



## ANU chemist uncovers secret of oil catalyst

An ANU chemist has helped uncover the structure and means of formation of a valuable catalyst used to convert gas to petrol. The discovery could contribute to the design of more selective catalysts for the petrochemical industry.

The Professor of Physical and Theoretical Chemistry in the Research School of Chemistry (RSC), Professor John White, made the discovery a few weeks ago at the Argonne National Laboratory, part of the University of Chicago, where he collaborates with Dr Lennox Iton. The Argonne Laboratory, one of the best in the USA, named the joint ANU-Argonne work as outstanding in its March 1987 submission to the US Department of Energy. ANU and RSC were both mentioned in the citation.

Soon after he came to ANU from Oxford University, in 1985, Professor White won the University of Chicago's prestigious Argonne Fellowship and Prize. He saw this as a way to build up a relationship between ANU and Chicago. For a joint project he chose a new and interesting field of academic and applied value, the chemistry of gels.

A gel is a solution, mostly water, that behaves in a seemingly rigid way. A silica gel looks like thick white glue. The structure and behaviour of gels is a physico-chemical mystery of similar difficulty to that of polymers.

The problem also has great industrial interest. Some years ago the petroleum company, Mobil, found a way to change the floppy gel into a crystal, called zeolite. These crystals have become the basis of the New Zealand gas-to-petrol conversion industry and other petroleum refining but no-one knew how they were formed.

Zeolites have aluminium and silica in their crystal structure, with lots of small holes. These pores allow the entry of crude hydrocarbon molecules which can then be 'cracked' and reformed into other, useful hydrocarbon chains. The particular zeolite used in New Zealand to convert methanol gas to petrol is called ZSM-5. It is a fine white powder of almost pure silica, which is totally penetrated by regular holes.

Professor White sought to understand the formation of ZSM-5 zeolite by using a new technique that he pioneered in Europe — small-angle neutron scattering. In this technique a powerful stream of neutrons is piped out of a nuclear reactor, a wavelength is selected and a focused beam is then passed through a sample of gel, or whatever, to a detector. The small-angle scattering pattern on the detector gives some idea of the sample's structure.

The advantage of neutron scattering is the ability to 'see' different parts of the structure. This 'contrast variation' is achieved by changing the refractive index — the tendency to scatter neutrons — of the medium containing the sample. That way, different parts of the structure can be made 'invisible' to neutrons, so other parts can be seen more clearly.

Small-angle neutron scattering has been applied successfully to biology, particularly in determining the structure of simple spherical

viruses. In such viruses a core of genetic material (RNA) is surrounded by an envelope of protein. The protein and RNA scatter neutrons to different degrees. Placing the virus in a medium with the same refractive index as the protein made the protein envelope disappear and enabled the neutron beam to show up the RNA. By changing the medium to one that scatters as much as the RNA, the neutron beam revealed the details of protein structure.

Using small-angle neutron scattering, Professor White and Dr Iton could see how zeolite crystals were formed. In a normal gel, long strands of silica were tangled together. The strands could be made to grow, like snowflakes, into crystals or amorphous silica. This process can be controlled using a template molecule, in the case of ZSM-5 this template is the tetrapropyl ammonium ion. Added to the gel, the template molecules got the strands of silica to wrap around them, forcing the tangle to become more organised. It is this step that has been clearly visualised in the present work, even for gels at room temperature. Finally, after heating, ZSM-5 becomes a pure silica structure of vertical and horizontal pipes.

Once the silica structure is fixed, the template molecules are burnt out, leaving the pores that do the catalytic job.

Professor White says that he is still uncertain of some aspects of zeolite formation. He is working to demonstrate paradigm cases with predictable results from the use of templates. Recent work shows this may be possible. Then other templates could be used to produce different zeolite crystal structures and new uses. More selective catalysts could make refining more efficient.

The value of existing zeolites and the potential for new ones means that the research is of great interest to petrochemical companies. AMOCO has already expressed interest in Professor White and Dr Iton's work.

The potential of neutron scattering has also made the technique a top priority for Australian research. The Australian Atomic Energy Commission hopes to attach such an instrument to its nuclear reactor at Lucas Heights in Sydney. With existing chemical expertise, this could help Australian scientists catch up with Europe and the USA.

Professor White believes the exciting results with zeolite show the value of the ANU-Argonne collaborative project. He hopes that future collaboration can take place on superconducting materials — an area of rapid international progress — and other unusual materials, such as mixtures of metals and minerals that have unusual properties and may make new ceramics.



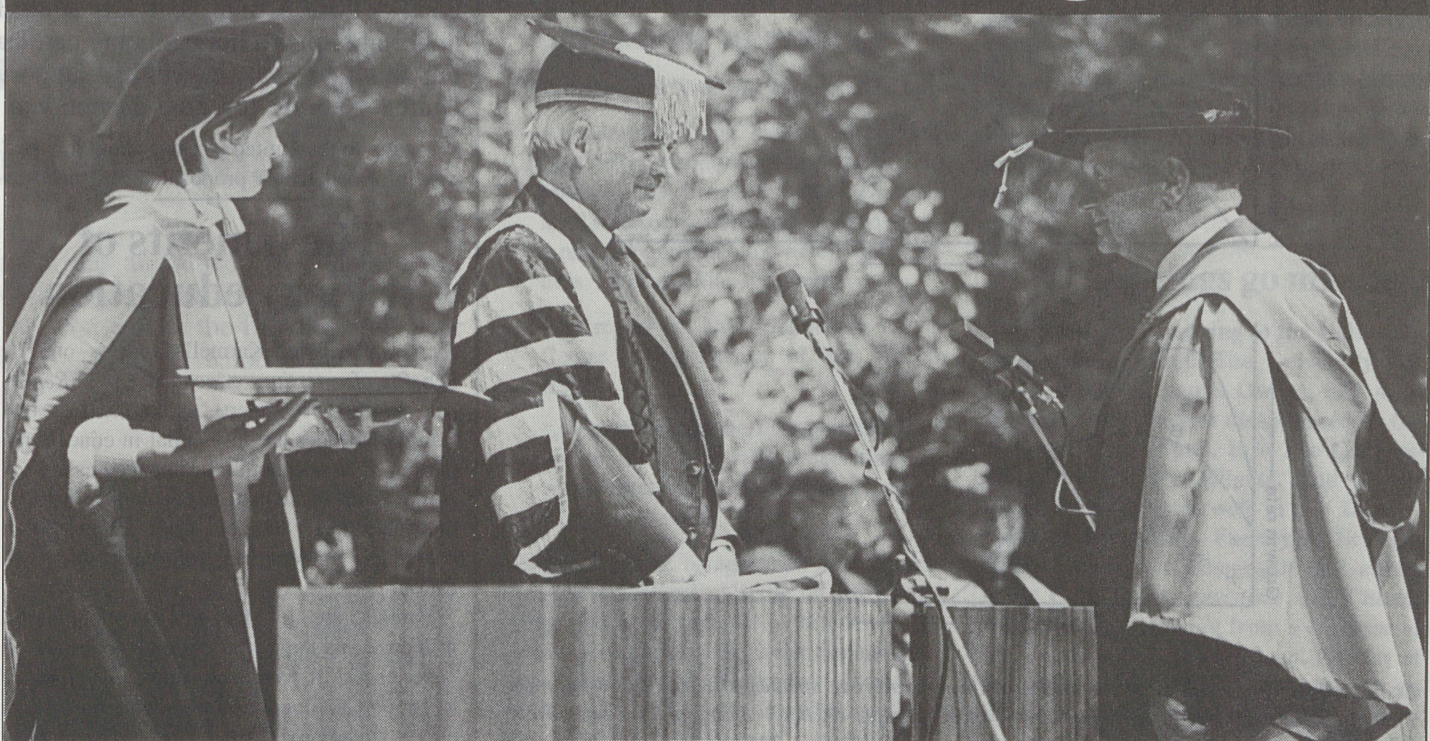
Professor John White.

Warwick Green

### In this issue

Salinity in mangroves .....	2
An industry is born .....	3
Conferring of Degrees .....	4/5
Council notes .....	6
Crossword .....	6
Classified etc. ....	7/8

## Autumn Conferring



The new ANU Pro-Chancellor, Sir Gordon Jackson, officiating at his first Conferring of Degrees ceremony at the University, confers the honorary degree of Doctor of Laws on former ANU Deputy Vice-Chancellor, Emeritus Professor Noel Dunbar (right), as the Registrar, Dr Rosalind Dubs, holds the Citation ready. Photo by Marlee Maxwell. For detailed coverage of the Autumn Conferring ceremonies, turn to pages 4 and 5.

# Mangroves sacrifice growth to build up salt tolerance

The first major natural science project at the University's North Australia Research Unit (NARU) has produced important new information on the diversity and salinity responses of mangrove species.

The Mangrove Coasts and Tidal Wetlands Project, (first featured in *ANU Reporter* last year), funded mainly by the Commonwealth Tertiary Education Commission, is due for completion at the end of this, its fifth, year. Dr John Chappell, a Professorial Fellow in the Department of Biogeography and Geomorphology, Research School of Pacific Studies, is its principal investigator. The project was designed to study the evolution and dynamics of mangrove and tidal systems: what these areas look like in detail and how they have been and are affected by changes in water chemistry, sedimentation and other physical factors.

Within the framework provided by this geomorphologic research, Dr Marilyn Ball has been studying the distribution and structural organisation of mangrove forests in Northern Australia. 'Mangroves are of major ecological and commercial importance worldwide. Effective management of these resources depends on our understanding of the ecological bases of mangrove forest structure and function', Dr Ball told *ANU Reporter*. Apart from their importance to fishing, mangroves are a major source of fuel in Southeast Asia, producing the highest grade of charcoal known, and make valuable, fungi-resistant timber.

Dr Ball, working with Ms Sandra Pidsley and Mr Peter Hartney at NARU, first mapped the distribution of mangrove species along three major tidal river systems in the Northern Territory — the Adelaide, South Alligator and Daly Rivers. The forests were found to be more diverse and the species to be more widely distributed than previously thought. The population structures of the forests were analysed in relation to soil salinity and water content, two of the main factors affecting mangrove growth. The largest individuals of most species were found under low salinity conditions, but the species differed in the salinity regimes at which they were dominant.

For example, tall, well formed trees of *Ceriops tagal* are occasionally found in low salinity habitats in the upstream regions of the Adelaide River. However, dense stands of stunted *Ceriops tagal*, often less than two metres in height, dominate hypersaline habitats in downstream areas of the river. These results suggested that the more salt-tolerant species can become dominant in highly saline environments in which the salinities are sub-optimal for their growth but are even less favourable for the growth of less tolerant species (see Figure).

This finding was investigated in glasshouse and laboratory studies by Dr Ball, working with Ms Pidsley at NARU and Ms Susan Allen in Canberra. Seeds and propagules were collected from the major mangrove species and grown under a range of salinity conditions. (Many mangrove species have the interesting characteristic of being viviparous or giving 'live birth' in that young plants or propagules develop directly from the fertilized flowers without passing through a dormant seed stage.) The laboratory results were consistent with the field studies in showing that maximum growth occurred under low salinity conditions for all 18 species studied, but the species differed in the range of salinities at which they grew rapidly. In general, the broader the range of salt-tolerance of a species, the slower was its growth rate under optimal salinity conditions, as illustrated in the figure.

When grown in artificial communities at a range of salinities, the differences in growth characteristics between species with increasing salinity were consistent with differences in their relative performances along natural salinity gradients. For example, *Ceriops tagal* grew best in 5 per cent sea-water. However, the presence of other species sharply reduced its growth rate in 5 per cent seawater, but had



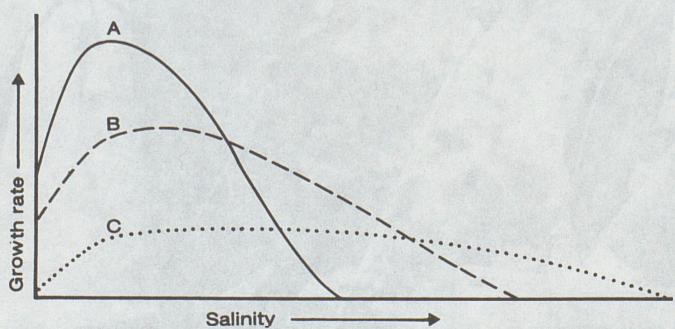
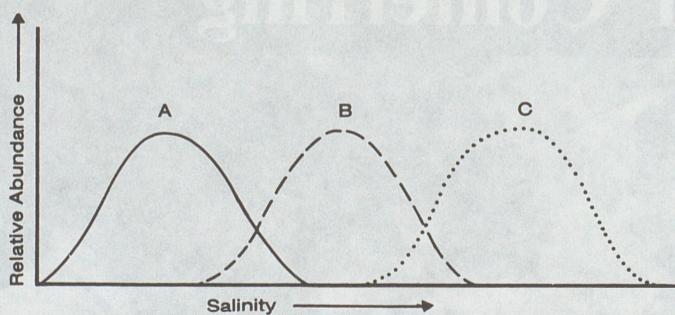
Dr Marilyn Ball (right) and technical assistant, Ms Susan Allen, are pictured in the Mangrove House at the Research School of Biological Sciences at ANU in Canberra.

no effect on its growth rate in 100 per cent seawater. So, in spite of growing best under low salinity conditions, the attributes which enable a species such as *Ceriops tagal* to tolerate high salinities restrict their abilities to compete with less tolerant species at low salinities. Apparently natural selection has favoured the extension of salinity tolerance, rather than shifts in the salinity optima for growth, even in species which characteristically occur in hypersaline environments.

This discovery that increasing salinity tolerance is apparently at the expense of rapid growth is of major importance to the study of mangroves and of salt-tolerance in plants. 'It goes against a popular notion that the mangrove species are optimally adapted to the

particular environments in which they are dominant', Dr Ball said. It seems that many species are dominant where they cope best in relation to other species.

Now, Dr Ball and co-researchers are conducting physiological studies with the aim of finding out what makes some species more salt-tolerant than others. This research is fundamentally important for understanding how plants function in saline environments, and the competitive advantages of different mechanisms of salt-tolerance. Such information is essential for effective management of our mangrove resources, and may help to solve practical problems in agricultural areas suffering from increased salinity.



Ecological and physiological responses of three mangrove species to variation in salinity. The top figure shows the distribution of three species (A,B,C) along a natural salinity gradient. Each species dominated a different range of salinities. The bottom figure shows the physiological responses of the same species to the same salinity gradient. Species A is dominant in salinities optimal for its growth, whereas species B and C are dominant in salinities which are sub-optimal for their growth but which prevent or limit the growth of the other species.

## Letters . . . Letters . . . Let

### Communication — an idea

Sir, — I am a final year law student at ANU. I also believe that the most important thing a human being can learn to do is to communicate with others. For this reason I am seeking support for a formal proposal to be put to the United Nations for an *International Year of Human Communication*.

I wrote to the United Nations about this and was informed that a proposal would need to

### The benefits of tertiary education

Sir, — Professor Karmel's address on *The benefits of a tertiary education* (*ANU Reporter*, April, 1987) alerts us to the fact that 'family attitudes are influential in educational participation and cannot be changed easily'. It is, however, inadequate to conclude as he does that 'we need schools and teachers that encourage students to continue their education.'

Parents are by far the most powerful influence and their attitudes change with their experiences. It would be more cost-effective to support adult/continuing education than to exhort already overloaded teachers to do more about something over which they have little control.

Merrelyn Emery  
Centre for Continuing Education

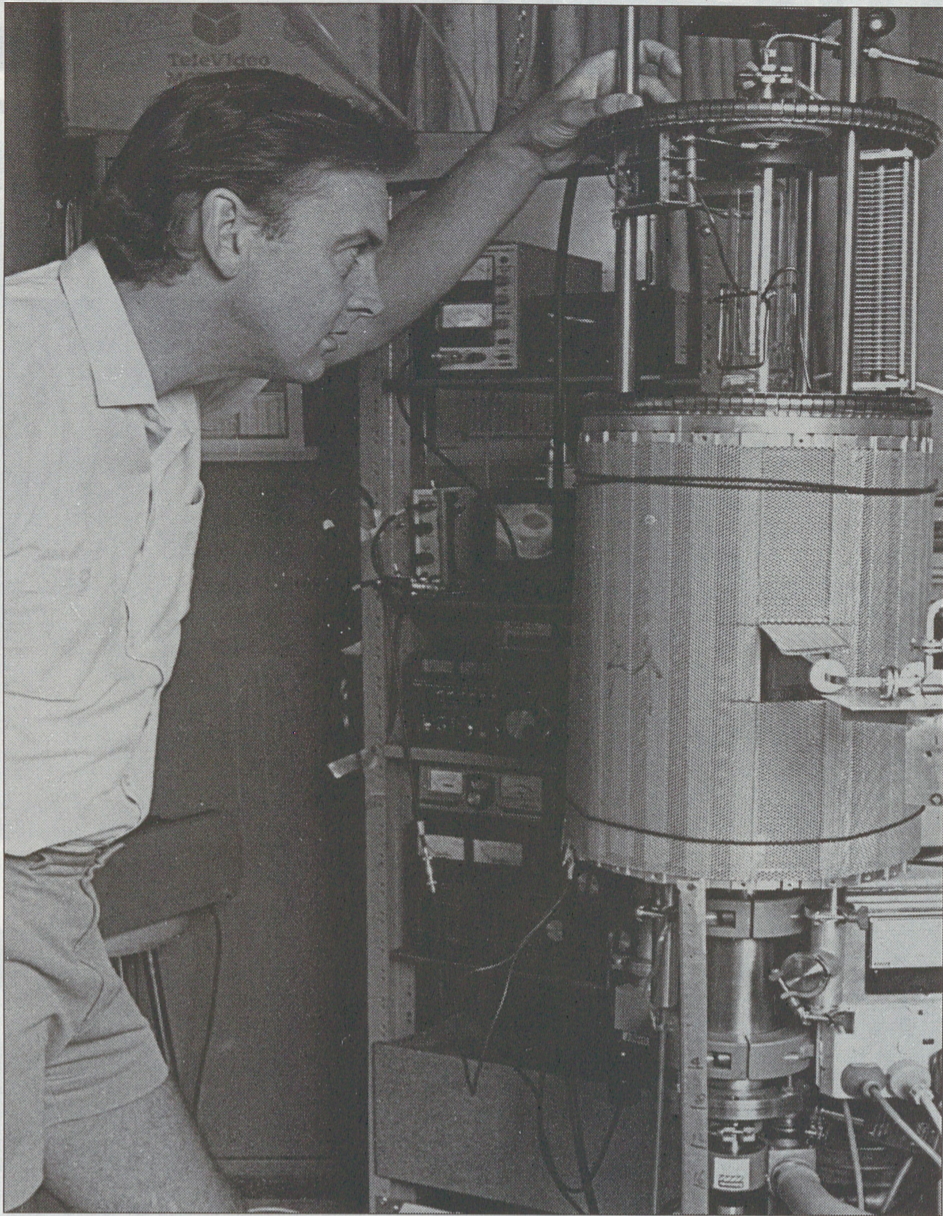
come from the Australian government. I wrote to Mr Hawke and eventually received a reply from a Foreign Affairs spokesman saying that the idea had 'obvious merit', but it would need 'sufficient support before it could go further'.

I am now looking for that support. Would any readers of *ANU Reporter* be willing to support in principle an International Year that involved people as individuals in such activities as literacy skills, public speaking, debating, finding a pen-friend, learning a foreign language, developing national and international language policies, developing and protecting rights to communication in courts and other areas of the public arena?

I would appreciate a short letter from anyone willing to support these and similar activities so that I can take the idea back to those with the capacity to put it formally to the United Nations General Assembly.

Kathryn Gunn  
Burgmann College, ANU,  
Box 1345 GPO,  
Canberra ACT 2601

# New micro-chip technology sold to French



Dr Rod Boswell is pictured with the plasma etching machine in the Plasma Research Laboratory at the Research School of Physical Sciences, ANU.

An invention for the manufacture of silicon chips is rapidly progressing towards commercial production. Within a year of being taken up by an Australian company, the technique has gone from prototype to an international production and marketing agreement.

A technique for the plasma etching of microelectronic circuits has been developed over a number of years by a Fellow in the Plasma Research Laboratory, Research School of Physical Sciences, Dr Rod Boswell, as featured in *ANU Reporter* in 1985/86.

The plasma etching of silicon chips is not new. The use of ionised gases, rather than liquids, is cleaner and more accurate. Otherwise, the process is analogous to developing film. A wafer (film) of silicon crystal is covered with a layer (emulsion) of semiconductor substances. A photographic mask, bearing the pattern of circuits, is laid on top.

The whole is placed inside an etching chamber, where the plasma and a background gas, such as sulphur hexafluoride, react with the substances on the surface of the chip. The emulsion in the area not covered by the film pattern is removed as a vapour.

Dr Boswell found a way to improve this method while doing basic research on space plasmas produced by radio waves. The radio-frequency plasma had a high density, which allowed faster and more accurate etching, but did not apply a high voltage to the wafer, which could be damaging. Dr Boswell quickly realised the discovery had the potential to make larger, cheaper and more reliable silicon chips.

In late 1985, ANU signed an agreement with ICOM Ltd, a Perth-based company, which had agreed to invest \$1 million in research over two years. ICOM is 49 per cent owned by yacht-racing millionaire, Mr Kevin Parry, and has interests in receiving and transmitting satellite signals.

Dr Boswell and technicians in the School designed and built a prototype plasma-etching chamber within a few months. In late 1986, Dr Boswell announced results at a conference and the large French communications company, Alcatel, became interested.

Alcatel is a division of the huge, French government-owned Compagnie General d'Electricité. Alcatel manufactures parts for satellites, electronics, telephone and plasma systems. Alcatel and ICOM have agreed to form a joint-venture for the manufacture of the ANU plasma-etching chambers in Australia.

Dr Boswell sees the venture as having the potential to become a multi-million-dollar business. Plasma chambers could be exported to Pacific rim countries and Europe.

Dr Boswell emphasises that the commercial investment did not come out of the blue. The production agreement follows a long period of international collaboration, himself working in France and French researchers coming to ANU. Joint experiments and a good personal relationship, combined with some lateral thinking on the engineering applications of basic research, were required.

The considerable effort required for testing and refining the plasma chambers should begin soon. Sales could begin by 1988 and peak in 1990. Meanwhile, Dr Boswell's group is working on other ideas on the deposition of materials by plasma. Experiments have indicated a quicker way of depositing amorphous silicon for solar cells and a simpler, cleaner way of nitriding steel. At the same time, the group is studying the behaviour of radio-frequency plasmas using computer models of plasma discharges.

Dr Boswell says that while the industrial application of this work takes time, the output of basic research has also been improved. 'Perhaps the brain has been sharpened in one direction,' he says, 'rather than trying to solve all the problems of space physics'. The increased output has been greatly aided by the increased private funding and staff numbers in the Laboratory.

Dr Boswell has a number of observations to make on success with industry. First of all, scientists must have the desire to find industrial uses for research, must read widely to find possible niches for their work and have some entrepreneurial spirit. Communication skills are also important: knowing people around the world and having the ability to get on well with business people, as well as other physicists.

## Two paintings go missing

Two paintings belonging to the University have gone missing. The University Art Curator, Mrs Johanna Owens, told *ANU Reporter* that the first disappeared on the weekend of 4/5 April. It is *The Conversation*, by Rodney Milgate, and it was taken from the stairwell in the Department of Chemistry, Faculty of Science. More recently, a lithograph of Gould's birds *Chlam: cerviniventris* and *Chlam: maculata* went missing from a corridor of the Department of Psychology, Faculty of Science. 'This picture is one of an irreplaceable set belonging to the University,' said Mrs Owens. Anyone knowing the whereabouts of these works is asked to ensure they are returned, before further action is taken.

## Humanities Research Centre to be reviewed

The Humanities Research Centre is to be reviewed. The Vice-Chancellor, Emeritus Professor Peter Karmel, has appointed Professor Paul Bourke, the Director of the Research School of Social Sciences (RSSS), to be Convenor of the review committee.

The other members are Professor M J Charlesworth, of the School of Humanities at Deakin University, Dr R G Cushing, the Dean of the Faculty of Arts at ANU, Professor F C

Jackson, Department of Philosophy (RSSS), and Professor G A Wilkes, of the Department of English at the University of Sydney.

### TERMS OF REFERENCE

The committee's terms of reference are:

- to consider and advise the Vice-Chancellor on future developments of the HRC, on the assumption that the present level of resources devoted to it continues; a relevant consideration here is the Centre's Strategic Plan proposal;
- to report on the relationship of the Centre to the Faculty of Arts and to RSSS;
- to comment on the international standing of the Centre and its relationships with universities and other organisations within Australia.

Submissions are being sought from interested members of the University on any matters falling within those terms of reference. The review takes place in the week beginning 13 July, and written submissions should be forwarded by 22 June; the same date applies to those wishing to make oral submissions.

Administrative arrangements are being handled by Mr Christopher Marshall, School Secretary, RSSS (x2257).

## Extra Rhodes Scholarship to mark Bicentennial

The Governor-General, Sir Ninian Stephen, has announced in Canberra that there is to be an eighth Rhodes Scholarship for Australia — to mark the Bicentennial. The new Scholarship will be awarded for the first time this year for 1988, when it will be known as the Bicentennial Rhodes Scholarship.

Commenting on the announcement, the Chairman of the Rhodes Trust, Lord Blake, said that since the Trust's establishment 85 years ago, more than four hundred and fifty Rhodes Scholars had been selected.

'A number have gained international renown,' said Lord Blake. 'All, in whatever path of life they have followed, have contributed to the mutual understanding and friendship which the Bicentenary in part celebrates. Their calibre has brought great benefit to Oxford and much prestige to the Rhodes Trust, and our decision to award a further Scholarship reflects our opinion that the calibre of recent generations is just as

strong as that of their predecessors. Cecil Rhodes hoped that his benefaction would attract young people of exceptional quality. Australian Rhodes Scholars have certainly lived up to his expectations.'

The new Scholarship will be awarded by the Committee at present chaired by the Governor-General, which meets at ANU in November. In future, it will award two Scholarships, to be known as the Rhodes Scholarships for Australia-at-large.

Each state selection committee may nominate up to two candidates, and two may also be nominated from Australian territories.

# Conferring of Degrees — Autumn 1987

## Three honorary degrees as 600 graduate

One of the highlights of the autumn graduations at the University was the conferring of an honorary degree of Doctor of Science on the eminent Chinese geologist, Professor Liu Dongsheng. The University has few foreign honorary graduates and the degree recognises both Professor Liu's distinguished achievement as a scholar and the close links between ANU and China.

In the citation for Professor Liu's honorary degree, the Head of the Department of Biogeography and Geomorphology, Research School of Pacific Studies, Professor Donald Walker, described the growth of the links between ANU and the Chinese Academy of Science (Academia Sinica) of which Professor Liu was a leading member. The working association between the two organisations was formalised in the ANU — Academia Sinica Quaternary Studies Program in 1980. This collaboration, led in China by Professor Liu, has been 'remarkably productive'.

In 1949, Liu Dongsheng was one of China's few geologists. The economic needs of the new People's Republic turned his attention to the search for valuable minerals — copper, gold, nickel and rare elements. Then he worked as an engineering geologist on Yellow River dam sites. Finally, he turned to the study of the massive blankets of wind-blown dust that cover much of northern China. The control and agricultural exploitation of this dust is vital to China. Professor Liu found in the dust information about past climates, animal and plant migration and practical problems of soil conservation.

Liu became Professor in the Institute of Geology in Beijing and is Director of the new National Museum of Science and Technology there. He told his ANU audience last week: 'I treasure the degree you have awarded me, not only as a reward for my 40 years of work in science, but also as an expression of the co-operative relationship between this University and the Academy of Sciences of China and as a symbol of the goodwill of Australians toward the Chinese people.'

At the three degree ceremonies on Wednesday and Thursday, 6 and 7 May, more than 600 graduates received their degrees. Professor Liu addressed science graduates on Thursday afternoon.

### FIRST CEREMONY

Earlier, on Wednesday afternoon, the Director of the Research School of Social Sciences, Professor Paul Bourke, addressed graduates in economics, law and Pacific Studies. Professor Bourke spoke of the way modern industrial organisation and communications had radically affected the way traditional institutions, such as the church and parliament, performed their roles.

He noted that universities had been progressively embraced by the legal apparatus of the state, through administrative law reform, and also by demands for the application of market processes. Market forces were more subtle and pervasive than debate about cost-recovery through fees and privatisation. Modern methods of corporate management were being applied to university research, leading to the formation of multi-disciplinary research teams to supplant traditional discipline-based departments. The teams were supposed to be more flexible and responsive to rapid change.

Another aspect of the institutional convergence of universities and large corporations was the unionisation of academic staff. Academics were represented before the Federal Conciliation and Arbitration Commission.

He said that people outside universities increasingly told universities what to do. University affairs had become subject to public law and public debate, and so more political. Higher education could, in the not too distant future, become a major item in a federal election, Professor Bourke said.

However, he said there remained an irreducible minimum of profound scholarship and dedication which was the university tradition. When the political issues were forgotten, graduates would remember the excitement of study and research, solving problems, writing theses and delivering papers.

### SECOND CEREMONY

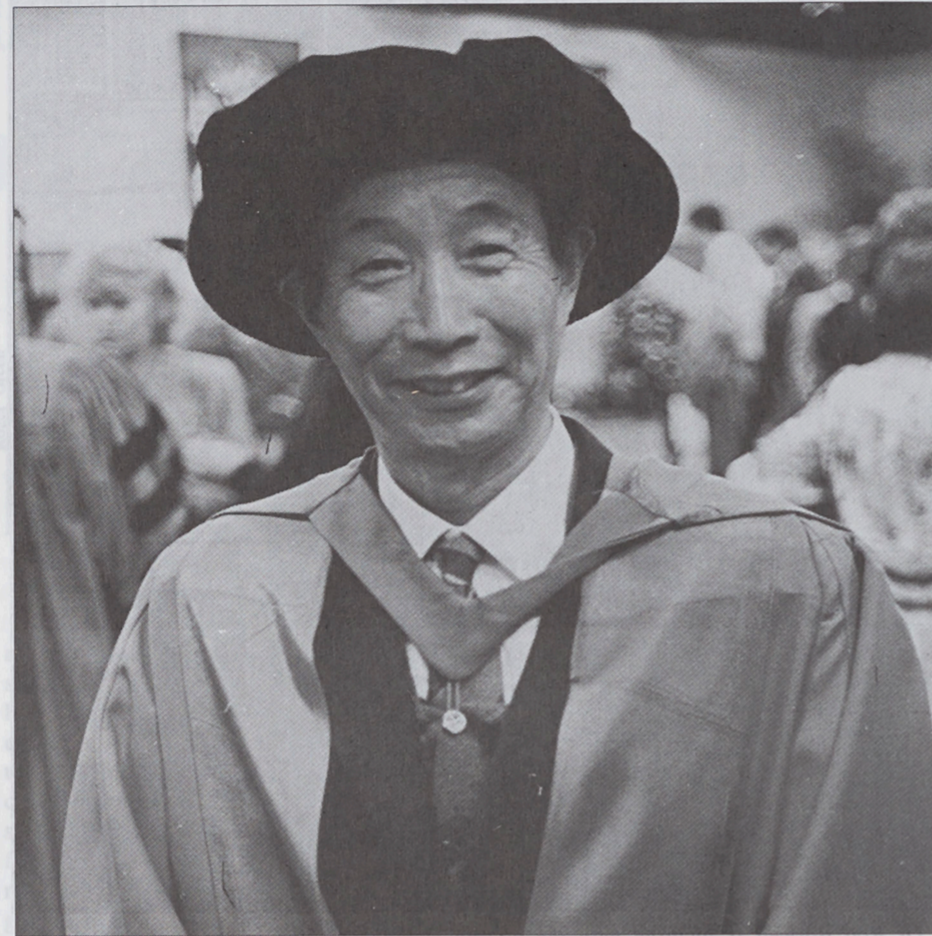
On the Thursday morning, the Head of the Department of Prehistory and Anthropology, Faculty of Arts, Professor Isabel McBryde, addressed graduates in arts, Asian Studies and social sciences. Professor McBryde spoke on the usefulness and relevance of knowledge of the humanities and social sciences, particularly prehistory. She said graduates and academics should be able to justify their disciplines and their role to the community at large.

She discussed the value of studying the past and the possible outcomes of the Bicentennial. 'We are all in a sense slaves of the past — we cannot hide from its daunting achievements nor from its pain. We should not trample on it, reject it or evade its challenges, nor should we reduce its threats by trivialising it,' Professor McBryde said. 'There can be exciting and positive approaches to our Bicentennial, accepting both the pain and achievements of our pasts.'

She said positive responses required the critical judgments and perceptions developed in study and research, and the skills and understanding that are the gifts of the humanities and social sciences.

Honorary degrees were conferred on Mr Robert Langdon and Emeritus Professor Noel Dunbar, as well as Professor Liu. Mr Langdon, the first Executive Officer of the Pacific Manuscripts Bureau in the Research School of Pacific Studies, received an honorary Master of Arts. Under his direction, the Bureau gained an international reputation as a resource centre for Pacific history.

Professor Dunbar received an honorary Doctor of Laws degree. Professor Dunbar, a physicist, was Foundation Professor of Physics at Canberra University College (later incorporated into ANU). He later became Dean of the Faculty of Science at ANU, and in 1968, Deputy Vice-Chancellor. In that position he earned wide respect as a sharp, consistent and tough administrator, according to the Citation of the present Deputy Vice-Chancellor, Professor Ian Ross. In 1977,



Pictured above after receiving the honorary Doctor of Science degree is Professor Liu Dongsheng; below, left, waiting during the Citation, is Dr (then Mr) Robert Langdon, on whom was conferred the honorary degree of Master of Arts; below, right, giving the address during Thursday morning's ceremony is Professor Isabel McBryde. Photographs on these two pages by Marlee Maxwell, Stuart Hay and Warwick Green.



Professor Dunbar was appointed Chairman of the Universities' Council of the Commonwealth Tertiary Education Commission, from which he retired last year.



Among the doctorates awarded, one went to the author of the review of Australian defence, Dr Paul Dibb. He did his PhD in international relations. A former journalist, Dr Gordon Stephen Reid, was the University's first part-time PhD candidate.

Winners of the 1986 University Medals in Law were Susan Marlene Davies and Pauline Ann Ridge. The J.G. Crawford Prize was awarded to Dr James Street Fingleton for his

PhD research on changing land tenure in Melanesia. A University Medal in Economics was awarded to Michael Gamini Alles. The Tillyard Prize was shared by Jane Holley Connors and Lesley Ann Ward. A University Medal in Geography was awarded to Peter Gordon Cook. Joshua Simon Getzler won a University Medal in History. A University Medal in Asian Studies was awarded to Sally Angela Hone. Andrew James Kirk received a University Medal in Computer Science. Stephanie Kathleen Legg-England was awarded a University Medal in Psychology and Katherine Ann Lazenby-Cohen was awarded a University Medal in Zoology.



Damir Abraham is pictured outside the Canberra School of Music, proudly displaying his Master of Economics degree to fellow student Martin Jones, and Martin's parents, Phil and Monica Jones.



Dr Paul Dibb receives his Citation as Doctor of Philosophy from the Chancellor.



The camera turns on the expectant and proud faces of many parents, family groups and friends during one of the three degree ceremonies held this Autumn.



Winners of the 1986 University Medals in Law were Susan Davies, left, and Pauline Ridge.



Marriage student Sheila Gilpin, LLB, is pictured with friends Evelyn Austin, left, and from Sydney, Rosemary Shutte.



The Chancellor confers the degree of Master of Agricultural Development Economics on Bertrum Magani Bud Stephan.

The Vice-Chancellor, Professor Karmel, told a meeting of the Council of the University on 8 May that one of the most encouraging features of enrolments in 1987 had been the substantial increase in new full-time students coming to ANU straight from school. These, he said, had shown an 18 per cent increase over 1986 figures.

Overall, full-time enrolments had risen significantly compared with last year (up 7 per cent), whereas part-time enrolments had fallen substantially (down 14 per cent). Although there had been a large increase in new undergraduate enrolments, it had to be remembered that the 1986 intake had been abnormally low and the current intake, in fact, represented a return roughly to the 1985 level.

Total equivalent full-time students are up by nearly 2 per cent and now stand just above the top of the planning range set down by the Commonwealth Tertiary Education Commission for 1987, said Professor Karmel.

He said the increase in full-time enrolments and the decrease in part-time enrolments had been a common feature throughout Australian universities and Colleges of Advanced Education in 1987 and seemed to have been related to the imposition of the \$250 Higher Education Administration Charge. The decline in part-time enrolments appeared to have been mainly among older students, particularly older women.

Professor Karmel said the Report of the Higher Education Administration Charge Monitoring Committee, issued at the end of April, recommended that the existing categories of students presently exempted from the Charge be widened to include additional categories of social security beneficiaries. It also recommended that the Charge be linked to the length of courses, so that part-time students would not pay significantly more than full-time students over the duration of their courses.

**ASTECC REPORT**

The Vice-Chancellor told Council that the Australian Science and Technology Council (ASTECC) report *Improving the Research Performance of Australian Universities* contained two pages which referred directly to ANU. Of principal interest, he said, was the proposal for a review of the Institute of Advanced Studies. CTEC, however, had expressed the view, and this was supported by the AVCC, that such a review would not have high priority among CTEC's other reviewing activities. These included a review of the discipline of Law across Australia and a review of training for science teaching.

Professor Karmel said that while the proposal to review the Institute might appear to be threatening, the University should see such a review as an opportunity to demonstrate the particular roles and characteristics of the Institute and the high levels of performance to be found within. This view was shared by himself and the Chairman of the Board of the Institute, as well as the heads of the research schools.

**Medical research travel grants**

Travel grants for medical research workers in the UK, Ireland and Australia, to visit each other's country for periods of up to three months, are being offered by the Wellcome Trust of London, in association with the Clive and Vera Ramaciotti Foundations of Sydney. The Trustees are looking for proposals for full time research, or to acquire experience with new research techniques, that indicate originality and imagination. Postdoctoral research training overseas and attendance at meetings of congresses are specifically excluded. Applications must be supported by the head or a senior member of the applicant's institution or

Other matters considered by Council included:

**TERMS OF OFFICE**

The Chancellor, Sir Richard Blackburn, informed Council that he would not be available for consideration for a further term of office beyond his present term, which ends on 15 April 1988.

The Deputy Vice-Chancellor, Professor Ian Ross, whose term ends on 10 September 1987, is to be re-appointed for one year from that date, so that continuity in the senior administration is ensured for the incoming Vice-Chancellor. Professor Karmel's term will end on 31 December 1987.

**EQUAL OPPORTUNITY**

Council approved the following as the University's policy statement on Equal Employment Opportunity:

*The Australian National University is committed to the promotion of equal opportunity for all persons including women, people of Aboriginal and Torres Strait Island descent, members of racial and ethnic groups and people with disabilities.*

*This commitment is to be interpreted so as to be consistent with the operation of the merit principle in the recruitment and promotion of all staff and in the selection and education of all students.*

*The University accepts that as an employer and educator it has a responsibility to eliminate and ensure the continued absence from within its structure of any source of direct or indirect discrimination on the basis of any factors not related to work performance including race, colour, national or ethnic origin, nationality, sex, marital status, pregnancy, age (excluding contractual retirement age), sexual preference, political conviction, religious belief, social origin or disability.*

**BUILDINGS**

The Solid State Physics/Computer Services Centre building is to be renamed the 'Leonard Huxley Building' in honour of Sir Leonard, physicist and former Vice-Chancellor of the ANU. The lecture theatre in the building is already named after him.

**RESEARCH SCHOOL OF BIOLOGICAL SCIENCES**

Council noted, at its March meeting, that eight groups had been established in the Research School of Biological Sciences in place of the departments. The leaders of the eight groups will be:

- Developmental Neurobiology  
Dr A.D. Blest
- Ecosystem Dynamics  
Dr I.R. Noble
- Molecular Genetics  
Dr G.D. Clark-Walker
- Plant Cell Biology  
Professor B.E.S. Gunning
- Plant Environmental Biology  
Professor I.R. Cowan

- Plant Molecular Biology  
Dr A.J. Gibbs
- Population Genetics  
Dr J.B. Gibson
- Visual Sciences  
Professor G.A. Horridge

**HEADSHIP**

Dr L.J. Hume has been appointed head of the Department of Political Science, Faculty of Arts, from 9 May 1987 until 31 January 1988.

**Cryptic Crossword No 1**

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19			20					21				
						22						
23		24								25		
			26									

Nevera

**ACROSS:**

1. Place where Rod is in the middle of drinking. (5,6)
7. Not a palindrome! (3)
8. It's easily bent so nail is withdrawn in soft model. (6)
9. Hydrophobic Scotsman. (3)
11. Sometime with one heavenly woman. (5)
12. A small company by one old Indian. (4)
13. Where nations come together at the end of a gun. (2)
16. 6 could be confused with it in a wordless manner. (5)
18. Frenchman gives the impression of being rich. (5)
19. About power about. (2)
20. An area that seems painful. (4)
21. (See 4 down).
22. A laboratory worker briefly upsets a drunk. (3)
23. There's a declaration when poor oval in a state. (6)
25. Eck of a measure. (3)
26. Six footer's friend goes round institution, muddled and a target for abuse. (2,4,5)

**DOWN:**

1. It's unnatural when two points about an initial question produce tax of 10% then complicate it with one cent at the end. (9)
2. A northern word the church make known. (8)
3. Italian scientist who had piles. (Sounds like a hard one!) (5)
4. and 21 across. Drag along hesitatingly after far off information is truncated and leads to nearby mountain prominence. (7,5)
5. Memorable date of oriental art gallery. (3)
6. Animal goes about marking the territory. (3)
10. Lice! RSC moves to seats higher up in the theatres. (7)
14. It's not 1d of course! (9)
15. An American's promise is required before the game commences. (1,3,4)
17. Reforming drunks take two measures then arrange piano piece. (7)
21. A geometric shape generated by the revolution of a conic about an axis? Sounds like a lot of bull! (5)
23. Ban unions within the institution initially. (3)
24. Unfinished shape of eggs. (3)

ANU Reporter wishes to thank Nevera for his puzzle, the solution to which will appear in the next issue. If you would like to submit a University-related crossword, brain-teaser or similar contribution, please contact the Editor on 49 4171.

## External examinations or internal assessment?

A public forum to address the question *Which is better: external examinations or internal assessment?* is to be held at ANU on Thursday 4 June, in the Copland lecture theatre. The forum is being organised by an off-campus group called the PACT Foundation, which stands for Promoting Accountable Classroom Teaching.

The organisers say that the measurement of scholastic performance in Australia today falls into three broad categories:

- the use of external exams to monitor internal assessment;
- the introduction of internal assessment as part of a process of phasing out external examinations; and
- total reliance on internal assessment.

The organisers continue: 'There is a serious division of opinion inside Australia about the trend towards the school-based assessment of curricula which are devised, designed and monitored by teachers in each school, separately'.

The Chairman of the forum, which begins at 8.00pm, will be Professor Eugene Kamenka, of the History of Ideas Unit in the Research School of Social Sciences. Speakers will include Professor Dame Leonie Kramer, ANU Council member, and Professor of Australian Literature at the University of Sydney.

All interested members of the public are welcome, and further information may be obtained from the Secretary of PACT, Mr Don Moore, on (062) 86 2096.

## Scuola Superiore Enrico Mattei

The Scuola Superiore Enrico Mattei in Milan has announced a competition open to Italian and foreign citizens for admission to one year of study at postgraduate level in the field of Economic Management subjects. Courses will begin in November and end the following June. They will be held in Italian, with an intensive Italian language course beforehand. Grants of approximately A\$880 will be awarded. There will be no registration or tuition fees and text books and other materials will be provided free. In addition, contributions will be made towards board and lodging expenses. The prime requisite for admission is a degree in chemistry, economics, business administration, engineering, geological science, industrial chemistry, information science and technology, law, mathematics, political sciences or statistics. Applications may be obtained from the Scientific Attache, Italian Embassy, PO Box 360, Canberra City, ACT 2601. The closing date is 10 June.

## Two ANU staff elected to Newcastle University Council

Two ANU academic staff members have been elected to the Council of the University of Newcastle. They are Dr Diana Day, a Research Fellow in the Centre for Resource and Environmental Studies, and Dr Noel Rutherford, who is Warden of Bruce Hall. They faced competition from four other candidates to win the Convocation positions. Both have previously held positions on Council, Dr Day as a Convocation member, Dr Rutherford as a staff representative.

## ANU research features in *New Scientist*

The highly respected British journal *New Scientist* has detailed research on molecular structures carried out by a team from ANU, headed by Dr Leo Radom, a Senior Fellow in the Research School of Chemistry. The report carries the prediction by the team of the existence of exotic, positively-charged molecules containing bonded carbon and helium atoms. The scientists are the first to counter the 70-year-old theory that helium is so inert that it will not combine with anything.

## Adult Education School

The fourth National School in Adult Education is to be held at Bruce Hall from 29 June to 2 July. The topic this year is *Educating the Public* and guest speakers will include Bill Taylor, Co-ordinator of the National AIDS Education Campaign and Barry Elliot, one of Australia's foremost research and communication psychologists, who will focus on the Cronin Drink-Driving Campaign. Further information can be obtained from the Centre for Continuing Education, ANU, GPO Box 4, Canberra ACT 2601. (062) 49 3891.

## New Celtic journal

Celtic writers and scholars are invited to contribute to a new journal to be published each October by the Celtic Council of Australia, with support from the Celtic Studies Unit of Sydney University. It is anticipated the journal will act as a vehicle for Celtic scholarship and of Celtic cultural events in Australia. Anyone interested in contributing or subscribing to the Celtic Council, should write to Vice-Convenor of the Council, Mr Roger Thomas, 125 Bradfield Road, West Lindfield, NSW 2070.

## Future of Japanese economy

An international authority on East Asian societies, Professor Chalmers Johnson, will speak at a free lunchtime lecture at ANU next month, on *The Future of the Japanese Economy: Is the miracle over?* Professor Johnson is from the University of California, Berkeley, and is visiting Australia as a guest of the Minister of Foreign Affairs, under the Special Overseas Visitors program. He has written extensively on Japan, particularly on the role of the state in Japan's economic development. His books include *Japan's Public Policy Companies* and *Miti and the Japanese Miracle*. Members of the public are invited to attend the lecture, which will be held in the Coombs Lecture Theatre, Fellows Road, on 1 June at 12.30pm. Inquiries to University Information (tel. 49 4144/49 2229).

## One-stop Science Shop

The Australian Academy of Science is launching an ambitious project aimed at promoting public understanding of science and technology. It is setting up an information service, whereby scientists and technologists linked to a central office are able to pass on authoritative information and comment to members of the public, secondary schools, politicians and journalists. Similar schemes are already operating successfully in the USA and UK. The Academy is seeking \$100,000 from government sources as a 'seeding' commitment towards the project which would enable it to approach other possible supporters, especially institutions and industries with an involvement in research and development. For further information, contact Dr Bob Crompton (062) 49 2403, or Dr Peter Pockley (02) 697 2866 or (02) 660 6363.

Continued from page 8

### Wednesday 17 June

*Pacific & Southeast Asian History, RSPacS sem*, Dr Hugh Laracy — Watriama: Pretender and patriot (or A black man's defence of white Australia). 2.30pm, sem rm D, Coombs.

*Philosophy/Political Science/Sociology (Joint)/Arts*, Special seminar series 2, Professor B. Ollman — Marx's dialectical method, 2pm, sem rm 2095, Haydon-Allen.

*RSC/Inorganic Chemistry sem*, Dr Wasantha Wickramasinghe — Neutron diffraction studies of some transition metal hydride complexes, 11am, sem rm 134, RSC.

### Thursday 18 June

*History, RSSS sem*, Dr Avner Offer — Did Germany really starve in the first world war? 10.45am, sem rm D, Coombs.

*Sociology, RSSS sem*, Mariah Evans and Jonathan Kelley — The legitimization of inequality, 4pm, sem rm E, Coombs.

### Friday 19 June

*Philosophy/Political Science/Sociology (Joint)/Arts*, Special seminar series 3, Professor B. Ollman — Marx's dialectical method, 2pm, sem rm 2095, Haydon-Allen.

*Scottish Country Dancing*, is held every Tuesday in the ANU Arts Centre, 12.40-1.20pm (no charge) staff and students welcome; inquiries x3790.

### Tuesday 26 May

*Canberra School of Music*, Music at lunchtime, a varied program presented by student musicians, 12.30pm, University House, \$5.50 with ploughman's lunch.

### Wednesday 27 May

*Canberra School of Art Forum Lecture*, Andrew Sayers, Curator of Drawings at the Australian National Gallery. CSALT, admission free.

*University II Toastmasters Club*, weekly meeting, 12.30-1.30pm, IRU sem rm, Chifley bldg.

*Canberra School of Music*, 12.30pm, Canberra School of Music, Manuka Circle. Jazz at Manuka, lively lunchtime jazz at the original School of Music, bring your lunch.

### Thursday 28 May

*Canberra School of Music*, Jazz series II, Gerry Scott and Friends, featuring CMS Big Band, directed by Don Johnson, 8.15pm, Llewellyn Hall.

*The University Toastmasters Club*, weekly meeting, 12.30-1.30pm, IRU sem rm, Chifley bldg.

### Friday 29 May

*Canberra School of Music*, a varied program presented by student musicians, Canberra International, Northbourne Ave, 12.30pm, snacks & lunches available.

### Tuesday 2 June

*Canberra School of Music*, CSM Brass Ensembles, Canberra Chamber Chorus, Trombone Ensemble, Organist — Barbara McRae, Baritone — Michael Strasser, 8.15pm, St Andrew's Church, Forrest.

### Wednesday 3 June

*Canberra School of Art, Art Forum Lecture*, Helmut Lueckenhäuser — a design maker who creates sculptural furniture or functional sculpture, 1pm, CSALT, Admission free.

### Thursday 4 June

*The University Toastmasters Club*, weekly meeting, 12.30-1.30pm, IRU sem rm, Chifley bldg.

### Tuesday 9 June

*Canberra School of Music*, Music at lunchtime, a varied program presented by student musicians, 12.30pm, University House, \$5.50 with a ploughman's lunch.

### Wednesday 10 June

*Canberra School of Art, Forum Lecture*, Noelene Lucas — creates sculptures that explore the themes of light and fire, she will talk and show slides of her work, 1pm, CSALT, Admission free.

*Canberra School of Art Photo-space Gallery*, Photomedia Graduating Student Exhibition, 10-26 June, Mon-Frid, 9-4pm.

*Canberra School of Art Gallery*, John Walker — Exhibition Monoprints, Mon-Fri 10-5pm, Sat 12-5pm, 10 June-28 June.

### Friday 12 June

*Canberra School of Music*, Special VIII, mid-year concert, 8.15pm, Llewellyn Hall.

### Saturday 13 June

*Canberra School of Music*, Piano Workshops presented in association with Friends of the CSM. Fees \$7 per session or \$40 for entire workshop, from 13-16 June 1987. Contact: 467816.

### Wednesday 17 June

*Canberra School of Art Forum Lecture*, Tracey Moffatt, Sydney based film-maker, CSALT, 1pm, Admission free.

## Awards

Details on the following scholarships may be obtained from the Graduate Students Section located on the lower ground floor of the Chancelry Annex.

*Australian Institute of Medical Laboratory Scientists Postgraduate Scholarships 1988*. Closing date 31 October 1987. Application forms available from, National Secretary, AIMLS, P.O. Box 450, Toowong, Qld 4066.

*Rotary Foundation International Peace Scholarships*. Tenable at University of Bradford School of Peace Studies, Bradford, West Yorkshire, England. Application forms are available from local Rotary Clubs. International closing date 15 July 1987.

*Australian Meat and Livestock Research and Development Corporation 1988 Postgraduate Study Awards*. Tenable at Australian or overseas universities for postgraduate study. Closing date 31 July 1987.

*Hosei University International Fund Foreign Scholars Fellowship*. For six to twelve months. Closing date 31 May 1987.

*Australian Graduate School of Management Travel Scholarships* for Fifth Australian Student Workshop in Management Research 24-26 July. Closing date 1 June 1987.

*Philips International Institute of Technological Studies Postgraduate Scholarships 1988*. For BSc holders who wish to study postgraduate Electrical Engineering. Enquiries close 17 July. Applications close 31 July. Application forms and information available from Mr I.K. Anstey, Philips Industries Holdings Limited, P.O. Box 1138, North Sydney, NSW 2060.

*Cotton Seed Distributors Limited Postgraduate Research Award*. For the Sciences, preferably agriculture and the cotton industry. Closing date 31 October 1987.

Information and application forms for the following Scholarships are available from the Department of Education, P.O. Box 826, Woden ACT 2606 (telephone 837777).

*French Government Postgraduate Scholarships 1988/9*. In literature, linguistics and education. Closing date 31 August 1987.

*French Government Awards for French Teachers*. Closing date 31 August 1987.

*French Government Scientific Fellowships*. For 3-6 months for postgraduates. Closing date 12 June 1987.

*Federal Republic of Germany Scholarships 1988/89*. For twelve months. Applicants must have a Bachelor degree and good knowledge of German.

*Anzac Fellowships 1988*, Closing date 17 July 1987, Contact: Secretary Anzac Selection Committee, Department of Education, PO Box 826, Woden 2606.

*Awards for Study in New Zealand*, Closing date 12 June 1987, Contact: Awards and Exchange Section, Department of Education, PO Box 826, Woden 2606.

*German Government Scholarships*, Closing date 19 June 1987. Contact: The Secretary, Department of Education, (German Government Scholarships), PO Box 826, Woden 2606.

*Research Grants 1988. Postgraduate Scholarships. Australian Tobacco Research Foundation*. Closing date 19 June 1987, Contact: Mr D.H. Fraser, x3692.

*Research Grants 1988. Electrical Research Board. Electrical and Mechanical Engineering*. Closing date 26 June 1987. Contact: Mr D.H. Fraser, x3692.

*Research Grants. Criminology Research Council*, Contact: Mr D.H. Fraser, x3692.

*Rothmans Fellowship for Postgraduate Research*, Closing date 24 July 1987, Contact: The Secretary, Rothman's University Endowment Fund, C/- The University of Sydney, NSW 2006.

Details on the following scholarships and awards may be obtained from the Careers and Appointments Service located on the ground floor of the Chancelry Annex.

*Imperial College of Science & Technology*. Partial awards in the field of Mining. Closing date 30 June 1987.

## Meetings

*Education Accountability Conference*, 3-4 August 1987, Canberra College of Advanced Education, Bruce, ACT. Contact: Executive Secretary, Education Accountability Conference, Catholic Education Office, PO Box 317, Manuka, ACT 2603.

## Visitors

**Dr Roy Howat**, formerly University of Western Australia, Visiting Fellow, Humanities Research Centre, 6 May-6 September 1987, interests: Music, (Debussy and Orient), x2223.

**Mr Don'o Kim**, Sydney Novelist, Visiting Scholar, Humanities Research Centre, 8-10 weeks, interests: Australia in Far East (Literary-wise), 495371.

**Professor N. Quarry**, N.S.W. Institute of Technology, Visiting Fellow, Humanities Research Centre, May-July 1987, interests: European and Japanese architecture, x3438.

## Arts and Entertainment

Entries for the next issue close at 5pm on Wednesday 3 June and will be for the period Monday 15 June to Friday 3 July inclusive. Each notice should be typed on a separate piece of paper. Publication is restricted to events on campus only.

# Classified

Advertisements are restricted to staff and students of the University and members of Convocation, and to 20 words each. Normally, only one advertisement per person can be accepted for each issue. Typed advertisements should be sent or delivered to ANU Reporter, University Information. The envelope should be marked 'Advertisement'. No advertisements can be accepted over the telephone. The closing date for next issue is 5 pm Wednesday, 3 June, Inquiries, x2229.

## For Sale

**Volvo**, 264GL, 1978, reg 2/88, gd cond, auto, air cond, elec windows & antenna, power steering, sound system, \$8,500 ono; x3187.

**Volkswagen**, station wagon, auto, very gd cond, 1973, radio, tow-bar, \$2200; 494129/812495 (ah).

**Ford LTD**, 1979, immac cond, long rego, leather seats, power brakes, windows, seats, big V8, 5.8 ltr engine, \$9,000 ono; 515810.

**Datsun 180B**, station wagon, 1977, gd cond, rego 4/88, going o'seas, \$3700 ono; Hisa 493831.

**Wardrobe**, white, wooden, in gd cond, lots of hanging and storage space, reas price; 494676/583753.

**Camera**, Nikon F301, 35-70mm, \$900 ono, new \$1250; Starblitz flash \$165, new \$220; Stereo cabinet \$100; Tony 476513.

**Pram**, stroller/car basket + safety net \$65; Car seats \$10 ea; Walking frame \$10; Stair gate \$10; 2 pure wool coats, lined, size 3 & 6, camel colour \$15 ea; Padded jacket \$3; Capuccino machine \$30; Louvre door, standard size \$20; 513128 (ah).

**Computer**, Apple II compatible, disk drive, green monitor, Z80 card, 80 column card, software, \$700 ono; Tennis racquet, Fischer superform XL graphite reinforced \$130; 493135 (ah).

**Blender**, super-mix Spurge, also includes twin beaters, juice extractor, knife sharpener, \$40 ono; x2433/542688 (ah).

**Stove**, electric, with hot plates, grill & oven, \$20 ono; x3291/887602.

**Lounge suite**, 40's vintage, 1x2 and 2x1, tan/white covers, gd cond, \$150; Rod 893128 (bh)/470286 (ah).

**Heater**, elec, column, cream on casters, 3 heat positions, \$100; x4357/480337 (ah).

**Computer**, Osborne 1 plus Epson MX80 printer, complete word-processing package for \$850; Spellcheck and lots more including manuals. IEEE Centronics cable, \$30; 644240 (bh)/477719 (ah).

**Computer**, Epson personnel, 512K dual disk drive, IBM compatibles, keyboard, monitor and some software, urgent sale, \$1500 ono; Rm F05, Toad Hall.

**Ski Lodge Share**, for sale at Guthega; 468431 (bh)/863929 (ah).

**Toyota Corolla**, 1976, Oct rego 1987, new lam windscreen, \$2800; x4539/824527 (ah).

**Cot**, portable, mesh, very good condition, \$65 ono; 822626 (ah).

**Dining room suite**, walnut stained 6' x 3' table & 8 matching chairs, velvet covered, very gd cond, \$600; x2000/x4523/823872.

**Stove**, electric, Simpson Karumba, with solid hot plates and rotisserie, gd cond, \$250; x4297/814953 (ah).

**Renault 16TS**, white, good condition, reliable transport, \$1300; 412512 (ah).

**Sigma**, station sedan, GJ model, 1982, 2.0 litre, 5 speed, one owner, carefully maintained, exc cond, \$6800; x2589/916441 (ah).

**Camera**, Canon AE SLR, flash, lens & doubler, \$290; Calculator, HP 41CV, extra functions and memory, rechargeable \$425; Beanbag, black, double heavy duty vinyl, \$80; x4328/513880.

**Mazda 323**, 5 door, 1980, exc cond, cassette, new battery & tyres, rego 10/87, dealer warranty 1/88, \$6500 ono; 495378 after 6pm.

**Record player**, stereo & radio, \$75; Stereo cabinet with glass doors \$45; Bike's, man's 10 speed, girl's as new, \$95 ea; Old English oak chest of drawers, offers; 582531 (ah).

**Valiant**, 1973, mechanically exc, body good, rego July 1987, \$1,100 ono; 472389.

**Mazda 808**, S/W, 1977, tow bar, cassette, exc cond, reliable vehicle, \$2600 ono; x4215/851279 (ah).

**Stove**, Westinghouse split-range with cupboard stand, \$350; Freezer, Ignis upright, \$290; Dinner set, 8 setting, Noritake, Amirette, \$250; 475591 (ah).

**Sleeping bag**, dacron, Fairydown Leading Lite, 5 degree rating, little used, \$130; Bill x2021/812622.

**Plants**, Geraniums and fushias, named varieties, \$1.50; x3632/816641.

**Baby's** karrimor papose, exc cond, \$35; x3632/816641.

**Camera**, Olympus OM-30 with Tamron 35-70 zoom, exc cond, \$240 ono; David x2463/475704 (ah).

**Honda Civic**, 1974, 3 door manual, 110,000 kms, exc cond, records available, \$3200; 514526, Sat-Sun 10am-6pm.

**Fridge**, Indext, goes well, 118cm x 55cm x 53cm, \$100; 416970 (ah).

**Arm chairs**, two, \$30 ono; Fridge, Kelvinator 336L, as new, \$450 ono; Dining suite, pine 5 piece, as new, \$450 ono; 581687 (ah).

**Freezer**, 210 litre, \$125; Wooden playpen, folding cot, chrome high chair, bike, girl's 16", small stack hat, large trailer load firewood, \$35; x2665.

**Antique linen**, lace, buttons and flowers, also a 1920's 2 piece lace dress in perfect order; 863342.

**Magazines**, scientific American, from 1883, bound in 6 monthly volumes; 863342.

**Stereo loudspeakers**, Tannoy monitor LZ3, \$400; KEF cadanza, \$200; Tandberg 20W receiver, \$100; Sansui 50W amp, \$210; Leak valve system with Lenco 85 TT, \$300; Bill x3495/x3508.

**Ford Meteor**, 1983, 1.5L, immac condition, long rego, 63,000 km, \$7900 ono; x3852/813963.

**Toyota Corolla**, 1976, fully imported, well kept, rego 3/88, new tyres & seat covers, \$3300; 493315/474542.

**Dishwasher**, National Computermatic, push button, exc cond, \$275; Washing machine, Hoovermatic, twin-tub, \$120 ono; 546083 (ah).

## Accommodation Available

**House**, Downer, quiet non-smoker to share with 1 other, own room and sitting room, close Dickson shops, female pref, \$60 p.w. plus expenses; x2422/2414/416551 (ah).

**House**, Curtin, avail 20 June-1 August 1987, 2 br and study, ideal academic visitors; 719266.

**House**, Page, furnished, avail end June-mid Sept 1987, 2 br, \$100 p.w. 548466 (ah).

**House**, Macquarie, comfortable 3 br, partly furnished, garage, carport & gardenroom, easy care garden, close all amenities, avail early June for 7-9 months, \$155 p.w. 494203/513843 (ah).

**House**, 3 br, f/f, avail Sept 22-end of Jan 1988, 12 mins drive ANU, no pets, pref non-smokers, \$160 p.w. x2293/883901 (ah).

**Aranda**, 2 storey flat, female required to share; 897811 (bh), 514347 (ah).

**House**, Kaleen, 3 br, unfur, family room, huge garage, easy care garden, long lease, \$155 p.w., sorry no groups; 548351.

**House**, Murrumbidgee River near Tharwa, two non-smoking people wanted to share 4 br home, own transport essential, \$50 p.w. each; Donald x4081/375145.

**Skiing accommodation**, Jindabyne, fully equipped, 2 br unit, high & low season rates; (02) 4519492 (ah).

**House**, Braddon, person to share large 3 br home, non-smoker, \$47.50 p.w. Marcus or Ian 571625 (ah).

**House**, Red Hill, 4 br, avail one month from 10 July 1987, \$155 p.w. + elec & bond; x2701.

**House**, Ainslie, share warm & sunny, non-smoking home, close to Civic and ANU; 473653.

**House**, Downer, non-smoker to share comfortable home with working woman and small child, \$45 p.w. Anne 496994 (ah or bh).

**House**, Lyneham, 2 br available, 27 June-3 August 1987; 480125 (ah).

**Room**, Aranda, in 3 br house for non-smoker, share with 2 others, \$43 p.w. 459535/515517 (ah).

**House**, Turner, 2/3 br, sunny rooms, cosy garden, long lease, \$165 p.w. x4758/485214 (ah).

## Accommodation Wanted

**Staff member**, would like to rent and carefully look after your furnished house from early June; x4336/571642.

**House**, for rental sought by small responsible family until approx Nov/Dec 87, will mind pets; 821879.

## Secretarial

**Typing**, wordprocessing, assignments, theses, job applications, job resumes, ANU graduate with secretarial experience, \$2 A4 double spaced page; 275509.

## Wanted

**Upright freezer**, in good condition; x3634/275741.

**Travel pack**, reasonable condition and price, down sleeping bag, must be cheap; Bill x2021/812622.

**Colour monitor**, daisywheel printer (suit Commodore 128), large desk or computer desk, TV 12 volt, colour; Peter x2054/812522.

## Miscellaneous

**Transport**, offered to commuter travelling Hawker, University daily, share petrol; Alison 4488, x12.

# Academic Diary

Diary entries for the next issue close at 5pm on Wednesday 3 June and will be for the period Monday 15 June to Friday 3 July inclusive. Please assist us by submitting ALL diary entries on forms available from University Information, x2229.

## Monday 25 May

**Psychology/The Faculties sem**, Miss C. Wocadlo — Performance anxieties, 3.30pm, sem rm 105, Psychology bldg.

**ANU Group for study of Women's History sem**, Julian Thomas — Women and the 1938 Sesqui-centenary, 12.30pm, sem rm G47, A.D. Hope.

**Sociology/The Faculties sem**, Mr Masao Nobe — Quality of social participation: Report of a Can-

berra survey among women, 3.45pm, sem rm 2095, Haydon-Allen.

**Urban Research Unit, RSSS sem**, Professor Bruce Davis — Heritage conservation in Australia: Some issues and dilemmas, 11am, sem rm D, Coombs.

**Geography/Arts Special sem**, Dr Bill Gammage — Narranderra shire, 2-3.30pm, Lecture rm I, Dedman bldg.

## Tuesday 26 May

**Far Eastern History RSPacS/ Demography RSSS**, Dr J. Fincher — Population information and development planning in 20th century China, 11am, sem rm E, Coombs.

**RSC/Inorganic Chemistry sem**, Dr John Parise — A glimmer of structure in the structureless, 2pm, sem rm 134, RSC.

## Wednesday 27 May

**History of Ideas Unit, RSSS sem**, Professor Eugene Kamenka — Context, power and ideology — revisionist methodologies in the History of Ideas, 11am, sem rm D, Coombs.

**Human Geography, RSPacS sem**, Dr Peter Rimmer — Japanese construction companies and the Australian regional state: remodelling the Australian urban system, 2pm, sem rm C, Coombs.

**Pacific & Southeast Asian History, RSPacS sem**, Dr Donald Denoon — An agenda for the social history of Papua New Guinea, 2pm, sem rm D, Coombs.

**Linguistics/Arts sem**, Professor Bob Dixon — Sub-grouping in Australia, 4pm, sem rm 2135, Dedman.

**Botany/The Faculties sem**, Dr David Day — Partitioning of electron transport in the respiratory chain of plant mitochondria, 1pm, sem rm, Botany.

**Women's Studies sem**, A.C.T. Health Authority — health down there: cervical cancer and pelvic inflammatory disease, 12 noon, sem rm 1133 Haydon-Allen.

**RSC/Inorganic Chemistry sem**, Dr Stan Kennedy — Structural relations and mechanisms in crystal structure changes, 11am, sem rm 134, RSC.

## Thursday 28 May

**Sociology, RSSS sem**, TBA, 4pm, sem rm E, Coombs.

**History, RSSS sem**, Dr David Neal — Free society, penal colony slave society prison? Characterising early New South Wales, 10.45am, sem rm D, Coombs.

**Biogeography & Geomorphology, RSPacS sem**, Zhu Zhong Rong — Sedimentation and diagenesis of the quaternary raised coral reefs of the Huon Peninsula, New Guinea — PhD proposal, 10.45am, sem rm C, Coombs.

**International Relations, RSPacS sem**, Paul Kattenberg — Some critical issues in US foreign policy making, 11am, sem rm B, Coombs.

**CRES**, Drew Clark — Natmap digital cartographic data and GIS programs: implications for map users, 12.30-2pm, CRES sem rm, 5th fl, Hancock.

**Political & Social Change, RSPacS sem**, Dr Chandra Muzaffar — The rise of religious and ethnic consciousness in contemporary Malaysian politics, 3pm, sem rm A, Coombs.

**Australian Society for Microbiology sem**, Professor Robin Weiss — Envelope properties of the AIDS virus, 5.30pm, Florey LT, JCSMR.

**Far Eastern History RSPacS/ Demography RSSS sem**, Professor H. Bielenstein — China's population AD 2-1982: 2. Sung to Yuan, 1.30pm, sem rm D, Coombs.

**RSES sem**, Professor W. Compston — The role of xenocystic minerals in tracing crustal evolution, 4pm, sem rm, Jaeger bldg.

**RSC/Organic Chemistry sem**, Dr Roger Summons — Doing organic chemistry on rocks: Hydrocarbon fossils of ancient microorganisms, 11am, sem rm 134, RSC.

## Friday 29 May

**Political Science/Arts sem**, John Hart — The Democratic Party, The Fairness Commission and the 1988 Presidential elections, 11am, sem rm 2069, Copland.

## Monday 1 June

**Public Lecture**, Professor Chalmers Johnson — The future of the Japanese economy: Is the miracle over?, 12.30-2pm, Coombs LT, Coombs.

**Psychology/The Faculties sem**, Miss D. Terry — Stress, coping strategies and adaptation in married couples, 3.30pm, sem rm 105, Psychology bldg.

**Australian Society for Microbiology sem**, Dr Harold Perkins — Peptidoglycan and B-lactam antibiotics, with particular reference to *N. Gonorrhoea* and *S. aureus*, 5.30pm, Florey LT, JCSMR.

**Urban Research Unit, RSSS sem**, Dr Joan Vipond — Housing policy options, 11am, sem rm D, Coombs.

## Tuesday 2 June

**Peace Research Centre sem**, Professor Jean Chesneaux — The crisis in New Caledonia: Kanak political culture and French political practice, 11am, sem rm A, Coombs.

**Demography, RSSS sem**, Mr Kashem Majumder — Determinants of infant and child mortality in Bangladesh: a logit linear model analysis. A thesis proposal, 3.30pm, sem rm A, Coombs.

**Far Eastern History RSPacS/ Demography RSSS sem**, Professor H. Bielenstein — China's population AD 2-1982: 3. Ming to 1982, 11am, sem rm A, Coombs.

## Wednesday 3 June

**Linguistics/Arts sem**, Gi-Hyun Shin — Topic and nominative nominals in Korean, 4pm, sem rm 2135, Dedman.

**Botany/The Faculties sem**, Dr Paul Kriedeman — Sun-shade acclimations and growth capacity of rainforest tree seedlings, 1pm, sem rm, Botany.

**Philosophy Society**, Drew Khlentos — Can deduction be justified? 8pm, sem rm F, Coombs.

**Women's Studies sem**, Dr Margaret Grocke — The gender data base, 12 noon, sem rm 1133, Haydon-Allen.

## Thursday 4 June

**History, RSSS sem**, Dr W.S. Ramson — For the term of a natural life — lexical evidence of a moving experience, 10.45am, sem rm D, Coombs.

**CRES sem**, Dr Jon Altman — Aboriginal economic development in the East Kimberley, 12.30-2pm, CRES sem rm, 5th fl, Hancock bldg.

**International Relations, RSPacS sem**, Richard Higgott — The state and the international politics of structural adjustment: A theoretical introduction with Australian examples, 11am, sem rm B, Coombs.

**Law, RSSS sem**, David Neal — Magistrates and political authority in early New South Wales, 4-6pm, sem rm D, Coombs.

**Sociology, RSSS sem**, Paul Wilson — Crime in Australia: Rhetoric and reality, 4pm, sem rm E, Coombs.

**Far Eastern History RSPacS/ Demography RSSS sem**, Professor H. Bielenstein — China's population AD 2-1982: 4. Stagnation and growth, 3.30pm, sem rm A, Coombs.

**Australian Federation of University Women — ACT**, monthly meeting. Guest speaker, Janet Hunt, member of Women's Inter-

national League for Peace & Freedom. & National Women's Consultative Council. 12.30pm, Robertson rm, St John's Church Hall, Reid.

## Friday 5 June

**Political Science/Arts sem**, John Ballard — The politics of AIDS in Australia, 11am, sem rm 2069, Copland.

**Economic History/The Faculties/ RSSS Joint seminar**, Professor Lee Alston — Technological choice and the organisation of work, 11am, sem rm E, Coombs.

## Tuesday 9 June

**RACI-Canberra Branch Lecture**, Professor B. Hyde — New high temperature superconductors, 5.30pm, sem rm 134, RSC.

## Wednesday 10 June

**Linguistics/Arts sem**, Dr Ada Valentini — Problems of discourse planning and politeness in German impromptu speech, 4pm, sem rm 2135, Dedman bldg.

**Botany/The Faculties sem**, Dr Alexander Hansen — Symbiotic nitrogen fixation of some Western Australian shrub legumes in their native habitat or under ameliorated conditions, 1pm, sem rm, Botany.

**Philosophy Society**, Professor R. Stoothoff — Compatibilism, 8pm, sem rm F, Coombs.

**Pacific & Southeast Asian History, RSPacS sem**, Dr Esta Ungar — Notions of leadership and power in 15th century Vietnam, 2-3.30pm, sem rm D, Coombs.

## Thursday 11 June

**History, RSSS sem**, Dr Duncan Bythell — The rise and fall of brass bands: An episode in popular culture, 10.45am, sem rm D, Coombs.

**Linguistics, RSPacS sem**, Professor Ulrich Ammon — Some problems of a systematic description of the social status or function of linguistic systems, 2pm, sem rm C, Coombs.

**CRES sem**, Professor J. Mackie — Politics of the world oil situation, 12.30-2pm, CRES sem rm, 5th fl, Hancock bldg.

**International Relations, RSPacS sem**, Richard Leaver — South Africa and sanctions, 11am, sem rm B, Coombs.

**RSC Lecture**, in Chemistry in Australia series. Professor Peter Farrell — Current research in the Travenol Centre for medical research, 11am, RSC LT.

## Friday 12 June

**Political Science/Arts sem**, Hayden Lesbirel — Domestic resistance to implementing Japan's energy policy, 11am, sem rm 2069, Copland.

**RSC School Colloquium**, Professor E.R. Davidson — Application of computational chemistry to problems of structure, spectra and reactivity, 11am, sem rm 134, RSC.

## Monday 15 June

**Philosophy/Political Science/ Sociology (Joint)/Arts**, Special seminar series I, Professor B. Ollman — Marx's dialectical method, 2pm, sem rm 2095, Haydon-Allen.

## Continued on page 7

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