching review project (from left) Ms Jenni Livingston, Mr John Loughran, Mr Warren Fineberg and Mr Lawrence Ingvarson.

# Learning from sex and liberty

Author and civil libertarian Beatrice Faust, currently working as a course developer at Gippsland's distance education centre, has written a study of sex, feminism and sociobiology, *Apprenticeship in Liberty*.



Ms Beatrice Faust.

In the book, published this month, Ms Faust examines the differences that determine sexual behaviour, and the origin of these differences.

It explores biological and historical information as well as confronting the opinions of prominent feminists such as de Beauvoir, Greer and Hite.

Ms Faust argues that in their reactive differences, "men and women are different only to the extent that they experience their bodies differently. Research shows that anything that can be said about the female body can also be said about the male body".

Endogenous differences in sexual style and aggressive conduct also are crucial in understanding sexual behaviour, she says.

She contends that suffragettes, building on female sexuality, tried to enforce feminine standards on men, but built a cage for women as well. Since that era, women had been the oppressors as well as the oppressed in sexual matters.

Ms Faust wrote her first feminist editorial in 1956 and her first abortion article in 1963. Co-founder of the Victorian Council for Civil Liberties, founder of the Women's Electoral Lobby and briefly president of the Abortion Law Repeal Association, she has a long-standing interest in civil rights, reproductive rights and sexuality.

She published her first book, *Women, Sex and Pornography*, in 1980.

## O B I T U A R Y

Professor Bill Walker, a pioneer of educational administration and a former Councillor of Chisholm Institute, died suddenly last month. He was 62.

At the time of his death he was carrying out a review of the structure of management and business at Monash.

He retired in 1989 after 10 years as chief executive and principal of the Australian Management College at Mt Eliza, where executives from private enterprise and the public service undertook intensive study in management. It was as professor of education at the University of New England that Professor Walker established his reputation.

He introduced postgraduate external studies, mainly for principals and school administrators, that changed the nature of educational management in Australia. The university became known internationally as a major centre in this field.

Professor Walker was behind the establishment of the Commonwealth Council for Educational Administration at New England. His influence can be seen in areas as diverse as the creation of the ACT school system, establishment of a university in Darwin, security of HSC examinations in NSW, education of nurses, restructuring of the Victorian education ministry after 1980, and appointment of chief executives.

He was a prolific author of books and articles and travelled constantly as a public speaker, commentator and adviser in educational planning, both here and overseas.



## Publish and be well read

Help is at hand for aspiring academic authors. They can now apply to the Monash University Publications Committee for assistance in publishing their scholarly works.

The committee receives an annual grant to facilitate publication of works emanating from, or associated with, Monash.

According to committee chairman, Professor David Aspin, this is one of the lesser-known ways for Monash authors to get into print. Despite the relatively small number of grants awarded, the committee has had great success over the past few years.

"We are able to offer very clear and comprehensive advice to authors on how to negotiate with a range of publishers and how to get the best possible public presentation at the cheapest possible cost for their product," Professor Aspin said.

In addition, authors can apply to the committee for financial aid to cover publishing costs. Although there are no limits to the amount the committee can grant an author, most ask for between \$1500 and \$5000.

Very high quality publications are then produced, generating royalties for the author and income for the university, Professor Aspin said. From these royalties authors repaid their initial grant.

"It has been our experience that the costs of universities giving authors loans are set off within about three or four years. After that, in many cases, the authors are well in profit. Because the university's name is associated with the publication, the university continues to get the kudos," he said.

The committee was anxious to give as wide a range of authors as possible the chance to publish. "At the moment I would say that there are sufficient resources available for colleagues across the university to feel that there'd be strong support for even the most recondite of publications to receive recognition," he said.

"I would want to encourage authors to realise that this is a way of getting their works into public notice with a basis of financial support as quickly as we can arrange it."

For information or advice about publishing a thesis as a book, contact Mr Charles Lucas, Senior Editor, Publishing and Advertising, extn 73 2560.



Director of Medical Informatics, Dr Branko Cesnik (left), presents Ararat GP Dr Peter MacIsaac with a personal computer, one of 10 being used by isolated practitioners in the telecommunications pilot study.

## Computers link remote GPs

The isolation of general practice is being tackled by a computer-based telecommunications project in the Department of Community Medicine.

The PHOCUS (Primary Health Oriented Computer Users System) project is building a network to help general practitioners share information and have access to teaching material and diagnostic support.

A pilot study involving 10 GPs from remote areas of Victoria and New South Wales already is under way. By the end of January 1992 about 100 practitioners throughout Australia are expected to be on line.

The Faculty of Medicine's director of medical informatics, Dr Branko Cesnik, said PHOCUS was an alternative method of interaction for GPs isolated by distance or social circumstances.

"A solo GP in Carlton is potentially as isolated as one in a remote area," he said. "Such a practice can be affected by all the same things. Although the system is obviously useful in rural practices, we are not limited to them."

Dr Cesnik said that GPs in rural areas often were cut off from the medical community because they could not attend conferences and share information with colleagues. "This system gives them a way to stay in touch that they would not have otherwise," he said.

The system will give GPs access to teaching materials prepared for them in the department, as well as reviews of med-

ical literature relevant to general practice. GPs may consult colleagues, send electronic mail and nominate interest groups, such as sports medicine. They can also use the system to send faxes or telexes.

GPs will be able to pose diagnostic questions and make comments on a group bulletin board.

"They can request information and then come back in a couple of days and have a look to see what response others have given," Dr Cesnik said.

They also will have access to the Victorian Institute of Forensic Pathology's material on the coronial responsibilities of doctors. In addition, a Community Medicine department proposal to establish interactive teaching packages on the 10 main groups of therapeutic drugs appears likely to receive approval soon.

The 10 GPs taking part in the pilot study until October will act as mentors for new additions to the system.

IBM has provided 10 personal computers on loan for the pilot study, as well as financial support. The computer system software for the first 10 machines has been provided by Mednetwork.

GPs in the pilot study will have the option of buying the PCs at a reduced rate. Dr Cesnik said IBM's strong interest in the project signalled their interest in the primary health care area.

## A murder in the lab?

by Hazel Edwards

A murder mystery unfolded in the biochemistry laboratory at Clayton campus last month.

For three hours on a Sunday afternoon, 15 murderous amateur actor-readers took over for a dramatised reading of a novel-in-progress.

The reading was organised by Plotters Anonymous, four authors who have been collaborating for the past year on a manuscript titled 'Untwisting the Double Helix'.

Readings took place in the dark room, electrophoresis room and a mock protest was held in the biochemistry car park. The story is not set at Monash but most of the action takes place in a university laboratory.

The plot revolves around a scientific discovery of commercial significance. After a lab technician is found dead in a photographic darkroom, a series of deaths occur on campus.

Liz Gardener, one of the Plotters Anonymous group, is researching her PhD in the biochemistry department. She asked the university's permission to hold the reading on location to help provide a scientific atmosphere.

Her co-authors all have links with Monash: Melbourne University lecturer Dr Maryse Rochecouste is a former French lecturer, and Barbara Gardiner completed her BA as a mature-age student. Apart from holding a MEd from Monash, Hazel Edwards, the project's initiator, is author of almost 100 books.



Plotters Anonymous and friends pose in the lab.

Each of the four writers brings different skills to the book. As a professional author of almost 100 books, Hazel is the project's initiator.

She says: "Maryse is the logical thinker, Barbara is our major researcher and word processor and Liz

provides the scientific background. Observers are intrigued that four writers can agree."

As a result of the dramatisation, Plotters Anonymous intends rewriting the manuscript. The book is expected to be published next year.



# GRANTS

## CSIRO-Monash collaborative research grants

The CSIRO-Monash University Committee recently made its selections in the latest round of grants for collaborative research.

Overall funding was sustained at the increased level of \$200,000, as was the case in the 1990-91 round.

The committee considered 47 applications for projects requesting funds of \$839,000. The 30 projects approved are listed below.

Chief Investigator	Faculty/Department	Project title	Amount (\$) approved
Dr S. Cox	Earth Sciences	Automated analysis of fault surface topography using digital stereo pairs: fracture genesis and appropriate roughness models	8000
Dr J. Davis	Physics	Study of collapse prone ash eucalypt during drying using non-destructive methods	15,000
Dr G. Deacon	Chemistry	Activation of carbon-hydrogen bonds by metal complexes	3500
Mr R. Gani	Mechanical Engineering	Spray cooling of die-casting dies	5000
Professor B. Hart	Water Studies Centre	Solid state nuclear magnetic resonance spectroscopy of dissolved and particulate organic matter	6000
Professor M. Hearn	Centre for Bioprocess Technology	Fabrication of immobilised enzyme biocatalysts	10,000
Professor B. Holloway	Genetics and Developmental Biology	Genetics of pseudomonas corrugata strains used for biological control of take-all of wheat	7200
Dr M. Hooper	Chemistry	A joint CSIRO-Monash study of aromatic hydrocarbon signatures of important sources in the Latrobe region airshed	5000
Professor W. Jackson	Chemistry	High temperature chemistry of model polycyclic aromatic hydrocarbons and of coal-derived materials	9000
Dr R. King	Pharmacology	Pharmacological studies for the development of novel-acting drugs with potential for treatment of Alzheimer's Dementia	5000
Dr P. Lake	Ecology and Evolutionary Biology	Tropical savanna woodland stream communities: their seasonal dynamics and response to catchment disturbance	5000
Mr A. Maeder	Computer Science	Automated residue classification for machine wear monitoring	7500
Dr I. McKinnon	Chemistry	Agglomeration of water dispersible controlled release agricultural chemical microspheres into fast dissolving extrudates; with emphasis on reducing case hardening of extrudates	6000
Acting Professor R. Mein	Civil Engineering	Development of an improved real-time flood forecasting procedure	3600
Professor W. Melbourne	Mechanical Engineering	Wind loads on a curved-roof building	7500
Professor J. Monaghan	Mathematics	Advanced vortex method algorithms	5000
Dr B. Muddle	Materials Engineering	Duplex toughening of zirconia-based ternary alloys	5500
Dr K. Murray	Chemistry	Synthesis, properties and applications of novel polymeric electrically conductive composites	6500
Dr J. Peterson	Centre for Geographical Information System	Scope for using the microBRIAN image processing for enhancing and transforming CAT scan digital data for augmenting the success of medical diagnosis	7000
Dr I. Prince	Chemical Engineering	Development of an industrial scale process for the biological production of the mycotoxin phomopsin	6000
Dr B. Roberts	Ecology and Evolutionary Biology	Hormonal control of development in Australian agricultural and domestic pest blowflies	12,000
Dr J. Sellar	Materials Engineering	New technique for the toughening of electrical ceramics using monoclinic zirconia	7000
Mr J. Sheridan	Mechanical Engineering	Investigation of the stability of separating fluid flows	3500
Dr D. Smyth	Genetics and Developmental Biology	Isolating genes for flowering in Arabidopsis by transposon tagging	8000
Dr T. Sridhar	Chemical Engineering	Catalytic distillation	7000
Dr Z. Stachurski	Materials Engineering	Toughening mechanism in a two phase (matrix/inclusion) polymer blend: Analysis of stresses around an inclusion by finite element analysis: Relating known strength criteria to the stress states around the inclusion	5000
Mr R. Strugnell	Microbiology	Development of antigen delivery system for the ovine immune system	6000
Dr P. Temple-Smith	Anatomy	The molecular basis of sperm maturation-identification, isolation and preliminary characterisation of rabbit epidymal secretary proteins interacting with spermatozoa	3700
Professor G. Thorburn	Physiology	Control of placental and foetal hormones related to the initiation for parturition in sheep	6000
Dr N. Wreford	Anatomy	Influence of the GNRH agonist Deslorelin on testicular morphology and sperm production in the bull	8500



# RESEARCH

## MONASH

### Throwing money out the window?

*Buildings of the future could have 'smart' windows, which automatically adjust to changes in external temperature and light. Professor Bruce West's research team is looking into this and other applications of sol-gel deposition, a window coating process which promises significant energy savings.*

Australian office buildings and homes consume enormous amounts of energy each year keeping cool in summer and warm in winter. A significant amount of that energy could be saved by special window coatings that reduce transmission of infra-red radiation – heat.

For the past two years, Professor Bruce West's research group in the Department of Chemistry has been synthesising exotic metal compounds for a new branch of ceramic technology called sol-gel deposition.

Among other things, the sol-gel deposition process can be used to deposit a thin, transparent ceramic film on glass that will selectively exclude heat radiation in summer, and reduce radiant heat loss in winter.

The sol-gel process is a convenient and relatively inexpensive way of depositing thin, homogeneous ceramic coatings on other materials. The substrate is dipped in a solution of metal-organic compounds – called alkoxides – in an organic solvent.

The thickness of the film can be controlled by the rate at which the substrate is withdrawn from the solution, or by altering the viscosity of the solution. The solvent in the layer is then allowed to evaporate.

The substrate, now coated with a layer of metal alkoxide, is allowed to react with water vapour in a controlled humidity chamber, forming a gel-like layer of metal hydroxide. Heating the material drives off water to form the oxide. The oxide layer is then annealed to produce a uniform crystalline layer whose physical, optical or electrical properties vary according to its crystal structure, which can be controlled by the temperature of annealing.

The Monash chemistry department is a partner in a sol-gel research con-

sortium with Sydney University of Technology, the Materials Research Laboratory of the Defence Science and Technology Organisation (DSTO) and Silicon Technologies Australia Pty Ltd, the commercial partner. The project was funded until March this year by a \$300,000 Generic Industrial Research and Development (GIRD) grant. The consortium has been invited to apply for a further grant to continue its work.

Professor West's group is responsible for making solutions of the various metallic compounds that go into the coatings; some complex chemistry is involved. The University of Technology group, under Dr John Bell, carries out the coating trials and part of the surface analysis and testing of the coatings. DSTO scientists in the Maribyrnong materials research laboratory are responsible for additional analysis of the chemical composition, thickness and integrity of the layers.

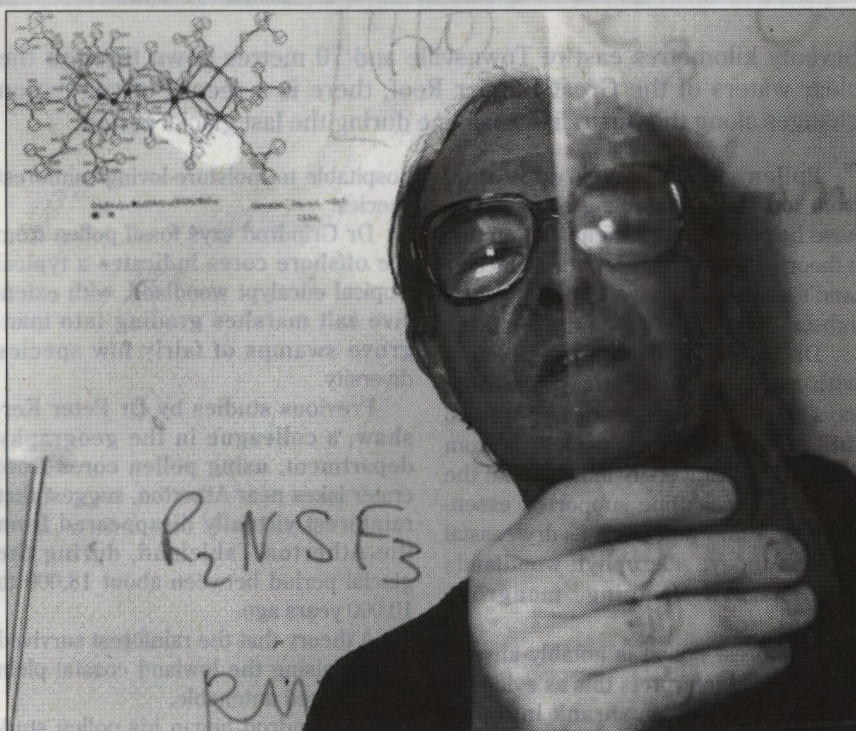
In his office Professor West keeps a pane of glass with an attractive light amber cast; it has been coated with cadmium stannate (cadmium-tin oxide), to alter its heat-radiation transmission properties. Several years ago Victoria's Solar Energy Council (now the Energy Conservation Council) funded a project to investigate the use of sol-gel deposited cadmium stannate as a coating for greenhouse glass.

The cadmium stannate forms a passive filter that selectively admits long-wave heat radiation from the sun by day, but is relatively opaque to the shorter-wavelength heat radiation radiated back into space from the greenhouse interior, keeping the glasshouse warmer during the colder months and at night.

Buildings of the future could have 'smart' windows, with their transmission characteristics controlled by an electric current that temporarily changes the electrical composition of the ceramic layers. The Monash group also is associated with the University of Technology group in a NERDDC-funded project to produce such windows.

Professor West says smart windows would consist of several layers of ceramic sandwiched between two layers of glass. The electrochromic layer – the active layer – would consist of a ceramic such as tungsten trioxide, nickel oxide or vanadium oxide, in contact with another layer that acts both as a conductor and storage medium for charged atoms called ions.

These two layers would be sandwiched between two layers of a trans-



*Professor Bruce West examines a pane of glass coated with a cadmium stannate sol-gel layer. The glass has an amber tinge.*

parent conducting ceramic, possibly cadmium stannate. An electrical current applied through the sandwich causes ions to migrate out of the ion-storage layer into the electrochromic layer, changing its colour and transmission properties.

Professor West says the attraction of the system is that the window's transmission properties could be modified dynamically to take account of changes in temperature or light levels in the external environment. The smart window would adjust to keep a building warm or cool, or to maintain even lighting, providing savings in heating, cooling and lighting costs.

The sol-gel process has a very wide range of potential applications. The properties of the ceramic layers depend not only on the metal oxide or combination of metal oxides used, but on the crystal phases produced by different annealing temperatures.

Annealing temperatures may also limit the choice of substrate. For example, any annealing temperature over 700° rules out glass as a substrate, because glass melts at this temperature.

One very important application may be in producing ceramic coatings on metals to improve their resistance to wear or corrosion. Professor West says such coatings already are being examined for this purpose, but existing deposition techniques such as plasma spraying do not give the precise control needed to produce homogeneous layers of uniform thickness. The coatings may also contain defects or fissures that expose the underlying metal to corrosion by air, or may bond imperfectly to the substrate.

Professor West says it may be possible to prime the surface of the substrate with a thin layer of a suitable ceramic using sol-gel deposition, and then to use other methods of deposition to increase the thickness of the layer.

The big advantage of the sol-gel process for industry is that large and

complex shapes can be coated by immersion in large tanks of the gel solution, and thus both inner and outer surfaces can be treated.

The sol-gel process is also applicable to the production of mixed metal oxide layers such as barium titanate, a piezoelectric ceramic. Piezoelectric ceramics have an unusual crystal lattice that responds to physical pressure by generating a small electric current; on the other hand an applied electrical current causes the crystal to expand slightly. Piezoelectric crystals are widely used in the electronics industry as signal transducers or pressure sensors. Some also respond to light.

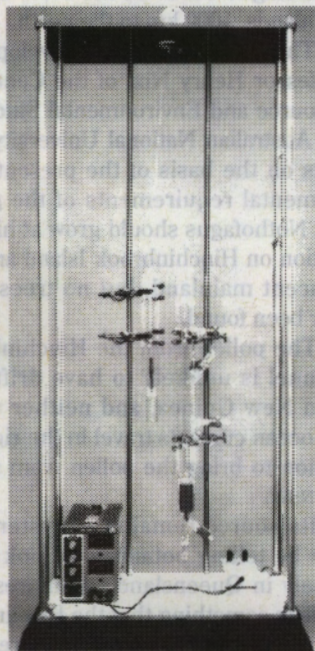
There is considerable current interest in producing piezoelectric layers on various substrates, including silicon, for use in specialised surveillance and sensing devices.

Other ceramics have ferroelectric properties. They undergo a semi-permanent change in their crystal structure in response to an electrical current or magnetic field, and show considerable promise as a new storage medium for computer data.

An Australian-based company, Ramtron International, has developed a ferroelectric computer chip that could store programs or data in a form that could be easily updated. Mass storage of data would require the production of homogeneous ferroelectric ceramic layers a few nanometres thick. The sol-gel process is particularly suited to this.

Professor West says that taking the sol-gel process into industry involves some problems, most notably the industrial health and safety aspects associated with using large volumes of organic solvent.

However, Silicon Technologies Australia already is developing several of the sol-gel processes resulting from the GIRD program with the objective of producing commercial piezoelectric and optical devices.



*The two-metre tall apparatus used to coat glass by sol-gel deposition.*



# Fathoming submerged shorelines

*Buried deep in the sediments of the Great Barrier Reef is a record of the plants which grew on coastal plains during the last glacial age. Palynologist Dr John Grindrod is using fossil pollen to show how Australia's coastline retreated as the polar ice caps melted.*

Seventy kilometres east of Townsville and 70 metres down through the clear waters of the Great Barrier Reef, there is a record of vegetation changes along the Australian coastline during the last glacial period.

Pollen grains preserved in mud from former coastal mangrove swamps have helped Monash scientists to refute a theory that during this period Queensland's tropical rainforests underwent a substantial change in their distribution.

Dr John Grindrod, a palynologist with the Department of Geography, says the fossil pollen spectrum from drill cores obtained by geologists from James Cook University indicate that the prehistoric coastline supported essentially the same vegetation as dry coastal regions today: sclerophyll woodlands with narrow fringing mangrove swamps.

Rainforest pollen is notably absent. Dr Grindrod interprets this as evidence that the rainforests shrank into protected pockets on the ranges that provided enough moisture to keep them alive.

Then, as now, the rainforest was sustained by orographic rain: moist air masses moving in from the oceans cooled as they rose up the seaward slopes of the ranges, causing their moisture to condense and fall as rain.

The only difference was that the air masses had much further to travel. In places the coastal plain was up to 70 km wider than today. The extensive coastal plain would have been quite arid and in-

hospitable to moisture-loving rainforest species.

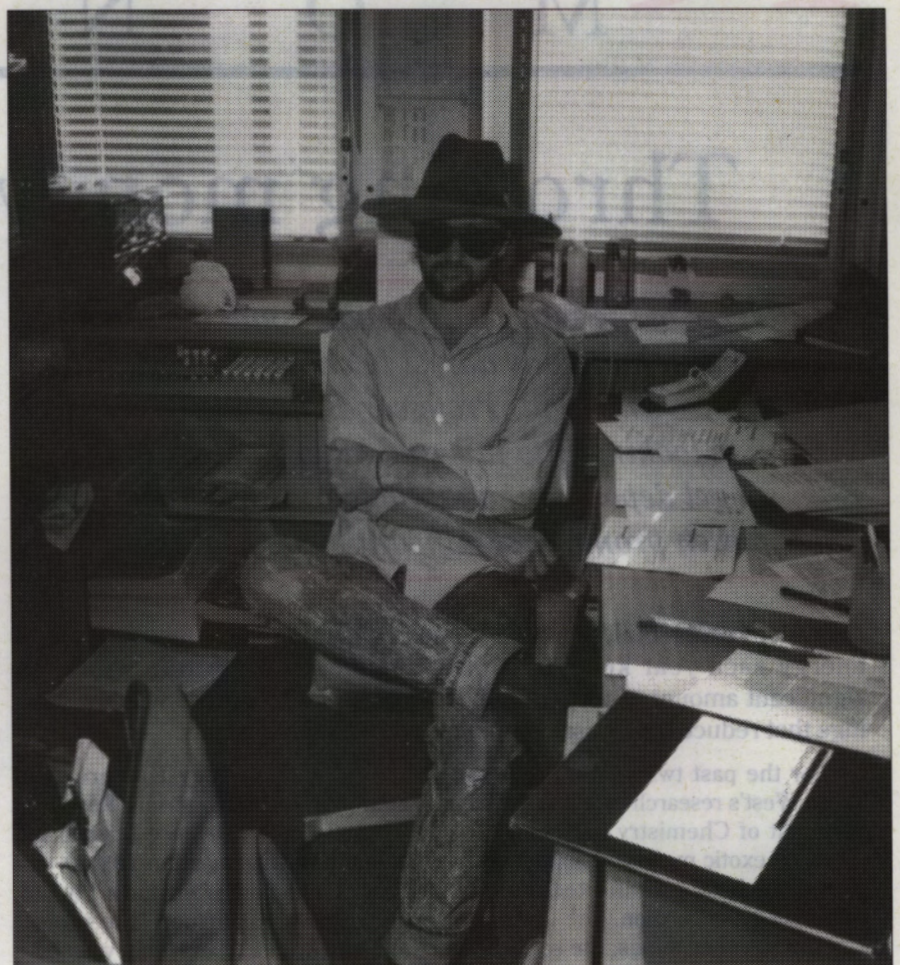
Dr Grindrod says fossil pollen from the offshore cores indicates a typical tropical eucalypt woodland, with extensive salt marshes grading into mangrove swamps of fairly low species diversity.

Previous studies by Dr Peter Kershaw, a colleague in the geography department, using pollen cores from crater lakes near Atherton, suggest that rainforest virtually disappeared from the Atherton Tableland, during the glacial period between about 18,000 to 10,000 years ago.

A theory that the rainforest survived by colonising the lowland coastal plain now seemed untenable.

Dr Grindrod began his pollen studies while holding a National Research Fellowship during the 1980s; the Fellowship was shared between Monash and James Cook universities. When he took up a full-time lectureship at Monash, the fellowship was taken on by Dr Gabrielle Crowley, who is studying modern pollen assemblages from marine sediments in north Queensland.

The modern cores serve as a reference point for interpreting the fossil pollen spectra in cores obtained offshore in a drilling program undertaken by James Cook University geologists.



Dr John Grindrod.

Ms Jane Dye, a PhD student in JCU's geology department, who is studying sedimentology processes in the offshore environment, has made her cores available to Dr Grindrod for fossil-pollen analysis.

Dr Grindrod says fossil pollen from Townsville's offshore continental shelf is sparsely distributed and low in species diversity. A gram of core material contains about 2000 pollen grains, typical of modern pollen spectra from the stunted mangrove swamps that grow near Townsville today.

Further north, where the modern coastal environment is more humid because of the proximity of the coastal ranges, the pollen grain count rises to about 100,000 per gram, and species diversity is much higher – more typical of the species-rich and more luxuriant mangrove swamps that fringe the Hinchinbrook Channel between the mainland and Hinchinbrook Island.

Most of the fossil cores provided for pollen analysis by JCU geologists are from the outer reef region; the deepest cores come from about 70 km offshore. By carbon dating organic material from the cores, Dr Grindrod and Ms Dye have been able to establish how the coast retreated as sea levels rose with the melting of the polar ice-caps at the end of the glacial period.

"The sea level we have derived from the cores is in broad agreement with the established sea level record for south-eastern Australia based on information collected at or near the present day coastline," Dr Grindrod said.

"It tells us that sea level was about 60 m lower than present about 12,000 years ago, and gradually rose to stabilise at its modern level about 6000 years ago.

"But there are significant discrepancies. For example, our data points from the outer shelf of the reef are about 20 m lower than would be predicted from our knowledge of sea levels.

"There are a lot of studies in the scientific literature to suggest stability of

the outer continental shelf during the past 20,000 years or so, but our evidence suggests that it has been warped downwards about 20 m by the weight of overlying seawater.

"This would have implications for the growth rates of coral on the Great Barrier Reef during the same period, because the reef must have grown faster to keep pace with rising sea levels."

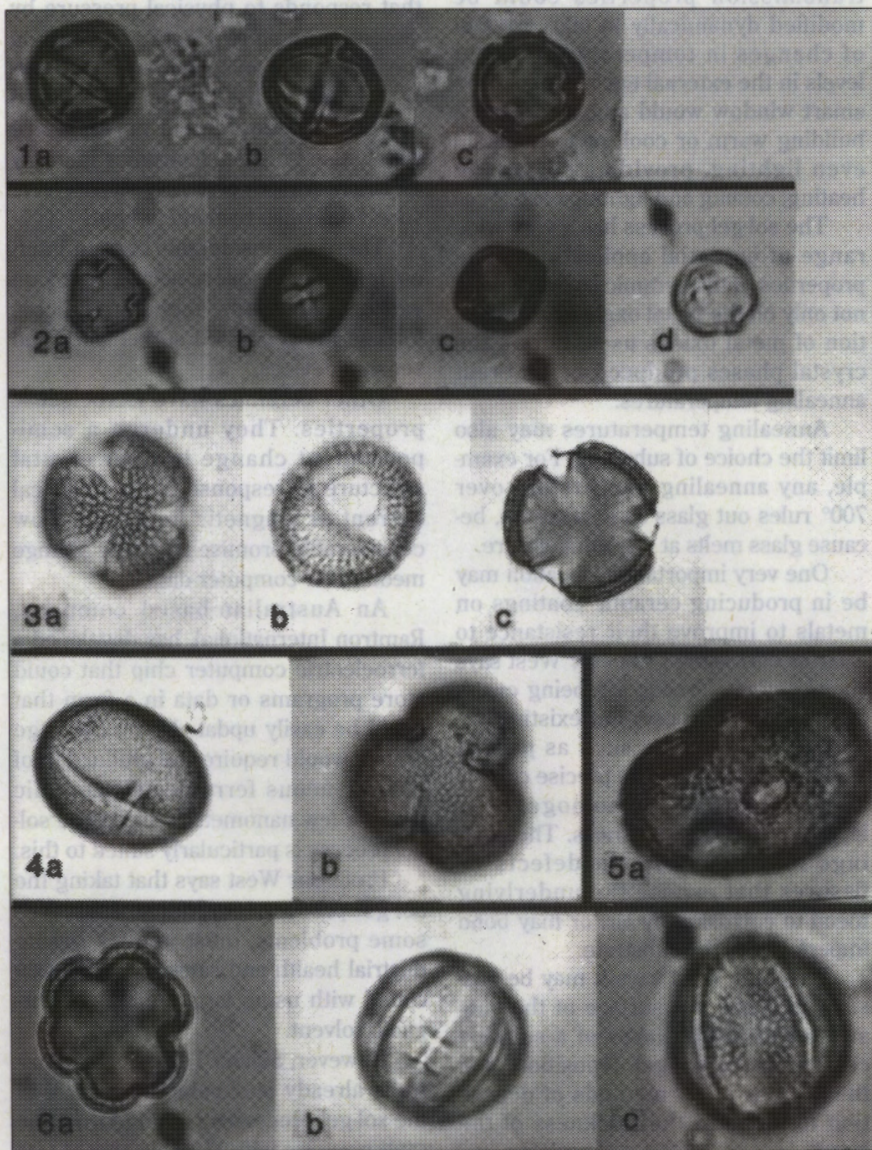
The pollen grains from the offshore cores are from a diverse range of mangrove species including *Rhizophora*, *Ceriops*, *Bruguiera*, *Avicennia* and *Sonneratia* – genera that grow at various places along the coast today.

One enigmatic presence in Dr Crowley's modern pollen cores from the Hinchinbrook Channel is pollen from southern beech, *Nothofagus*. *Nothofagus* is not known to grow in the region – *Nothofagus moorei* grows more than 1000 km to the south in Lamington National Park, just south of the Queensland border, while about 10 species of *Nothofagus* occur in the New Guinea Highlands, 1000 km to the north.

The Bioclim program developed by Professor Henry Nix, of the Centre for Resource and Environmental Studies at the Australian National University, predicts on the basis of the present environmental requirements of the genus that *Nothofagus* should grow at high elevation on Hinchinbrook Island and the adjacent mainland, but no trees have ever been found.

The pollen from the Hinchinbrook channel is unlikely to have drifted in from New Guinea, and neither winds nor ocean currents travel in the right direction to bring the pollen from northern NSW.

Its source remains a mystery – it may be telling botanists to look more closely in Queensland's rainforests, to confirm something that the Bioclim program, a piece of software with a remarkable record for such predictions, already knows in its electronic heart of hearts.



Mangrove pollen types, at varying exposures.



# Striking drugs from plant roots

*A microbe which splices its own genes into the cells of its plant hosts may help to produce therapeutic drugs. Professor John Hamill is investigating a root-cell culture system which could have applications in the pharmaceutical industry.*

The crown gall bacterium *Agrobacterium tumefaciens* has held centre stage in plant molecular biology for more than a decade. In the 1990s its role as a general purpose agent for delivering new genes into plants may come under challenge from its lesser-known cousin, *Agrobacterium rhizogenes*.

*A. rhizogenes* (Greek: 'root-maker') also performs the biological miracle of splicing its own genes into the cells of its plant hosts, but its genetic surgery produces an effect that is outwardly normal, instead of the plant being disfigured by the rampant cancer-like growth of crown gall tissue.

The most significant change occurs beneath the surface of the soil: infected plants make prolific root growth. The roots are fast growing and highly branched, and there are many more of them.

Professor John Hamill, of the Department of Genetics and Developmental Biology, says the package of genes that *A. rhizogenes* inserts into the root cells seem to integrate smoothly into the cell, working under the supervision of the plant's natural genetic mechanisms instead of overriding them.

Professor Hamill, who came to the university this year after working on the bacterium at the AFRC Institute, Norwich, says *A. rhizogenes* offers a window through which the genetic events involved in root development may be viewed. The microbe can be used to introduce new or synthetic mutant genes into plant root cells to perturb or divert natural biochemical pathways.

This capability also makes the root-making microbe attractive to the pharmaceutical industry. Isolated root tissue that has been genetically transformed by infection with *A. rhizogenes* contin-

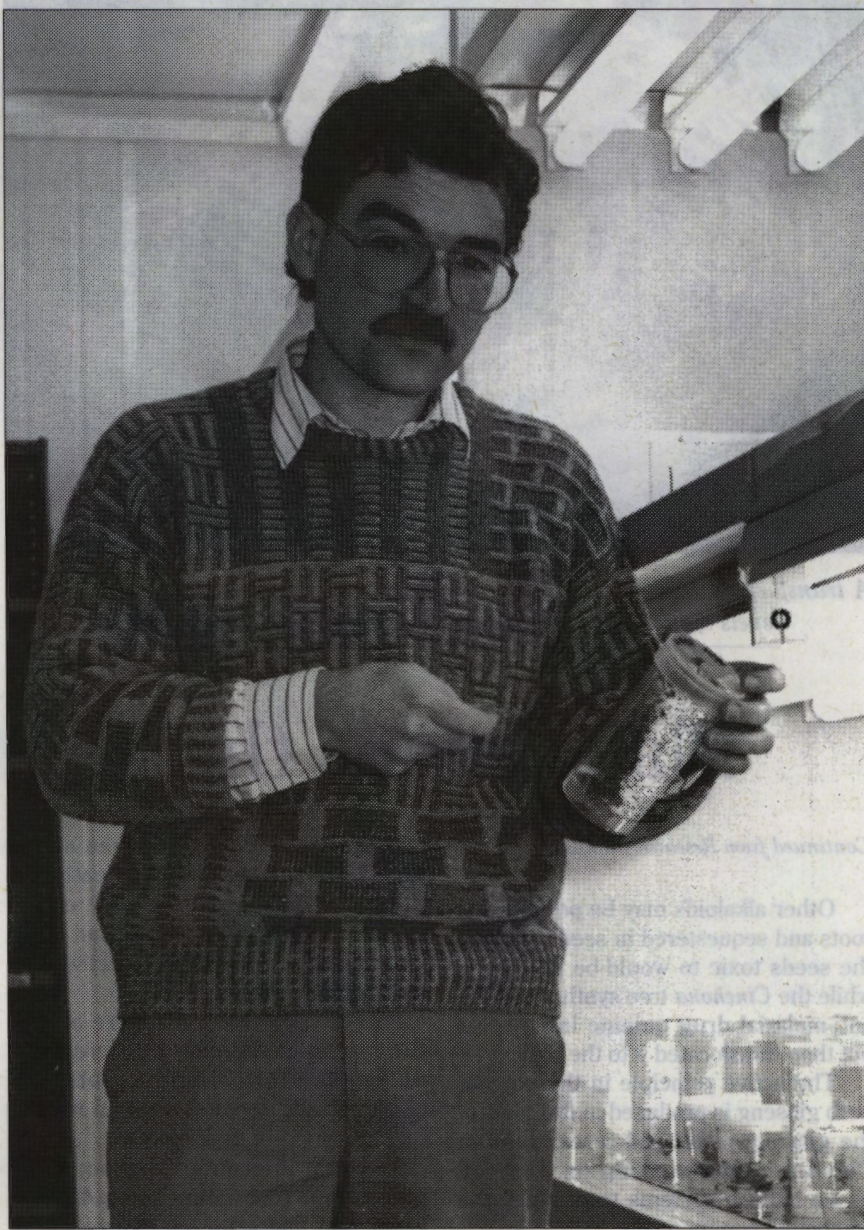
ues to produce roots prolifically in tissue culture, when supplied only with basic nutrients.

Many plants make novel biochemical compounds in their roots, even though these compounds – called secondary metabolites – may later be translocated from the roots to other sites in the plant, such as stems or leaves. Professor Hamill says root-cell tissue culture systems have two big advantages over conventional callus-tissue culture systems.

The transformed cells synthesise their own hormones, and in the right concentrations; the culture needs to be supplied only with appropriate levels of mineral salts and a carbon source in the form of sugars, to maintain growth. Potentially it is more adaptable to an industrial setting.

The second advantage lies in the nature of root cells themselves. They are fully differentiated: a term that means they pass through the full range of developmental events needed to produce mature roots. Professor Hamill says this means that the cells function just as they do under natural conditions, and their coordinated genetic activity produces the full range of precursor compounds and secondary metabolites found in natural roots.

In callus tissue culture, the cells are actually grown in an arrested state of development. Even though the callus tissue comes from a plant that makes a



Professor John Hamill.

useful compound under natural conditions, the genes involved in its synthesis may fail to switch on under artificial culture systems because the cell does not achieve maturity.

What genes does *A. rhizogenes* place in plant cells? Professor Hamill says that work overseas has very recently shown that at least one important gene makes the cells sensitive to plant growth hormones called auxins. But instead of overproducing auxins that would result in uncontrolled growth, the gene is responsive to levels of auxin in the root tissue; this natural feedback mechanism ensures that growth is regulated in a way that does not compromise the plant.

Auxins are well known in horticulture. A synthetic auxin such as naphthalene acetic acid (NAA) causes cuttings to develop roots. At a deeper level, auxins switch on genes in coordinated groups, setting in train a developmental sequence that often ends with mature roots. "I'm beginning to study what genes are involved in controlling root differentiation," he said.

"Auxin synthesis genes tend to make a lot of auxin, and the auxin predisposes cells to multiply and form tissues that are sensitive to auxin. This sets up a hormone balance in the plant that favours root development and other banks of genes respond to the order.

"It raises some fascinating questions. Is a shoot a shoot because certain genes are suppressed, or because other genes are switched on? The attraction in studying roots is that they are probably not as complicated as the above-ground organs of the plant. For example, fewer genes are probably required

to make a root than to make structures like shoots or flowers.

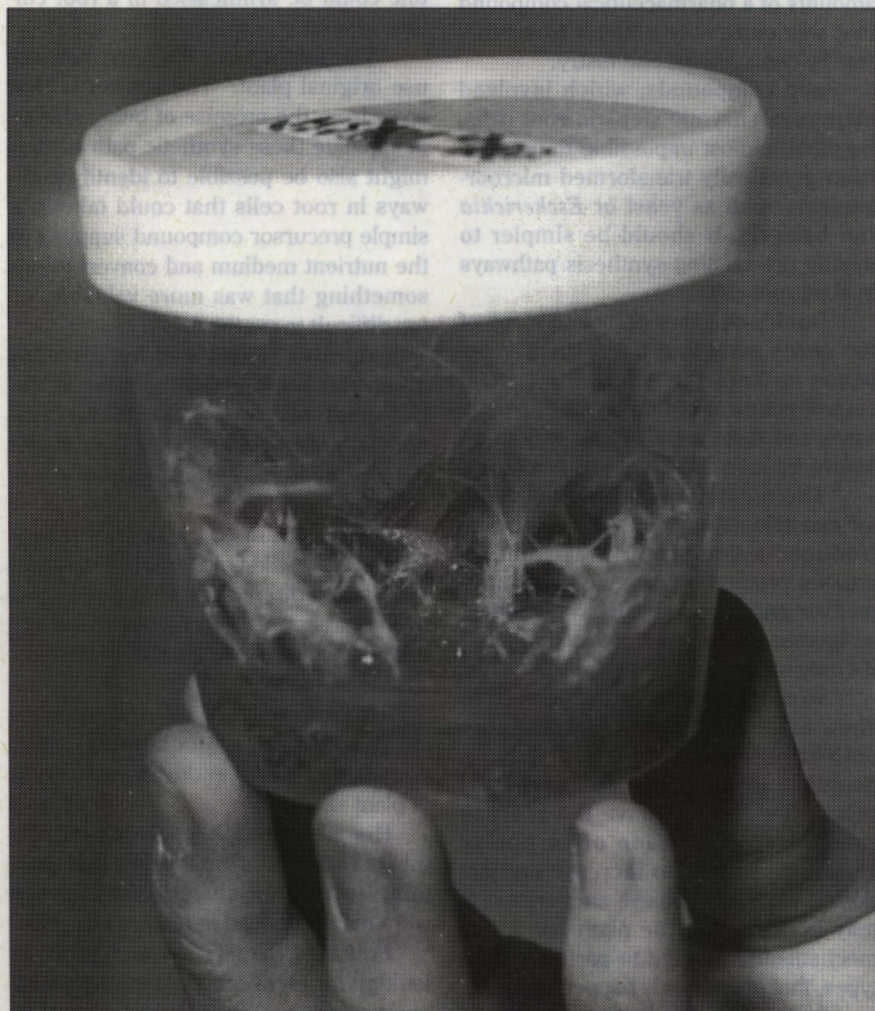
"Yet despite this simplicity, not enough research has been done on roots. They are the forgotten plant organ."

Professor Hamill notes that plants produce a huge pharmaceutical range of chemicals, including alkaloids that are of interest to drug companies, and thiopenes which may be useful in controlling destructive nematode eelworms that attack the roots of crops.

"Only about 15 per cent of the world's plants have been looked at for their biosynthetic capacity, yet these have yielded thousands of alkaloids, and new ones are being reported every month," he said. "There is huge potential there – these compounds are known as folk medicines around the world, so that much of the research is focused on plants with known medicinal properties.

"For a long time it was thought that such compounds were simply metabolic end-products or waste products. It's now clear they play an important role in the ecology of the plant, defending it against pests."

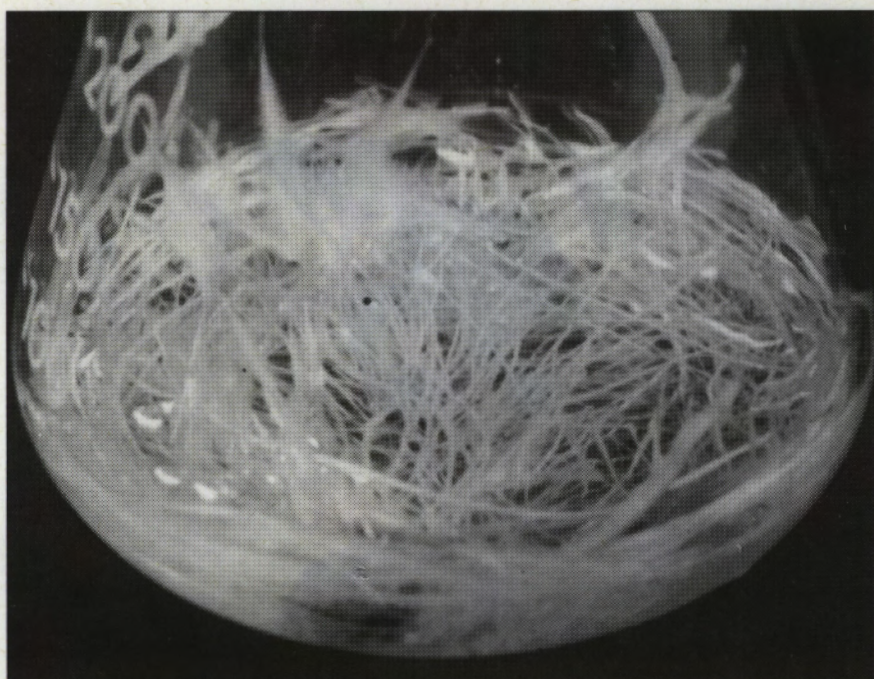
Professor Hamill said experiments nearly half a century ago had shown that some alkaloids were synthesised in root cells and translocated to other parts of the plant and stored in tissues such as stems and leaves, presumably to deter leaf-chewing insects and herbivores. For example, tomato plants grafted onto tobacco rootstocks had been found to produce nicotine throughout their tissues.



*A laboratory root culture, which has been infected with the bacterium *Agrobacterium rhizogenes*, promoting prolific growth.*

Continued on Research Monash 4





A transformed root culture of *Datura*, growing *in vitro* and containing high levels of the therapeutic drugs hyoscyamine and scopolamine.



Transformed root of *Datura* showing the presence of a marker gene (the dark tip areas) *B-Glucuronidase*, originally isolated from *E. coli*.

## Plant genes the key to useful compounds

Continued from Research Monash 3

Other alkaloids may be produced in roots and sequestered in seeds, making the seeds toxic to would-be predators, while the *Cinchona* tree synthesised the anti-malarial drug quinine in its roots but then translocated it to the bark.

The active principle in the popular herb ginseng is produced in the roots of the ginseng plant, and researchers in China are now working on root-cell tissue culture systems to produce the compound commercially.

Professor Hamill said his group planned to study Australia's pituri bush, *Duboisia hopwoodii*, which produces two pharmaceutically useful drugs, hyoscyamine and scopolamine, in its roots. These compounds are also translocated to the leaves: Aborigines used to chew pituri leaves to ward off hunger and fatigue.

These two compounds were closely related; hyoscyamine is converted to

scopolamine by two enzymes as the final steps in the synthesis pathway. Professor Hamill said the gene encoding one of these enzymes had been cloned, and was known to be active only in pericycle cells in roots.

Since pericycle cells were among the specialised cells to differentiate during the formation of roots, the enzyme could serve as a useful marker for studying root development.

Several international groups had transformed root tissues using *A. rhizogenes*, and had achieved expression of genes inserted into the cells. Professor Hamill said the bacterium transferred the genes on a loop of DNA called a plasmid, which seemed to function in the same way as the well known Ti-plasmid of *Agrobacterium tumefaciens*.

Many of the genes on the *A. rhizogenes* plasmid remained unidentified, although some were likely to be common to both bacteria. On present indications, there could be more than a

dozen genes, of which three or four were probably involved in controlling root growth.

"We can use the plasmid to add foreign genes to the cells, so as we are interested in one of the secondary metabolites, we can try to perturb the synthesis pathway by deliberately altering the expression of the genes in it. Alternatively we can add new genes that perturb its activity in some way – for example, by turning the activity of particular genes up or down and looking to see what effect it has.

Using new techniques for switching off genes, it should be possible to block side-branches in synthetic pathways to cause production of different compounds. Professor Hamill said some compounds with very complex structures arose in competing pathways during the same synthesis process; by blocking one branch of the pathway, it might be possible to produce large amounts of a pharmaceutical compound that was extremely difficult to synthesise by conventional chemistry.

Such compounds, which involved numerous enzymic steps in root cells, would be almost impossible to produce from genetically transformed microorganisms such as yeast or *Escherichia coli* bacteria. It should be simpler to modify pre-existing synthesis pathways in plant root cells.

"But it's still very early and many of the genes must first be isolated. It depends on knowing where the critical control points are in the synthesis pathways, and there's still a long way to go before we know which points to attack.

"The nicotine synthesis pathway, for example, is quite short. We have introduced a gene from yeast that increases production of one of the intermediate enzymes, and we have obtained an increase in nicotine production – but it's only modest, about twofold.

"What this tells us is that we need to know more about what regulates these pathways, and why particular compounds end up in particular types of cells. Now that we have the tools to cause over-expression of particular genes, we can try to increase production. If we fail to achieve an increase, it may indicate that the plant has other mechanisms, specific to particular cell types, that prevent this happening.

"By learning the plant's own internal rules, we may be able to achieve substantial increases in expression of desirable compounds."

Professor Hamill said the Madagascar periwinkle, *Catharanthus roseus*, provided a good example of the promise of root culture systems with modified synthesis pathways. The leaves and stems of periwinkle were the main source of vinblastine and vincristine, compounds used to treat certain childhood leukaemias.

The molecules are very complex, made at high levels in the plant's shoots from the chemical union of two precursor molecules, catharanthine and vindoline. Professor Hamill said his former colleagues at Norwich had shown that while catharanthine was made in root cultures of Madagascar periwinkle, vindoline was only produced in leaves during photosynthesis.

"If there were only one or two crucial genes missing, we could envisage modifying them to make them active in roots, so that vinblastine and vincristine could be synthesised in a root culture system.

"You might ask: 'Why just not just use original plant?' The answer is that apart from the promise of being able to manipulate these synthetic pathways, it might also be possible to identify pathways in root cells that could take in a simple precursor compound supplied in the nutrient medium and convert it into something that was more valuable, or too difficult to synthesise."

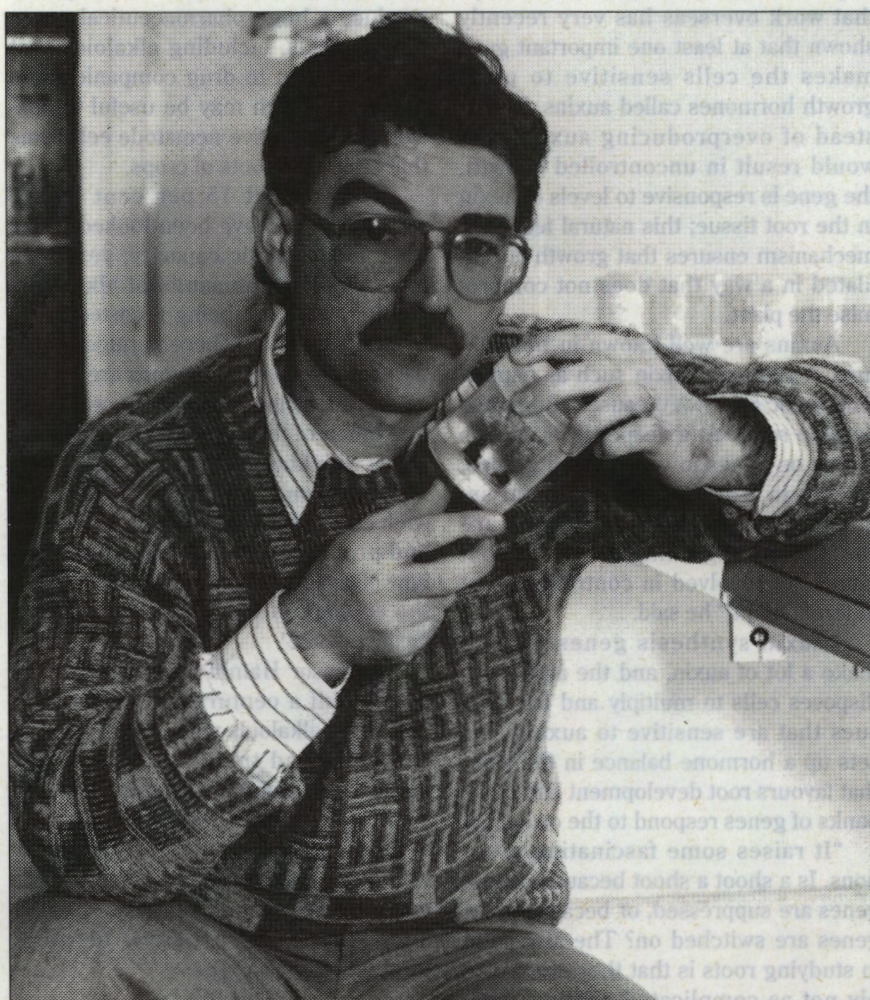
Professor Hamill said his research group was working with a group at the University of NSW to evaluate the commercial potential of another type of cell culture system, called a shooty teratoma.

This system of cells was transformed by a wild-type strain of *Agrobacterium tumefaciens*, which produced over-expression of hormones called cytokinins, causing the culture to develop a mass of shoots.

This system could be used commercially to produce biochemical compounds that were produced exclusively in plant shoots.

His group had been doing experiments with mint: the terpenes that gave mint leaves their characteristic flavour were only produced in mature leaf cells.

Professor Hamill's research group is looking for expressions of interest from companies that might be interested in sponsoring research into the development of commercial root culture or shooty teratoma cell culture systems.



Professor John Hamill with a laboratory root culture.



## A taste of uni life for secondary students

After most Monash students had packed up their books at the end of last semester, more than 250 Year 11 students converged on the university for their first experience of tertiary education.

The students, representing public and private schools from all over Victoria, took part in a three-day live-in course based at the Halls of Residence.

The Junior University Program (Science/Engineering), which is run by the Course and Career Centre, aims to give students incentive and motivation to continue their studies at university level, and to broaden awareness of the available course and career opportunities.

The focus of the program was on science, engineering and technology and included visits to these faculties.

"The program aims to provide Year 11 students with an orientation towards tertiary study in general, and towards Monash University in particular, in the hope they will come here," program organiser Ms Rosemary Martin, of the Course and Career Centre, said.

"Students with real potential who may be uncertain or unaware of the opportunities open to them may gain most benefit from the program."

As well as the academic program the students participated in a host of extracurricular activities. "The social aspect of the program is as important as the educational one," Ms Martin said.

Current Monash undergraduates act as hosts to the students. Students are encouraged to participate in all sessions from lectures, practical sessions, course information sessions and social activities.

These residential programs had proved to be a beneficial orientation to



Year 11 students Ms Lisa Ewenson (Lauriston Girls) and Mr Peter Mathews (Ballan Park) in the anatomy museum during the three-day live-in junior university program.

tertiary life and provided participants with a chance to meet with other students from all over Victoria, Ms Martin said. Feedback from students attending past programs had been consistently positive.

"Many students have an idea of what they want to study. A common response was that the program helped them decide and also gave them an idea of what university life was like," Ms Martin said.

Student comments about the program included:

"I gained a knowledge about courses and careers that has given me guidance. I feel much more confident in career decisions; I previously felt lost," Bianca, Wesley College.

"The student hosts gave me valuable insight into Monash from their point of view," Mark, Ashwood Secondary College.

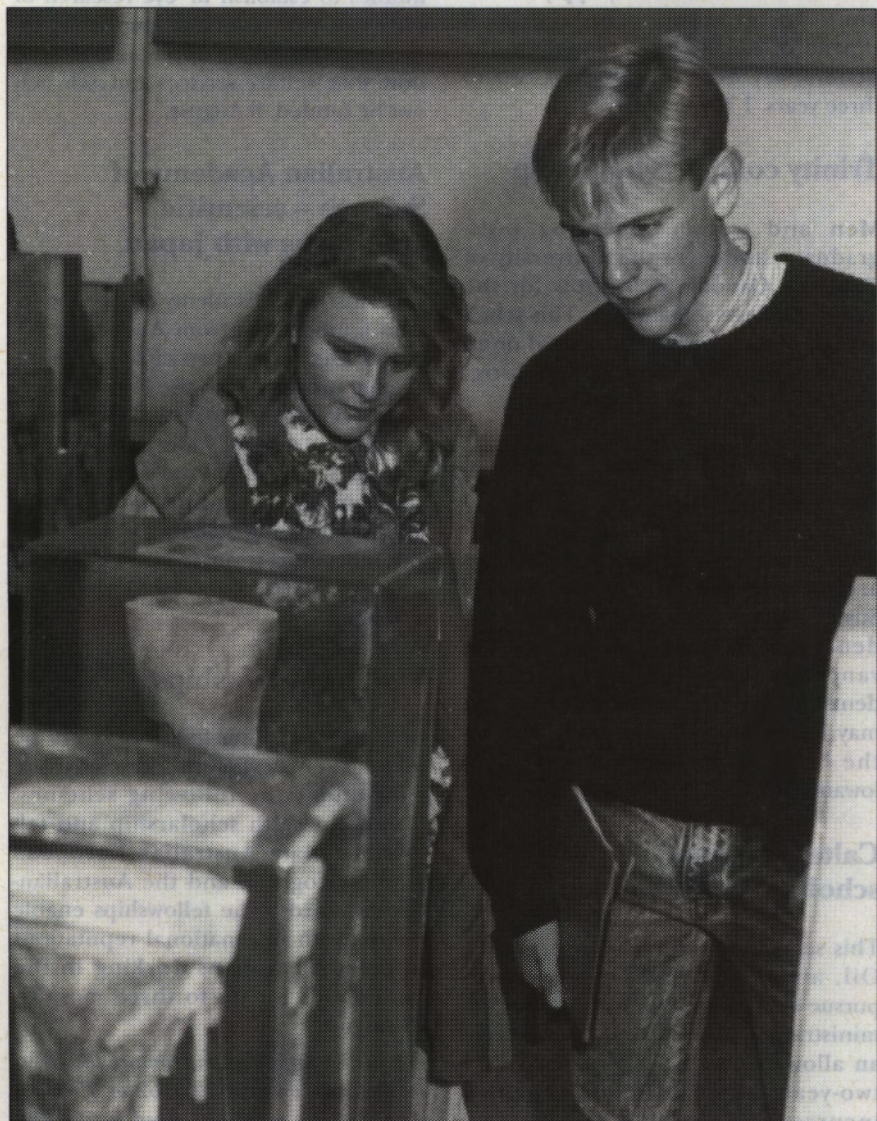
"I met lots of different students with similar career interests as my own," Andrew, Oberon High.

"The program seems to take some of the pressure off and makes university

seem fun. It also reinforces how competitive entry is and the hard work necessary to get in and do well," Genevieve, Star of the Sea College.

"It was better than I expected because I had some choice in what I wanted to do during the program," Rachel, Shepparton High School.

The Science/Engineering Junior University Program is in its second year. A general junior university program, which has been running for six years, will be held in December.



Ms Tracy Lowe (Benalla) and Mr Michael Rees (Hawksdale) view another anatomy exhibit.

The Australian Financial Review

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## Scholarships and fellowships

### Pig Research & Development Corporation award

Undergraduates, holder of honours degree or master's in agricultural sciences, may apply for the award offered by the Pig Research and Development Corporation. The award is tenable in the field of agriculture at La Trobe University and consists of a stipend of \$17,427 pa. 9 August.

### Country Women's Association scholarship

The Country Women's Association of Victoria is offering a scholarship to Victorian graduates who wish to study for a higher degree in any Australian university in the field of environmental sciences. 31 August.

### Harkness fellowships

Australian citizens of exceptional ability, aged between 21 and 36 years are invited to apply for the 1992 Harkness fellowships. The beneficiary must undertake study for one or two years in an American institution, and living and travelling expenses will be covered by the award. 31 August.

### Rhodes scholarships

Australians aged between 19 and 25 years who hold a bachelor's degree are invited to apply for the Rhodes scholarship. The scholarship supports further studies and research at Oxford University. 2 September.

### Visiting scholarships for Commonwealth experts

The Federal Government is offering a number of schemes to help exchanges between Commonwealth or European experts and Australian academics. Submissions are invited from educational institutions for the nomination of eminent scholars who will be visiting Australia between July 1992 and June 1993. 6 September.

### CSIRO vacation scholarships

CSIRO's Division of Oceanography at Hobart is inviting applications from undergraduates in their final year for a number of vacation scholarships. The scholarships tenable for some eight weeks in summer consists of a personal allowance of \$325 pw, rent and travel allowances. 13 September.

### The Sir Robert Menzies allied health award

The Sir Robert Menzies Memorial Foundation is offering a scholarship for graduates in allied health sciences who have a project that would prove valuable to this particular field of study. The award, tenable for two years, includes a stipend of \$18,000 pa, tax free. 20 September.

### Fulbright awards

The Australian-American Educational Foundation has advertised the Fulbright program for 1992. Under next year's program, undergraduates and professionals in the visual and performing arts can apply for the postgraduate student award. The beneficiary will receive an allowance of \$15,000 a year and travelling expenses.

The allowance for the postdoctoral fellow, for which PhD holders are eligible, is \$16,500 pa. Professionals in business management and industrial relations are eligible for the professional scholarship consisting of a stipend of \$3250 pm and a travelling allowance. 30 September.

### Japanese language program

Keio University, Japan, is launching an Australian student Scholarship for a Japanese language program. Undergraduates in final years or graduates with experience in the study of Japanese are eligible for a 12 month course in Japanese language. The scholarship covers admission and tuition fees and comprises a book allowance. 4 October.

### Lionel Murphy postgraduate scholarships

The Lionel Murphy Foundation will provide a number of Australian and overseas postgraduate scholarships for Australian graduates undertaking higher degrees in science and law. The annual award for study in an Australian university is \$12,500, and for study abroad (one year only) \$25,000. 20 October.

### Shell postgraduate scholarship

Undergraduates with honours in the field of science, engineering, computer science or economics may apply for the Shell postgraduate scholarship. A stipend of \$20,000 pa is payable to the beneficiary over a period of two to three years. 1 November.

### Trinity college scholarship

Men and women pursuing postgraduate studies at the University of Toronto, Canada, may apply for the Trinity College scholarship. This scholarship offers board, a cash award or assistance in the form of teaching. 1 February 1992.

### Evan Lewis-Thomas law studentship

Evan Lewis-Thomas Law studentships are offered annually by the Sidney Sussex College, Cambridge, UK, to students undertaking research or advanced courses in law. The studentships are tenable for one year but may be extended for another year on the basis of performance. The allowance is £1000. 1 February 1992.

### Caltex national scholarship for women

This scholarship, sponsored by Caltex Oil, aims to encourage women to pursue studies in business or public administration. Beneficiaries will receive an allowance of \$24,000 a year for a two-year period to cover expenses incurred in studying overseas. 20 September.

### ANU vacation scholarships

The Australian National University offers a number of vacation scholarships in its Institute of Advanced Studies. The scholarships are generally tenable for eight to 12 weeks between December and February and cover travel expenses to Canberra, accommodation and a living allowance of \$100 a week (tax free). 15 August.

### Australian Development Cooperation Scholarship Scheme

The Australian Vice-Chancellors' Committee has announced the establishment of a special one-off AIDAB scholarship scheme for 1992-93 for overseas students from developing countries wishing to study in Australian universities. Preference will be given to applicants enrolled or enrolling in environmental studies, population planning, poverty alleviation policies or export of Australian educational services. The award will help beneficiaries with tuition fees. 25 October.

For further information, contact the Higher Degrees and Scholarships Section on extn 75 3009.



## Research grants

### Retinitis Pigmentosa Association

The Association invites applications for high quality research related to Retinitis Pigmentosa (RP). Funds should be directed to research (either clinical or scientific) relevant to RP, seeding monies to establish RP eye research or PhD students, overseas studies or exchange. Intending applicants should note that welfare services and aids may not be funded. 8 August.

### Australian Academy of Science - scientific exchanges with Japan

The Australian Academy of Science invites applications from Australian scientists who wish to participate in an exchange program with the Japan Society for the Promotion of Science between 1 July 1992 and 30 June 1993. Proposals in any field of natural science, basic and applied, including mathematics and engineering science, will be considered. Short-term (3-6 weeks) and long-term (6-12 months) visits are available.

### Visiting fellowships

In 1992-3, visiting fellowships will be offered to experts from relevant countries under the following schemes: Commonwealth scholarship and fellowship plan, Australian-European awards program, and the Australian-Greek awards. The fellowships enable visitors with international reputations to meet Australians working in the same fields for up to three months. 23 August.

For further information, contact the Office for Research on extn 75 5162 or 75 5134. Applications must be lodged by the date specified.

## THINKING OF ADVERTISING?

Have you ever wondered how to advertise a course or event? Monash now has an advertising office to arrange the booking and creative design for all promotional advertising.

Earlier this year, Monash signed an agreement with advertising agency Austin Knight to handle all the university's advertising.

All recruitment advertising is placed through the Human Resource Services office, and the Communications Department's Advertising Office books and verifies the arrangements for all promotional advertising.

To place a promotional advertisement, departments must complete an 'Authority to Book Advertisement' form (available from the Advertising Office in numbered books) and then send it to the office through the internal mail or by fax (extn 73 2729) along with the text for the advertisement.

That's all there is to it. When the invoices are received, the Advertising Office will check the costs and placings, pass the invoice to Accounts Payable for processing and send a copy to the department for its records. Austin Knight can also be instructed to provide designs and even write the ads.

Direct advertising inquiries to Advertising Officer Ms Adrienne Dooley on extn 73 2379. Or use the university's electronic mail system: [adrienne@publications.ccc.monash.edu.au](mailto:adrienne@publications.ccc.monash.edu.au)





## High country holiday

The Victorian high country is to be the scene of a unique holiday program for 15 intellectually and physically disabled people from the Frankston area.

The four-day holiday in October is being organised by the Caroline Chisholm School of Nursing and the Department of Community Medicine.

"Universities should serve the community in which they function, as well as promoting cooperation between the various health disciplines," lecturer in development disability at the School of Nursing, Ms Sue Elsom, said.

The holiday, to be held at Bright Alps Guest House at the foot of Mount

Buffalo, will be the first extended vacation for some of the disabled people.

"The holiday will also enable the accompanying carers to develop their skills in providing nursing care to the disabled whilst sharing their enjoyment of the sights and experiences of the high country," Ms Elsom said. "It will also offer a much-needed break to the families who provide care during the remainder of the year."

Nursing students, who plan to subsidise the program so those in financial difficulty can attend, are seeking help with fundraising activities. For further information, phone extn 74 4379.



The Minister for Industry, Technology and Commerce, Senator John Button (left), with the Vice-Chancellor, Professor Mal Logan, outside the purpose-built ACUS at the Monash Science and Technology Park.

## Software centre targets growing export markets

A major research and development facility for computer software was opened recently at the Monash Science and Technology Park by the Minister for Industry, Technology and Commerce, Senator John Button.

The Australian Centre for Unisys Software (ACUS), at Blackburn Road, Clayton, is the park's biggest tenant. It employs 70 people and this year has a research and development budget of \$8 million.

Under a Partnership for Development between Unisys and the Federal Government, the Monash ACUS expects to outlay \$25 million over the next three years to develop export-oriented technologies.

Senator Button said the technical skills of ACUS staff would be complemented by Monash's expertise. "I hope we will see more firms committing to this form of close association with our leading universities," he said.

Unisys manufactures information systems and defence systems in 100

countries. At the park, ACUS will work on the CareSys health care system, an open systems security product and a software development tool.

Senator Button said that declining market growth for traditionally profitable computer products – such as mainframes and desktop personal computers – meant that manufacturers faced a declining share of a more slowly growing cake.

A move from proprietary to open systems would determine the fate of many computer firms.

"Value added services is the highest growth market in the information technology industry, and on track to becoming its largest single source of revenue within a few years," Senator Button said.

"Australia is well placed to compete in this market."

Australia had great growth potential to become a software and services centre, particularly for the Asia-Pacific region.



Monash's contingent at the World Student Summer Games was farewelled at the Sports and Recreation Association last month. More than 6000 athletes from 120 countries attended the games in Sheffield, England. Australia finished 15th overall. Monash team members received a cheque from the Sports and Recreation Association and the Vice-Chancellor. Above, the director of the association, Mr Doug Ellis, congratulates Paul Trimboli while Bruce Cochrane (left) and Joshua Frydenberg look on.

## Diplomats to study politics

Nine Indonesian foreign affairs officials have arrived at Monash to begin an intensive English language training course.

It is the first group to take part in a Department of Politics pilot program in which Indonesian diplomats undertake studies leading to a Diploma and Master of Arts degree specialising in International Relations. The program, run with the Australian International Development Assistance Bureau and the Indonesian Department of Foreign Affairs, began in June.

In addition to the English training, students will take politics subjects as a bridging course to the program.

According to one of the course coordinators, Dr Andrew Linklater, the diplomats have studied in the Indonesian university system.

They also have attended an 18-month program in diplomacy run by the Indonesian Government.

However, not all the diplomats have studied politics before.

"We are really trying to put them through a combination of second and third year subjects in the first instance to prepare them for graduate studies in the department," Dr Linklater said.

The department has employed an Indonesian-speaking tutor and adviser to provide support for the students.

## Press cuttings

The following is a selection of Monash print media coverage over the past month:

1 July *The Dandenong Journal* – Dr Kevin O'Connor, Geography and Environmental Science: Business awards meet change.

2 July *The Age* – Associate Professor Tony Dingle, Economic History: Sewers took the smell from Melbourne.

2 July *The Age* – Dr Bob Birrell, Sociology: Plea on migrant unemployment.

2 July *The Adelaide News* – Dr Bob Birrell, Sociology: Migrant control urged.

3 July *The East Gippsland News* – Professor Tom Kennedy, Monash University College Gippsland: Gippsland Expansion for Monash.

4 July *Daily Commercial News* – Associate Professor Amrik Sohal, Manufacturing Management: Manufacturers meet 'round table.

4 July *The Age* – Mr Graeme Macmillan, Public Sector Management Institute: State balance sheet is not propaganda.

5 July *The Age* – Dr Kevin O'Connor, Geography and Environmental Science: Melbourne getting raw deal on airport funds, says report.

5 July *The Age* – Dr Eve Feal, Koori Research Centre: Role models the key for Koori women.

5 July *The Age* – Mr Bruce Knox, History: Pride in our system a sign of maturity.

6 July *Herald-Sun* – Dr Peter Vulcan, Accident Research Centre: Safer but still no respect.

8 July *The Dandenong Journal* – Professor Amrik Sohal, Manufacturing Management: Execs meet.

8 July *The Dandenong Journal* – Dr Chris Maher, Geography and Environmental Science: Not a bad time to trade up despite a dash of cold water.

8 July *The Age* – Professor Richard Fox, Law: On-the-spot justice growing in an unprincipled fashion.

9 July *The Canberra Times* – Professor Mark Wahlqvist, Medicine: Authoritative answers to questions about diet.

10 July *The Age* – Dr O'Connor, Geography and Environmental Science: Government play a role in big market.

11 July *The Age* – Professor Graeme Davison, History: Readers are the problem.

14 July *The Sunday Age* – Dr Helen Herrman, Psychological Medicine: Half of city's homeless 'are mentally ill'.

15 July *Herald-Sun* – Professor Paul Zimmet, Molecular Biology: Diabetes to rise – expert.

16 July *Herald-Sun* – Dr Chris Browne, Physiology: Welcome into the world of the womb.

16 July *The Financial Review* – Professor Yew-Kwang Ng, Economics: Exploding the myths of migrant effects.

16 July *The Age* – Professor Garry Harris, School of Marketing: Value for money now more critical.

16 July *The Australian* – Mr Peter Johnson, PhD student: Hotter, cheap brown coal researcher's burning issue.

17 July *The Australian Financial Review* – Dr Bob Birrell, Sociology: Type, not tally, crux of migration debate.

19 July *The Age* – Professor Noel Murray, Civil Engineering: Glue may put people at risk.

20 July *The Age* – Ms Liz Wright, Management: Management changes needed.

20 July *The Canberra Times* – Dr Peter Singer, Human Bioethics: Pleasure and pain of the animal kind.

21 July *The Sydney Sun-Herald* – Siobhan Martin, Forensic Psychology: This TV show is not fit for kids.

Press cuttings may be perused at the Public Affairs Office, first floor, Gallery Building, Clayton campus.





## Diary

### AUGUST

**3 Evening Concert** *National Boys' Choir in concert*, conducted by Peter Casey and Philip Carmody. Robert Blackwood Hall. 8 pm.

**4 Lunchtime Concert** *Monash University Orchestra*, conducted by Richard Green. Robert Blackwood Hall. 12-1 pm. *Shakuhachi Music*, 1-1.30 pm. *Ensemble performances of Western Music*, 1.30-2 pm. *Orchestral Concert*, 2-3 pm.

**Evening Concert** *Echoes in Counterpoint*. Robert Blackwood Hall. 7.30 pm.

**5 Reproductive Biology Lectures** *Women's Health*, by Professor David Pennington, Professor Lorraine Dennerstein, and Professor John Funder. Main lecture theatre, Monash Medical Centre. 7-9.30 pm. Until 7 August. Inquiries: 75 2765.

**6 History and Philosophy of Science Lecture Series** *The professor and the journalist: Scientists in popular conservation disputes*, by Ms Libby Robin, University of Melbourne. Senior Common Room, Mannix College. 8.15 pm.

**Mechanical Engineering Seminar** *The relation between finite element and experimental modal analyses*, by Professor Virgil Snyder, Michigan Technological University. Meeting Room 203, Engineering Building 5. 4.15 pm.

**Thesis Eleven Conference** *Reason and Imagination: A modern or postmodern dialogue*. Sir John Monash Business Centre. 9.30 am - 5 pm. Until 9 August. Inquiries: extn 75 2980.

**7 Annual Indonesian Lecture Series** *Non-government aid organisations*, by Mr Graham Habgood, Ms Maria Strintzos and Mr Pat Walsh. R3. 7.30 pm.

**7&8 Centre for Science, Mathematics & Technology Education Seminars** *Two joint seminars - VCE mathematics: Two perspectives*. 7 August *A mathematicians view of VCE mathematics*, by Professor Warren Ewens. Room G34, Education Building. 12.30 pm. 8 August *A mathematics educator's view of VCE mathematics*, by Dr Dudley Blane. Room G34, Education Building. 12.30 pm.

**8 Religious Centre Lunchtime Concerts** *Violin/piano duo with visiting Dutch clarinet virtuoso in music by Mozart, Debussy and Milhaud*, by Spiros Rantos and Brachi Tilles with Reinier Hogerheyde. Religious Centre. 1.10 pm.

**Koorie Studies Lecture** *Kinship: Clans and land, moieties and subsections*, by Dr Don Williams. R6. 1-2 pm.

**Southeast Asian Studies Seminar** *Recent microeconomic developments in Indonesia: Problems of adjustment*, by Dr Anwar Nasution, University of Indonesia. Room 515, Menzies Building. 11.15 am.

**9 Evening Concert** *Percussion Fanfare*. Robert Blackwood Hall. 8 pm.

**Linguistics Seminar** *Code switching*, by Professor Anna G. Ramat, Università di Pavia. Room S426, Menzies Building. 11 am.

**Classical Studies Public Lecture** *Aspects of daily life in Ancient Egypt: Classical and modern historians versus Egyptian sources*, by Associate Professor Naguib Kanawati, Macquarie University. R1. 8 pm.

**10 Evening Concert** *Celebrity concert*, featuring McDonalds Moomba Youth Band. Robert Blackwood Hall. 8 pm.

**13 National Centre for Australian Studies Research Seminars** *Cinemas in Victoria*, by Mr George Ivanoff. NCAS Meeting Room. 10-11.30 am.

**Professional Secretaries Networking Group** *Stress Management*, by Dr Peter Selvaratnam. Banquet Room, first floor, Union Building. 12.45-2 pm. RSVP: Ms Di Barker, extn 75 4110 by 9 August.

**History and Philosophy of Science Lecture Series** *Logic, science and the execution of witches*, by Professor John Bigelow. Senior Common Room, Mannix College. 8.15 pm.

**14 Annual Indonesian Lecture Series** *Development project consultancies*, by Dr Glen Chandler, Mr Donald Moffat, and Dr Susan Blackburn. R3. 7.30 pm.

**15 Ecology and Evolutionary Biology Seminar** *Signal transduction in plants*, by Professor Roger Parish, La Trobe University. S8. 1 pm.

**Music Work-in-Progress Seminar** *Drums and Gongs: Rhythm in Korean music*, by Dr Keith Howard, University of Durham. Music Department Auditorium. 9.30 am.

**Southeast Asian Studies Seminar** *Cambodian historiography in the People's Republic of Kampuchea*, by Mr Justin Jordens. Room 515, Menzies Building. 11.15 am.

**16 Linguistics Seminar** *Code switching among Turkish immigrants*, by Dr Henrik Boeschoten, Universiteit Brabant. Room S426, Menzies Building. 11 am.

**20 History and Philosophy of Science Lecture Series** *Phineas Gage's contribution to the development of brain surgery*, by Mr Malcolm MacMillan. Senior Common Room, Mannix College. 8.15 pm.

**22 Religious Centre Lunchtime Concerts** *Visiting Italian ensemble*, by Ensemble Bruno Maderna. Religious Centre. 1.10 pm.

**Ecology and Evolutionary Biology Seminar** *The Amazon River system: Environment and fishes*, by Professor Bill Muntz. S8. 1 pm.

**23 Linguistics Seminar** *Connectionism: The new paradigm?* by Dr Nicholas Morcovescu. Room S426, Menzies Building. 11 am.

**27 National Centre for Australian Studies Research Seminars** *Writing a commissioned history, 3: A history of Victorian roads*, by Mr Bill Anderson. NCAS Meeting Room. 10-11.30 am.

**History and Philosophy of Science Lecture Series** *Wegener's continental drift: The problem of its rejection*, by Mr Peter Riggs. Senior Common Room, Mannix College. 8.15 pm.

**29 Ecology and Evolutionary Biology Seminar** *Plant phenolics and mammalian herbivores*, by Ms Clare McArthur. S8. 1 pm.

**Southeast Asian Studies Seminar** *Report on fieldwork in France, Thailand and Singapore: The Lon Nol regime in Cambodia*, by Mr Justin Corfield. Room 515, Menzies Building. 11.15 am.

**Religious Centre Lunchtime Concerts** *Monash University Choir*, conducted by Andre de Quadros. Religious Centre. 1.10 pm.

**30 Linguistics Seminar** *Grammatical traces of some 'invisible' semantic constructs*, by Professor Ronald Langacker, UC San Diego. Room S426, Menzies Building. 11 am.

**Evening concert** *Festival Concert - Melbourne School Band Festival*. Robert Blackwood Hall. 7.30 pm.

### SEPTEMBER

**3 History and Philosophy of Science Lecture Series** *The Rev Mr Julian Tenison Woods - A pioneer on a tightrope*, by Mr Peter Corcoran. Senior Common Room, Mannix College. 8.15 pm.

**5 Southeast Asian Studies Seminar** *Islam, politics and society in Indonesia*, by Abdurrahman Wahid. Room 515, Menzies Building. 11.15 am.

## Notes



### Parent teacher education courses

The Monash Parent Teacher Education Centre Association is running two six-week courses in the coming months. *Becoming a cooperative family* will be held on 14, 21, 28 August and 4, 11, 18 September from 7.45 to 10 pm. This course will run again on 16, 23, 30 October and 6, 13, 20 November at the same times.

The second course entitled *Becoming better teachers* will be held on 14, 21, 28 August and 4, 11, 18 September from 7.45 to 10.15 pm. This course will also run again on 16, 23, 30 October and 6, 13, 20 November. For further information on either course, contact Ms Val Foster on extn 75 2889.

### Music practice at Religious Centre

Monash staff and students are invited to use the Ronald Sharp organ in the Religious Centre for music practice. The organ is available to musicians who

are preparing for examinations or who wish to maintain a standard of proficiency at the keyboard. For further information about fees for practice and bookings, contact the Chaplains' Office on extn 75 3160.

### Fitness at Frankston

Aerobics at the Frankston campus will begin in the second semester on Wednesday 24 July. Classes will be held in the B Building gymnasium on Mondays at 4 pm, Wednesdays at 4 pm and Fridays at 1 pm. The cost is \$3 per class or \$20 per semester.

Lunchtime yoga classes will start on 31 July. The classes run from 12 pm to 1 pm in Room D211 and cost \$3 per class or 10 classes for \$25. Beginners may join the first class free.

### Chaplaincy library

The Chaplaincy library has a selection of about 1000 books under the following sections: the Bible, the Church, Theology, Ethics, Religious Studies, Education and Jewish Studies.

Books may be borrowed for up to one month. Renewals are available.

The library, on the first floor of the Union, Clayton campus, is open between 9.30 am and 4.30 pm.

### DICTA-91 papers sought

A conference entitled *Digital image computing: Techniques and applications*, will be held at the Royal Exhibition Building Conference Centre from 4 to 6 December.

Papers are sought for presentation at the conference and publication in the conference proceedings. For further information, contact the Australian Pattern Recognition Society at the Department of Computer Science on extn 75 5777.

### Economic conference

The first International Congress on Economic Advancement of Developing Countries will be held from 9 to 14 November, 1992 in Singapore. The theme of the conference is *Development and Growth*. Authors are requested to submit an extract of their paper(s). For further information and brochures, contact Dr Akbar Hessami on extn 75 3562.

### Japanese music recital

The Monash Japanese Club, in association with the Japanese Music Archive and the Department of Music, will be

promoting Japanese music during second semester. A recital will be held on Monday 5 August at 1 pm in the Music Auditorium, 8th floor, Menzies Building.

The music of Koto, Shakuhachi and Shamisen will be performed by Satsuki Odamura and David Brown. Discounted lessons for Koto and Shakuhachi will be offered to Monash staff and students during semester.

For further information contact Sarah Jane on 544 8637 (ah) or contact the Japanese Club.

### Accommodation

**Brighton:** Person wanted to share delightful, furnished, two bedroom, older style flat with 41 year old woman, retired secondary school teacher. Garden, library and office space. Fifty metres walk from swimming beach. No pets. \$70 per week, \$80 with garage, share expenses. Phone 592 4416.

**House Sitter:** Efficient and happy professional couple to live in, and care for a home whilst owners are away - for a period of six months - from August. References are available. Phone: Sheila Pritchard 818 6743.



## Theatre alive and well in Frankston

Professional theatre is thriving in Frankston, following the enthusiastic response to the opening of the first Monash University theatre subscription season at the George Jenkins Theatre.

The theatre, which is presenting three plays this year, has received more than 500 full season subscriptions since bookings opened in June.

"Frankston traditionally has had a strong theatre background and the George Jenkins has long been a focus for community theatre groups," manager of the Alexander Theatre, Mr Phil A'Vard, said.

"By taking quality professional theatre there, the Monash University season will give Frankston even greater entertainment value."

The Monash season of professional theatre is now in its third year at the Alexander Theatre, Clayton campus.

The Frankston season is sponsored by the Sidney Myer Fund. A cheque for \$15,000 was presented to the Deputy Vice-Chancellor, Professor Geoff Vaughan, at the season's official launch.

Professor Vaughan said the Monash season brought the best in Melbourne theatre to the outer metropolitan areas. "We hope that this will become an annual event," he said.

"It is the support of the Frankston community that will determine the season's ongoing success."

The season's first show, *Alive and Kicking*, will be followed by *Wallflowering* from 13 to 17 August and *The Adman* from 27 to 31 August. *The Adman*, starring Shane Bourne, begins at the Alexander Theatre on 14 August.

For George Jenkins Theatre bookings, phone 784 4300, and for the Alexander Theatre, phone 565 3992.



## Noddy sings and dances

Thousands of children flocked to the Alexander Theatre to see Noddy (above) in the recent musical production *Noddy goes to Toyland*.

Enid Blyton's famous Noddy books have been revamped and were re-released last year. The new versions have done away with anything that might be misconstrued as racist or sexist. *Noddy goes to Toyland* was a stage adaptation of the new books, featuring all the familiar characters.

Coming children's attractions at the Alex will include *Humpty Dumpty and friends*, presented during the September school holidays by the Queensland Marionette Theatre Group; and *Hip hip hippo*, a play based on the story *There's a hippopotamus on my roof eating cake*, by local author Hazel Edwards. For more information and bookings, phone extn 75 3992.



Professor Geoff Vaughan accepts a cheque for \$15,000 from Mr Peter Monachetti, store manager of Myer Frankston, at the launch of the Frankston theatre season.

## Talking language...

Australia's stocks as a world pacesetter may have fallen in recent years, but one thing is certain: we remain one of the experts in the management of myriad languages.

And as 1992 ushers in the virtual disintegration of Europe's borders - with the inevitable collision of countless proud languages - attention now is being focused on the way Australia has been able to maintain its multilingualism.

Cataloguing our successes, and our failures, is a new book by Professor Michael Clyne, head of the Department of Linguistics and research director of the Language and Society Centre.

In *Community languages: The Australian experience*, Professor Clyne explains how we manage to maintain more than 100 languages in a predominantly English-speaking environment.

So how did a nation so comparatively young reach a position where language experts overseas now are looking in our direction for guidance?

The influx of immigrants from all parts of the world to this country in the 19th century produced a unique multicultural and multilingual mix. In areas of Melbourne and Adelaide, for instance, it was possible to do all your shopping in German. Australia boasted a thriving German press for many years.

According to Professor Clyne, at least 100 schools in Australia taught lessons bilingually. There was, in fact, a non-discriminatory laissez-faire approach to multilingualism in most Australian colonies. Governments neither encouraged nor discouraged the use of community languages.

But then came the Education Acts, passed in most colonies between 1872

and 1880, which, in effect, had a homogenising effect. Monolingualism - that is, English as the lingua franca - became the norm.

The outbreak of war in 1914 served to strengthen Australia's aggressive monolingualism. People were forced to forget their multilingual heritage. For instance, most German place names around the country were changed, 69 in South Australia alone.

Amendments to the state education acts during World War I outlawed bilingual education in four states. In the 1930s, local radio became a purely English medium and the last of the German-Australian newspapers, the *Queensland Herald*, ceased publication in 1939.

According to Professor Clyne, people were abused for using languages other than English on the street, and telephone conversations in foreign languages were sometimes intercepted.



Forty years on, the cultural climate is quite different. With its promotion of social and cultural equity and the provision of services in languages other than English, we now have in place a National Language Policy that is the envy of the rest of the world.

We also have thriving multilingual radio stations, multicultural television, a telephone interpreter service, 32 languages taught in VCE, and a progressive policy on multilingual holdings in public libraries.

So what happened in the intervening years? Several things, says Professor Clyne: "There were changes in self-concept in the 1960s and early 1970s. With the weakening of ties with Britain, we began to ask, 'how are we different?' The answer, of course, was that we were multicultural."

"The difference is that in Britain they talk of race, while here, where there has been ongoing migration, we talk of culture."

"Then there were the early reformist years of the Whitlam government. A vocal group of second generation Australians of non-British descent - known as the 'ethnic lobby' - found assimilation undesirable."

"There was a quest for a new identity. Groups were demanding change. Certainly there was a very strong grass-roots movement in which people tried to get away from large-scale structures towards ethnic rights."

Through the medium of sub-titled films and public radio, languages were given a forum previously denied to them. The changes were drastic.

"For the first time, people were being given the opportunity to maintain their language, to observe how language was being renewed in their

country of origin. It gave the young a peer group register."

"People saw that an Australian was no less an Australian just because he or she spoke a language in addition to English."

According to Professor Clyne, more and more families are maintaining their languages, particularly the new groups of immigrants such as Turks, Vietnamese and Arabs.

"Such groups which are culturally different to the dominant group tend to hold on to their languages longer. Most also arrived in Australia after attitudes towards bilingualism became more favourable."



Professor Clyne eagerly awaits data from the 1991 census, which he hopes will confirm a slow but sure decline in the language shift to English away from community languages. Certainly primary schools throughout Victoria are helping the trend: no less than 17 languages are taught at that level.

"More and more Australians are recognising the importance of bilingualism in today's world. In fact, multilingualism is now one of Australia's most important resources," Professor Clyne said.

*Community languages: The Australian experience* is published by Cambridge University Press. Recommended paperback price is \$29.95.



**S**CIENTISTS HAVE a saying that no piece of research is finished until the results are published. This is not just a public relations exercise or, to put it more kindly, an announcement of new findings to an interested community of scholars. In many cases, consideration of the results and challenge to them may go for years – Wegener's theory of continental drift is an excellent example.

Publishing a research paper is not just a matter of writing it up and waiting for it to appear in a journal. In between lies a step which is largely hidden from public view: secret reports on the paper by one or more referees, whose role is to advise the journal editor as to the acceptability of the submitted paper.

Few papers survive the refereeing process unaltered, and many are rejected outright. Rejection may not mean – usually does not mean – that the work is shonky or even seriously flawed. More often the reasons for rejection carry with them a positive message: try a more appropriate journal, more or less specialised perhaps, or one which does not offer rapid publication. Or it might be advice about more experimentation that is required, that two papers should be combined, or – rarely – that a large manuscript should be split in two.

Papers which are not subjected to refereeing become what is known in the trade as the grey literature. Magazines and their editors accept such works because they conform to a theme, because they are likely to stimulate debate and thus increase sales of the journal, or for a host of other reasons. Scholarly journals stake their reputations on the fact that everything they publish is refereed and so, continuing the colour-coding, this would be regarded as the white literature.

Most editors pass the referees' comments – but not the names of the referees – to the authors and advise them about what is required to make their manuscripts acceptable for publication. The scope for unethical behaviour by referees who can take advantage of such privileged information is obvious, and the rare proven cases are part of the folk culture of science.

Peer review – as the process is known – is constantly criticised and modifications are often suggested. For instance, it has been suggested that authors' names and addresses be deleted from the versions which go to the referees, noting that such manuscripts should not contain phrases such as 'in our earlier work!' In the social sciences, experimenters have found great variation in referees' comments on the same manuscript when it is submitted



by Ian Rae

with the names of high-status or low-status authors on the title page. Some – a very few – journals give their authors the signed referees' reports but this practice has never become widespread.

With these caveats, I think the white literature (refereed) is in pretty good shape. Much of the grey literature (unrefereed) is destined to remain just that, but some company and government reports are important documents and their authentication is in the public interest. Can you believe BHP on the Board of Works? If you think not, what could we do to improve the credibility of any research which is published in their names?

The Environment Protection Authority of Victoria has recently tackled this problem by appointing a reference panel of expert scientists to provide an overview of the contributions of several groups to a Melbourne-wide study of dioxins.

This group of substances – 'dioxin' is a code word for the 75 polychloro-dibenzodioxins and polychloro-

dibenzofurans which vary in their known toxicity – was detected in effluent from the factory of Nufarm Limited, an agricultural chemicals company in the western suburbs. Greenpeace activists had sampled the company's discharges to sewer, and paid for the dioxin analysis. Based on these facts they predicted human health hazards and damage to the downstream ecosystems, and called for action.

The EPA and MMBW stepped in and Nufarm production was halted but then permitted to resume if it met certain standards for its effluents. Meanwhile, studies were commenced of the Nufarm plant, the sewage system and its Werribee Treatment Complex, fish and shellfish in Port Phillip Bay, and soils in a number of locations around the city.

In order to improve public confidence in the findings of these studies, the EPA also appointed a reference panel which I chaired and which also included a CSIRO waste-water expert, an epidemiologist from the University of California at Berkeley, and an environmental scientist from the Office of Technology Assessment of the US Congress.

The reference panel did more than just referee the contributions. It had available the first drafts of the reports and it recommended modifications to their presentation and, in a few cases, asked for more work. The panel also commented on a human health risk study prepared by one participating group, and again the advice was taken up in the final version. Participants in the studies expressed appreciation of the work of their 'referees' and the process seems to be a valuable one which EPA will employ in future studies of this kind.

Finding people who are experts, willing to serve on the panel, and not already involved in the matters under study can be a problem in our relatively small scientific communities. Overseas and interstate participants are always likely to feature strongly on reference panels. Another critical problem is setting the dimensions of the study, and hence the breadth of membership of the panel, so that all important angles are covered.

In the case of Nufarm, the Greenpeace response was to the effect that insufficient attention had been given to food chains and marine ecology in the bay. Nonetheless, public confidence in the process was high, and the broader aspects highlighted by Greenpeace are likely to be included in a subsequent study for which the critical planning is just beginning.

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## DIOGENES



**C**EMETERIES ARE pretty much the same everywhere: smaller versions of towns or suburbs, they repeat the orderliness of the world beyond their walls. Graves are like houses, often bordered by flowers, per-

fectedly circumscribed, their epitaphs like street numbers.

But unlike suburbs, cemeteries are quiet. Conversations are muted, the occasional gentle laughter provoked by the headstones' awkward and self-conscious euphemisms. Visitors' heads are mostly bowed: to inspect a grave, offer a prayer, place a flower.

The same surname, repeated over and over, provokes questions from sightseers, who step carefully across the narrow rectangle before each headstone as if their very weight will crush the life out of the occupants.

And cemeteries can be touchstones. One outside Villers-Bretonneux in northern France is the resting place for 772 of the 1200 Australians who died in bitter fighting for the town in April 1918.

As in much of France, it is easy to imagine the smooth ploughed fields that border the town turning to mud and inland lakes in winter and wartime.

Over the years Villers-Bretonneux has become a kind of shrine for tourists

from this country, particularly the young. They wander the long lines of crosses, murmuring the epitaphs:

*Should I fall, grieve not,  
I shall be one with the sun,  
wine and flowers*

*To be with God,  
which is far better*

The curator at Villers-Bretonneux is a Scot, 23 years distant from his native Aberdeen. As well as tending the graves, he comforts those Australians overcome by the thought of so many of their countrymen surrendering their heartbeats so far from home.

Each week he sees them: people in search of meaning, men and women for whom the sight of a rough-hewn cross in a foreign country somehow gives form to their shapeless nationalism. Even so, each cross is a question mark without an answer.

Across the Channel, and much further to the north, lie the Shetland Islands, where the cemeteries tell other stories.

In many cases, Shetland women are buried under their maiden names. Wilhelmina Smith, who is buried just outside the islands' main town of Lerwick, died in 1903 at the age of 73. Her headstone's brief words encapsulate the rigours of island life almost 100 years ago. They are as sad as any eulogy.

She and her husband had seven children. Only one survived into adulthood: John died at the age of one, James at three months, James John at four months, Jane at 15, Charles at one, and Wilhelmina at 14.

The headstone was erected by the couple's daughter, Joanna, who bore them two grandchildren. The two children, both of whom were christened William Erasmus after their grandfather, never reached their first birthday.

The value of such places lies in the way their very order seems to affirm the human spirit, however tragic the grave-stone's silent message. For where there is method and pride in the advertising of death, surely there must be a corresponding order in life.