

MONTAGE

NEWS FROM THE CAMPUSES OF MONASH UNIVERSITY

Volume 2 Issue 9

October 1991

RESEARCH

M O N A S H

LIFTOUT INSIDE

University adopts smoke-free policy

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

A review by the Occupational Health and Safety (OHS) policy committee found overwhelming support for a total ban.

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

The ban applies to public and communal areas of university residences, but not non-communal areas. A total ban will continue at the Frankston Halls of Residence.

However, the ban does not apply to the university clubs at Clayton and Caulfield campuses and the student unions at Caulfield and Frankston. This is because these areas are not occupied by Monash University.

Training and information coordinator at OHS, Ms Anne Ohlmus, said the aim of the policy was to provide a healthy environment for all staff and students by eliminating their exposure to passive smoke in Monash buildings.

A recent Federal Court decision held it was misleading and deceptive for the Tobacco Institute to state there was little evidence that cigarette smoke caused disease in non-smokers.

In the light of this ruling, employers could be liable for workers' compensation and common law claims

from employees exposed to passive smoking. A South Australian court recently awarded a non-smoking worker \$3000 compensation for chronic lung irritation caused by workplace smoking.

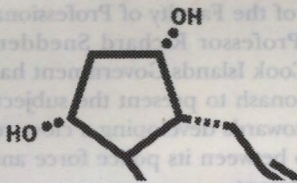
Ms Ohlmus said the success of the policy would depend on the cooperation of smokers and non-smokers. "Advice to smokers on cessation options is now available from the occupational health nurses in the OHS branch, the university health service at Clayton, or community services at Caulfield and Frankston," she said.

"For those who wish to continue smoking, it is recognised that an adjustment period will be required to eliminate or reduce smoking during working hours. Smokers should note that adjustment breaks are a privilege not a right, over which the supervisor has some discretion.

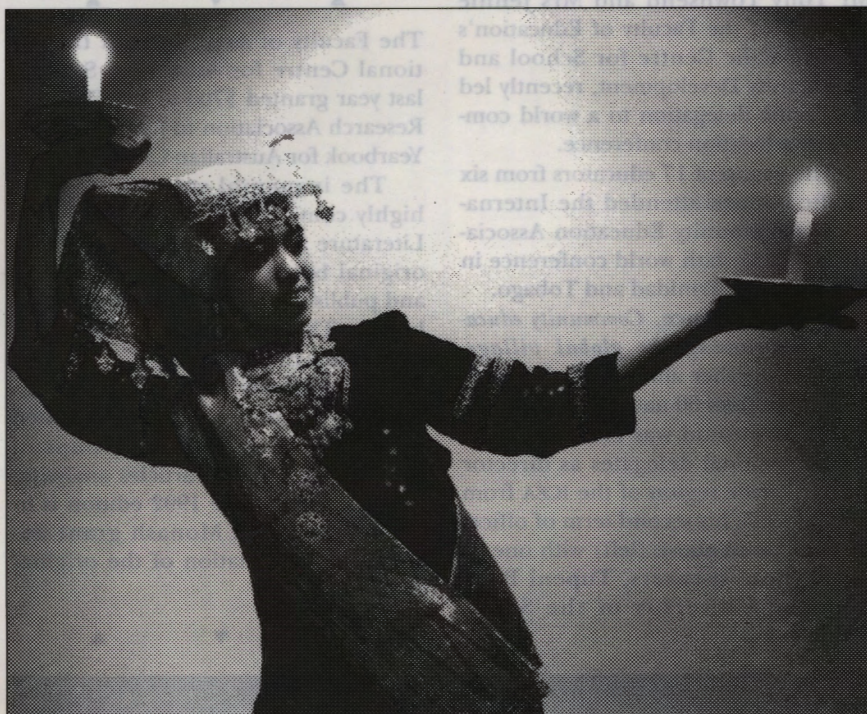
"Smokers taking such breaks should, in the interests of others, also take care not to smoke in the immediate vicinity of entrances and exits to buildings. Non-smokers should see these breaks as a compromise that they are willing to make to achieve a smoke-free environment."

For further information contact the OHS branch on extn 75 5006. Occupational health nurses may be contacted on extns 75 4048 and 75 5005.

INSIDE RESEARCH



- Governing the unborn state
- Charting inner space



Picture: BRIAN CARR

Upiek Hajizar, who will take part in the wedding ceremony concert.

Indonesian music and dance wedded

A traditional Indonesian wedding ceremony – combining music, dance, ritual and humour – is to be presented in the Robert Blackwood Hall.

The concert, *Raja Sebara* or *King and queen for a day*, to be held at 8.15 pm on 11 October, is thought to be the first full-scale production of authentic Minangkabau culture in Victoria.

Music department students and the local Indonesian community will take part in the production, which features dancer Heni Gustina and visiting music lecturer, Doktorandus (Drs) Hajizar. During a four-month residency in the department, he and his wife Upiek, who is teaching dance, are promoting Indonesian culture, especially the Minangkabau performing arts.

He has brought with him a range of Minangkabau musical instruments, including a small bronze talempong orchestra, bells, zithers, fiddles, and a range of wind and untuned percussion instruments. Drs Hajizar has been teaching talempong and other West Sumatran music.

As part of the visit, organised with the help of the Victorian Indonesian Language Teachers' Association and with a grant from the Australia-Indonesia Institute (Department of Foreign Affairs), Drs and Mrs Hajizar also have visited schools which teach Indonesian language.

Drs Hajizar, a well-known musician who has performed throughout Sumatra, in Jakarta, and in the US, appeared at last year's Melbourne International Festival. He has studied at the University of North Sumatra. Monash has close ties to that university through its Ethnomusicology department, founded in 1977 with Music department head, Professor Margaret Kartomi, as its first foreign adviser.

She was instrumental in arranging the residency after reading a thesis by Drs Hajizar, a lecturer in Minangkabau music at the Music Academy at Padang Padang, West Sumatra. He is studying English while at Monash and is hoping to continue his music studies in Australia next year.

Security stepped up

Security measures on the Clayton campus continue to be stepped up, according to the manager of Central Services, Mr Bill Cunningham.

He said the recent rape of a female student in the south-west car park of Clayton campus had underlined the need for all staff and students to exercise caution, particularly after hours.

Recent measures included:

- three extra security guards on night patrol, and two more during the day;
- an increase in the number of female security officers;
- more regular patrols by Victoria Police;
- the spending of \$130,000 on improved lighting, especially in car parks;
- removal of vegetation around pathways;
- an extension of the security bus service.

Mr Cunningham suggests that at night staff and students should use only well-lit paths, walk in groups rather than alone, avoid talking to strangers, and use the security bus service. The Vice-Chancellor, Professor Mal Logan, has met with a student delegation to discuss matters related to security. Further security projects are being considered.

Central Services also provides a security escort service to car parks for students and staff working after hours. Security officers can also routinely check on those working back at night. Bookings are required for both services. Contact extn 75 2054 for further details.

INSIDE

- | | |
|--------------------------------------------|----------------------------------------------|
| 3 Medicine delivered by distance education | 7 Islamic leader: mosque and state separated |
| 4 Child-care emphasised | 8 Savant: Graeme Davison in the suburbs |
| Letter: arts precinct | Diogenes: springing |
| 5 Heavyweight dinosaurs | |

AROUND THE CAMPUS



Mr Tony Townsend and Mrs Jennie Cowdell, of the Faculty of Education's South Pacific Centre for School and Community Development, recently led the Pacific delegation to a world community education conference.

The group of 17 educators from six Pacific nations attended the International Community Education Association's (ICEA) sixth world conference in Port of Spain, Trinidad and Tobago.

The conference, *Community education: Developing the global village*, brought together almost 400 delegates from more than 60 nations.

Mr Townsend was elected by the Pacific regional delegates as director for the Pacific region of the ICEA from 1991 to 1995, his second term of office. He is pictured above (left) with one of the keynote speakers, Tupeni Baba from the University of the South Pacific in Fiji.

Two Police Studies subjects were taught in the Cook Islands recently at a two-week course for 20 members of its 108-strong police force.

In Raratonga, head of department, Associate Professor Robert Smith, and part-time lecturer, Chief Superintendent David Axup, presented subjects from the Associate Diploma in Police Studies.

Dean of the Faculty of Professional Studies, Professor Richard Snedden, said the Cook Islands Government had invited Monash to present the subjects as a step towards developing a close relationship between its police force and the department.

The Faculty of Arts, through the National Centre for Australian Studies, last year granted \$700 to the Christian Research Association to help develop a Yearbook for Australian Churches.

The inaugural volume has been highly commended in the Australian Literature Society's annual awards for original books written by Australians and published by Australian publishing houses. The yearbook was one of the 40 entrants in the awards.

The yearbook is intended to be an annual publication, providing updated information on religious groups in Australia and topical articles analysing religious issues. The 1992 edition is in production. The Monash grant enabled the compilation of the original database.



The second edition of one of the best-selling books on Australian politics was launched last month by the MLA for Oakleigh, Mr Race Mathews.

Australian politics: Realities in conflict, by Professor Hugh Emy and Dr Owen Hughes, provides up-to-the-minute analysis of the effects of economic restructuring upon the political system, the trade-offs required between economic and political systems, and the prospects for democracy.

Professor Hugh Emy, who is a member of the Department of Politics, is the author of *The politics of Australian democracy* and *Public policy: Problems and paradoxes*. Dr Owen Hughes teaches in the Graduate School of Management, where he is an assistant director of the Public Sector Management Institute.

An anthology of Koorie poetry edited by the director of the university's Koorie Research Centre, Dr Eve Fesl, was launched last month by the Minister for Aboriginal Affairs, Mr Tom Roper.

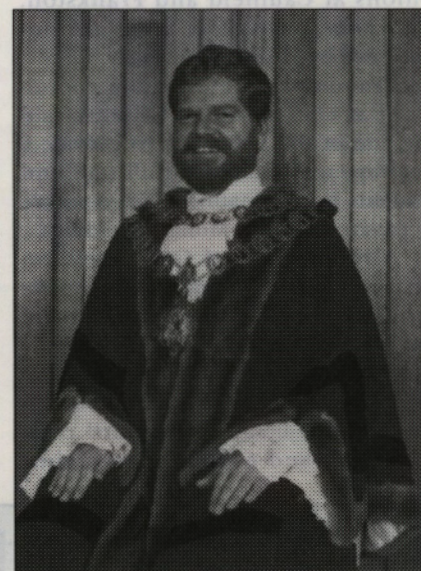
Koorie poems of the heart was published, says Dr Fesl, "not on the basis of a perceived excellence but on the basis that Koories today still have a message to send to others". Copies of the book are available from the Koorie Research Centre. The cost is \$10.

Professor John Crisp, deputy head of the Mechanical Engineering department, has been elected to represent Australia on a new international body, the World Committee for Biomechanics. He also is chairman of the international steering committee for the Asia-Pacific Vibration Conference, at Monash from 25 to 29 November.

A collection of poetry by Hector Monro, a former professor of philosophy at Monash, was launched in the Department of English drama studio last month. *Gravity tests* is the 33rd volume in the Poetry Monash series, published by the department.

Building and services manager at Caulfield campus, Mr Michael Fuller, was elected Mayor of the City of Frankston in August for a one-year term. He is pictured below wearing the mayoral robes.

Mr Fuller's wife also served as mayor of the bayside suburb in 1984-85.

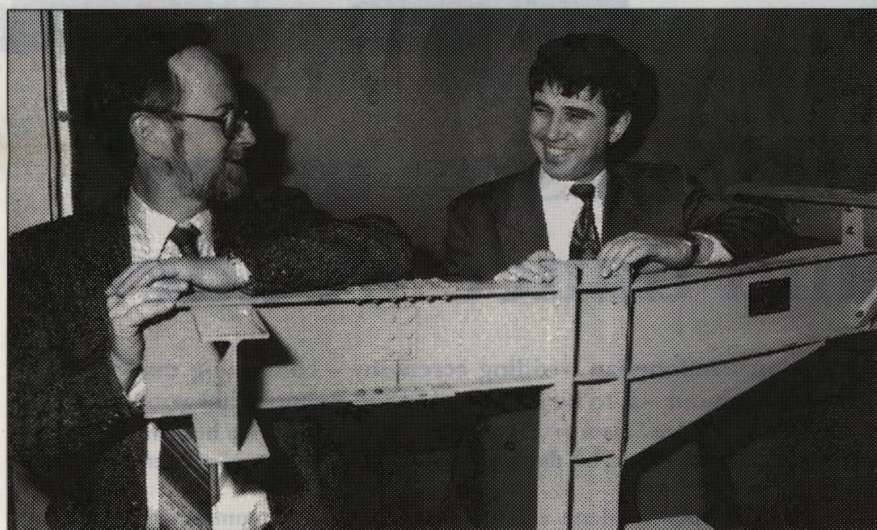


GIPPSLAND

The Digital Imaging Applications Centre (DIAC) was launched officially last month. About thirty guests, including the Vice-Chancellor, Professor Mal Logan, saw a presentation of DIAC's hardware and software research contract achievements.

The DIAC director, Professor Ken Spriggs, noted especially the support from Pro-Vice-Chancellor Professor Tom Kennedy and the college advisory committee for the centre.

The presentation included an outline of DIAC's industry-academic research link with the Australian Securities Commission (ASC). Guests cast a computer vote for an official DIAC logo, chosen from computer colour screen displays.



The Australian Institute of Steel Construction (AISC) presented the Department of Civil Engineering with a steel connection model last month.

AISC Regional manager, Mr Paul Allilomou, and engineering lecturer, Associate Professor Paul Grundy, are pictured with the model. The Caulfield campus and Monash University College Gippsland also have been presented with models.

The institute plays a major role in the education of future building and

construction industry professionals. Its senior technical staff lecture on practical steelwork construction and fabrication.

Mr Allilomou welcomed the opportunity to develop further the relationship between the steel industry and Monash. The AISC also presented Monash with a comprehensive steel design teaching pack at an education workshop late last year.

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
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 Syme Media (Inc. in Victoria)
142-144 Frankston-Dandenong Road, Dandenong.

Registered by Australia Post:
Publication no. VBG0435.



At the launch (from left): Professor Kennedy; general manager of ASC's National Information Processing Centre, Mr Alan Ruff; Professor Logan and Professor Spriggs.

Journalism MA first in the state

Monash is to introduce the state's first postgraduate degree in communications next year.

The Master of Arts in Communications, offered by the National Centre for Australian Studies (NCAS), is aimed at senior journalists, or other communications professionals working in public relations, public affairs and advertising.

Senior research assistant at the centre, Mr Peter Robinson, said the coursework degree would assist in journalists' professional development and establish teaching and research resources on the Australian media and communications theory.

"We are establishing a genuinely interdisciplinary program of teaching which draws on history, social and critical theory, cultural studies and visual arts," he said.

"An innovative feature of the program is that a quota of one quarter of the places available will be reserved for candidates who do not have a bachelor's degree but do have substantial industry experience."

Working journalists and communications professionals also would be actively involved in the teaching program.

"There will be a series of monthly lectures which, although not a formal part of the course, students will be expected to attend," Mr Robinson said. "These lectures will be given by foreign correspondents, prominent writers, and former editors, both in Australia and overseas."

Depending on candidates' experience, the degree may be completed in one or two years of full-time study. The course's compulsory subjects include Soci-

ety, culture and the study of Australia; Media history and politics; and The future of communications.

Elective subjects will be taught by the NCAS, the Centre for Comparative Literature and Cultural Studies, and the departments of Linguistics, Anthropology and Sociology, and Visual Arts.

The two-year MA is open to candidates with a degree in any field, or equivalent qualification. The one-year MA is for those with a degree in any field and five years industry experience, a degree in any field and an appropriate graduate diploma, an honours degree, or equivalent qualification.

As well as the MA, the NCAS will offer a Graduate Diploma in Communications in 1992.

A second Press Fellowship, part of the Ideas for Australia program, also will be offered through the centre next year. The fellowships are awarded to allow journalists to participate in university life. This year's Press Fellow is Age education writer Mr Luke Slattery.

Advanced medicine brought home to GPs

The first medical course offered in Australia by distance education is to be introduced at Monash next year.

The Graduate Diploma in Family Medicine, set to begin in March, has been developed by the Department of Community Medicine and the Centre for Distance Learning at Gippsland. The course is designed mainly for general practitioners, but individual units may be taken by other health workers.

Senior lecturer Dr Leon Piterman said the course would be delivered through print, audio, video and computer, enabling students to stay in touch with the institution and teaching staff at all times.

The diploma aims to increase GPs' knowledge and skills in specific areas, as well as providing an appreciation of the discipline in which they work through critical appraisal.

"The department has led the field nationally and internationally in developing computer-assisted learning programs," he said. "This will eventually become one of the most important means of imparting knowledge and skills to doctors in rural and remote areas."

Dr Piterman said most interest in the course had come from rural and remote areas where medical educational activities were obviously lacking.

"A surprising number of city doctors have also expressed interest on the basis that they will not have to give up precious practice time to attend a post-graduate course," he said.

"We received more than 200 responses from all over Australia to just one national advertisement, from which 70 applicants already have completed preliminary enrolment."

He said students would be linked to the PHOCUS (Primary Health-Oriented Computer Users System) national network, currently being developed in the department.

This would allow students to communicate directly with each other.

"Such a linkage will not only help reduce the isolation of rural and remote doctors but also will help form a common bond between diploma students," Dr Piterman said.

It was hoped that the course would become a prototype for other courses in the Faculty of Medicine, as well as for other medical educational bodies and institutions. Such programs could be attractive to medical graduates in the Asian-Pacific region who may lack the resources to travel abroad for post-graduate study.



At the Community Medicine department, course developers for the Family Medicine associate diploma, Dr Leon Piterman (left) and Dr Roger Strasser, are pictured with course coordinator, Ms Jeanette Bourke.

Course materials are being developed by Dr Piterman and Dr Roger Strasser, who have conducted Community Medicine's master's course in family medicine for the past three years.

The material is being converted to the distance education format with the assistance of Dr Michael Parer and Mr Noel Jackling at Gippsland. The department's course administrator, Ms Jeanette Bourke, is to coordinate the program.

The two-year diploma's two compulsory units cover the academic basis of general practice and research methods in general practice. In addition, elective units include learning and teaching family medicine, preventive care, musculoskeletal medicine, palliative care, electrocardiography skills, computers in medicine and rational prescribing.

The diploma may be upgraded to a master's degree through additional course work and a minor thesis.



PhD student Ms Sharon La Fontaine is presented with the Young Achiever Award trophy by the Premier, Mrs Kirner.

Gene probe test earns Young Achiever award

A PhD student in the Department of Microbiology has been named Victoria's Young Achiever of 1991. Ms Sharon La Fontaine, 24, won the award for developing a test which promises reliable, early diagnosis of footrot.

By detecting the disease in sheep, cattle and goats before they develop physical symptoms, the test has the potential for significant savings in the agriculture industry.

It will allow earlier treatment of infected animals and reduce the spread of the disease when an outbreak occurs. Other advantages include healthier animals, reduced veterinary costs and better quality wool.

Footrot costs Australian sheep farmers tens of millions of dollars in lost production every year. At present, a confirmed diagnosis can take up to three weeks.

Ms La Fontaine's system, based on gene probe technology, can be used to detect the microbe which causes footrot directly in clinical samples. This method avoids the usual delays involved in culturing the organism in the laboratory.

Gene probes use distinctive DNA sequences to distinguish an organism from all others, even closely related species. The research also led to the renaming and reassignment of the microbe - now called *Dichelobacter nodosus* - which causes the disease. Ms La Fontaine also won the Australian Wheat Board Rural Development Award.

Her work was featured in the *Montage* research supplement last month.

Letter to the editor

from Professor Margaret Kartomi, Department of Music.

Should Melbourne's second arts centre be on campus?

Establishing an Arts Precinct on the Clayton campus could make Monash a major arts centre for audiences of the south-eastern suburbs. Indeed, the university could become a focus for the arts – second only to the Victorian Arts Centre (VAC) – by expanding professional and amateur artistic activity at Clayton and in the George Jenkins Theatre on the Frankston campus.

The university is blessed with arts venues superior to any other university in Victoria, and yet they are generally underused and underpromoted.

If Monash was to adopt a comprehensive artistic policy and strategy, it would not only bring considerable prestige, but also make more efficient use of the disparate resources which are presently expended on drama, music,

art exhibitions, film screenings and other activities.

It has been proposed that the university cooperate in this venture with the VAC, and present a selection of its sponsored performances at Monash. With the centre's entrepreneurial assistance and partnership, the arts program as a whole could conceivably become self-sufficient within a few years.

The idea of the Arts Precinct has developed primarily out of the academic needs and new performance directions of the Department of Music and the drama sections of the Departments of English, and Asian Languages and Studies. A new orchestral performance course began this year and new

drama courses will start next year. The Playbox Theatre Centre and the professional seasons at the Alexander and George Jenkins theatres already are well established.

Physically, the concept involves building an enclosed walkway to link the main performance centres: the Religious Centre, Robert Blackwood Hall, the planned Information Services building (adjacent to the hall and devoted partly to the performing arts), Alexander Theatre and the Gallery Building.

The proposal would require new licensed premises, where light meals and suppers could be served, and a lounge area for patrons.

Margaret Kartomi

Affirmative action plan emphasises child-care

Women should stand up and be counted on the issues of equal opportunity and affirmative action, according to Professor Marcia Neave, of the Faculty of Law.

"Change will only occur if we continue to pursue it," Professor Neave, said at the launch last month of the Monash University Affirmative Action Program.

She said that statistics compiled by the Equal Opportunity Unit showed that Monash had a problem with underrepresentation of women on the academic staff. In addition, female general staff were concentrated in sex-segregated jobs and few women held senior administrative positions.

Women on the academic staff were concentrated in the lower levels of the academic hierarchy and, across the whole of Monash, were more likely than men to be in contract positions. There were few women of the rank of associate professor or above and women were more likely than men to be in part-time employment.

The merger of Monash with Chisholm Institute provided the opportunity for reassessment of progress in the Affirmative Action Program, and the development of a new plan to meet the needs of the enlarged university.

The chief objective of the program is a balanced representation of women and men on equitable terms in all

courses, both undergraduate and postgraduate, in all occupational groupings and classifications, and in all decision-making bodies.

"The revised Affirmative Action Program integrates the programs existing before the merger," Equal Opportunity Manager, Dr Margaret James, said. "The objectives and strategies were decided after considering the statistics."

"We have placed a significant amount of emphasis on child-care. We are also hoping that the faculties next year will undertake special affirmative action initiatives, especially in relation to postgraduate students and academic staff. These areas are best dealt with within each faculty so we are looking forward to their cooperation."

"It is one of our concerns that there is a high proportion of women in contract employment, particularly the academic staff. This area needs to be examined more closely."

She said 82.1 per cent were on contract compared with 40.9 per cent of male academic staff.

Staff and students were invited to attend a series of information sessions to launch the 'Monash University



Dr Margaret James

Affirmative Action Program – Objectives and Strategies 1991–92'.

The new program, endorsed recently by the Equal Opportunity Committee, is designed to achieve equal education and employment opportunity for women at Monash.

The speakers at the three campuses were Mrs Win McDonnell, former member of the Monash University Council, Professor Marcia Neave, Faculty of Law, and Dr Gabrielle Baldwin, Higher Education Advisory and Research Unit.

"We have already implemented some parts of the program. It consists of a lot of small strategies reaching out to all corners of the university," Dr James said. "It will be evaluated and revised as experience dictates."

The present program applies until the end of 1992.

Computer ware prices undercut

Contracts signed recently between the university's Computer Centre Shop and major suppliers mean that staff, students and departments can buy computer equipment and software at discount prices.

Major brands such as NEC, ACER, IBM and Apple Macintosh are available. In addition, more than 120 software lines are on sale at prices up to 60 per cent less than at commercial computer retailers.

The centre's manager, Mr Ron Coster, said because the shop was not run as a commercial venture, it was able to undercut commercial outlets.

"Apart from a small mark-up to cover freight and other expenses, the shop is maintained purely to provide high quality and reliable equipment to the Monash community at reasonable prices," Mr Coster said.

"The main purpose of the shop is to give departments, staff and students access to equipment, and project the profile of the Computer Centre."

Purchases by departments are sales tax exempt because the university is classed as a non-profit organisation. Staff and students still must pay the tax on goods bought through the shop.

The shop, on the ground floor of the Mathematics building on the Clayton campus, is open on Tuesday and Thursday from 10 am to 1 pm. Telephone extn 75 4740.

To Public Affairs Office, first floor, Gallery Building, Clayton campus.

Please send _____ presentation folders @ 80 cents each to:

Name: _____

Department: _____

Campus: _____

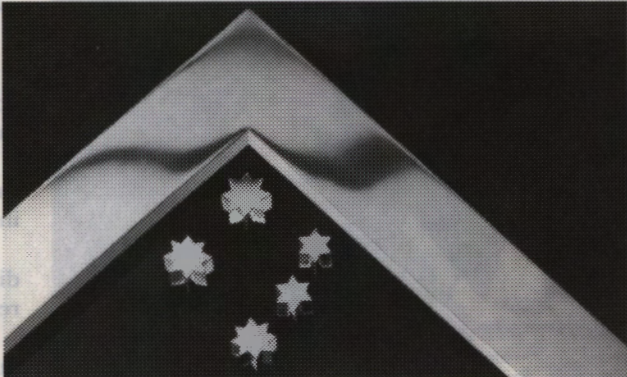
Total cost: \$ _____

Account code for billing: _____

The Communications Department offers:

Monash Christmas cards and presentation folders

Featuring the university's corporate image



Twenty full colour horizontal cards with envelopes cost \$8, or 40 cents each.

The message is: *Season's Greetings from Monash.*

To order, contact Ms Susan Byrne on extn 75 5059.

Full colour loose-leaf presentation folders cost 80 cents each. A special rate applies for orders of more than 1000.

The A4 folders are ideal for brochures, papers, pamphlets, course notes etc.

They also take thick documents such as *Monash: An introduction.*

To order, complete the coupon at left and send to Public Affairs, or contact extn 75 2067.

Making history in the schools

Supporting the teaching of history in secondary schools is the aim of a catalogue of new activities and publications from the Department of History.

The first in a series of audio tapes has just been released, and workshops and lectures for secondary students and teachers will begin next year.

The *Australian cultural traditions* tapes cover songs of migration and of work and protest, arranged and sung by Danny Spooner with historical commentary by senior lecturer Dr Marian Aveling. In the tapes, Danny talks about the songs' usefulness as historical sources.

Dr Aveling said the tapes, accompanied by brief notes and the text of the songs, could be used in classrooms or as a base for individual research. They are available from the department for \$13 each.

At a meeting earlier this year with history coordinators from secondary schools in the regions around Monash, teachers urgently requested course materials for the new VCE history units.

In March, the department will hold the first workshops on Australian history and the city in history. Department members will prepare annotated bibliographies listing recent publications relevant to specific study areas.

Dr Aveling said teachers were being encouraged to contact the department with their particular needs. "In the first instance we are concerned with Year 12, although inquiries from other areas are welcome," she said.

For students, the department is planning a Sunday lecture day in March. The lectures will cover areas of study within Australian history, the city in history and revolutions. Other units will be included, depending on demand.

"Teachers also reported a need for class sets of documentary source books for individual student use," Dr Aveling said. The books – directing students to concrete events, groups, individuals, ideas or institutions – will be sold to schools by the department from November 1991.



Dr Pat Vickers-Rich and friend: a reconstruction of a hatchling *Protoceratops*, an Asian dinosaur of the Cretaceous Period.

A heavyweight dinosaur book

Before purchasing Dr Pat Vickers-Rich's new book on prehistoric animals of Australasia, prospective buyers should consider taking a course in weight lifting.

Vertebrate Palaeontology of Australasia, a 1437 page history of the study of ancient backboned animals of the region, tips the scales at just over three kilograms, giving new meaning to the term "heavy reading". But the book is anything but ponderous.

Within its pages is a wealth of information on Australasian palaeontology, illustrated with line drawings, maps and artists' impressions of ancient fish, reptiles, birds and mammals.

The reaction to its publication has been remarkable, Dr Vickers-Rich said. Following a story last month in *The Age*, more than 400 orders were received in only two weeks. The initial print run of 750 is almost sold out.

Dr Vickers-Rich, a reader in earth sciences, is not surprised by the reaction. "There has always been an interest out there, but until now there has been a paucity of literature on the subject at a price people could afford. While Europe and the US have published many detailed books on prehistoric animals, similar books in Australia have been few and far between, and some of those quite inaccurate."

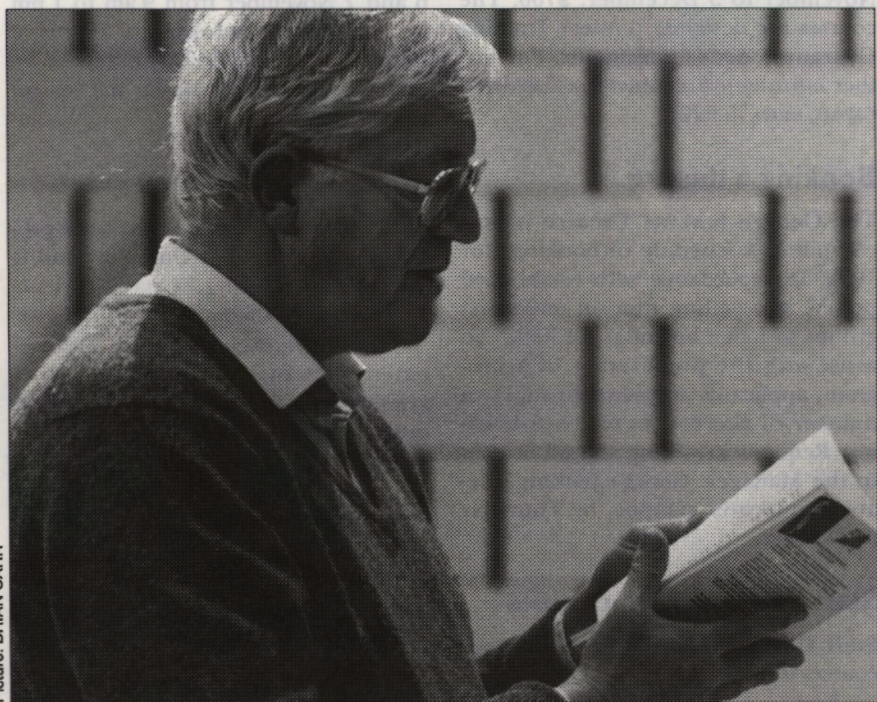
The book, eight years in the writing, is based on a third-year course Dr Vickers-Rich has been teaching and coordi-

nating since the mid 1970s. Each chapter is written by a specialist guest lecturer. Edited by Dr Vickers-Rich, Dr Tom Rich, Jennifer Monaghan, and Robert Baird, the cost of the book is as small as it is heavy. At only \$59.50, it is a real featherweight in Australian publishing.

At the same time, Princeton University Press has brought out a second edition of the successful *Kadimakara: Extinct vertebrates of Australia*, coedited by Dr Vickers-Rich. The current edition, on sale around the world, is less a reference book than its heavier cousin, and is aimed at readers who are unfamiliar with the scientific terminology, yet interested in the detail of prehistoric life of the Antipodes. *Kadimakara* is on sale at \$65, and contains more than 30 full-page colour impressions of prehistoric life by artist Frank Knight.

Early next year, Dr Vickers-Rich will complete the trifecta with the publication of the long-awaited *The wildlife of Gondwana*, a companion volume to Dr Mary White's book on plant evolution, *The greening of Gondwana*.

The new book, which will contain some of the most meticulous artists' impressions of Australian prehistorical animal life to date, will cover about 500 million years of the prehistory of the supercontinent, Gondwana, which took in parts of Australasia, South America, Antarctica and Africa. *The wildlife of Gondwana* will be published by Reed Books and is expected to cost \$49.95.



Noted Australian poet Peter Porter read from his own work at a recent lunchtime recital on the Clayton campus, sponsored by the Vera Moore Fund for the Performing Arts.

Briefly

AN INTERNATIONAL health organisation, chaired by Professor Roger Short of the Centre for Reproductive Biology, has been awarded a major grant for AIDS prevention programs in developing countries.

Family Health International (FHI) was granted \$168 million by the US Agency for International Development to expand HIV prevention and control programs in Africa, Asia, Latin America and the Caribbean. FHI's AIDS Technical Support Project aims to reduce the rate of sexually transmitted HIV infection by providing developing countries with the expertise to mount AIDS prevention programs. The grant will expand successful small-scale projects into national operations.

Professor Short has been chairman of the board of directors of FHI, a non-profit biomedical research and technical assistance body, for eight years.

MONASH LAW GRADUATE Mr Neil Rees, a proponent of human rights and legal aid, has been appointed foundation Dean of Law at the University of Newcastle. He is expected to take up his post in December.

Active in legal aid, he helped to establish the Springvale Legal Service and the Kingsford Legal Centre, Sydney. He worked for the Aboriginal Legal Service, Melbourne, later becoming a founding member of the Aboriginal Law Research Unit at the University of NSW and a founding editor of *Aboriginal law bulletin*.

Mr Rees has served as member of the Attorney-General's Task Force on Human Rights, and as a consultant to the governments of NSW and WA on equal opportunity law. He is the second Monash law graduate to be appointed a deanship. The first was Dean of Law, Professor Bob Williams.



Diary

OCTOBER

3 Southeast Asian Studies Seminar *Education of slum children in Bangkok*, by Charin Naksook. Room 515, Menzies Building. 11.15 am.

4 General and Comparative Literature Seminar *The concept of the popular*, by Professor John Frow, Queensland University. Room 809, Menzies Building. 2.15 pm.

5 Evening Concert *Preston citadel band in concert*, featuring principal trombone soloist Clarence White. Robert Blackwood Hall. 8 pm.

7 English Seminar *English studies in the nineties*, by Dr Dennis Bartholomeusz. Departmental Library, Menzies Building. 12.10 pm.

Librarianship, Archives and Records Seminar *The role of the library in the reading program of the primary school*, by Ms Anne Bult and *Newspapers in Melbourne public Libraries*, by Mr Timothy Yeo. Room 403, Menzies Building. 2.15 pm.

8 Australian Studies Seminar *The horse in Australian cultural production*, by Nan Mantle. NCAS Meeting Room. 10–11.30 am.

School of Accounting Seminar *Staff seminar research program*, by Mr Warren McGregor, Associate Director Australian Accounting Research Foundation. Accounting Meeting Area, 4th level, C Block, Caulfield campus. 11 am.

Anthropology and Sociology Seminar *Sociological theory as methods of writing patriarchy*, by Ms Dorothy Smith, Ontario Institute for Studies in Education. Departmental Library, Menzies Building. 11.15 am.

9 Monash Chemical Society Seminar *Is centralised research management really necessary?* by Professor F. Larkins, University of Melbourne.

Environmental Forum *Ecofeminist perspectives*, by Ms Angie Gutowski, Ms Christina Sickert and Ms Jenni Dunne (GSSES Women's Discussion Group). R6. 5.15 pm.

General and Comparative Literature Seminar *The paradox of form: Literature and self-reference*, by Dr David Roberts. Room 809, Menzies Building. 3.15–5.15 pm.

Genetics and Developmental Biology Seminar *Recent research developments into the major histocompatibility com-*

plex, by Dr Brian Tait, Royal Melbourne Hospital. Room 662, Biology Building. 4.15 pm.

11 Morning and Evening Concert *King and Queen for a day – Raja Sehari*, directed by Hajizar. Robert Blackwood Hall. Day performance: 10.30–11.40 am. Evening performance: 8.15 pm.

Music Research and Work-in-Progress Seminar *Western opera: A discussion with reference to voice production and aesthetics*, by Mr Graham Clarke. S807. 4.30 pm.

Accounting and Finance Seminar *Flexible manufacturing strategies: Implications for organisational arrangements and manufacturing performance measures*, by Dr Margaret Abernethy, University of Melbourne. Room 954, 9th floor, Menzies Building. 2.15 pm.

Linguistics Seminar *Acquisition of grammatical categories: Examples from Warlpiri*, by Dr Eve Bavin. La Trobe University. Room S246, Menzies Building. 11 am.

14 English Seminar *The long shadow of Hanging Rock: Australian film in the 1980s*, by Dr Brian McFarlane. Departmental Library, Menzies Building. 12.10 pm.

Librarianship, Archives and Records Seminar *The history of Victorian prison libraries*, by Mr Norman Turnross and *A pH survey of Australian published materials*, by Ms Lu Sheridan. Room 403, Menzies Building. 2.15 pm.

15 Faculty of Business Seminar *Staff seminar research program*, by Dr Max Sutherland, Sutherland Smith Research. Clayfield Room, ground level A block, Caulfield campus. 11 am.

16 Genetics and Developmental Biology Seminar *The molecular basis of cell recognition in flowering plants*, by Dr Marilyn Anderson, University of Melbourne. Room 662, Biology Building. 4.15 pm.

Environmental Forum *Environmental activism and the law*, by Mr Brian Walters. R6. 5.15 pm.

18 Evening Concert *The University of Melbourne School of Music end of year concert*, with the School of Music Orchestra and Choir. Conducted by Christopher Martin. Robert Blackwood Hall. 8 pm.

Accounting and Finance Seminar *Some preliminary evidence concerning stock market volatility*, by Mr Timothy Brailsford. Room 954, 9th floor, Menzies Building. 2.15 pm.

Monash Chemical Society Lecture *Chemistry in the public interest: Approaches and opportunities*, by Professor D James, Deakin University. S2. 4 pm.

Linguistics Seminar *Discourse analysis in a cross-cultural context*, by Professor John Gumperz, UC Berkeley. Room S426, Menzies Building. 11 am.

20 Afternoon Concert *Music at Blackburn High School Annual Concert 1991*. Robert Blackwood Hall. 2 pm.

21 English Seminar *Australian women's science fiction*, by Dr Jannen Webb (ACU). Departmental Library, Menzies Building. 12.10 pm.

Librarianship, Archives and Records Seminar *Library services for the housebound*, by Ms Julie Frankeni. 2.15 pm. *Report on the recent conference to celebrate the 100th anniversary of the establishment of the Dutch society of archivists*, by Mr Frank Upward and Mrs Livia Iacovino. 3.15 pm. Room 403, Menzies Building.

22 Australian Studies Seminar *Women in the Australian churches*, by Pat Major. NCAS meeting room. 10–11.30 am.

Anthropology and Sociology Seminar *Politicising gender: Women and the state in Australia and the USA*, by Desley Deacon, University of Texas. Departmental Library, 10th Floor, Menzies Building. 11.15 am.

23 Monash Chemical Society Lecture *The CSIRO atomic absorption project*, by Alan Walsh, Faculty of Science and Dr P. Hannaford, CSIRO Division of Materials Science & Technology. S2. 4 pm.

Genetics and Developmental Biology Seminar *Population biology of a cytoplasmic incompatibility system in Drosophila simulans*, by Dr Michael Turelli, University of California. Room 662, Biology Building. 4.15 pm.

General and Comparative Literature Seminar *Holes in the simulacral: Ecology and the satellite age*, by Mr Robert Hartley. Room 809, Menzies Building. 3.15–5.15 pm.

24 Music Research and Work-in-Progress Seminar *Boethius and Hucbald: Companions in a Melbourne manuscript*, by Dr Carol Williams. S807. 9.30 am.

25 Linguistics Seminar *Code switching in conversation*, by Professor John Gumperz, UC Berkeley. Room S426, Menzies Building. 11 am.

28 Librarianship, Archives and Records Seminar *Planning to get a job? How to prepare your CV and present yourself at the interview*, by Ms Jenn Evans (freelance Library and Information Systems) and Ms Judith Ellis (Archival Systems Consultants). Room 403, Menzies Building. 2.15 pm.

30 Monash Chemical Society *How will the tertiary institutions cope with the chemistry CATs?* by Mr R. Sanders, VCAB and Sunshine Secondary College, and Mr C. Dwyer, Vermont South Secondary College. S2. 4 pm.

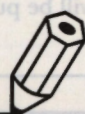
Genetics and Developmental Biology Seminar *A genetic and physical analysis of the pseudomonas solanacearum genome*, by Ms Madol M Escudra. Room 662, Biology Building. 4.15 pm.

NOVEMBER

1 Linguistics Seminar *Processing coordinate constructions in categorial grammar*, by Dr Gerry Altman, Sussex University. Room S426, Menzies Building. 11 am.

6 Monash Chemical Society Seminar *Annual general meeting and presidential address: Reflections on research*, by Professor R. Martin. S2. 4 pm.

Notes



Toastmaster members

Monash Toastmasters is seeking new members. Toastmasters, an organisation of men and women who seek to raise their self confidence through improving their speaking ability, is open to all staff and students. The club operates on a 'try before you buy' basis. It meets on the first Tuesday of every month at 1.05 pm in Room 164, Education Building, or the third Tuesday of every month at 5.45 pm in the Seminar Room, Sports and Recreation.

For further information, contact Ms Gwen Rowe, extn 75 5008, Mr Doug Rash, extn 75 4579, or Ms Joan Szalman, extn 75 2787.

An angry workshop

The Office of Continuing Education will present a course entitled *Anger: An occupational hazard for health professionals* on 10 October.

The intensive one-day course, presented by Mr Robert Hockley, is designed for managers and supervisors, human resource personnel, counsellors and health/welfare workers. The cost is \$120. For further information, contact the Office of Continuing Education on extn 73 2809.

Short courses on SPSS/PC+

The Department of Anthropology and Sociology is offering two-day courses on SPSS/PC+ to coincide with the introduction of the university's site licence. Courses are scheduled for 1 and 3 October, 5 and 6 October (weekend), 8, 9, 15, 16 October (evenings), and 5 and 7 November. For further information, contact Mr Peter Hiller, 562 0539 or Ms Juliet Yee, extn 75 2984.

CIPAG courses

The Victorian Centre for Image Processing and Graphics (CIPAG) is offering the following new courses: *Introduction to computer animation and visualisation*. Four days: 8–11 October. \$975. *Advanced computer animation and visualisation*. Three days: 6–8 Novem-

ber. \$975. *Programming and using RenderMan*. Five evenings, 6.30–9 pm: Tuesdays and Thursdays from 19 November to 3 December. \$700. The courses are designed to meet Training Guarantee Act requirements. For further information, contact the Secretary, CIPAG, extn 75 5227.

Booking a theatre

The George Jenkins Theatre is now compiling a schedule of bookings for 1992. In accordance with established policy, it is calling first on university groups to lodge bookings for 1992. To assist with the preparation of a program, applicants are asked to supply a number of alternatives for each booking. Requests in writing should be sent to the Manager, George Jenkins Theatre, Frankston campus, by Thursday 31 October.

Staff development courses

Staff Development will present two courses in the coming weeks.

Economics for non-economists will be held on Mondays 21 and 28 October from 9.30 am to 1 pm in the Staff De-

velopment Training Room, first floor, University Offices. The cost is \$85.

Effective writing skills will be held on 6 and 7 November from 9 am to 1 pm in the Staff Development Training Room. The cost is \$50. For further information, contact Ms Di Barker on extn 75 4110.

Monash promotional video

A new promotional video has been produced about Monash University and is available for viewing by staff, students and external audiences.

The 16 minute video will be used extensively in schools, at university briefings and public presentations, and overseas.

Loan copies are available free of charge for up to 48 hours. Contact Ms Susan Byrne in the Communications Department on extn 75 5059. Copies of the video also are on sale for \$30. Contact Mr Byron Nicholls on extn 73 2084.

Send contributions for Notes and Diary to The Editor, Montage, Public Affairs Office, first floor, Gallery Building, Clayton campus, phone extn 75 2067, fax 75 2097.

Islamic leader challenges our prejudice

by Greg Barton

Australian prejudice about Islam and its role in Indonesian society were challenged during the visit to Monash of Abdurrahman Wahid, an Islamic leader of world stature.

Abdurrahman is head of Nahdlatul Ulama (NU), the largest Islamic organisation in Indonesia – the world's largest Islamic nation. With about 20 million members, NU is that country's single most important group, outside the government's ruling party and the army.

His Australian visit last month was organised by the Centre of Southeast Asian Studies, where he is a visiting fellow. A major seminar *Contemporary trends in Indonesian Islam* was the centrepiece in a program of academic seminars, public lectures and media interviews.

During his visit, he surprised commentators and audiences with pluralist liberal ideas, not usually associated with Islamic leadership.

At the two-day seminar, overseas and Australian academics explored Abdurrahman's influence on Islam. Since taking over the leadership of NU in 1984, he has overseen the official withdrawal of the organisation from party politics and opened up vigorous debate on many Islamic issues previously considered sacrosanct.

He advocates a reinterpretation of scripture in the light of 20th century experience. For example, following



Abdurrahman Wahid, head of one of the world's largest Islamic organisations.

principles rather than adhering to strict traditional codes of conduct.

Abdurrahman Wahid's endorsement of a separation between mosque and state exists alongside his appreciation of the core values of Islam. He is a new type of Islamic teacher; one who is

equally at home with Western learning and classical Islamic doctrine.

He studied at the Al-Azhar Islamic university in Cairo, Egypt, and went on to further studies in Arabic literature at the University of Baghdad, Iraq. He returned to Indonesia in 1970 and

began a career as an *Ulama*, or Islamic teacher.

His influence is felt in the religious, political and intellectual spheres of Indonesian life. He has a reputation as a liberal thinker of strong convictions, with extraordinary boldness in his public views.

In Indonesia, he is controversial but well liked, particularly among the younger generation. Abdurrahman is seen as a capable leader who has maintained the support of his people, the trust and respect of government officials and the independence of his own vision and that of NU.

At the seminar, Monash scholars Dr Herb Feith and Professor Merele Ricklefs, as well as Dr Harold Crouch and Professor Jim Fox of the Australian National University, outlined how Indonesian Islamic thought has become more sophisticated and open.

Overseas speakers included Dr Martin van Bruinessen from the Netherlands and Professor Mitsuo Nakamura from Japan.

Rather than simply accepting the trend for a separation between religion and politics as a necessity, the majority of Indonesian Muslims now see it as a liberating development – largely due to Abdurrahman's influence. The secular nature of the modern Indonesian state is widely recognised as a positive development.

Greg Barton is PhD candidate in the Centre for Southeast Asian Studies.

Press cuttings

The following is a selection of the past month's print media coverage:

- 1 September *The Sunday Age* – Dr Martin Ryan, Social Work: Debtor harassment boosts bankruptcies.
- 3 September *The La Trobe Valley Express* – Mr Peter Johnston, Chemical Engineering: Brown coal can be a more efficient source of energy.
- 3 September *Hastings Independent* – Mr Tom Davies, Chemistry: Reed beds may replace septic tank: Expert.
- 4 September *The Age* – Dr Pat Vickers-Rich and Dr Tom Rich, Earth Sciences: Monster book of fossils.
- 4 September *The Age* – Professor Robert Smith, Police Studies: The thought(ful) police.
- 4 September *The Age* – Professor Geoffrey Thorburn, Physiology: Drug stresses put foetal brain at risk.
- 6 September *Gippsland Times* – Professor Tom Kennedy, Pro Vice-Chancellor, MUCG: Study options open up.
- 9 September *The Age* – Dr Chris Maher, Geography: Market fails to react to lower rates.
- 9 September *The Age* – Professor Bill Russell, PSMI: Spend \$100m on rail, bus service, says PTC.
- 9 September *Launceston Examiner* – Professor Louis Waller, Law: Embryo experiments: Ethical rift on report.
- 9 September *The Australian* – Professor Louis Waller, Law: Bid to extend embryo testing.
- 9 September *Canberra Times* – Professor Louis Waller, Law: Embryo experiments: Ethics experts disagree.
- 10 September *The Australian* – Dr Kevin O'Connor, Geography: Sydney targets business crown.
- 10 September *The Australian* – Professor Tony Duggan, Law: Academic attacks re-

luctance for uniform consumer protection.

10 September *The Age* – Ms Helen Forgasz, School of Graduate Studies: Second-rate excellence.

11 September *The Border Mail* – Professor Marcia Neave, Law: Law still biased against women: academic.

11 September *The Australian* – Professor Marcia Neave, Law: Women 'still not equal' at law.

11 September *The Adelaide Advertiser* – Professor Marcia Neave, Law: Women's work 'labour of love' in courts' eyes.

12 September *The Herald-Sun* – Ms Sharon La Fontaine, Microbiology: Farmers' friend our top achiever.

13 September *The Age* – Professor Carl Wood, Obstetrics and Gynaecology: Wood puts case for paid surrogacy.

14 September *The Burnie Advocate* – Dr Jenny Redman, Psychology: Body clocks may hold key to longevity.

14 September *The Age* – Professor Alan Trounson and Dr Karen Dawson, Centre for Early Human Development: Human embryo scientists see better alternative to abortion.

14–15 September *The Weekend Australian* – Professor Brian Parmenter, Centre of Policy Studies: Labour key to prosperity.

16 September *Warrnambool Standard* – Professor Carl Wood, Obstetrics and Gynaecology: Frozen egg advance to help women – professor.

17 September *The Canberra Times* – Professor Carl Wood, Obstetrics and Gynaecology: Researchers find way to save ovaries.

17 September *The Canberra Times* – Professor John Head, Economics: GST 'will cash in on the master tax cheats'.

17 September *The Financial Review* – Dr Ian Ward, Economics: Strategy behind Gorbachev's plans.

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

Hospital departments move

The relocation of wards and medical units from Prince Henry's to the Monash Medical Centre (MMC) and other hospitals was completed last month.

Following the closure of the hospital, about 1000 of its general and medical staff have moved to Clayton. Monash's clinical and research departments at Prince Henry's also will move to the centre later this year, along with the affiliated Prince Henry's Institute of Medical Research.

The Surgery, Medicine and Psychological Medicine departments are expected to move late next month, following commissioning of the new E Block at MMC and winding up of teaching commitments at Prince Henry's.

Resource manager for medicine and surgery at Prince Henry's, Mr

Bruce Ross, said the relocation involved a total of 150 staff.

Medicine, surgery and the Prince Henry's Institute would be situated in E Block, psychological medicine in P Block, and some offices and wards in D Block.

He said the new buildings at MMC offered staff a substantial improvement in laboratory and office facilities, as well as reducing travelling time to the Clayton campus.

Fourth, fifth and sixth year medical students are taught by the Faculty of Medicine at its hospital-based departments.

Research skills developing

Monash's professional development program is up and running successfully with 20 staff members, representing all four campuses, taking part.

The \$223,000 pilot program – financed by the Federal Government and organised by the Higher Education Advisory & Research Unit (HEARU) – aims to enhance Monash's teaching and research reputation.

Program participants will cover many aspects of research, teaching, administration, and the university's links with the community during the five-month course. Subjects include curriculum design and evaluation, staff appraisal, research design, analysis and

administration and graduate student supervision.

Mr Dilip Nag, of the School of Civil Engineering at Monash University College Gippsland, said the program was particularly useful for participants from campuses which previously had undertaken only limited research work.

"Some of us come from campuses which weren't as research oriented as the main Clayton campus, so the program gives us some pointers on how to start research work, write papers and so forth," Mr Nag said. In addition, he said the program provided a valuable forum for meeting colleagues from other campuses and exchanging ideas.

IT IS HARD for a historian to read the newspaper these days without a strong sense of déjà vu. You don't have to be a believer in numerology to detect an uncanny resemblance between the economic landscape of the early 1990s – the company crashes, bankrupt banks, foreclosures, empty skyscrapers, falling house prices, unemployment and poverty – and that of the early 1890s. For Mirams, Fink and Bent read Skase, Herscu and Bond. For the ill-fated Premier Building Society read Pyramid; for the Commercial Bank read Trico. For the old Rialto building read the new.

Then, as now, Melbourne was undergoing one of its periodical fits of remorseful self-examination. A poet of the 1890s, the self-styled Melbourne Juvenal, reflected on the tendency of Melburnians to lurch from moods of extravagant optimism to periods of equally extravagant despair:

*Ours is a city ever in extremes,
Or in a nightmare or in golden dreams.*

People wondered whether there was something basically wrong, unnatural even, in the development of the city. "Is Melbourne overbuilt?" one commentator asked in 1891. Was the sprawl of suburbs for which the city, even then, was becoming notorious, a blessing or a curse? Could its people really afford to sink so much in bricks and mortar, roads and railways? Was the craze for individual home ownership, that had lured so many young Melburnians into debt and repossession, a siren-call to disaster?

Now as the *golden dreams* of the 1980s give way to the *nightmare* of the 1990s, Melbourne is once again a city in extremes. Only yesterday, it seems, we were congratulating ourselves on being 'the world's most livable city'. (A fading billboard on the exit road from Tullamarine Airport still advises arriving passengers of the fact.) But many of the virtues that contributed to the city's reputation for 'livability' – low residential densities and good urban services, for example – suddenly have become vices in the eyes of some experts.

The recent spate of newspaper articles about 'Melbourne 2000', the Victorian government's discussion paper on 'Urban Development Options for Victoria' and Mr Brian Howe's Program for Better Cities have revived some old worries about the costs of Melbourne's sprawl and raised some new ones, especially about the high costs of energy and pollution that come with our almost universal dependence on the automobile. For the first time in a century, politicians and planners are seriously proposing to reverse the long historic march that has made Melbourne one of its most suburbanised cities on earth.

One of the important hidden forces in urban planning is the inertia of the past. Cities are hard institutions to change: they are literally set in concrete. As strong as the concrete, however, are the historical forces that have made Australians such confirmed



by Graeme Davison

suburbanites. From the very beginnings of white settlement the suburb was the Australian urban ideal.

When Arthur Phillip founded Sydney in 1788 he laid it out on along suburban lines. "The land", he declared, "will be granted with a clause that will prevent more than one house being built on the allotment, which will be sixty feet in front and one hundred and fifty in depth" – roughly the dimensions of a standard suburban block! Within four years of its foundation in 1834, when Melbourne was still little more than John Batman's "village", real estate men were already urging its "Capitalists, Merchants, Farmers, Traders and Yeomanry" to consider the advantages of living on a "suburban allotment".

The suburbanised form of the Australian city was reinforced by the aspirations of successive generations of immigrants. For English town dwellers in the 1850s, as much as Greek peasants in the 1960s, the suburban house and garden was a symbol of individual freedom and economic self-sufficiency. From the outset, cities like Melbourne were able to utilise the latest forms of urban technology – railways, cable cars, telephones. They built the suburbs around them

rather than demolishing the city to make way for them, as many Old World cities were forced to do.

Australian governments have long subsidised the suburban way of life. In colonial times they built suburban roads, railways, schools and police stations, not – as in the United States – out of local property taxes which would have curbed the pace of development, but out of central government revenues. In the twentieth century, and especially since World War II, Federal governments have increased the subsidies with road programs, cheap housing finance, tax relief and "home-savings grants" for home owners. From the 1960s the mortgage belt of the capital cities became the place where Australian governments were made and unmade, and political parties competed for its allegiance largely on the basis of what each would do to foster the suburban way of life.

In the early 1990s this suburban way of life faces grim new challenges. They are posed, not by the current recession alone, but more formidably by the rapid dismantling of the economic, political and technological structures which have so long supported it. As the world economy is uncoupled from the old resource base, cities like Melbourne – with its traditional dependence on wool, wheat and protected manufacturers – may become marooned in an economic backwater.

High interest rates and the rising costs of urban services may make it harder for the next generation of Melbourne householders to afford the traditional quarter acre block. Rising energy costs and increasing levels of traffic congestion and atmospheric pollution will make the long commute to the suburbs slower, more expensive and more unpleasant. And, as rationalising governments whittle away the subsidies that supported the suburban way of life, their life-support systems may crumble and decay.

Happily, not all the forces of contemporary society work against the suburbs. Some of the features of post-industrialism – high reliance on electronic communication and shorter working hours, for example – may actually favour more dispersed, rather than more concentrated, patterns of urban life. If the tide has turned against the suburban way of life, it is not just because we can no longer afford it, but because we have begun to question the values that once supported it.

Declining levels and changing sources of immigration, smaller families and smaller government have created a new urban agenda in which concentration comes to seem more virtuous and attractive than dispersal. How achievable such an agenda may be remains to be seen, for as yet we Melburnians have barely begun to think ourselves out of the suburban mind-set that has been such an enduring feature of our history.

Graeme Davison is Professor of History.

DIOGENES



AFTER KICKING over winter's last traces, we finally have arrived at spring. Just about everyone is glad to be over the hump – why, even those arch jeremiahs, editorial writers,

have lately been singing the season's praises.

A recent *Age* editorial positively sang: "As trees that appear dead in winter come to new life in spring, brighter days always lie ahead. 'If winter comes,' asks Shelley, 'can spring be far behind?'"

The answer, of course, is an unmitigated "indubitably". But the writer also maintains that the ordinary Londoner believes spring begins "on the day the first crocus appears in my garden".

This is all very fine in a country where the seasons are clearly delineated – where winter rolls into spring only on parliamentary order, and spring dissolves into summer as a result of a referendum.

In Australia, things are a little more clouded. But here are some handy harbingers:

1. Spring has sprung south of the equator when road maps are carefully uncreased and children are reintroduced to the country's unterracottaed

parts: "We're now leaving the city limits, kids. You may experience a little turbulence in the cerebral region at the sight of these green paddocks and the conspicuous absence of convenience stores. But in their place we have a kind of wall-to-wall quiet. Just wind down the windows and listen to the wind." (Caution: By summer's end, the spring expedition may be forgotten. No one has thought of introducing farm animals to video games.)

2. Like the first crocus, spring in the Australian suburbs is proclaimed by the sight of a family in hot pursuit of their dog. For this is canine washing time – when pooches, biters, mongrels, pedigrees, hounds, tykes, mutts and lap dogs alike are subjected to an unenticing plunge into a tin bath of tepid water laced with sundry suds of an obnoxious and possibly fatal flea deterrent.

3. You know it's spring in Australia when the peace of Saturday mornings is broken by loud suburban curses

aimed at implements mechanical: Victas, Whippersnippers, electric edge clippers and the like. Winter tinkers mysteriously with their innards and unrestrained fury, judging by the cacophony, is the only cure. Not all that long ago, tools would either withstand the onslaught or bite back. Today they lose a vital cog and surrender meekly.

4. Each year, always in the cold and mournful days of winter, Melbourne sort of sags around its nether regions. But you know it's spring when, under pressure from fine-weather home buyers, newly awakened suburbs start flexing their muscles for a vernal assault on the next hill (where they lay down a main road, establish a bridgehead at the planned shopping centre, and begin their inexorable annexation of the next rise).

And it is indeed spring when laughter, unforced and unrehearsed, pierces the soft suburban twilight. As if winter was just a bad dream.

RESEARCH

MONASH

Governing the unborn state

Rather than acting as a neutral interface, the placenta may actively control the physiological state of the fetus. Professor Geoff Thorburn has warned women to avoid high doses of aspirin during pregnancy because it may interfere with the subtle chemical interplay that determines fetal development.

Aspirin and related compounds like paracetamol and indomethacin are the world's most widely used anti-pain and anti-inflammatory drugs. Recently, aspirin has also been shown to help prevent heart attack and stroke by acting as an anti-clotting agent.

It is also among the safest of drugs, having few adverse side effects when taken in small quantities. Small wonder that aspirin has the reputation of a wonder drug. But Professor Geoff Thorburn, head of the Department of Physiology, now has sounded a warning to women: high doses of aspirin should be avoided during pregnancy.

The anti-inflammatory properties of aspirin and aspirin-like drugs derive from the fact that they suppress the activity of hormone-like chemicals called prostaglandins.

In a study funded by the National Health and Medical Research Council, Professor Thorburn and the members of his research team – Drs Stuart Hooper, Richard Harding, David Walker, Ross Young and Greg Rice – have shown that one particular prostaglandin secreted by the placenta, PGE₂, plays a central role in maintaining the specialised metabolism of the developing fetus.

Their new evidence points to the possibility that indomethacin, a more potent form of aspirin, may subtly interfere with fetal development by suppressing placental production of PGE₂. The risk is most pronounced where the fetus is already under stress because of an inadequate placenta or because the mother smokes or takes drugs.

The research team believes that, while not yet definitive, their evidence at least warrants the addition of aspirin to the list of drugs that should be used with caution in pregnancy.

Professor Thorburn recently has begun to publicise a new view that the placenta, rather than being a passive interface between mother and baby, actively maintains pregnancy by dictating the physiological state of the fetus.

The Monash group does most of its research on sheep – a species that Australian scientists have studied intensively for more than half a century. The species is a convenient model for studying pregnancy and fetal development; it is readily available, and pregnant sheep are less likely to abort than primates if the fetus is briefly removed from the womb. This is done to implant catheters into blood vessels during pregnancy, allowing study of the fetus in its natural environment in an unstressed, conscious mother.

While sheep obviously differ from humans, they are similar in fundamental aspects of pregnancy, most notably the contrasting metabolic states of the mother and the fetus. Professor Thorburn says the developing fetus spends

very little time awake; most of the time it is in REM sleep (rapid eye-movement sleep, a phase of sleep when humans dream) or in quiet sleep.

It “breathes” intermittently and very shallowly, to exercise the lungs and the diaphragm. According to Professor Thorburn, this breathing practice is important because if it is prevented experimentally, development of the diaphragm and the lungs is impaired and the newborn may not breathe properly.

Fetal circulation also differs from that of the mother. With oxygen and carbon dioxide being exchanged via the placenta, most blood is diverted through the umbilical blood vessels to the placenta instead of going to the lungs. This diversion of blood flow away from pulmonary (lung) circulation to systemic (general body) circulation occurs via a special blood vessel, the ductus arteriosus, which is kept open by PGE₂.

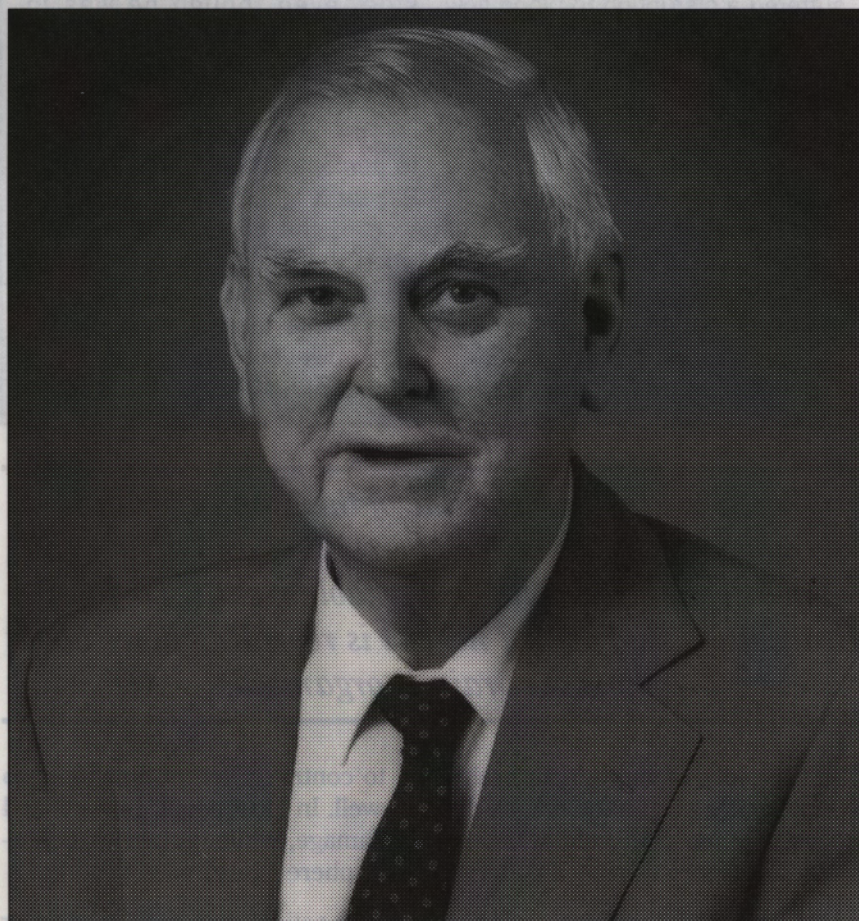
In the fetus, the normal thermo-regulation mechanisms that heat and cool the body after birth must be suppressed. The fetus lives in a virtually constant environment resembling a Turkish bath. The temperature is 37°C, with humidity a constant 100 per cent – conditions that would be lethal for the adult. The fetus, in fact, usually has a body temperature of about 38°C, one degree higher than that of the mother.

“In the lamb, and to a lesser extent in human babies, the kidneys of the fetus are surrounded by a layer of brown fat, which is a rich source of energy,” Professor Thorburn said. “At birth, the sympathetic nervous system increases the newborn’s metabolic rate to compensate for the cool environment.”

“The brown fat is burned up, and generates a lot of body heat for up to two days, which can be critical for the newborn’s survival. After the brown fat is used up, the newborn must rely on shivering thermogenesis, to generate heat from muscle activity.”

Professor Thorburn says the importance of brown fat as a heat source can be understood by considering the case of lambs born during a cold, wet winter, when the wind chill factor might produce perceived temperatures well below 0°C. Brown fat metabolism and shivering each would generate about 50 per cent of the lamb’s heat requirements.

“One other difference between fetal and post-natal metabolism is that various enzyme pathways in the liver,



Professor Geoff Thorburn.

which are suppressed throughout pregnancy, switch on immediately after birth. These enzyme pathways become functional within 30 minutes,” he said.

“Consider that here we have quite a big baby approaching full term, shoved into a very confined space and bathed in its own urine. Nobody has really considered the implications of this state; that these conditions might actually be imposed on the fetus, suppressing or inhibiting many of the activities such as consciousness, thermo-regulation, breathing, and liver metabolism that it will need immediately after being born.

“The work of my group over the past five years has led me to propose that placenta is secreting at least one regulatory substance into the fetal circulation, called prostaglandin E₂. I am proposing that changes we associate with the transition from the fetal to the newborn state are due to PGE₂.

“Once the doctor ties the cord and separates the fetus from the placenta, the inhibitory role of PGE₂ is removed. The fetus wakes up, cries, inflates its lungs, begins to breathe continuously, turns on new enzyme pathways in the liver, and begins to burn brown fat to keep itself warm.

“On our evidence, and the evidence of others, it is clear that the placenta is actually dictating the physiological and metabolic state of the fetus. It has never been enunciated in that way before.”

Professor Thorburn says PGE₂ is clearly just one of a number of substances secreted by the placenta that are involved in regulating fetal metabolism, but says the idea that the placenta has this role is “novel and interesting”. PGE₂ exerts different effects on various organs by controlling synthesis of a substance called cyclic

AMP (cAMP), which in turn regulates the function of enzymes.

In some tissues, PGE₂ increases cAMP levels, but decreases it in others. In brown fat tissue, for example, PGE₂ reduces cAMP levels, preventing the burning of the brown fat during fetal life, ensuring that the fetus does not overheat.

But in the pancreas, it stimulates cAMP synthesis, which increases insulin levels. Insulin causes blood glucose, the body’s primary fuel source, to be sequestered in the liver as glycogen, for use as a readily available energy source after birth. (By lowering blood glucose, cAMP maintains the low metabolic rate of the fetus.)

The group’s research has shown that the placenta is so effective at keeping the fetus in this quiescent state that even if a tube is introduced into trachea of unborn lamb, and oxygen is made available to the lungs, it will not breathe while it still remains connected via the placenta to the mother. But if the umbilical cord is clamped, the fetus starts breathing as if it had already entered the outside world. When the clamp is removed, the fetus stops breathing again.

Professor Thorburn says PGE₂ may play a central role in initiating birth, by promoting the maturation of a number of organ systems that the fetus will depend on when it is born, but at the same time it suppresses their function before birth.

The most important organ for survival outside the womb is the lung. Recent overseas work on human lungs has shown that during the last six to eight weeks of pregnancy, the fetal lungs begin to produce a surfactant.

Continued on Research Monash 4

Charting inner space

Patient X: a case study

Patient X, a 60 year old male, was admitted to hospital with weakness of the left side – a tell-tale signature of a mild stroke. A brain scan confirmed that he had suffered a disruption to blood flow in the vicinity of the right parietal lobe, towards the rear of the brain.

In hand-eye tests to assess his condition, Patient X showed a curious deficit in perception. When asked to bisect a series of horizontal lines drawn on a sheet of paper, he would make a mark towards the right-hand end of the line, rather than in the middle, as if he was unaware that the line

extended out to the left.

Similarly, when asked to cross out stars randomly distributed over a page, Patient X only succeeded with stars on the right side, even though he was instructed to scan the whole page. It was as if the left side of the page did not exist for him.

The problem was not confined to perceptual tests. At mealtimes Patient X ignored food on the left side of the plate, only eating it when the plate was rotated 180 degrees. He shaved only the right side of his face, leaving the left side unwashed and covered with bristles.

When the left or right side of the human brain is damaged its links between perception and action can be disconnected, with remarkable results. Dr John Bradshaw's study of left neglect is revealing more about how the brain is organised.

The two sides of the human brain tend to control different functions, so when damage occurs the results differ as well. In most people, speech and language is more affected after left side damage, while certain spatial capacities are more disrupted with right hemisphere injury.

Dr John Bradshaw, neuropsychologist and Reader in the Department of Psychology, and postgraduate students Ms Jane Pierson and Mr Jason Mattingley, have been studying a condition known as unilateral neglect.

It occurs after brain damage from accidents, stroke, tumours or cerebral haemorrhage. "Patients with right hemisphere lesions suffer from left neglect; they typically fail to attend to or orient towards events in that side of space", Dr Bradshaw said.

"Left neglect is more common and more severe than right neglect, and the disability is more persistent. We are following patients through and mapping their progress over time."

The group is interested in subtle residual deficits after the patients have returned home, particularly in their ability to respond to stimuli in their normal environment. This is where the link with motor components of the neglect syndrome comes in.

Mr Mattingley says patients with posterior or parietal damage to the right hemisphere usually show deficits in perception; they fail to perceive things in the left side of space. If damage is to the anterior or frontal region, it manifests itself more in deficits in directionality of movement and orientation.

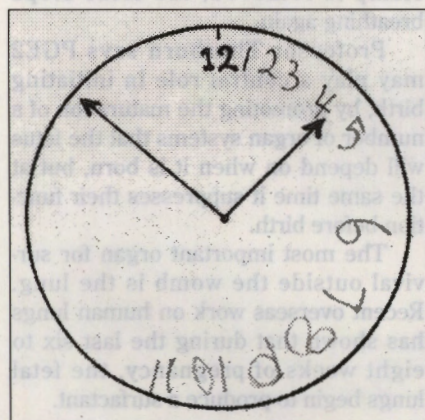


Figure 1.

The patient may avoid turning or looking towards the left, and may have difficulty in moving the right hand towards the left, even though the hand and arm are not physically impaired. Somehow the link between perception and action is disrupted, a connection so seamless that it is usually impossible to say where one ends and the other begins.

Dr Bradshaw and his group have developed computer-based testing systems which analyse the various parameters of movement. For example, the difference in time that a patient takes to initiate and to execute a variety of simple or complex movements.

"Patients with neglect have difficulties shifting or directing attention in a particular direction, which manifest themselves in the control of movement," Dr Bradshaw said. "This includes how movements speed up at the beginning or slow down at the end of a trajectory."

"Each side of the brain is responsible for attending to the opposite side of space, so that the left side attends to the right and vice versa. But on top of that there is an overall dominance of the right side of the brain for the perception of and control of movement in space. This matches the usual dominance of the left side of the brain for most language functions."

"Consequently, the right hemisphere controls spatial attention not just on the opposite (left) side, but to some extent on its own right side as well. This means that when the right side is damaged, the effects of unilateral neglect are much stronger than when the left hemisphere is damaged. Then, however, there is typically gross disruption to speech, which rarely occurs with right side damage."

The group also uses a face-matching task to assess the purely perceptual aspects of neglect. We normally recognise people or their expressions by concen-



Happy-sad face composites: most people will usually judge the composites with the smile on the left as the happier faces.

trating on features on the left side (as viewed) of the face.

The photographs above illustrate the bias. Most people will judge the bottom two composite faces with the smile on the left as the happier, even though a pair (top and bottom) of such composites are exact mirror images of each other.

However, a patient suffering from left neglect due to a posterior right-hemisphere lesion concentrates on the right side of the face, and will usually judge the composite with the smile on the right as the happier.

This asymmetry is replaced by changes in movement parameters in or towards the left side of space when the damage is more anterior.

Dr Bradshaw says even normal people are somewhat lopsided in facial movements. When they begin talking, the right side of the mouth is likely to open slightly earlier, and to make larger speech movements.

"Watch speakers on TV – about eight out of ten show this pattern", Dr Bradshaw said. "For this reason when we make happy-sad composite faces for testing hemi-neglect patients, we must make sure that we include all four combinations of happy and sad, left and right."

Since the anterior parts of the brain are devoted – among other things – to the initiation and control of movement, after a stroke involving these regions attention problems manifest themselves more in the motor domain. As the posterior parts are more involved in integrating sensory information, damage appears more in the perceptual domain.

Mr Mattingley says that Patient A, for example, shows an abnormal perceptual bias in the face test. She judges faces with the smile on the right as happier, but is relatively normal in terms of movement parameters.

Patient B, however, is abnormal in his movement control, but shows the normal pattern of asymmetries with the

face test. "We find that our simple and non-invasive techniques can help identify whether neglect stems from an anterior or a posterior lesion," he said.

Dr Bradshaw quotes an interesting example of perceptual deficit observed by a neurologist colleague at the University of Milan, in Italy. Professor Eduardo Bisiach was testing the ability of patients with left unilateral neglect to imagine a scene with which they were very familiar – the Piazza del Duomo in central Milan.

Their task was to describe what buildings could be seen from their imaginary viewpoint at one or other end of the Piazza. "They would describe all the buildings on the right side without any difficulty, but would ignore, forget or fail to mention any on the left side," Dr Bradshaw said.

"Then the patients were asked to imagine themselves at the other end of the Piazza, and to repeat the exercise. They now described all the buildings on the other side, when previously they had been unable to do so. This suggests that neglect can apply in the generation and description of mental images."

"Indeed such observations have led to a controversy among neurologists and neuropsychologists, concerning the nature of the unilateral neglect syndrome. Some claim, from such demonstrations as the Italian imagery task, that neglect simply involves impairment in the ability to generate, maintain or access one side of an imaginal or veridical representation of space. Others argue that the representation may be more or less intact, but the problem lies in attending to one side of the imagined scene."

"We believe that account must be taken of the locus of injury. That said, attention factors and the control of actual or intended movement – and the latter is itself one aspect of attention – are major determinants. Perception can rarely be totally isolated from action."

In another example of unilateral neglect, Professor Vigouroux of the Clinique de Neurologie in Paris analysed the paintings of a well-known modern French artist who suffered a right-posterior stroke. In work completed after his stroke, the artist did one of two things. He either failed to complete the left side of the painting, or he completed the painting but omitted the left side of objects in it: he drew half-people, or half-houses.

Dr Bradshaw says that drawing half a house, half a face, half a clock (see figure 1) or half a sunflower is in fact a useful diagnostic indication when patients are initially screened for presence of the syndrome. He says that when these patients are asked why they ignore things to the left, they give responses like: "I didn't think it mattered," or "I didn't notice it," or "It's not very important".

The information does, in fact, enter the brain but does not penetrate the upper levels of awareness. In a dramatic demonstration described in the prestigious science journal *Nature*, Dr John Marshall, a neuropsychologist at Oxford University, drew pictures of several houses, some of which had flames emerging from the left side.

He asked one of his patients suffering from left neglect to describe the houses. At no time did she mention that some of the houses were on fire. She was then asked which houses she would prefer to live in; she invariably chose the houses without the flames. "At an unconscious level she acknowledged the fact that something was wrong with the houses," Dr Bradshaw said, "but could not say what it was."

The question of "unconscious" awareness is becoming interesting in a much broader area of psychology. There is a syndrome known as prosopagnosia: the inability to recognise faces, even your own when you are looking in a mirror.

"It invariably involves right posterior damage, though there may also be some left posterior damage too," Dr Bradshaw said. "These patients are quite unable to recognise their wife, husband or doctor by facial appearance. But they can recognise them by voice, or by visual cues such as the presence of a mole, spectacles or a beard."

"Where it becomes interesting is that it is possible to use something like a lie-detector test, which measures automatic changes in blood pressure, heart rate or skin conductance, to determine whether a particular stimulus arouses the individual. It has recently been shown that these patients show the

physical correlates of arousal when shown a familiar face, even though they claim not to know who it is – as if their conscious awareness has been disconnected from their automatic processing mechanisms."

Such findings, Dr Bradshaw says, bear upon a range of interesting neurological conditions like 'blindsight' and amnesia. A form of amnesia appears in the Korsakoff syndrome which affects subcortical structures and is associated with prolonged alcohol excess and vitamin deficiency.

"The Korsakoff patient very rapidly forgets. If I give such a patient a task, go out of the room, and come back some minutes later, the patient will not remember me or the task and I will have to be re-introduced," he said. "However if we use the same measures of autonomic response, we can show that memory has been retained, even though the patient has no conscious access to it."

"A century ago the French neurologist Claparède entered a Korsakoff ward with a drawing pin concealed in his hand, and shook hands with a patient, pricking him. A week later, when he returned to the ward, the patient refused to shake hands with him, though he could not say why and he denied ever having met Claparède."

Dr Bradshaw says that more and more researchers are finding in aspects of brain function such as perception, attention, pattern recognition and memory, that it is possible to disconnect conscious aspects of neural and information processing from the unconscious ones.

A classical example is the phenomenon of blindsight. With major damage to the occipital cortex where the visual image is first elaborated, the patient is functionally blind and denies being able to see anything. However, when forced to guess the location or direction of movement of lights briefly flashed, the patient achieves a high level of accuracy, while claiming that the task is foolish because he or she can see nothing. Residual subcortical mechanisms which do not access conscious awareness, and which are involved in automatic orienting and attention, may be responsible.

"A lot goes on that we are unaware of," Dr Bradshaw says. "Consciousness is layered. People with hemi-neglect have not lost the ability to perform, but for some reason the results of unconscious processing no longer reach conscious awareness. We might be able to tap such unconscious mechanisms to assist in rehabilitation."

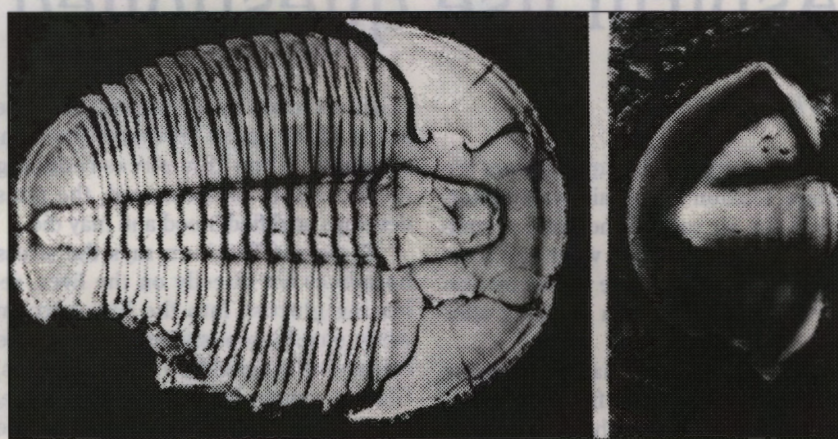


Figure 2.

Taking sides in prehistory

Dr Bradshaw has published widely on the phenomenon of lateral asymmetry. He is writing a book with Associate Professor Lesley Rogers, formerly of Monash and now at the University of New England, on the evolution of language and tool use in humans. These lateral faculties characterise our species.

The oldest known behavioural asymmetry dates to the Cambrian period, 500 million years ago. Fossil trilobites, an extinct group of marine arthropods which superficially resemble king crabs, often show damage that suggests they survived attacks from predators.

The scars generally occur on the right side of the body, suggesting that trilobites adopted a defensive posture – or were subjected to a unidirectional attack – that exposed the right side (see figure 2).

Dr Bradshaw says a similar explanation may account for observations that in recent times male impalas tend to have many more scars on the right side of the body after encounters with rivals in the mating season, suggesting that they turn left rather than right during such competitive engagements (see figure 3).

The right hemisphere of the vertebrate brain seems to play a major role during precopulative behaviour – as evidenced by lesion experiments with rats and chicks – and this bias in brain function may be reflected in leftwards turning tendencies in the male impala.

Further studies with rats show that the right hemisphere seems to predominate in the mediation of emotional and spatial behaviours, just as it does in humans. Moreover, in a free-field choice situation rats tend to turn right, as do humans, in the absence of emotional or other pressures.

In mice mothers, the left hemisphere of the brain seems to respond preferentially to alarm or other calls emitted by their pups; in humans, the left hemisphere is largely responsible for speech and language. Dr Bradshaw says the same functional asymmetry is evident in song control in songbirds.

Parrots usually hold food with their left foot, equivalent to our left hand, and manipulate it with the beak, corresponding to our right hand.

While monkeys and lower primates may appear to use either hand to obtain food, under conditions of awkward posture they tend to reach with the left hand. This may reflect right-hemisphere spatial control, or use by the right hand to steady the body while reaching awkwardly.

Terrestrial higher primates like the gorilla and chimpanzee prefer the right hand to manipulate objects, but like ourselves tend to hold their young

in the left arm, keeping the right hand free. Dr Bradshaw says that from research into many species of Old World monkeys, and in the African apes, the right hand seems to be used for complex, speeded, manipulative tasks involving spontaneous practised activities, or where fine control over grasping pressure is required.

In macaque monkeys, seven out of ten forelimb dimensions are larger on the right, with the disparity greatest in the large bones of the forearm, the ulna and the humerus. Humans show a similar pattern. Dr Bradshaw says it is not simply due to hypertrophy with age – the tendency of the favoured limb to develop larger dimensions through use.

DNA evidence indicates that the African and Asian apes diverged about 12 million years ago. The gorilla branched off around 8 million years ago, while chimpanzees and humans diverged as recently as perhaps 6 million years ago.

By around 2.5 million years ago our presumed ancestor – though still very small in brain – was making crude stone tools to cut plant materials and perhaps meat. Dr Bradshaw says examination of the cutting surfaces of these tools indicates that the makers were predominantly right handed.

However, many of our other lateral functions would seem to have a far more ancient ancestry, with communicative and manipulative functions largely the province of the left side of the brain, and spatial and emotional aspects more of the right.

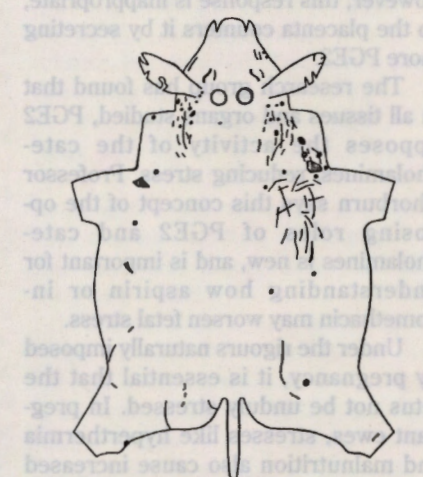
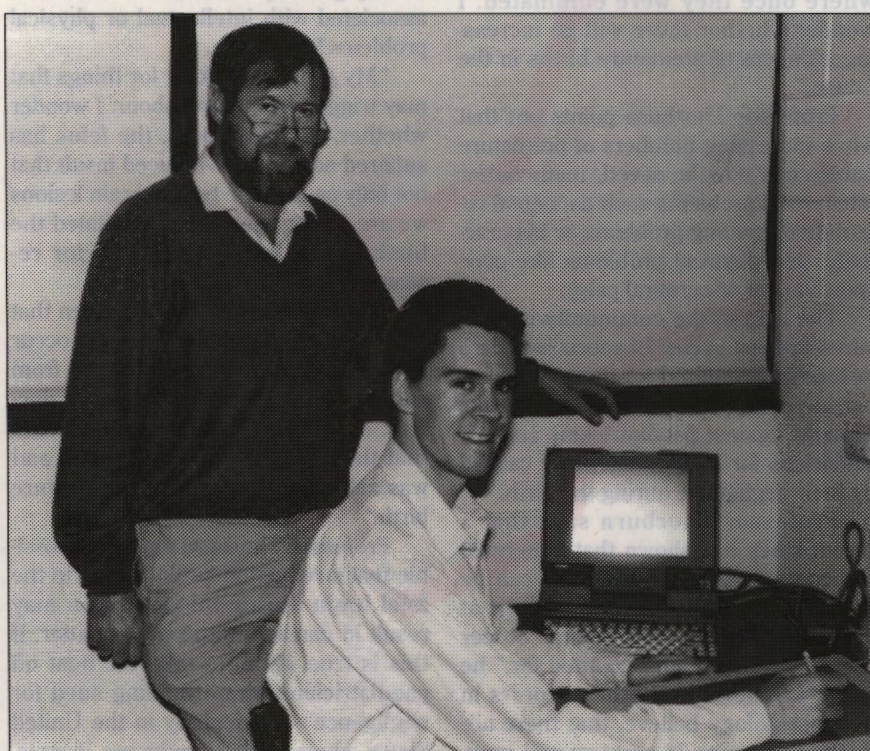


Figure 3.



Dr John Bradshaw (left) and research student Mr Jason Mattingley.

Aspirin use questioned

From Research Monash 1

This detergent-like liquid lowers the surface tension at the air-water interface in the air sacs of the lung, permitting the lungs to inflate when the fetus takes its first breath. The surfactant also prevents the lungs from deflating after birth.

Babies born more than eight weeks prematurely have insufficient surfactant, and cannot inflate their lungs fully. They may experience oxygen deprivation unless they are put in an oxygen-enhanced atmosphere. Too much oxygen can cause adverse effects, including blindness.

Professor Thorburn says it was formerly thought that production of the surfactant was stimulated by cortisol from the adrenal gland, which sits atop the kidneys. But it is now known that PGE2 works in concert with cortisol to mature the fetal lung through its intermediary, CAMP.

In almost every enzyme system in the body, there are regulators to control the regulators. Prostaglandins like PGE2 are controlled by several enzymes, including one called cyclooxygenase.

Aspirin and indomethacin bind to cyclooxygenase. It was this link that caused Professor Thorburn to become concerned about the use of aspirin in pregnancy because aspirin decreases cyclooxygenase activity.

"This is the point of giving aspirin or indomethacin: it lowers fever in the mother," Professor Thorburn said. The more potent drugs like indomethacin also suppress the inflammatory response in mothers with arthritis.

"The dilemma that now arises in obstetrics is that prostaglandins also stimulate uterine contractions. It turns out that they are even more potent than oxytocin, the hormone that has long been known to be involved in the onset of labour. It is becoming common practice to treat women coming into premature labour within indomethacin or similar compounds to block prostaglandin synthesis and thereby inhibit uterine contractions. We would ask: What effect does this have on the placenta and the fetus?"

Professor Thorburn's research team has found that if blood flow to the fetus is reduced, both the placenta and the fetus become hypoxic: they show symptoms of oxygen deprivation. If the fetus is hypoxic, there is an increase in serum levels of two hormones associated with stress, adrenalin and noradrenalin – generically called catecholamines.

Catecholamines mediate the activity of the sympathetic (autonomic) nervous system, which in adults is responsible for the 'fight-or-flight' reaction when danger is encountered. In the fetus, however, this response is inappropriate, so the placenta counters it by secreting more PGE2.

The research group has found that in all tissues and organs studied, PGE2 opposes the activity of the catecholamines, reducing stress. Professor Thorburn says this concept of the opposing roles of PGE2 and catecholamines is new, and is important for understanding how aspirin or indomethacin may worsen fetal stress.

Under the rigours naturally imposed by pregnancy, it is essential that the fetus not be unduly stressed. In pregnant ewes, stresses like hyperthermia and malnutrition also cause increased placental production of PGE2.

If indomethacin is administered while the mother is stressed, it inhibits

PGE2 secretion by the placenta, and the action of the stress hormones goes unopposed. When this stress-reducing mechanism is compromised, the fetus develops acidified blood and may die.

Professor Thorburn says the stress hormones act directly on the liver, releasing glucose into the bloodstream while simultaneously suppressing the release of insulin from the pancreas. Glucose cannot be removed to storage, resulting in high glucose levels in the fetal circulation.

As already described, PGE2 opposes these mechanisms, keeping the blood glucose at a low level. When the placenta is exposed to higher levels, the glucose 'burns' up, producing lactate as a waste product and sending it back into the fetal circulation.

High lactate levels cause the sensations of muscle fatigue and pain in athletes and others undertaking strenuous exercise. Lactate acidifies the blood, making it more difficult to obtain oxygen and to eliminate carbon dioxide. The body goes into oxygen deficit, and the person begins to gasp for breath.

The fetus, dependent on its mother's blood as its sole source of oxygen, must live within a strict oxygen budget. "If you give a mother indomethacin the fetal breathing rate goes up dramatically because it lowers PGE2 levels in fetal circulation that normally suppress fetal breathing," Professor Thorburn said.

"Even though the fetus is not breathing air, its oxygen demand increases due to the effort of breathing, and that's bad news, particularly if it is already stressed by low levels of oxygen in the maternal bloodstream associated with maternal stress. Generally, we have found that the placenta can compensate for a low dose of aspirin or indomethacin by increasing PGE2 output.

"Our present study suggests that it may be possible to get away with using indomethacin in pregnancy if the fetus is healthy. But if the fetus is compromised in any way – for example, if the mother is a heavy smoker or has an inadequate placenta – that's really bad news for the fetus."

Another newly-discovered role for PGE2 is its involvement in another stress pathway between the pituitary gland in the brain and the adrenal glands – source of the stress hormones – atop the kidneys. In a pioneering study, New Zealand obstetrician Professor Sir Graham Liggins showed that activation of the pituitary-adrenal stress pathway triggered birth in the sheep, and developed the concept that the fetus actually initiated its own birth.

"It has proved difficult simply to transfer that concept to the human fetus," Professor Thorburn said. "When a hormone like cortisol is infused into the sheep fetus, activating this stress pathway, it induces premature labour. But the same experiment doesn't work in primates.

"Some other factor seems to be involved in primates. My suspicion is that some sort of dialogue between the placenta, the adrenal and the lungs may be important in initiating labour in humans. I recently gave a talk in at the University of British Columbia in Vancouver, in which I linked fetal maturity to birth. I argued that the survival of any mammal species depends on the fetus being sufficiently mature at birth to suckle and breathe.

"The level of maturity may differ between species, but is always appropriate for the survival of any given species; it is different in birds, marsupials,



Members of the fetal and neonatal research group in the Physiology department (from left) Drs Stuart Hooper, David Walker and Greg Rice. Behind text below: the structural formula for the PGE2 prostaglandin.

monotremes and placental mammals, but the principle remains the same.

"There has to be a common mechanism for that to happen. The adrenal is already known to secrete cortisol, which plays a role in inducing various enzyme systems when the fetus is mature.

"I believe the placenta assists this process by producing PGE2, which maintains appropriate levels of CAMP in maturing tissues and organs, variously suppressing or promoting the specialised enzyme pathways involved in fetal metabolism."

The cause of most premature labour is unknown, although some 20 per cent of cases are due to infection of the fetal membranes. This leads to premature release of PGE2, stimulating uterine activity. Whether genetic factors – for example, some enzyme abnormality leading to increased PGE2 production – may cause premature labour, is not known.

Whatever the cause, premature labour results in the fetus being born in an immature state. Only a quarter of a century ago most babies born 10 weeks early would die. Today, medical science is able to save babies born 15 weeks early.

"I wonder from time to time – now that all these babies are being saved that would never have survived in the past, whether there may be a genetic tendency for premature labour, and whether such genes are now being maintained in the human gene pool where once they were eliminated. I wonder whether there will be increasing numbers of premature births in the future."

Professor Thorburn points out that while increasing numbers of premature babies can now be saved, many suffer intellectual problems such as mental retardation, reading problems or hyperactivity, and physical problems like poor coordination or cerebral palsy.

The cost to the community is measured not just in cost of specialised care or teaching required for these children, but increasingly in the cost of law suits brought against paediatricians and obstetricians for injuries allegedly caused by their negligence during the birth.

Professor Thorburn says that a recent study has shown that a mere 20 per cent of perinatal problems can be conclusively linked to some event at birth. "A huge number – some 80 per cent – are simply unaccounted for," he said. "I believe, and other experts in fetal physiology believe, that there are things happening in early or mid pregnancy that go undetected, and which are a likely cause of these problems."

"Some of my colleagues in Canada have shown that relatively minor periods of oxygen deprivation in the fetus can cause quite significant lesions in the white matter of the brain. The white matter is equivalent to the communication lines between the functional parts of the brain.

"The fetus survives, but if you talk to a neuroscientist, the type of damage caused to the white matter could account for many of the deficits that we see in many of these children after birth. The problem is that we don't have any way of detecting fetal distress in the middle months of pregnancy – it's difficult enough even later in pregnancy. The important point is that the brain may be much more sensitive to this type of damage during early development.

"Abortion tends to be fairly rare after the first trimester of pregnancy. This is going to be a very important area for future research. Technically, we are going to have to become much more sophisticated to understand what can happen to the brain during this period of development.

"A research group at Columbia University in New York that is using very sophisticated ultrasound techniques to screen premature babies at birth. They're starting to detect lesions in the white matter of the brain at the time of birth, so they are following these babies as they grow up to see if the lesions are associated with intellectual or physical problems later in life.

"My group is looking for things that may trigger premature labour. I wonder whether, in many cases, the fetus has suffered some stress-induced insult that not only caused the type of brain lesions we are seeing, but also precipitated the birth. It's a fascinating area for research.

"The assumption has long been that problems with brain development occur in the perinatal period, and result from some sort of wrong treatment by doctors. Maybe it's the other way around: that the lesion was already there, and was actually the trigger for premature birth."

Professor Thorburn says it is possible that a reduction in blood flow to the fetal brain during mid-gestation may result in damage to the white matter. If this is true, it might take the heat off paediatricians who are being sued for negligence – particularly in the United States where such lawsuits are increasingly common – and result in huge insurance pay-outs.