Report of the Council for the period
1 January 1985 to 31 December 1985
To His Excellency The Right Honourable Sir Ninian Stephen, AK, GCMG, GCVO, KBE, Governor-General of the Commonwealth of Australia and Commander-in-Chief.

We have the honour to transmit to Your Excellency Part 1 of the Report of the Council of the Australian National University for the period 1 January 1985 to 31 December 1985 furnished in compliance with Section 33 of the Australian National University Act 1946. This part of the Report covers the activities of the University.

Part 2 of the Report containing the Auditor-General’s Report and Financial Statements will be presented to you separately.

R.A. Blackburn
CHANCELLOR

P.H. Karmel
VICE-CHANCELLOR
Information about the University

In a report of this size it is not possible to give a full account of all the activities of the University in the year under review. This report comprises four sections:

— a review of the year
— brief reports on the research schools, faculties, academic centres and other areas of University activity
— examples of some University research projects, and
— tabulated information and statistics.

For those Members of Parliament — and members of the public — who would be interested to have more detailed information on the work of one or more of the research schools, faculties, centres or units, the Registrar would be glad to supply on request copies of any of the detailed reports which all sections of the University submit annually to the University Council. Lists of academic publications of departments in the research schools and faculties, which give an indication of the range of research activities in the University, are available in the Parliamentary Library and to individuals on request.

The address for such inquiries is
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The Australian National University
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CANBERRA ACT 2601
Telegraphic address Natuniv Canberra
Telephone number (062) 49 5111
Telex Natuni AA62760

Inquiries relating to matters of a general nature concerning the University should be directed to
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The Australian National University
GPO Box 4
Canberra ACT 2601
Telephone number (062) 49 2229
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The Year in Review

The Australian National University (ANU) is both a teaching university and a centre for original research in the biological, physical and social sciences. The University, as the only completely research-oriented Australian university without undergraduate facilities, was established under the Australian National University Act 1946. The unique character of the ANU changed in 1960 when teaching faculties were added through amalgamation with the Canberra University College. Since then the University has operated with two distinct but interrelated parts — the seven research schools, which form the Institute of Advanced Studies, and the five teaching faculties which form The Faculties.

The Institute of Advanced Studies consists of the four original schools established in 1946 and three added since. The original schools are the Research Schools of Pacific Studies, Physical Sciences, Social Sciences and the John Curtin School of Medical Research. The Research Schools of Biological Sciences and Chemistry were added in 1967 and Earth Sciences in 1973. These fields of interest were chosen because of their importance to Australia or because they could be studied to advantage in Australia. The schools of the Institute do not offer undergraduate teaching but have more than 500 graduate students most of whom are working toward the degree of Doctor of Philosophy.

The five faculties — Arts, Asian Studies, Economics and Commerce, Law, and Science — have as one of their principal tasks the teaching of undergraduate students. In addition, The Faculties has a commitment to research and graduate training of the same order as that in other Australian universities with undergraduate enrolments.

In terms of academic activities and budgets, the Institute constitutes about two-thirds of the University and The Faculties about one-third. Detailed reports on the research schools and the faculties are set out in the relevant sections of this Report.

Spanning the two parts of the University, which operate under a single administration, are the Library, the Computer Services Centre, some academic research centres and a group of essentially separate entities which in 1980 were drawn together to form the Division of Educational Services. Detailed reports relating to these are to be found in the section 'Other University Activities'.

The statutory functions of the University, specified in the Australian National University Act 1946, include —

(a) the encouragement and provision of facilities for graduate research and study both generally and in relation to subjects of national importance to Australia; and
(b) the provision of facilities for university education for persons who elect to avail themselves of those facilities and are eligible to do so.

The first of these broadly describes the functions of the Institute of Advanced Studies, and the second describes one of the main functions of The Faculties.

There was a small increase in total enrolments in 1985 to 6353 undergraduate and graduate students. The total student load (equivalent full-time students) was 2.5 per cent greater than in 1984, and was within the range nominated by the Commonwealth Tertiary Education Commission for the 1985–87 triennium. Enrolments in The Faculties rose slightly but the Institute of Advanced Studies and Academic Centres saw a rise of 13 per cent to 545 graduate students. New undergraduate enrolments were up by 10 per cent and the number of students coming directly from school was also about 10 per cent higher than in 1984.

The minimum standard of entry for undergraduate courses remained the same as in 1984 except for Economics and Commerce. The minimum level was the 40th percentile of achievement in the tertiary entrance examination (i.e. the top 40 per cent of those presenting for the Higher School Certificate or equivalent). The cut-off for Economics and Commerce was the 30th percentile (up from the 35th percentile for BComm and the 40th percentile for BEc). The level for Law remained at the 9th percentile. Enrolments in each faculty remained similar to 1984 with the only significant change being a shift of about 100 enrolments from Economics to Commerce.

The proportion of students studying full time continued to rise and the proportion of women students rose to 50.9 per cent of total enrolments. In 1985, of the 1444 new undergraduate enrolments, 367 enrolled in science, an increase of 6 per cent. Of these, 38.4 per cent were women. The number of new female students enrolling in science courses since 1982 has not shown any marked variation.

As forecast last year, the proportion of overseas students among new undergraduate enrolments has continued to rise. Overseas students numbered about 10 per cent of new 1985 undergraduate enrolments and
were focused heavily in the commerce course. More than half the overseas undergraduate students at the University are enrolled in the Faculty of Economics and Commerce. The proportion of overseas students in that Faculty was 25.5 per cent; for the degree of Bachelor of Commerce the proportion was 44 per cent, including 57 out of 129 new enrolments.

**Overseas students**

During the year the Minister for Education announced details of the Government's decision on future arrangements for overseas students wishing to study in Australia. The Government had received advice on overseas student policy from the Committee of Review of Private Overseas Students Policy (the Goldring Report), the Committee to Review the Australian Overseas Aid Program (the Jackson Report) and the Commonwealth Tertiary Education Commission. The main features of the new policy are:

- An annual ceiling on overseas students in all categories, to be determined by the Government and not to exceed aggregate numbers now applying.
- Separate quotas for individual countries.
- Flexibility to enrol overseas students up to 10 per cent of the total number enrolled in an institution, and up to 20 per cent in any course.
- The Overseas Student Charge will represent 35 per cent of the full cost of a place in 1986, and 45 per cent in 1987. For 1986, this will mean that the charge will be $4340 per annum.
- An Overseas Student Office will be established within the Commonwealth Department of Education to provide improved administration of the Overseas Student Program.
- Guidelines have been recommended under which institutions are permitted to offer places, above and beyond those places subsidised by the Australian Government, at full cost in normal degree courses. Such courses may include mainstream courses delivered in Australia, courses conducted offshore, and non-mainstream courses delivered in Australia. The University may admit fee-paying overseas students beyond the numerical limits provided they do not displace Australian students, they do not absorb Commonwealth-funded resources and they are charged full costs including an appropriate allowance for buildings and equipment.

Paragraph 27(1)(o) of the *Australian National University Act 1946* empowers the Council of the University to make statutes with respect to the payment to the University of certain classes of fees. This does not include the power to charge fees for studies undertaken for the purpose of obtaining a degree or diploma. The Government has amended the Act to give the Council the power to charge fees for award courses. Such power
is necessary if the University is to mount any full fee courses for overseas students. The University is not at present planning to provide such courses. Their provision will need careful consideration: their viability will have to be determined and the means by which working capital can be provided to establish them.

The following table sets out the number of degrees and diplomas completed from 1976 to 1985. The decline in the number of bachelor degrees of the early 1980s has been arrested, reflecting the rise in undergraduate enrolments. Awards of graduate diplomas and the degree of Bachelor of Letters continue to rise. There was a welcome increase in the number of honours degrees in 1985.

<table>
<thead>
<tr>
<th>Courses completed* 1976–1985**</th>
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<tbody>
<tr>
<td>pass manual</td>
<td>849</td>
<td>921</td>
<td>908</td>
<td>941</td>
<td>923</td>
<td>840</td>
<td>872</td>
<td>852</td>
<td>803</td>
<td>867</td>
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<tr>
<td>honours</td>
<td>173</td>
<td>189</td>
<td>197</td>
<td>177</td>
<td>170</td>
<td>162</td>
<td>140</td>
<td>158</td>
<td>177</td>
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<tr>
<th>Graduate diploma and LittB</th>
<th>13</th>
<th>60</th>
<th>73</th>
<th>13</th>
<th>60</th>
<th>73</th>
<th>13</th>
<th>60</th>
<th>73</th>
<th>13</th>
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<tr>
<td>Master degree</td>
<td>81</td>
<td>91</td>
<td>97</td>
<td>102</td>
<td>97</td>
<td>105</td>
<td>75</td>
<td>78</td>
<td>101</td>
<td>93</td>
</tr>
<tr>
<td>PhD</td>
<td>93</td>
<td>123</td>
<td>103</td>
<td>132</td>
<td>129</td>
<td>124</td>
<td>125</td>
<td>115</td>
<td>100</td>
<td>101</td>
</tr>
</tbody>
</table>

| Total                      | 1196| 1324| 1305| 1352| 1319| 1265| 1294| 1258| 1258| 1362|

* Excluding higher doctorates and honorary degrees
** Years ending 30 June

The improvement in the levels of recruitment and employment of graduates, observable over the past two years, continued in 1985 paralleling the overall improvement in national economic activity and employment levels.

National figures, compiled from the Annual Graduate Destination Survey co-ordinated by the Graduate Careers Council of Australia, show that the proportion of new first-degree pass graduates from universities working in the public sector rose slightly from 19 per cent in 1984 to 19.5 per cent in 1985. Private sector figures revealed continuing improvement, with employment levels for new first-degree pass graduates reaching 22.9 per cent compared to 18.5 per cent in 1983 and 21.3 per cent in 1984. This was a return almost to the 1982 level of 23 per cent.

Employment figures for Australian National University graduates mirrored the national trend. There was a further decrease in the proportion of graduates still seeking work on 30 April from 6 per cent in 1983 to 5 per cent in 1984 to 4 per cent in 1985. These figures include both bachelor and graduate degrees. A high proportion of graduates from all disciplines found their final full-time work in the Australian Public Service; with 63 per cent of full-time bachelor degrees and 33.8 per cent of all graduates finding full-time government employment. The proportion of ANU graduates entering first jobs in the private sector is lower than that of the Australian
universities generally (11.4 per cent of all graduates in 1985 compared to the national figure of 21.7 per cent), though this situation has been improving in recent years.

Competition for jobs in the commercial area remains keen but graduates with good degrees in economics, accounting or computing are still better placed in the job market than their counterparts in the humanities, social sciences and natural sciences. Difficulty in obtaining work on the part of non-vocational students ('generalists') can often be attributed to their uncertainties in career direction rather than exclusion on the part of employers. Nevertheless, 'generalist' graduates found employment in a wide range of occupations and industries (including administration, marketing, banking, finance, community service, electronic and print media, the hospitality and tourist industries, museum or gallery work, and so on). The demand for 'generalist' graduates appears to be growing steadily. In particular, a wide variety of employers, both public and private, are seeking graduates as potential entrants to their management/executive streams, where a diverse range of skills (e.g. flexibility, analytical and decision-making ability, good communication, the ability to acquire new skills quickly) are often more important than any specific content/knowledge gained during their degree.

Funds from the Commonwealth Tertiary Education Commission

The year 1985 was the first of the 1985-87 triennium. The grants for each year of the triennium recommended by the Commonwealth Tertiary Education Commission for the ANU for recurrent expenditure, equipment and minor works were approximately the same in real terms as they had been in 1984. They included continued provisions for the teaching of Vietnamese and for the North Australia Research Unit. The Commission has confirmed that the University's special responsibilities for Asian studies and forestry have been taken into account in the University's grants.

The University has not received any money for major capital works since 1975 nor have sufficient funds been provided for minor works to enable major rehabilitation of older buildings to be undertaken. Because of this, Council decided toward the end of 1984 to earmark annually approximately $1m of investment income to a building fund from which some modest new building and major repairs to others can be financed. It is expected that some acute problems will be relieved in this way over the next three years, at the end of which the arrangement will be reviewed.

In relation to student numbers, the Commission stated that it expected institutions 'not to expand significantly beyond the limits of planned growth so as to avoid spreading (their) scarce resources too thinly'. The Commission's Universities Council specified planning ranges for student load for ANU for each year of the triennium as 4200 to 4500 EFTSU.
The University commissioned a series of prints from Arnhem Land artists. Printmaker, Ms Banduk Marika from Yirrkala, with a lino-cut used for making prints showing some family totems and goannas.

undergraduate enrolments and 5025 to 5325 EFTSU total enrolments. These ranges represent approximate stability for the University.

Since 1977, when recurrent grants reached their peak in real terms, there has been a decline of about 3 per cent. Since there have been increases in costs that are not reflected in adjustments for changes in cost and salary levels, the University has had to reduce its real activities by more than the decline in real grants. In last year's Report attention was drawn to savings arising from the University's participation in the new Australia-wide Superannuation Scheme for Australian Universities. This has been largely offset by a sharp increase in premiums for workers' compensation.

The following table compares full-time equivalent staff, other than casual staff, financed from recurrent grants for the years 1977, 1984 and 1985. The level of such staff has declined by over 11 per cent since 1977.
<table>
<thead>
<tr>
<th>Staff category</th>
<th>1977</th>
<th>1984</th>
<th>1985</th>
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<tbody>
<tr>
<td>Research only [a]</td>
<td></td>
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<tr>
<td>Academic</td>
<td>518</td>
<td>553</td>
<td>525</td>
</tr>
<tr>
<td>Non-academic</td>
<td>1225</td>
<td>1124</td>
<td>1100</td>
</tr>
<tr>
<td>Total</td>
<td>1743</td>
<td>1677</td>
<td>1625</td>
</tr>
<tr>
<td>Teaching &amp; research [a]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic</td>
<td>402</td>
<td>360</td>
<td>367</td>
</tr>
<tr>
<td>Non-academic</td>
<td>355</td>
<td>289</td>
<td>292</td>
</tr>
<tr>
<td>Total</td>
<td>757</td>
<td>649</td>
<td>659</td>
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<tr>
<td>Academic activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>169</td>
<td>131</td>
<td>128</td>
</tr>
<tr>
<td>Computing [b]</td>
<td>76</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>Other [c]</td>
<td>24</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Academic services</td>
<td>269</td>
<td>220</td>
<td>216</td>
</tr>
<tr>
<td>Student services</td>
<td>21</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Administration</td>
<td>376</td>
<td>344</td>
<td>323</td>
</tr>
<tr>
<td>Buildings &amp; Grounds</td>
<td>200</td>
<td>140</td>
<td>142</td>
</tr>
<tr>
<td>Public Services</td>
<td>24</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>3390</td>
<td>3069</td>
<td>3003</td>
</tr>
</tbody>
</table>

*Excluding casual staff; includes part-time expressed as full-time equivalent
(a) Excludes visiting staff and staff paid from outside funds
(b) Includes Management Services Group and Data Processing Unit
(c) Audio-visual and language laboratory

Intellectual vigour and productive scholarship and research continues to flourish, in spite of the decline in Commonwealth funding in real terms and the necessity to continue operations under severe constraint. This has been assisted by the practice of sponsoring visiting fellowships.

Some 360 or so visiting fellows spent varying lengths of time at the University in 1985, some with financial help — usually very modest — and some without. The return to the University by way of the contributions made by visiting fellows is considerable, far exceeding the small costs involved. Approximately three-quarters of the visitors come from overseas with the balance from within Australia. Visiting fellows include distinguished retired members of staff who continue to pursue vigorously their scholarly interests. The program benefits not only ANU but other Australian universities; the visitors usually spend time at other Australian universities and are available for consultation with Government agencies and private organisations. Visitors to ANU from other Australian universities gain through contact with these overseas visiting fellows as well as with ANU academics.
Ancillary activities

A number of activities, ancillary to the main functions of the University, operate under the University’s control. These activities include student halls of residence, staff accommodation, a staff social centre, an arts centre, University House, and a small shopping centre which includes a pharmacy, bookshop, travel agency, several banks and a post office. Additional space needs of existing tenants have been met by an extension to the shopping centre. The extension is adjacent to the Arts Centre and gives it some extra studio space. The extension has been funded from rents received.

The ancillary activities generate their funds wholly or substantially from charges which they make for services. In 1985 these exceeded $11m gross.

Funds from outside sources

In addition to the funds obtained through the Commonwealth Tertiary Education Commission, the University, in recent years, has been successful in attracting considerable funds from outside sources. In 1985 these funds amounted to $15.5m, with an additional $6m income from the University’s own investment activities and sundry income.

Outside grants provided support for some 250 staff, 70 of whom were academic staff. Details of the larger grants are set out in the following table. A complete list of grants is set out in the Appendices at the back of this Report.

| Donor                                          | Amount  
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Australian Development Assistance Bureau (including $1.4m for the Nepal-Australia Forestry Project, $1.24m for research and development assistance in third world countries and $4.43m for higher degree courses in Demography and Agricultural Development Economics)</td>
<td>3,073</td>
</tr>
<tr>
<td>Department of Industry, Technology and Commerce (comprising $0.5m for the FUSE/LYMAN Project and $1.15m for the STARLAB Project)</td>
<td>1,650</td>
</tr>
<tr>
<td>Department of Science (including $0.840m for Australian Research Grants Scheme and $1.17m for ANU participation in the proposed National Science Centre)</td>
<td>1,391</td>
</tr>
<tr>
<td>Department of Health (NHMRC funded grants, including $0.449m for Social Psychiatry Unit)</td>
<td>966</td>
</tr>
<tr>
<td>Department of Foreign Affairs (including $0.349m for Peace Disarmament and Arms Control Centre)</td>
<td>748</td>
</tr>
<tr>
<td>Department of Education (including $0.561m for Centre for Mathematical Analysis)</td>
<td>704</td>
</tr>
<tr>
<td>The Ford Foundation (including $0.491m for Child Survival in Asia Project)</td>
<td>636</td>
</tr>
<tr>
<td>Agrigenetics Research Corporation (including $0.298m for soil inoculation of sorghum, maize and tropical grasses)</td>
<td>622</td>
</tr>
<tr>
<td>United Nations Fund for Population Activities (including $0.237m for a demographic study in Indonesia)</td>
<td>539</td>
</tr>
<tr>
<td>Department of Primary Industry (including $0.131m for Australian wool research and $0.320m for meat research)</td>
<td>470</td>
</tr>
<tr>
<td>Australian Bicentennial Authority (Encyclopedia of the Australian People)</td>
<td>204</td>
</tr>
<tr>
<td>Anglo-Australian Observatory (support for 150&quot; telescope)</td>
<td>203</td>
</tr>
</tbody>
</table>
The road junction near the Indrawati Khola linking Chautara with Kathmandu and Lhasa in Nepal. Chautara is the field headquarters of the Nepal–Australia Forestry Project which is managed by the Department of Forestry, Faculty of Science.

Department of Resources and Energy (National Energy Research Development and Demonstration Council) 170
Department of Prime Minister and Cabinet (Centre for Research on Federal Financial Relations) 161

These grants were directed towards the following objectives:

Australian Development Assistance Bureau (ADAB) The Bureau once again provided substantial financial support for a number of programs in the National Centre for Development Studies including Rural Development Courses for Bangladesh and the Philippines. Other projects, which covered a wide range of research and development topics, included the Nepal–Australia Forestry Project, managed by the Department of Forestry. This project has been attracting growing international interest
since its current phase began in 1978. The project, jointly sponsored by
the Nepalese Government and ADAB, aims to reverse the trend toward
deforestation in an area within the hills of Nepal and to provide firewood,
fodder and timber for local community use. The project is innovative and
is seen as a pilot for similar programs elsewhere in Nepal and in other
countries.

**Australian Research Grants Scheme** Members of the staff of the Institute
are not eligible for grants from the Australian Research Grants Scheme
(ARGS), but awards are made to members of The Faculties. In 1985 staff
members were awarded 51 separate grants. The largest of these ($48,800)
got to Dr D.S. Gardner and Dr R.G. Attenborough of the Faculty of Arts
for research into ‘Subsistence and ecology in their social context amongst
the Mianmin, West Sepik Province, Papua New Guinea’. Dr W.S.
Ramson’s Australian National Dictionary Project received $46,000.

**FUSE/LYMAN Project** The design and development studies of the
STARLAB instrument package undertaken by the University in
September 1982 were completed in 1984 and presented to the Department
of Science and Technology. Central to the instrument package is a unique
light-detecting system developed at Mt Stromlo. Basically a large
supersensitive high-speed electro-optical camera, it could be adapted for
uses other than astronomy, for example, in defence work, robotics,
medicine, mining and remote sensing.

The instrument package was designed originally as part of the STARLAB
project — a joint Canadian–United States–Australian effort to put a one-
metre UV telescope into orbit far above Earth’s atmosphere via the space
shuttle. The launch was scheduled for 1990. However, soon after the
withdrawal of Canada from the STARLAB project the University entered
a contract with the Australian Research and Industrial Incentives Board
for further studies of the STARLAB detectors. With the official closing
down of the STARLAB project in December 1984, Australia signed an
agreement with the European Space Agency (ESA) and the National
Aeronautics and Space Administration (NASA), to commence tripartite
studies on a new far UV spectroscopic space telescope code-named FUSE/
LYMAN. It is envisaged that the instrument package designed for the
STARLAB project will be integral to the new telescope. It is hoped that the
first venture into space of the Mt Stromlo and Siding Spring Observatories
detector will be in 1988 in a project named *Endeavour*.

**NHMRC Social Psychiatry Unit** Fully funded by the National Health and
Medical Research Council, the Unit is the longest established of four such
centres set up by the Council during the past 10 years. Its function is to
carry out research in the area of social psychiatry and the epidemiology
of mental disorders and to provide a resource for advanced training and
consultation in this field. As such, the Unit’s principal interests are to examine the distribution of mental disorders in the population and to identify groups with conspicuously unmet service needs. Its two principal streams of work are the causes and natural history of neurosis and the epidemiology of mental disorders in later life. A continuing and associated interest is the connection between social support and relationship, and psychiatric disorders.

Centre for Mathematical Analysis The Centre is directed by Professor N.S. Trudinger, on secondment from the Department of Mathematics, Faculty of Science. Other ANU mathematicians involved in its activities include Professor R.P. Brent, seconded from the Department of Computer Science, Faculty of Science, since mid-1983, and Professor L.M. Simon of the Department of Mathematics, Research School of Physical Sciences. Dr F. De Hoog from CSIRO and Professor A.G. MacIntosh from Macquarie University are associate members of the Centre. The Centre’s research is primarily focused on the theory and application of partial differential equations and computational methods. Its members have been drawn from other Australian universities, on secondment or on outside studies programs, and from overseas. Since its foundation the Centre has produced important research ranging from the resolution of outstanding mathematical conjectures to the design of, and the computer simulation of, foundry castings.

Australian Meat Research Committee This research program has been funded solely by the Department of Primary Industry, through the Australian Meat Research Committee, since November 1979. The applied aspects centre on the development of methods for controlling the sex ratio of progeny in agricultural livestock. In the short term this will be achieved through in vitro sexing of embryos prior to implantation. In the longer term, the aim is to separate sperm prior to artificial insemination permitting control of progeny sex at the point of fertilisation. In the distant future it should be possible to alter the sex of embryos by gene transfer.

Agrigenetics Research Corporation Funding has continued for investigations into biological aspects of nitrogen fixation in leguminous and non-leguminous plants and for microbial associations connected with yield in crop plants. In 1985, work continued in the Department of Genetics, Research School of Biological Sciences on two projects concerned with the symbiotic relationships between Rhizobium bacteria and some leguminous plants and Rhizosphere bacteria with maize and sorghum crops and in the Department of Botany, Faculty of Science, Dr P.M. Gresshoff on isolating a nitrate-tolerant symbiotic mutant.
United Nations Fund for Population Activities  The International Population Dynamics Program (IPDP) provides technical assistance to countries of Asia and the Pacific. 1985 marked the sixth year of a United Nations Fund for Population Activities grant which allowed the ANU to assist the population program of Indonesia. This assistance took the form of long-term advisers to universities, scholarships for MA students at the ANU, collaborative research on the Indonesian family planning program, and help in the development of population policies and the design of population research projects.

In recognition of the University’s pre-eminent role in Indonesian population studies, the Ford Foundation made a three-year grant for the development of training and research programs aimed at formulating ways of reducing high rates of infant and child mortality in the region. The IPDP also continued to assist Brawijaya University in East Java in collaboration with the International Development Program of Australian Universities and Colleges.

National Energy Research Development and Demonstration Council  Dr J.N. Israelachvili, Department of Applied Mathematics, headed a team whose research into the properties of fluids has relevance to the extraction of the large amounts of oil which remain in the ground after conventional extraction methods. The project has been accepted as part of the Enhanced Oil Recovery program being undertaken by the International Energy Agency.

Institute of Advanced Studies  Peace Research Centre  In 1985 the Centre, which was established in 1984 under an agreement between the University and the Department of Foreign Affairs, had its first full year of operation.

The initial support staff posts were filled in 1984 and work proceeded on building up library and reference resources. In 1985 Mr A.J.R. Mack was appointed Head of the Centre. Mr Mack, formerly of the University’s Strategic and Defence Studies Centre, taught International Politics at Flinders University of South Australia from 1975 to 1984.

Two research positions have been filled. Visitors to the Centre have included Randall Forsberg, Director of the Institute for Defence and Disarmament Studies in Boston, and Sverre Lodgaard of the Stockholm Peace Research Institute. The first part of a two-part project on the history and practice of peace research, Peace Research in the 1980s, was published in 1985 while Mr Mack was still in the Strategic and Defence Studies Centre.

Mount Stromlo and Siding Spring Observatories (MSSO)  This is the last year in which the Mount Stromlo and Siding Spring Observatories will report as a department of the Research School of Physical Sciences. The
University Council has approved new administrative arrangements to take effect from 1 January 1986. The Observatories will continue to be associated with the Research School of Physical Sciences. The Director, MSSSO, will be a member of Faculty Board and members of the academic staff of the Observatories will remain members of Faculty, but the Observatories will in future report through a new body called the Advisers on Astronomy Policy. These new arrangements are designed to facilitate the management of the Observatories without diminishing academic and administrative co-operation with the Research School.

Special appointments as professor The Council has decided to make available a number of special appointments as professor within the next three years. The decision to appoint up to six professors in the Institute of Advanced Studies will allow the University to give recognition to especially distinguished members of staff. The appointments will be made from applicants already holding academic appointments and will lapse when the post is vacated.

Reviews No School reviews were carried out in 1985. Reviews were carried out of the Departments of Economic History, Economics and the Centre for Economic Policy Research, Law and the History of Ideas Unit in the Research School of Social Sciences; the Departments of Biochemistry, Physical Biochemistry and Microbiology in the John Curtin School of Medical Research; the Department of Theoretical Physics in the Research School of Physical Sciences; and there was a combined review of the Departments of Population Biology and Genetics, the Molecular Biology Unit, the Virus Ecology Research Group and the Centre for Recombinant DNA Research in the Research School of Biological Sciences.

The Faculties

Universities and Colleges Admissions Centre The Council has decided that from 1986 the University would participate along with 20 other NSW tertiary institutions in the NSW Universities and Colleges Admissions Centre (UCAC).

The Centre was established in its present form in 1979 and its purpose is to receive and process applications for the majority of first degree or diploma courses for the participating institutions. It operates as a clearing house for admission purposes but does not establish policy or set admission levels for institutions.

Membership of UCAC means that most applicants for 1986 entry to ANU undergraduate courses have had to nominate their ANU preference or preferences on the UCAC application form, which had to be submitted by 1 October 1985. The ANU will continue to distribute its own information material to schools in other states that are not covered by UCAC at present.
The visit of Comet Halley was closely watched by the University's Mount Stromlo and Siding Spring Observatories and many of the earliest pictures of the Comet came from the Uppsala Schmidt telescope at Siding Spring Mountain. This picture taken in November shows the Comet in the upper right-hand corner passing the Pleiades (Seven Sisters) cluster at 107 million kilometres from the Earth, and 253 million kilometres from the Sun.

Appointment procedures Procedures used for making academic appointments in The Faculties were reviewed. The University Council has approved statements of appointment procedures which set out clearly arrangements for the advertisement of posts, the appointment of selection committees, the selection of candidates and the approval of appointments for all levels of academic staff. The procedures take account of the University's policy on equal employment opportunity.

Reviews The Department of Philosophy in the Faculty of Arts and two departments in the Faculty of Science, Computer Science and Forestry, were reviewed in 1985.
Periodic reviews of academic staff  Following its consideration of the report of the Senate Standing Committee on Education and the Arts at the end of 1983, Council resolved, amongst other things, that there should be periodic reviews of tenured and tenurable members of the academic staff, annually in the case of the Institute, biennially in the case of The Faculties. The first reports, covering activities from 1981 to 1985 and plans for the next two years, were submitted to the Vice-Chancellor during 1985. Heads of Research Schools and Deans of Faculties have found the review process well worthwhile. The act of reporting has afforded the opportunity for critical self-evaluation: it can play an important part in staff development and enable heads of departments and Directors and Deans to monitor the academic work for which they bear responsibility. The reports showed that most members of the academic staff had records which displayed their commitment to high levels of performance. Some had outstanding records of which the University can be very proud. Council has confirmed its commitment to periodic reviews, stressing the emphasis on staff development.

Joint appointments  New procedures have been adopted to encourage joint appointments between the Institute of Advanced Studies and The Faculties. The procedures reflect the Council’s policy that the entire intellectual resources of the University should be available to all of its members. A joint appointment is a full-time appointment within the University in which duties are shared in an agreed proportion across two departments. There is reason to believe that joint appointments will become increasingly common.

Fractional appointments  The University continues to support the principle of flexible working arrangements and the Council has adopted a policy to accommodate members of the academic staff who wish to change their working arrangements to fractional appointments. These arrangements provide for tenured superannuated fractional appointments for members of the academic staff.

Termination of academic appointment  The University Council has made a statute on termination of appointment. It embodies clearly defined procedures relating to the termination of the appointment of a member of academic staff on the grounds of misconduct, inadequate performance of duties or medical incapacity. Provisions for appeal are included.

Review of research resources  During the year the Vice-Chancellor appointed two small committees to review the current practices used in the management of research resources of both the Institute and The Faculties.
A large contingent of University academics gave papers at the 55th ANZAAS Festival of Science at Monash University. Professor G.L. Ada, Head of the Department of Microbiology, JCSMR, was interviewed for ABC national television after giving a paper to the session, Virus genes: practical uses.

Outside Studies Program

Since 1979, the University has operated a program of outside studies for academic staff. The program is the successor to the study leave arrangements that had operated, in common with all Australian universities, in the University since its establishment in 1946.

In making its recommendations on study leave to the Commonwealth Government in 1979, the Commonwealth Tertiary Education Commission stated that there were two basic institutional requirements served by the system of study leave:

- the need of members of the academic staff to have the opportunity periodically to carry out sustained research and scholarly activity free from teaching and routine administrative duties; and
• the need for some members of academic staff to work overseas in order to keep abreast of developments or to utilise research facilities or resource material not available in Australia.

The Commission’s recommendations related to the total amount of time in any year spent by academic staff on programs; the criteria for approval of programs; the length of individual programs; the location of individual programs; accountability (i.e. reports from individuals on programs undertaken). Subsequently, the Government indicated that it would expect universities to conform with the Commission’s recommendations.

The Commission indicated that the amount of time spent in total in any year should 'not exceed seven per cent of the available academic staff time; that for an individual the length of any one program should not normally exceed six months; institutions should take account of the increased availability of appropriate facilities in Australia for advanced work; institutions should publish annually information on the operations of their outside studies programs'.

The University believes that appropriate outside studies programs are of great importance to the academic health of the University and, for this reason, extended the scheme in 1984 to include the small number of non-tenured staff whose appointments run for at least seven years. As will be evident from the figures that are given below, outside studies programs, as they relate to the individuals and to the University as a whole, are operated within the bounds of the Commission’s recommendations, apart from that relating to location.

The University requires all staff seeking approval for outside studies programs to submit for approval details of the program and to report to the University on the results achieved. The proportion of members of staff taking programs within Australia remains small. The University believes that overseas study and research are essential for its scholars and researchers to remain at the forefront of their disciplines; the University must maintain its high standing in the world of international scholarship and research.

The following summarises major features of 1985 programs compared with 1984.

<table>
<thead>
<tr>
<th></th>
<th>1984</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number participating</td>
<td>154</td>
<td>151</td>
</tr>
<tr>
<td><strong>Program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primarily research</td>
<td>84</td>
<td>57</td>
</tr>
<tr>
<td>primarily visiting institutions/consulting/teaching</td>
<td>70</td>
<td>94</td>
</tr>
<tr>
<td><strong>Length of program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 weeks or less</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>13 to 24 weeks</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>25 to 36 weeks</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>37 to 52 weeks</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All or principally within Australia</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>All or principally overseas</td>
<td>146</td>
<td>143</td>
</tr>
</tbody>
</table>
The total time in years approved for outside studies programs by members of the academic staff during 1985 was 36.8 compared with 40.44 in 1984. In relation to 1985 this represented 4.4 per cent of the total time of all members of the academic staff of lecturer and above. This percentage is well within the Commission’s guidelines of 7 per cent.

Of the 151 staff taking outside studies in 1985, 103 received some measure of financial assistance. The average grant for those receiving assistance was $2426 compared with $2433 in 1984.

Other major matters

Freedom of information  The University continued its long-standing practice in giving public access to many categories of its documents without requiring adherence to some of the formalities prescribed in the legislation.

During 1985 the University handled 34 requests for access to documents under the Freedom of Information Act 1982. Ten of these were carried over from 1984, including seven requests with the first decision pending and three under external appeal, one of which was the finalisation of an interim decision reported last year. Of the 34 requests seven were from students, 15 from academic staff, five from general staff and seven from the public.

At the end of the year access had been granted in full in 15 cases, granted in part in seven, refused in two, documents did not exist in two, one was withdrawn, three have decisions pending and four went to the Administrative Appeals Tribunal.

The following are details in respect of the four decisions against which appeals had been lodged with the Administrative Appeals Tribunal.

In connection with one request where the confidentiality of Council’s deliberations was at issue a Conclusive Certificate had been issued by the Vice-Chancellor under sub-section 36(3) of the Freedom of Information Act 1982. Following inspection of the relevant documents under sub-section 58E(2) of the Act the Tribunal affirmed the University’s decision under review and found that there was a public interest in non-disclosure of debate and deliberation at Council meetings except to the extent determined by the Council.

In dealing with the second case the Tribunal affirmed the University’s claim for the exemption of examination reports under section 45 and of external referees’ reports relating to an applicant under paragraph 40(1)(d) of the Act, thereby affirming a substantial portion of the University’s decision.

During the year the Tribunal has ordered the removal of two other appeals from its hearing list as the parties came to an agreement in respect of disclosure. In one case the agreement took place in 1984, in the other in 1985.
Naming of buildings  The Arts III building was named after Emeritus Professor L.F. Crisp, Professor of Political Science in the Faculty of Arts from 1950 to 1977, who died in December 1984. It is now known as the L.F. Crisp Building.

Council has now decided to name the special projects building, being constructed in the vicinity of Melville Hall, the J.G. Crawford Building. Work began in June on the building which is the first major academic building construction at the University in ten years. Sir John Crawford was responsible for the establishment of the Australia–Japan Research Centre and was a strong supporter of the creation and expansion of the Development Studies Centre (now known as the National Centre for Development Studies). He was also keenly interested in, and supportive of, the Public Policy Program. It seemed especially appropriate that this building should bear his name.

The building will house the Australia–Japan Research Centre, the National Centre for Development Studies, the Graduate Program in Public Policy and the Department of Computer Science. The building is being funded from the University's balances and the building fund, set up by Council in 1984, into which interest from certain long-term securities is being paid. A substantial portion of the cost of the building will be covered by rental charges.

This action has presented the opportunity to rename what had been the Life Sciences Library Building. In 1982 Council had approved that the Life Sciences Library Building be renamed the J.G. Crawford Building after the then Chancellor, Emeritus Professor Sir John Crawford. This building presently accommodates a substantial section of the Library, the Centre for Resource and Environmental Studies and the faculty office of the Faculty of Science. Council decided that this building should henceforth be known as the W.K. Hancock Building. The distinguished historian, Emeritus Professor Sir Keith Hancock, was one of the founders of the University and first Director of the Research School of Social Sciences. Sir Keith joined the University in 1956 and retired in 1965.

Administrative information systems  Since early 1984, considerable effort and resources have been devoted to upgrading and modernising the administrative information systems of the University. Good progress has been made but it may well take another one or two years before the process nears completion. The administrative systems include all the undergraduate and graduate student records, accounting and financial information, budgets, purchasing and stores information, personnel and payroll records, and asset registers, as well as a range of minor systems (telephone directory, convocation rolls, housing, etc.). The modernisation of the accounting system involves not only the University's main ledger system but also trading activities, restricted funds and investment activities. The quality of the University's administrative information
systems has lagged over the last decade or so. In March the University engaged the services of Professor Athol Carrington, who had recently retired from the post of Pro-Vice-Chancellor at the University of New South Wales, as a consultant to advise the University on the upgrading of its administrative systems.

The major recommendations which have been adopted were that the structure of administrative computing should be reorganised so that an integrated system under a single head should be established, and administrative computing should be separated physically from academic computing. A new Division of Information Systems under the control of the Treasurer will be established early in 1986 and will be formed by drawing together existing staff concerned with administrative computing.
from the Finance and Accounting Division, Secretary's Division and the Computer Services Centre. Project teams comprising systems development and applications programming staff will be formed for each of the major systems areas.

Repetition strain injury (RSI) In the 1984 Report it was reported that there had been a considerable increase in the number of staff with RSI in the University. The number of new workers' compensation claims relating to RSI dropped by 41 per cent in 1985 compared with 1984. However the financial impact of earlier claims in terms of increased insurance premiums was being felt in 1985. A substantial increase in premiums is in turn expected in 1986.

The University continued with measures mentioned in 1984 directed toward reducing the incidence of RSI. These measures are costly and this, together with the increased premiums, has put considerable strain on the University's budgets.

The trends of heavy occupancy and the demand for self-catering accommodation which appeared in 1984 continued in 1985. The waiting lists for undergraduates were much shorter than those for 1984, except for Burton and Garran Hall. In fact, by the end of the year there were some vacancies in most of the fully-catered residences. The demand for accommodation by graduate students was again very high with long waiting lists for both Graduate House and University House. The University was heartened by the response to the request made in late February for private accommodation for students.

From the beginning of 1985 kitchen accommodation was available to all 521 residents of Burton and Garran Hall following the completion of additional kitchen accommodation for 120 students.

One of the recommendations of the Toad Hall Review Committee which reported to Council in December 1984 was that the Hall should participate fully in the centralised student accommodation system. This happened in 1985 and greatly facilitated the allocation of places to students.

Since the establishment of the Australian Institute of Sport assistance has been sought from the University's affiliated colleges and halls of residence each year in the accommodation of some of its students. The accommodation required has been full board and in 1985 Burgmann College accommodated 24 and John XXIII College 70 Institute students. The Institute now has its own residences and will therefore no longer be seeking assistance from the affiliated colleges. However the University residences continued to provide some places for students from the Canberra College of Advanced Education and the Schools of Music and Art.
The range of accommodation available for students was increased when Burton and Garran Hall extended the kitchen facilities to allow for more self-catering style of accommodation. All 521 residents of the Hall now have access to self-catering kitchens. The halls and colleges offer a mixture of self-catering and fully-catered accommodation.

### Student residential accommodation — 1985 compared with 1984*

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<tbody>
<tr>
<td>Full board</td>
<td>952</td>
<td>943</td>
<td>782</td>
<td>737</td>
<td>162</td>
<td>188</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Self-catering</td>
<td>1078</td>
<td>1074</td>
<td>1025</td>
<td>1033</td>
<td>41</td>
<td>38</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>2030</td>
<td>2016</td>
<td>1807</td>
<td>1770</td>
<td>203</td>
<td>226</td>
<td>20</td>
<td>21</td>
</tr>
</tbody>
</table>

*At 31 May 1985 and 31 May 1984

**Amenities and services**

For most students the rigours of keeping pace with very demanding academic programs do not prevent them from participating in and enjoying the services and amenities of a non-academic kind available in the University. There are many such services and amenities. Some are provided by or supported by the University, others are provided more informally by students themselves with or without direct University support.

The activities of the most important of the organisations providing amenities and services are commented on in the following paragraphs.
Each of these organisations receive grants annually from a General Services Fee levied by the University on each enrolled student.

**Australian National University Research Students' Association Inc.**

Supervision of graduate students was a major topic of discussion for the Research Students’ Association (RSA) in 1985. The RSA welcomed the moves on the part of the University to appoint panels of supervisors (rather than just one) for PhD candidates and to publish a statement of the powers and duties of supervisors. A successful supervision forum was held at which a number of problem areas were discussed.

The Research Students’ Association continued to provide information and assistance to graduates on a whole range of matters through its Executive Officer and there was a strengthening of this part-time position. Communication with graduates was also improved with an upgrading in the style of the monthly newsletter.

In maintaining its high standard of student representation the Research Students’ Association has attempted to organise a graduate representative in every department of the University. This has been successful and has helped with disseminating information and in channelling reports of problems back to the RSA Executive.

**Australian National University Union**  The Union Board of Management has achieved another good financial result for the Union. Continued prosperity will depend upon the level of attractiveness of its premises and the quality of its service. There has been a significant run-down of the building, equipment and facilities over the past decade or more; the state of disrepair is now such as to impair seriously the quality of the service and the efficiency of the management.

It will not be possible for the Union to refurbish the building and replace equipment from its own accumulated funds, and unfortunately the level of annual surplus is limited by considerations of value for its members, most of whom are impecunious students.

A great deal of planning has been done this year with a view to achieving a large amount of refurbishing and replacement in 1986 but it will be necessary to borrow money for this purpose and to approach the work in stages.

**Australian National University Sports Union**  The recent completion and commissioning of an addition to the Sports Union’s premises has provided greatly improved facilities for the sports and recreation program, comprising rooms for weight lifting, recreational activities and the martial arts. This has enabled programs in this area to be refined, expanded and tuned to the changing needs of the University’s sporting community.

The continued success of University sports clubs in the ACT competitions was most encouraging and a strong indication of the sporting commitment of the University community.
The testing of fitness levels has proven to be one of the most popular activities offered by the University Sports Union.

Participation in the sports and recreation program both by seriously-minded athletes and by the average Sports Union member has continued to increase particularly in the area of fitness training and exercise; this justifies the belief of the Sports Union that the level of participation by members of the University community in sport and recreation is dependent to a large degree on the provision of adequate facilities.

Australian National University Students' Association In 1985 there was an increase in co-operation between the ANU Students' Association and other post-secondary student organisations. In the ACT, joint work on accommodation continued, and in October a joint Campus Newsletter was
The Association was active in the NSW Education Action Network, to which it affiliated in 1984. With the other member student organisations of the Network, the Association participated in major campaigns against the introduction of tuition fees and increases in visa charges for overseas students. Student responses to the Federal Budget and the taxation debate were produced. In March the Association organised a rally and march to Parliament House, attended by 1500 students, to protest against increases in visa charges for overseas students and the possible reintroduction of tertiary fees.

In September the Association took part in the National Students Action and Lobbying trip in Canberra, which involved students from the ACT, NSW (through the Network), Victoria, South Australia and Western Australia. The trip involved many interviews with parliamentarians and others, to convey students’ current concerns, particularly in the areas of student financing, tuition fees and visa charges, access and participation in education for disadvantaged groups.

As usual, a large part of the Association’s energy was devoted to providing help, information and advice to individual students, particularly in relation to academic, financial and personal problems. One area of increasing concern was the incidence of RSI among students.

The Association continued to provide financial and administrative support and advice for the many student clubs and societies on campus.

General meetings of the Association throughout the year drew large numbers of students to discuss matters of importance. Among other things, the Association expressed its total opposition to tertiary fees and apartheid.

The Association organised and co-ordinated a very successful Orientation Week, as well as contributing to orientation activities specifically for overseas students.

Several student publications were produced, including an Orientation Handbook, a Counter Course Handbook, a Students’ Association Calendar, and 12 issues of the newspaper Woroni, in addition to the joint Campus Newsletter mentioned above.

ANUTECH Pty Ltd, a company wholly owned by the University, facilitates external undertakings executed by members of the University by promoting the application of discoveries and inventions and facilitating contract research. As well, ANUTECH provides a mechanism for the supply of goods and services by the University or by its members where these goods and services could not be more appropriately provided by other organisations. Its activities include capacity for the manufacture, sale or lease of specialised equipment where commercial development is unlikely as well as the provision of consulting services and the
Child care is one of the University's lesser-known activities. There are four child-care centres on campus which cater for the children of students and staff. A holiday program is also run for school-age children during school vacation. One of the child-care centres organises for care of children of all ages in private homes around the inner Canberra suburbs.

management of contracts executed by members of the University. It also arranges for distribution of departmental publications, licensing of computer software and management of proposals for the external support of research including the development of inventions and related licensing arrangements.

During 1985 ANUTECH was responsible for handling 213 projects, generating a turnover in excess of $6.6m. The company may not offer goods or services at rates which do not allow full cost recovery, solicit custom by general advertisement or buy or sell real estate. It is a member of the Australian Tertiary Institutions Consulting Companies Association.

Over recent years the University has been providing increasing support to research activities conducted with other research bodies such as CSIRO and other universities, both in Australia and overseas. With CSIRO, a program of joint funding introduced in 1982 enabled more than 40 collaborative ventures to be undertaken in 1985 — more than twice the number undertaken in the previous year. Also, in collaboration with the Australian Atomic Energy Commission, research continued on the engineering aspects of SYNROC — a synthetic mineral aggregate developed in the Research School of Earth Sciences for the safe disposal of nuclear wastes. Altogether there were about 240 individual research projects undertaken by ANU in collaboration with other research bodies and these are listed in the Appendices of this Report.
Banks' Florilegium  Mr R.W.B. Reid, a prominent businessman with a long association in Australian-Swedish trade, has made available to the University and to the University of Uppsala, Sweden, a full set of *Banks' Florilegium*, to be shared between the two universities.

*Banks' Florilegium* consists of 738 botanical engravings which record the plants collected by Joseph Banks and Daniel Carl Solander and drawn by Sydney Parkinson on Captain Cook's first voyage round the world, 1768-1771. The engravings are printed in colour for the first time from the original 18th-century copperplates. These historic plates, bequeathed by Sir Joseph Banks to the British Museum, are exceptionally fine examples of the engraver's art and depict some of the first plants to engage the scientific attention of European voyagers in the Pacific Ocean, including the very first plants of New Zealand and eastern Australia ever to be gathered and studied by Europeans. This will be the first complete edition published from the 738 surviving copperplates. The edition will be limited to 100 complete sets.

The full set of the *Florilegium* contains 34 parts. The first 15 parts, which have now been published, comprise 227 plates and relate to Australian flora. Parts 16-34 relate to the flora of other countries visited by Banks and Solander. Parts 16-18 became available in Australia in late 1985, and
the remaining parts are scheduled to be published progressively by March 1989. Parts 1–15 will be located at the University of Uppsala in the first instance and such of parts 16–34 as are published by 1987 will be located at the Australian National University. At the end of 1987, the universities will exchange their holdings and repeat the exchange at five-yearly intervals thereafter. The collection will be housed in the Rare Book Room in the W.K. Hancock Building of the University Library.

**Australian National Dictionary** The first manuscripts, representing sections A–D of the Australian National Dictionary, were handed over to the publishers, Oxford University Press (Australia), in July 1985.

The complete manuscript, some two million words, will be a dictionary compiled on historical principles. It will be the authoritative work on Australian English. The project, headed by Dr W.S. Ramson of the Department of English, Faculty of Arts, is due for completion in December 1986. By that time the project members will have read over 7000 books, all Australian newspapers up to 1850, selected major newspapers up to 1900 and many other publications.

**Exchange agreements** In May, the Vice-Chancellor attended the 80th anniversary of Fudan University in Shanghai, and signed a formal exchange agreement between Fudan University and the Australian National University.

A delegation from the Institute of Oriental Studies of the USSR Academy of Sciences visited the University in October for the purpose of signing a protocol on academic co-operation between the Institute and the University. An informal exchange understanding has operated between the two institutions since 1974 and has been of great benefit to scholars of the Institute and the University.

**Menzies Lecture Series** During the year the Sir Robert Menzies Memorial Trust and the University announced the establishment of an annual Menzies Lecture Series. The lectures will be given at the Law Schools of the University of Virginia and the ANU in alternate years. Sir Anthony Mason, a Justice of the High Court of Australia and former Pro-Chancellor of the ANU, visited the University of Virginia in October 1985 to inaugurate the lectures. The lectures are held in honour of Sir Robert Menzies to mark his contribution to the law and public life. They also continue and consolidate the link already existing between the two law schools. The subject matter of the lectures will centre upon legal issues of common interest to the United States and Australia. Federation, constitutional law and administrative law will be dealt with and the ambit of the lectures is expected to extend to international law issues. The second lecturer in the series will be a leading American jurist who will visit Australia in 1986.
ANU and the Australian National Gallery  An agreement between the University and the Australian National Gallery has seen extensive alterations to the old Kingsley Street Drill Hall at the northern end of the site. The refurbished hall has been re-opened as the University Drill Hall Gallery, a gallery for use by the Australian National Gallery to hold changing exhibitions of contemporary art. For many years the Australian National Gallery has held many successful exhibitions in Melville Hall but under the restrictions of examinations and other events.

The Gallery contains a University Exhibition Room and a number of exhibitions have been held there showing works from the ANU’s own extensive art collection.

Questacon  The University continued its support and development of this ‘hands-on’ science exhibition which opened in 1980. The Centre attracted more than 20,000 school children in 1985. Among the distinguished visitors during the year was His Royal Highness Prince Charles the Prince of Wales. The 150,000th visitor passed through the doors early in 1985. The Questacon opens for restricted hours only. In 1985 the Questacon ‘Science Circus’, a travelling component of some of the exhibits, visited Wagga Wagga and Goulburn. The ‘Science Circus’ also performed at the 1985 ANZAAS Festival of Science at Monash University and the Expo/Open Day at the University of Wollongong.

In the five years since its inception, Questacon has grown almost beyond its capabilities, demonstrating the need for a comprehensive National Science Centre which it is hoped will be developed in the near future.

Assistance to outside institutions  The University encourages staff members to give specialist advice and assistance to outside institutions. The names of these staff members and the projects in which they are involved are listed in the Appendices. Several instances are worthy of note: Professor L. Zines, Dean, Faculty of Law, has been appointed to serve as a member of the Constitutional Commission; Professor D.A. Aitkin, Department of Political Science, Research School of Social Sciences, has been appointed part-time chairman of the Australian Research Grants Committee; Dr D.S. Anderson, Professorial Fellow, Department of Sociology, Research School of Social Sciences, has been appointed part-time chairman of the ACT Schools Authority; Mr Paul Dibb, Senior Research Fellow, Strategic and Defence Studies Centre, has been appointed as a consultant to the Government for 12 months to undertake a major review of Australia’s defence capabilities; Dr R.G. Garnaut, Senior Fellow, Department of Economics, Research School of Pacific Studies, was appointed as Australia’s Ambassador to the People’s Republic of China. Dr Garnaut joined the Prime Minister’s office in 1983 on secondment from the University as Senior Economic Adviser; Dr R.G. Gregory, Professorial Fellow, Department of Economics, Research School of Social Sciences, has been appointed to the Reserve Bank Board. The Quality of Education
Among the visitors to the University's 'hands-on' science centre, Questacon, was His Royal Highness Prince Charles, the Prince of Wales. Questacon 'explainer', Stuart Kohlhagen, an ANU PhD student, explains one of the exhibits to the Prince.

Review Committee, headed by the Vice-Chancellor, Professor P.H. Karmel, reported to the government in April on strategies for the Commonwealth Government for raising the standards attained by primary and secondary school students in communication, literacy and numeracy and for improving the relationship between secondary schooling and subsequent employment and education.

Outside appointments  A number of distinguished academics achieved notable outside appointments. Dr T.B. Millar, Professorial Fellow in the Department of International Relations, Research School of Pacific Studies, has been appointed Professor of Australian Studies and Head of the Australian Studies Centre at the University of London for a three-year term. Professor W.M. Corden, Professor of Economics, Research School of Pacific Studies, has been appointed to the Chair of Australian Studies at Harvard for one year. Professor L.W. Nichol, Professor of Physical Biochemistry and Chairman of the Board of the Institute of Advanced Studies, has left the University to take up the Vice-Chancellorship of the University of New England. Dr C. Duke, founding Director of the Centre for Continuing Education, resigned to take up the foundation Chair of Continuing Adult Education at Warwick University in England. Dr F.J. Allen, Fellow in Prehistory, Research School of Pacific Studies, left to take
up the Chair of Prehistory at La Trobe University. Dr J.S. Deeble, Senior Research Fellow in the NHMRC Health Economics Research Unit, resigned in April to become Director of the Australian Institute of Health. Dr R.A. Jarvis, Reader in the Department of Computer Science, Faculty of Science, took up the Chair of Electrical Engineering [Computer Systems Engineering] at Monash University. Dr J.L. Warhurst, Research Fellow in Political Science, Research School of Social Sciences, was appointed as Professor of Politics at the University of New England.

University appointments  A number of senior appointments were filled during the year. Professor P.F. Bourke took up duty as Director of the Research School of Social Sciences in succession to Professor G.M. Neutze; Dr R.V. Dubs as Registrar to fill the vacancy left by the retirement of Mr G.E. Dicker in 1984; and Professor J.W. White as Professor of Theoretical and Physical Chemistry in the Research School of Chemistry. Mr A.J.R. Mack was appointed Senior Research Fellow and Head of the Peace Research Centre.

The Chancellor, Sir Richard Blackburn, was re-appointed for a further two-year term from April 1986.

A number of new appointments were made to the University Council during 1985 including student representatives Mr G.D. Phillips, Mr N.G. McFarlane and Mr S.M.G. Hughes. Also appointed were Professor R.G. Ward, Professor K. Lambeck and Mr S.S. Schaetzel.
Visitors to the University  Large numbers of people visit Canberra annually and many make their way around the University campus unaccompanied. In 1985 over 50 tours were organised by the University for schools, overseas dignitaries and others. More than 700 students from the ACT, New South Wales and Victorian high schools attended the annual Information Day in June to introduce them to the idea of studying at ANU. The John Curtin School of Medical Research Open Days in September attracted many school children among the 8000 visitors.

Public lectures and conferences  A full program of public lectures was organised during the year and most were well attended by members of the public as well as members of the University.

Convocation  Convocation luncheons and lunch-time debates continued to be popular.

Media liaison  Each year the University receives a large number of requests from the local and overseas media for comment on current affairs and social and scientific matters. In 1985 the University provided contacts and briefings for many overseas journalists whose visits were arranged through the Australian Information Service Visiting Journalists Program.

Personal  The death of Emeritus Professor L.F. (Fin) Crisp in December 1984 marked the end of a 35-year old association with the University. Immediately before taking up his appointment to the Foundation Chair of Political Science in the Canberra University College on 1 January 1950, Professor Crisp was Director-General of Post-War Reconstruction. For several years he was Deputy Chairman of the Board of Studies and a member of the Council of the Canberra University College. He was also a member of the Interim Council and the Council of the Australian National University and Head of the Department of Political Science in the Faculty of Arts. Professor Crisp retired from the service of the University in 1977 but maintained his association with it as a Visiting Fellow in the Faculty of Arts.

Professor Hedley Norman Bull, Professor of International Relations in the Research School of Pacific Studies from 1967 to 1977, died at Oxford in May. In 1967, Professor Bull, a graduate of the University of Sydney and the University of Oxford, took up a chair in the Department of International Relations, Research School of Pacific Studies. He served as Research Chairman of the Australian Institute of International Affairs. In 1977 he was appointed Montague Burton Professor of International Relations and a Fellow of Balliol College at the University of Oxford.

In January Dr William Paul Bellingham, Senior Lecturer in the Department of Psychology, Faculty of Science, died. Dr Bellingham was appointed Lecturer in Psychology in 1969 and was promoted to Senior Lecturer in 1976.
Honours An honorary degree was conferred by the University in September on Sir Zelman Cowen (Doctor of Laws), former Governor-General and presently Provost of Oriel College at the University of Oxford.

During the year many University members received honours. They included:

Professor G.L. Ada, John Curtin School of Medical Research, Chairman of the Scientific Advisory Group of Experts of the World Health Organization.
To mark its 75th anniversary the University of Queensland conferred honorary degrees on a number of prominent Australians. Among them was the Vice-Chancellor, Emeritus Professor P.H. Karmel, who received a Doctor of Laws honoris causa for his contribution to higher education in Australia.

Professor A. Alfonso, Faculty of Asian Studies, the Order of the Rising Sun, third class, from the Emperor of Japan.

Dr M.A. Collins, Research School of Chemistry, the Rennie Medal of the Royal Australian Chemical Institute.

Professor H. Hughes, National Centre for Development Studies, Research School of Pacific Studies, the 1985 Boyer Lecturer for the Australian Broadcasting Commission.

Professor K.S. Inglis, Research School of Social Sciences, the Ernest Scott Prize of the University of Melbourne.

Emeritus Professor P.H. Karmel, Vice-Chancellor, a Doctor of Laws honoris causa from the University of Queensland.

Professor O.O.G. MacDonagh, Research School of Social Sciences, shared the Christopher Ewart Biggs Memorial Prize for 1985.

Dr R.M. Pashley, Faculty of Science, the 1985 Pawsey Medal.
Professor A.E. Ringwood, Research School of Earth Sciences, the Royal Society of Victoria Research Medal for 1984.
Professor S.R. Taylor, Research School of Earth Sciences, the Owen Award from Indiana State University.
Dr D.E. Yen, Research School of Pacific Studies, Foreign Associate to the US National Academy of Science.
Professor D.S. Walker, Research School of Pacific Studies, Fellow of the Royal Society of London.

Three members were elected Fellows of the Academy of Social Sciences in Australia. They were: Professor J.A.W. Forge (Arts), Professor H.G. Brennan (Economics and Commerce), and Professor H. Hughes (RSPacS).
Professor A.W. Snyder, Research School of Physical Sciences, was elected a Fellow of the Australian Academy of Science and was awarded the 1985 Lyle Medal of the Academy.

Two members were elected as Fellows of the Australian Academy of the Humanities. They were: Dr R.R.C. de Crespigny and Dr J.T.F. Jordens, both of the Faculty of Asian Studies.

Two members of staff were elected as Fellows of the Australian Academy of Technological Sciences. They were: Professor D.S. Mathewson and Dr J.B. Moore, Research School of Physical Sciences.

Other members of staff were awarded Australian honours: Professor H. Hughes, Research School of Pacific Studies (Officer of the Order of Australia), and Dr P.D. Drysdale, Research School of Pacific Studies (Member of the Order of Australia).

Several former staff members also received honours. They were: Emeritus Professor D.P. Craig, Research School of Chemistry (Officer of the Order of Australia), Emeritus Professor G. Sawyer, Research School of Social Sciences (Officer of the Order of Australia), and Miss M.G.C. Bouquet, Assistant Registrar (Academic Staffing), (Medal of the Order of Australia).
The Research School of Biological Sciences (RSBS) aims to address a selected range of key topics in biological research to advance the understanding of the structure and function of living organisms. Not only is such knowledge basic to the understanding of life on earth, but it can contribute to human welfare and our capacity to cohabit with, and benefit from, other organisms.

The School is one of the smaller and younger research schools in the University. Its activity is concentrated in six departments which are, in turn, grouped into three main areas of biological research — the plant sciences, the neuro-sciences and genetics. Work in this latter area was reviewed this year. The resultant report recommended an enhancement of research in molecular genetics and in the use of molecular methods in the work of other departments. In the process two departments and two independent units will be reconstructed into a Department of Molecular Biology and a Department of Evolutionary Biology.

Several features of the School's research warrant special mention in this year's report. One concerns the increase in international linkages, of which those with China have been particularly noteworthy. There has been a steady rise in the number of students undertaking graduate courses, notably in vertebrate neurobiology and biological nitrogen fixation in plants. The number and integration of collaborative research projects has also increased. The year saw the commencement of a three-year program, supported by the Australian Centre for International Agricultural Research (ACIAR), with the Fujien Academy of Agricultural Sciences to develop molecular probes to help study the fern *Azolla*. *Azolla* naturally fixes nitrogen and can be used in rice cultivation as a natural fertiliser. This work has application to rice productivity throughout South-East Asia and other tropical areas. Another project (also supported by ACIAR) has been developed with the South China Institute of Botany and the Rice Research Institute in Canton to study the chilling sensitivity of rice.

The University has a tradition of excellence in vision research, to which the Departments of Neurobiology and Behavioural Biology have made major contributions. Amongst important developments this year was the discovery by one of the former department's PhD students of an enzyme which, for a decade, researchers had inferred was necessary for light perception, but which had proved elusive. Using a technique which combined biochemical analysis with electron microscopy, the enzyme was identified in visual cells for the first time. The enzyme is phosphoprotein phosphatase. This discovery advances the understanding of vision, and
had wider relevance since similar enzymes allow other cells to control their growth and to communicate. The application of cytochemical techniques such as used here offers considerable promises for other cell systems.

Another highlight of 1985 has been the isolation by researchers in the Department of Population Biology of a large number of clones in *Drosophila melanogaster* which are near to and within genes involved in nerve connectivity, muscle development and early embryogenesis.

This research involved collaborative efforts of laboratories in the USA, West Germany, Japan, the Netherlands and Australia and was assisted by funding as a new initiative. The RSBS group has acted as a focus for a number of laboratories, each concerned with different aspects of the overall problem. One of the most promising aspects of this work is that some of the genetic factors developed for *Drosophila* may be useful for the study of animal development and brain function in general. It should now be possible, using these clones, to approach the detailed analysis of the building blocks used by most organisms to construct their nervous systems and interpret their embryological blueprints.

There is an increasing interest in RSBS building up the level of cooperation in teaching and research with other sections of the University. Although there has been active research co-operation for many years and although RSBS staff have participated in The Faculties teaching program, the establishment of honours courses is a recent development. The first of these courses to be offered was in neuroscience. The course, mounted in conjunction with the Department of Biochemistry in the Faculty of Science has been offered each year since 1983. This year the School, together with the Department of Zoology, has planned an honours course in cell biology. This course will concentrate on recent developments in biology which have focused on the cell as the central unit in organisation in living systems.

The main function of the Research School of Chemistry (RSC) is to carry out fundamental research into selected aspects of chemistry. There are presently 16 autonomous research groups, eight of which are devoted primarily to the discovery of new and interesting molecules by synthesis or by isolation from natural sources. Of the remaining groups, four are concerned mainly with determining the way that matter is structured, two with the way that molecules interact with electromagnetic radiation and two with various aspects of theory.

Two new research groups were established in 1985, while the appointment of Dr A.C. McLaren as a Professorial Fellow in the new Mineralogy Research Centre (a joint development with the Research School of Earth Sciences) has added important strengths to this new venture. One of the new groups is headed by Professor J.W. White whose...
main interests are in the chemical physics of low dimensional phenomena, including the synthesis, computer simulation, structure and spectroscopy of thin films, molecular metals, and intercalation compounds with unusual physical and chemical properties. The other group is led by Dr L.R. Brown who plans to study the structure and motions of macromolecules, including small proteins, polysaccharides and other biologically important molecules.

Dr Brown will also head a new service unit, the University Nuclear Magnetic Resonance Centre. This unit has been created under the umbrella of the Research School of Chemistry to provide facilities and expertise in the burgeoning technique of nuclear magnetic resonance to the University as a whole. The unit is presently equipped with a Bruker CXP 200 wide bore spectrometer, and Varian XLE 200 and XL 300 (wide bore) instruments. The construction of a fourth and much more powerful spectrometer, a Varian VXR 500 has been completed in Palo Alto, California, and will be shipped to Canberra in April 1986. An ADS 4000 data station has also been installed and software has been developed which will allow users to transfer data processing to any of the VAX computers on the campus, thereby ensuring that valuable spectrometer time may be reserved mainly for data acquisition.

The establishment of the new NMR facility is expected to have an especially important impact on biological research at the University and is an essential element of the School's developing interests in biological chemistry. The importance of the new technique is illustrated by the first-ever elucidation of the mechanism and local three-dimensional structure of the transport pathway in a membrane protein. The particular enzyme under study effects the transfer of chloride and bicarbonate ions across red blood cell membranes as part of the carbon dioxide transport in blood, but because it cannot be crystallised, more traditional methods based on X-ray crystallography are ineffective.

In the more established research areas, the synthetic chemistry groups have continued to produce a range of new and promising compounds. A series of molecules in which rare earth ions have been encapsulated in a cage composed of carbon, nitrogen and hydrogen atoms has afforded new photo-active systems and potential imaging agents for organs in intact biological systems. In the plant growth area a more efficient synthesis of a semi-synthetic gibberellin plant hormone has been developed which promises to overcome the problem of 'biennial bearing' (heavy crops alternating with light crops) which occurs in many woody angiosperms, including apple, apricot, coffee, and several species of citrus; isotopic labelling studies have elucidated the pathway by which plants biosynthesise the important cytokinin plant hormone zeatin. A new diacetylene polymer has been prepared which may have important applications in the area of photoconductors and microlithography.

The molecule benzyne, otherwise known as 1,2-dehydrobenzene, C₆H₄,
has been recognised by organic chemists for about 30 years as a transient species which is an important intermediate in certain substitution reactions of aromatic halides. Much less is known about the even more highly unsaturated species 1,2,4,5-didehydrobenzene, C₆H₂. It has now been found that both compounds can be trapped in the form of nickel complexes which are stable at room temperature. Preliminary indications are that the complexes, although stable, react readily with many simple molecules, so they should be extremely useful in organic synthesis.

One of the most exciting new approaches for the construction of complex organic molecules in recent years has been based on 'free radical' cyclisations. A new general method for determining the rates of such reactions has been found and computational methods have been combined in a novel way to provide reliable predictions concerning the products.

The scientific objectives of the Research School of Earth Sciences (RSES) can be summarised as the determination of the structure of the Earth and its evolution through time. How did the Earth form? How did it evolve to its present state? What have been and what are the interactions between the solid Earth, oceans, atmosphere and groundwater? The simple, all encompassing, objective quickly becomes a complex set of more specific, often technique related, goals. Thus the geophysicist uses the methods of seismology to map the structure of the crust, mantle and core. Laboratory physicists measure the physical properties of rocks in order to interpret the seismic measurements and to comprehend the response of the planet to forces arising from within. Geochemists analyse the chemistry and mineralogy of rock that have found their way to the surface and they experiment with these rocks under the very high pressures and temperatures that are characteristic of the Earth's interior. The geochronologists establish the time scale for the tectonic and geological processes that have shaped the Earth's surface.

The crust represents only a small part of the whole of the Earth yet many of the School's research programs are directed at this part of the planet. There are good reasons for this, for the crust is both a store-house of the Earth's resources and a library of the planet's history. The work reported in 1983 on the oldest crustal material, the 4.2 billion-year old zircons from Western Australia has been confirmed with the discovery of yet older material, nearly 4.3 billion years old. The metamorphic belts of Central Australia are being examined using different chemical and dating techniques to assist in understanding the tectonic history of this region. Xenoliths of deep crustal origin, brought to the surface in volcanic pipes, are being studied to examine the properties and evolution of the lower crust. Seamounts of the Tasman Sea have been dredged, in a joint experiment with CSIRO and the University of Tasmania, to study the
formation of these submarine volcanoes. Deformation experiments in the laboratory are being conducted on crustal materials to determine how the crust responds to forces.

The chemistry, geochronology, tectonic processes and physical properties of the crust are relevant to the study of the mineral resources of the Earth. The tectonic processes that shape the crust also provide the environment for minerals to mobilise and concentrate in economically viable deposits. The whys and wherefores of the mobilisation, transport and concentration are the subject matter for the new ore-genesis group whose leader, Dr I. Campbell, took up his position in August 1985. The work by Dr Campbell and Professor Turner of the geophysical fluid dynamics group, the processes leading to ore deposits in magma chambers and the formation of massive sulphide deposits on the sea floor, is one of several new starts in ore genesis research in the School. Another new start is in the application of samarium-neodymium isotope ratios to the study of ore-forming processes leading to uranium and base metal massive sulphide deposits.

The environmental geochemistry group examines the interactions between hydrosphere, atmosphere and crust. Water circulation through the crust plays an important role in mineralisation. It also leaves a record in dry lake beds of past climates and hydrological conditions. A potentially important and recent development is the study of the strontium and magnesium content of microcrustaceans known as ostracods for the concentration of these elements relate to the salinity and temperature of the water in which they lived. They are, therefore, indicators of past environmental change on time scales as short as a few hundred years and these creatures may help in distinguishing between natural and man-made factors in environmental change.

What can be learnt from the way the Earth works? To what use can this information be put? One example is the immobilisation of nuclear waste in a stable material, SYNROC, that is modelled after the terrestrial materials in which the naturally occurring radioactive elements were located in the first place. The ANU and the Australian Atomic Energy Commission are collaborating in the design and construction of a demonstration plant for the production of SYNROC containing simulated non-radioactive high-level wastes. The School’s work has also led to formalised bilateral agreements with nuclear energy authorities in Britain, Japan and Italy to lead to tests of SYNROC containing fully radioactive high-level wastes. Another example is the application of the high pressure–high temperature pressing methods developed in the experimental petrology group to improve upon the quality of certain metals or minerals, in particular the conversion of low quality industrial-grade diamonds into monolithic diamond composites. Professor Ringwood and his colleagues have succeeded in converting 10–80 micron diamond feedstock into composites weighing up to 8 carats and which exhibit compressive
strengths that are similar to tungsten carbide but which are much harder, and are suitable for use in drilling and cutting of rocks, ceramics and other hard materials. Further research and developments of these composites is being carried out jointly with a major Australian company.

The School is small in size both when compared with the other Schools in the Institute and with Earth Sciences Institutes elsewhere in the world. Research in many important areas of geology, oceanography, and atmospheric science cannot be attempted, a limitation that is partly overcome by a close co-operation with scientists from other Australian and overseas institutions. This co-operation is reflected in the fact that nearly 50 per cent of publications are co-authored with scientists outside the ANU. There is no other Earth Science Institution within Australia that has the same experimental facilities and expertise and, in recognition of this, these facilities are made available, selectively, to outside users from universities, government institutions and industry.

John Curtin School of Medical Research

During 1985 considerable further progress has been made by the School in its work aimed at the accumulation of the knowledge that is essential for an understanding of human function and disease. It is on the basis of this knowledge that advances in medical care will occur in the future, and that preventive measures will be defined that will eliminate the causes of some of the illnesses of mankind. Because of the nature of scientific research which explores the unknown, the results of experimental science cannot necessarily be predicted in advance and the use, to which knowledge obtained as a result of experiment will be put, cannot be stated with certainty. Work in the John Curtin School of Medical Research [JCSMR] has traditionally been laboratory-based. It is appropriate that it still covers a broad range of scientific disciplines from biochemistry to clinical care and that attempts are made to integrate the fundamental scientific activities of virologists and immunologists, for example, with the work of those who are studying patients suffering from disease. All the studies in the School are oriented to problems of understanding, preventing or treating diseases which affect human subjects.

Increasingly in 1985 the School has attempted to respond to pressures from Government and the community at large to seek ways in which the scientific observations made as a result of research can be drawn more directly to the attention of those who can use the science to develop diagnostic or therapeutic approaches which could be of commercial and industrial significance as well as of benefit to the community. Interactions between University staff and a number of industrial companies have been facilitated and a number of items of the School's work are now subject to exploitation by Australian organisations.

A few examples of the School's scientific achievements are set out below.
The molecular biology of energy transformation: A novel theory of the mechanism of action of the energy transducing triphosphatase (ATPase) of the bacterium *Escherichia coli* was proposed during the year. Site-directed mutagenesis experiments (i.e. the purposeful interference with the genetic code so that a protein altered in just one defined amino-acid is produced) were used to test the theory. These experiments led to a re-examination of the role of one of the sub-units (the a-subunit of the ATPase). A particular helix of amino acids which traverses the membrane is highly conserved in the corresponding protein of bacteria (*E. coli*), yeast, ox and man. This helix was recognised from the published amino acid sequences of the a-subunit or its equivalent from these various sources. The recognition of this conserved helix, which together with the general mechanism suggested in the previous model, could account for proton (hydrogen ion) translocation across the cytoplasmic or mitochondrial membranes, has opened up a new series of experiments involving site-directed mutagenesis which should throw further light on the mechanism of action of the ATPase.

New mutants of *E. coli* affected in cytochrome synthesis were isolated to extend the studies of the molecular biology of the electron-transport chain used in the oxidation of foodstuffs.

Novel antimalarial drugs: Because of rapidly developing resistance to chloroquine and other modern antimalarial agents, a search for new types of such drugs has been undertaken. This has led to the synthesis of two novel structures, Mannich bases from a bromonaphthyridinylandaminophenol and a trifluoromethylquinolinylaminophenol, which show excellent activity against the human malarial parasite, *Plasmodium falciparum*. Indeed their activities are superior to those of chloroquine, amodiaquine and the newly-established drug, mefloquine; more important, they are highly active against both chloroquine-sensitive and chloroquine-resistant strains of the parasite. The potential for clinical use of these agents is being evaluated.

Understanding human genes: Very significant progress has been made during the year in applying recombinant DNA techniques to increase our understanding of human genes, particularly the way in which genetic variation influences susceptibility to disease.

The human gene for α1 acid glycoprotein (orosomucoid) has been successfully cloned. This serum protein increases in concentration during inflammation. It appears to have an immunosuppressive function and is implicated in the body's response to infection. The cDNA has been sequenced and from this it has been possible to infer the amino-acid sequence of the protein. Work now in progress is throwing light on the structural organisation of the gene itself and will lead to a fuller understanding of the functional significance of α1 acid glycoprotein.

In another area, probes for the globin genes have been used to identify the precise nature of the globin deficiency disorders, or thalassaemias, in
More than 8000 people attended the John Curtin School of Medical Research open days in September. Dr C. Simeonovic explains a model of insulin-producing cells of the pancreas in the Transplantation Biology Unit to some of the many school children who visited the University.

Papua New Guinea. It has been shown that very high frequencies of chromosomes with one of the two normal α-globin genes deleted occur in coastal areas of Papua New Guinea. More recently several cases of single α-globin gene deletions in Aborigines from the Kimberley area of Western Australia have been found and another case from Mornington Island in the Gulf of Carpentaria. The finding is of great interest. This so-called 'silent' thalassaemia, because it shows no clinical symptoms, could well be a disorder introduced by Macassans, or other South-East Asians through contact with Aborigines during their annual beche-de-mer collecting trips to our northern waters.

Gene probes have also been used to assist in diagnosing the 'carrier'
state in several diseases caused by defective genes on the X chromosome. These include Duchenne muscular dystrophy and retinitis pigmentosa. Collaboration with workers in Sydney on a major study of X-linked mental retardation, the second most common genetic disorder affecting mental development, is well advanced.

Finally, DNA probes have been used to study the region of the chromosome coding for the histocompatibility antigens (HLA). Successful techniques have been developed which enable discrimination of the HLA DR types, known to be important because of their associations with a variety of autoimmune diseases, including juvenile diabetes mellitus. These DNA probes can discriminate further one of the HLA types known to be associated with diabetes, thus increasing the ability to distinguish the diabetes susceptibility genotype. The laboratory is also involved in similar studies of systemic lupus erythematosus and multiple sclerosis.

Academic and policy interest in the Pacific region is growing rapidly, particularly following a decade of rapid economic growth in a number of ASEAN and East Asian countries. Trans-Pacific trade now exceeds that across the North Atlantic. Strategic interest in the area is growing. Elsewhere in the world, for example in USA, New Zealand, Japan and France, new academic institutions have been, or soon will be, established with charters somewhat akin to that of the Research School of Pacific Studies (RSPacS). For over 30 years the School has carried out research on the societies and economies of East and Southeast Asia and the Pacific Islands. This is done through a wide range of disciplinary departments and multi-disciplinary centres and projects. The basic strength of the School lies in its staff who maintain wide contacts and develop intensive experience in the region. It is the ability to pursue long-term research on fundamental topics which is the hallmark of the School and which provides a unique base on which shorter-term policy or 'demand'-oriented studies can be mounted.

Despite its relatively long history as a major area studies centre the School is not static. During 1985 the National Centre for Development Studies (NCDS) has attracted considerable outside funding, expanded its research activity, and taken a major role in enlisting the co-operation of academics in other institutions. The Peace Research Centre (PRC) is now firmly established. A major multi-disciplinary project on industrialisation in Asia is well under way with studies of macro-economic issues and of social, economic and geographic transformations in the region. One of the great research questions of the region's prehistory is the location of the 'homeland' of the ancestors of the Polynesians and of the founders of the Lapita pottery tradition in Melanesia. This is the theme of a large project mounted from the Department of Prehistory. But, like the NCDS and PRC work and the Industrialisation Project, this is also a co-operative venture
involving scholars from other countries and other Australian institutions. So too is the mangrove and wetlands project of the North Australia Research Unit.

A steady stream of major books continued to be produced from within the School. Two examples published in December 1985 are representative of the results of detailed and long-term research. The book *Land and Power in Hawaii; The Democratic Years* by Professor Daws and an American colleague, Mr George Cooper, an attorney, was the publishing event of the year in Hawaii. Dr Desmond Ball and Dr Jeffrey T. Richelson, also from the United States, saw their book, *The Ties That Bind*, on international intelligence networks, published simultaneously in the United States, England and Australia and attract immediate attention.

On the technical side the year has been notable for the commissioning of high-resolution Carbon 14 counters of revolutionary design and accuracy based on research by Mr H.A. Polach of the Carbon 14 Laboratory and developed in collaboration with Turku University and the scientific company Wallac Oy, Finland.

The School continued to disseminate its work through the media of film, radio and conference as well as print. Amongst the many conferences mounted from within the School was that on rural Java held in Yogyakarta and organised by the Department of Political and Social Change in association with Gadjah Mada University. The meeting was conducted entirely in Indonesian, attracted much attention in the Indonesian press, indicated the in-depth work of members of the School, and was probably the first such venture by an Australian team in South-east Asia.

The Research School of Physical Sciences (RSPhysS) carries out fundamental research in selected branches of the mathematical, physical and engineering sciences including astronomy, mathematics, applied mathematics, atomic and molecular physics, engineering physics, nuclear physics, plasma physics, solid state physics, systems engineering and theoretical physics.

This is the last year in which the Mount Stromlo and Siding Spring Observatories (MSSSO) will report as a department of the Research School of Physical Sciences. Reference to this and to the work of MSSSO is to be found on p. 13. The outstanding work of the staff of MSSO was recognised by an excellence award of the Institution of Engineers of Australia for the design and construction of the 2.3m Advanced Technology Telescope at Siding Spring Observatory.

The last run with the ANU Homopolar Generator (HPG) was completed on 13 December 1985 bringing to an end an important era in the history of the School. The HPG project began in 1953 when Professor (later Sir Mark) Oliphant decided that a large homopolar generator could be used to power a proposed air-cored proton synchrotron. Although the
Synchrotron was never built, the HPG was brought into service in 1962 and since that time it has provided a high current source for a range of experimental projects including plasma devices, high field magnets and macroparticle accelerators or rail guns. The University's HPG was the world's largest homopolar generator. With its 1400 tonne magnet the HPG could store 500 megajoules of energy in its 80 tonne steel disks which rotated at 800 revolutions per minute. The HPG could deliver a current of 1.6 million amps into a suitable load. In recent years the HPG has been used entirely to power the LT4 tokamak in the Plasma Research Laboratory. The LT4 project has now been concluded and the HPG will therefore be retired and decommissioned after nearly quarter of a century of valuable service.

During 1985 the Plasma Research Laboratory made the first studies of plasma confined in a heliac, a new class of toroidal device in which the School now has a significant experimental lead. These studies form the basis of the new high temperature toroidal plasma facility which is in the course of design and construction to replace the LT4 tokamak. In an important application of plasma technology a $1m contract has been received from ICOM Ltd to study plasma surface interactions and to develop plasma etching techniques for use in silicon chip production.

The 14UD accelerator has continued to provide an outstanding facility for nuclear physics research. Extensive use has been made of the sub-nanosecond pulsed beam and further progress has been made on the construction of a single booster module as a prototype for SHEBA, the proposed post-accelerator. An important new development this year was the start of a joint project with AAEC, Lucas Heights, and CSIRO Division of Soils, Adelaide, to evaluate the use of the 14UD accelerator for dating very old ground water by determining its $^{36}$Cl content. These measurements have important hydrological significance and require quantitative sensitivities of about one part in $10^{15}$. Initial measurements, which have been highly successful, indicate the potential value of the 14UD accelerator in the rapidly developing applied field of accelerator-based mass spectrometry.

Several research groups in the School collaborate in the general area of atomic, molecular and condensed matter physics investigating a range of topics at the productive interfaces between physics, chemistry and, in some cases, biology. These groups involve staff members from the Departments of Applied Mathematics, Solid State Physics, Engineering Physics, and the Atomic and Molecular Physics Laboratories. Recent work by these groups has included studies of low-energy electron-molecule scattering, surfactants as immunosuppressants, long-range forces between hydrophobic surfaces, laser glazing of metallic glass alloy surfaces, directional couplers for optical fibres, optical holeburning, laser-plasma sources for EXAFS spectroscopy, and the properties of molecular clusters, a physical phenomenon intermediate between the gas phase and the liquid
In Australia to speak at the ANZAAS Congress was the renowned British astronomer Patrick Moore. While visiting the University, Mr Moore gave a talk on the history of Comet Halley.

and solid states. A number of these topics have important industrial applications.

The Department of Systems Engineering has investigated system identification, estimation, filtering, adaptive control and related problems. Research in information sciences has been strengthened by Professor Brent's appointment to a chair of Computer Sciences in the Department
of Engineering Physics. New research programs in the analysis of algorithms, parallel computer architecture and VLSI design have been established.

The Departments of Mathematics and Theoretical Physics have worked on a wide range of basic theoretical topics.

Following normal University procedures, a review of the Department of Theoretical Physics was completed in 1985 and a review of the Department of Solid State Physics was initiated.

The Research School of Social Sciences (RSSS) carries out research in selected areas of the social sciences with special, but by no means exclusive application to Australia. Research is carried out on the history, politics, demography and sociology of countries with which Australia has links and on the history of ideas in parts of the world from which we derive our cultural and intellectual heritage. Some of the School’s research, especially in philosophy and statistics, is theoretical and has application quite generally. The research in statistics deals with physical and biological as well as social phenomena.

The School’s research aims particularly to contribute to a better understanding of the causes and consequences of social, political and economic phenomena. This is pursued in part in an historical context, especially in the Departments of History and Economic History and the History of Ideas Unit. It is also pursued through comparative studies of Australia and other countries, and comparisons among Australian states and cities.

Many of the major achievements of the School take the form of published books. Professor K.S. Inglis’ *The Rehearsal: Australians at War in the Sudan 1885* and Professor O.O.G. MacDonagh’s *States of Mind: A Study of Anglo–Irish Conflict 1780–1980* were both published during the year. Professor MacDonagh was awarded the Ewart Biggs Memorial Prize for the promotion of Anglo–Irish understanding and Professor Inglis was awarded the Ernest Scott Prize for 1982 for *This is the ABC: The Australian Broadcasting Commission 1932–82*. Professor J.A. Passmore published *Recent Philosophers* and Professor P.J.O. Self *Political Theories of Modern Government*. Dr M.R. Osborne, Department of Statistics published his major study, *Finite Algorithms in Optimisation and Data Analysis*.

Work on a number of other books was substantially or wholly completed. Dr K. Tsokhas completed a book on the politics of the mining industry and Dr I. McAllister a book with Richard Rose on British voting. Dr P. Jalland completed two books, one on women, marriage and politics in Britain 1860–1914 and the other on the female life cycle in Britain 1880–1914. One volume from the Ageing Project, *Ageing and Families: A Support Networks Perspective* was completed and another is close to completion. Professor J.C. Caldwell, with P. Caldwell and P.H. Reddy completed their
Two members of the Department of History, RSSS, won important prizes for books published. Professor O.O.G. MacDonagh (left) shared the Christopher Ewart-Biggs Prize for *States of Mind*, a history of the Anglo-Irish conflict from 1780–1980. Professor K.S. Inglis (right) won the Ernest Scott Prize for a study of conditions of demographic change in South India. Nearly half of the volumes of the Bicentennial History have been sent to the publishers and the remainder will be completed in 1986. In the History of Ideas Unit Dr R.R. Brown completed a study of love and jealousy and Dr K. Haakonsen completed work on the MS lectures on jurisprudence by Thomas Reid. Professor S.J. Stoljar finished his book on keeping promises. Two books were completed in Philosophy, one by Drs R.K. Meyer, M.A. McRobbie and P.B. Thistlewaite on automated theorem proving and the other by Dr P.R.H. Forrest on the way in which our beliefs ought to change in the light of further evidence and experience. In the Law and Politics of Industrial Relations Project Dr D.W. Rawson finished work on *Unions and Unionists in Australia* and Dr C.H. Fisher on *Coal and the State*.

New appointees also introduced new areas of research. In Political Science Dr A. Mughan began a study of the relationship between social structure and voting choice in Anglo-American democracies and Mr J.H. Miller a study of the social and spatial distribution of Communist party membership in the USSR. Dr I. McCalman who joined the History Department works on the underworld in London 1796–1838. Dr D.T. Nguyen in the Department of Economics is studying exchange rate determination, open-economy macroeconomics and the simulation of dynamic macroeconomics. In the Department of Demography Dr A.N. Gray is working on Aboriginal population, especially household and family
structure and Dr C.M. Young on children leaving home and on mortality rates of migrants in Australia.

The Centre for Economic Policy Research, in conjunction with the Canberra Branch of the Economic Society, organised a seminar for senior economists (most in government) on developments in macroeconomics and public finance.

Professor G.M. Neutze retired as Director in September and resumed his position as Head of the Urban Research Unit. Professor P.F. Bourke, formerly Professor of American Studies at Flinders University of South Australia, assumed the position of Director on 1 October.
The Faculties

Faculty of Arts

The ten departments of the Faculty of Arts span humanities and social sciences. They are Classics, English, Geography, History, Linguistics, Modern European Languages, Philosophy, Political Science, Prehistory and Anthropology, and Sociology.

The Faculty's work, promoting critical and rational inquiry, a sense of history, an understanding of diverse cultures, and creative imagination, is aimed at producing humane and flexible graduates. The Faculty has suggested that assessments of the national interest, and of efficiency and effectiveness in higher education, should take account of this and that definitions of social and economic need should be broad enough to encompass such qualities.

Because of the great diversity of the Faculty, the efforts of recent years to make it more cohesive continued. Details of the revised BA degree structure were settled for full implementation in 1986: there will be provision for integrated interdepartmental programs in addition to more specialised study in one discipline. The Faculty also developed policies which would apply to honours programs across the Faculty. These moves reflected a concern with the content and quality of the BA degree as a whole, not just with discrete departmental components.

Guided by the staffing policy paper accepted in 1984 for the period 1985–1990, the Faculty managed to find some flexibility within its fixed staff quota. A small 'pool' was created to provide for new developments or to infuse new life into existing courses or programs. Each department provided a paper on its plans and priorities, an activity particularly important in view of the number of retirements occurring during this decade. At the end of 1985 the Faculty lost three professors, in addition to the three lost during 1983–84.

Enrolments increased in 1985, although no reason for the fluctuations of 1983–85 could be identified. The full-time proportion of undergraduates (54 per cent) was similar to that of 1983–84, as was the female proportion (64 per cent). The graduate students in Arts comprised over 18 per cent of the total number in the University. Among these graduate students was a higher proportion of female students in Arts (48 per cent) than in the University overall (32 per cent). The quality of the Faculty's students at the upper end remained very good. One University Medal (for undergraduate students) and one J.G. Crawford Prize (for graduate students) were awarded to students of the Faculty of Arts.

Staff members continued to be active in research, although for many it is only during the periods of Outside Studies programs or other leave that this activity can be brought to full fruition. Those staff members with
During 1985 two tendencies in Faculty enrolments seem to be consolidating into a trend auguring well for the future. After the slight fall in new under-graduate enrolments in 1984 (a direct consequence of the raising that year of the level of entry), new enrolments increased significantly at the under-graduate level. Moreover, there are indications that the Faculty may be attracting more students into the Honours School. The Faculty has simplified the requirements for entering fourth year honours without lowering standards; it is hoped that this will pay dividends in the immediate future.

The other area in which the Faculty has taken new initiatives is that of intermediate degrees. The LittB in Asian Studies has now been joined by two diplomas: the Diploma in Applied Linguistics, and the Diploma in South-East Asian Studies. This intermediate field of study is attracting increasing numbers, and Faculty hopes to develop it into a significant area of commitment and of academic service primarily to Asian students. It is hoped that some of these degrees, and the connected MA by course work, will in a couple of years supply more ably prepared candidates for PhD courses by research only.

The smooth operation of our Area Studies Committees, which drew specialists from all areas of the University for the planning of courses, and for discussion of various problems associated with the study of a particular area of Asia, has further increased collaboration with other faculties and with research schools. This is clearly exemplified by the collaboration of academics from across the University in the new diplomas and MA by course work, in the preparation of international conferences such as the International Conference on Thai Studies to be held at the ANU in 1987, and in publications such as Dr R.H.P. Mason's *Japanese Studies in the Australian Capital Territory*.

During the year some difficulties arose in the China Centre, relating to staff relations and to teaching schedules and methods. After the resignation of the newly appointed Head, the Vice-Chancellor requested the Dean to take over as Acting Head of the Centre for the time being. The University has now approved the advertising of a Chair of Chinese and it is hoped that the new appointee will provide the necessary leadership for a revitalisation of the China Centre.

The research activity of the Faculty staff has been maintained at a very satisfactory level. A good percentage of staff have secured grants from the ARGS or from the Faculties Research Fund. The Visiting Fellows program kept a brisk pace with some eight visitors during 1985 hailing from Belgium, Canada, Germany, Japan, Thailand, and the USA, including linguists, historians and specialists in religion and literature. A number of staff attended academic conferences in Australia and overseas and it is gratifying to note that an increasing number attend these conferences as a response to a specific invitation of the organisers.
The Faculty review of 1982 drew attention to the particular need within the Faculty for additional senior staff. Two important steps were taken to meet that need in 1985. In October the University approved the filling of the Chair of Economic History which had been unfilled since 1980. The Faculty and the Department of Economic History in particular welcome the benefits arising from an appointment to a professorial position in Economic History. Because of the strong interest by undergraduates in the Bachelor of Commerce degree and because extremely attractive job opportunities exist for well-qualified commerce staff in private industry, government and academic institutions, the Faculty had to work hard to recruit further staff, particularly at senior levels. A Readership in Accounting was advertised in an attempt to strengthen the quality of the research and of teaching of senior students in the Department of Commerce.

During 1985 two departments of the Faculty undertook new initiatives in providing courses which offered graduates working in the Australian Public Service, private enterprise etc. the opportunity to learn of recent developments in particular areas of economics and econometrics. The Faculty initiatives were organised under the auspices of the Economic Society of Australia (Canberra Branch). A two-day conference on 'The Economics of Regulation' was organised and presented by members of the Department of Economics. The audience, drawn from the public and private sectors, heard of recent developments in the broad area of economic regulation and deregulation. A four-day program of lectures and workshops on 'Practical Econometrics for Professional Economists' was presented at the University in October. The material included in this program provided participants with background to new methods of econometric investigation. In both instances those attending were asked to complete a questionnaire indicating their reactions to the program offered. Both initiatives produced very positive responses.

The Department of Economics benefited in 1985 and will benefit again in 1986 from the arrangements available within the ANU for temporary transfers. The Departments of Economics in the Research School of Social Sciences and the Research School of Pacific Studies, and the Centre for Resource and Environmental Studies have all invited senior staff in the Department of Economics, The Faculties, to transfer for periods of six to twelve months. It is an indication of the standing of staff within that Department that the recipient areas have chosen short-term transfers of this kind as one way to contribute to their research activity. This is an excellent means of sustaining research activity throughout the ANU and the consequent release of funds allows departments in The Faculties the opportunity to support their teaching programs with distinguished overseas academic visitors.

The Department of Statistics, The Faculties, and the Department of Economics, Research School of Social Sciences, initiated in 1983 a joint
appointment (linking the Institute and The Faculties) at the reader/senior fellow level and attracted an excellent appointment in applied econometrics. This arrangement was terminated in December 1985 but was a valuable experience for both participating areas.

The Centre for Research on Federal Financial Relations examines the major issues affecting intergovernmental financial relations in the fields of expenditure responsibilities, financial powers (both taxation and loan), grants arrangements and the scope of intergovernmental co-operation. It is financed by the Commonwealth Government, has only a small permanent staff and much of its research is carried out by visiting scholars. The Centre has established interest groups in other cities.

Most undergraduate law students combined their studies for the degree of Bachelor of Laws [LLB] with a degree course in another faculty, achieving both degrees in five years of full-time study. A substantial percentage of LLB candidates have graduated in another discipline before commencing their law studies. The Faculty also supervises candidates for graduate degrees by thesis, and conducts graduate programs offering course work for the degrees of Master of Law.

The ANU law students mooting team won the national championships in Hobart from teams representing 11 other universities. Members of the team, Philip Laskaris (left), Allison Hoyle (centre) and Ian Latham (right), are pictured with another ANU law student, Elizabeth Vardon (behind) who was elected President of the Australasian Law Students' Association for 1985.
International Law and Master of Public Law, and Graduate Diplomas in International Law and Public Law.

Competition for admission to the undergraduate course is keen. In 1985, approximately 1393 applications were received for 188 places.

On 7 September the Faculty sponsored jointly with the Commonwealth Ombudsman a one-day conference called 'The Ombudsman Through the Looking Glass'. The occasion for the conference was the impending retirement of Professor J.E. Richardson, the Commonwealth Ombudsman (a former professor of the Faculty). The conference was opened by Mr R. Ellicott, a former Attorney-General and Justice of the Federal Court. The large number of speakers ranged across a broad spectrum from those who represented complainants (such as Mr P. Cashman of the Public Interest Advocacy Centre), those who were the subject of complaints (such as Dame Leonie Kramer), and the holders of the office of Ombudsman in some of the Australian States (Mr G. Masterman, QC, of NSW). There were also contributions from one member of the Faculty of Law, from senior public servants, and from staff of the office of the Commonwealth Ombudsman. The result was a full review of the work of the Commonwealth office under Professor Richardson, the first holder of that office.

From 2–5 September a Workshop on Public Law was conducted. This Workshop was designed to meet the needs and interests of public servants at both Commonwealth and State levels whose work required that they have an understanding of the developments that have taken place in recent years in the fields of Commonwealth constitutional and administrative law. It succeeded in attracting public servants from the States and from the Commonwealth, and the links that were thereby established among the Workshop participants, and between the participants and the Faculty, will be of value in the future. The Faculty sees a link between such workshops and its graduate program in public law in the sense that the exposure of senior public servants to Faculty members may attract the former to the graduate courses. The organisation of and teaching in the Workshop was provided largely by Faculty members, although a significant contribution was made by senior public servants. The Centre for Continuing Education provided administrative support.

The Faculty publishes the Federal Law Review, The Australian Yearbook of International Law, and The ACT Supplement to the Legal Resources Book. In addition, members of the Faculty are editors of the Criminal Law Journal, The Australian Criminal Reports and The Australian Administrative Law Service.

Since the last report the following books by member of the Faculty have been published: Conservation Law in the ACT by M. Barker; The Freedom of Information Act by P. Bayne; Legal Foundations of the Welfare State by R. Cranston; Laying Down the Law: The Foundations of Legal Reasoning, Research and Writing in Australia by G. Morris, C. Cook, R. Creyke, R.
Comprehensive changes which had been recommended by the Review Committee, were made to the Legal Workshop course.

Co-operation with government and other public institutions by Faculty members continued to increase. This co-operation took the form of service as members on tribunals or policy-making bodies, consultants, advisers, or lecturers. In these ways assistance was given to many government departments or other governmental or parliamentary bodies.

Lectures were given to legal practitioners as part of a continuing legal education program and courses were conducted by Faculty members for the Canberra College of Advanced Education and the Canberra College of Technical and Further Education. Several meetings of the public law and public administration discussion group were held during the year. This group is organised by members of the Faculty as an informal meeting ground for members of the judiciary, academics in law and government, and senior public servants.

Members have professional associations with many community organisations, several of them accepting a particular commitment to the organisation and operation of the Canberra Community Legal Service. Close co-operation with members of the local legal profession was evidenced by the willing and enthusiastic assistance given by members of the profession in assisting with course development and teaching within the Legal Workshop, and the appointment of a Faculty representative to attend meetings of the Council of the ACT Law Society.

The Faculty of Science consists of ten departments. They are Biochemistry, Botany, Chemistry, Computer Science, Forestry, Geology, Mathematics, Physics and Theoretical Physics, Psychology, and Zoology. Two first degrees are awarded, Bachelor of Science and Bachelor of Science (Forestry). Apart from forestry and perhaps the rapidly developing discipline of computer science, the departments represent the traditional divisions of the physical and natural sciences. The Faculty aims to give students a basic background in science followed by opportunities to specialise in specific areas of interest in the honours year. All departments offer graduate courses leading to the Graduate Diploma in Science, and to the Master of Science and Doctor of Philosophy degrees.

Each department taught a carefully selected range of undergraduate units which may be combined in various ways in courses leading to the Bachelor of Science degree. All first-year students were assisted by academic staff advisers when initial enrolments were being made. Some combinations of units have given rise to criticism and Faculty decided on a full review of the structure of the science degree. Towards the end of the
year, Faculty endorsed a preliminary review report which emphasised the need for a more structured science degree, and for science graduates to have a command of at least one scientific discipline.

Total enrolments were similar to those in the previous year and were close to the Faculty quota. The quota for first-year students in computer science was filled but some precautionary quotas for second and third-year units in botany were not.

Improved employment prospects for graduates was one possible factor involved in the relatively stable enrolments. Some graduates found employment in areas outside their speciality but it is pleasing to note that of the six honours graduates in geology, the five who wished to continue in geology obtained jobs of their own choice by the end of their course.

Some departments introduced changes in undergraduate units as part of their long-term planning. In cases where units were discontinued, the relevant content was incorporated within related units offered by the same department. Similarly, the few new developments that were possible in the undergraduate area tended to occur within departments rather than between them. The question of possible inter-departmental planning was raised at academic staff discussions during the year. These discussions on 'faculty horizons' allowed a wide range of issues to be raised with all staff who were also invited to comment on the direction that they thought the Faculty should be heading over the next 5–10 years.

A most interesting concept discussed during the year was the proposed formal participation of staff from the Research School of Biological Sciences in a fourth-year cell biology honours course. After exploratory talks on ways of doing this, agreement was reached for the possible introduction of such a course in 1987. For 1986, the Department of Zoology agreed to run the cell biology honours course as part of their normal zoology honours course. A Faculty Committee was appointed to examine aspects of all honours courses involving substantial participation of staff from outside a particular department.

The report from the Review Committee of the Department of Forestry was presented to the Vice-Chancellor early in the year. Since then, the various recommendations have been examined and some implemented. It is pleasing to note that the University has given special consideration to the need for a tenured appointment in fire science, as recommended by the Review Committee and suggested elsewhere as filling a national role.

The continuing problem of equipment obsolescence was addressed by seeking assistance from the University major equipment fund for refurbishment as well as replacement needs. Other competitive funding bodies helped with equipment to some extent but the increase in non-teaching personnel funded by outside research grants was a major factor in the greater use and thus accelerated obsolescence of ageing equipment.

Apart from a five-year extension to the Nepal–Australia Forestry Project involving $7.5m and directed from the Department of Forestry, the total value of research grants awarded to staff increased from $2m to $2.5m.
The total number of grants remained at about 100. These research grants again played a critical role in providing salaries for research personnel although the uncertainty of success in competitive grant applications created difficulties for long-term planning of research effort. Indeed, it was recognised that increased dependence on external funding prevents some kinds of long-term research being undertaken.

While each department in the Faculty carried out a range of research activities, the combination of research grants and several publications during the year highlighted some areas more than others. Such productive research topics were: pentose phosphate pathway reactions, hydrogen and nitrogen metabolism in cyanobacteria (Biochemistry); growth substances in eucalypts, salt tolerance of plants (Botany); chemotaxonomy of lichens, thin water films between crystals (Chemistry); computational complexity (Computer Science); soil bacteria and fungi, Nepal–Australia Forestry Project (Forestry); genesis of granites, precambrian events in the Gondwana land fragments (Geology); astrophysics, statistical mechanics (Mathematics); aerophysics, structure of atomic nuclei (Physics); persistent gambling, coronary heart disease and type A behaviour pattern (Psychology); marsupial ecology, parasitology and helminthology (Zoology).
The role of the Centre for Resource and Environmental Studies (CRES) is to undertake research and facilitate discussion on resource and environmental policy issues of national importance. Emphasis is placed upon the social and economic factors involved in any policy problem and the social choices to which its analysis leads.

The Centre currently has programs which include the following areas of resource and environmental studies: air quality, water resources, forest resources, land degradation, energy and society-environment interactions. Some recent expansion has been possible through increases in co-operative activity with research areas outside the Centre and policy agencies. Some work has been directly funded by organisations such as the River Murray Commission, the Department of Arts, Heritage and Environment and the National Capital Development Commission (NCDC).

The final report of the Centre's largest-ever interdisciplinary study, undertaken on regional development in the Hunter Valley, was submitted to the National Energy Research Development and Demonstration Council in June. It makes policy recommendations aimed at maintaining the opportunities which resource development has brought to the region while ameliorating the environmental and social impacts on the local population.

Two exciting research initiatives contributed substantially to the research agenda in CRES in 1985. A feasibility study of the impacts of mining and tourism on the Aborigines of the East Kimberley region was undertaken and following its success has been expanded in scope. The project will be a collaborative one with the Australian Institute of Aboriginal Studies, the University of Western Australia and the Academy of the Social Sciences in Australia. It is both promising in a wider sense and unique. It is hoped that it will lay some foundations for future social impact assessment in CRES. It is also intended to establish a framework which allows the dissemination of research results to Aboriginal communities to enable them to develop their own strategies for dealing with social impact issues. A second initiative was the commencement of work on policy problems in the forestry sector. Here research is proceeding along a number of interrelated paths including the allocation of wood resources from public forests to industry and other uses. Specific projects include work on the woodchip export industry and rainforest conservation policy.

Of the more established programs in CRES, 1985 saw some projects within those programs come to fruition and others given further
development. In air quality, impact studies were completed in the Hunter region, Melbourne and Kalgoorlie, while analysis was broadened with a grant from the Department of Arts, Heritage and Environment to examine the needs for further emission controls on motor vehicles. In the water resources program, individual assessments of urban flood damage were undertaken with the computer package, ANUFLOOD, now used by three State agencies. A review of water quality monitoring requirements for environmental planning in the ACT was completed for the NCDC, and on the other hand, the salinity project was broadened to incorporate an institutional component with the environmental, technical and economic work so that policy options can be framed with cognisance of the institutional constraints.

Three major workshops were organised by the Centre in 1985, 'Water Planning in Australia', 'Land Degradation and Public Policy' and 'Prospects for Australian Hardwood Forests'. All three were associated with key issues where conflicts of interest exist throughout the community. In each case the relevant interest groups and policy advisers were invited to contribute and express their preferences and to help determine the priorities and trade-offs to be adopted for the well-being of the wider community. The proceedings of the workshops have been edited within the Centre and reviewed externally and are being made available as CRES publications.

During 1985 the Humanities Research Centre (HRC) concentrated upon the theme 'Hellenism: Rediscovering the Past'. Four major conferences formed the focus of the year's activities. The first, in May, on Hellenism and Byzantium; the second, in June, on Hellenism in Europe since the Eighteenth Century; the third, in July, on Ancient Hellenism — Greek Colonists and Native Populations; and the fourth, in August, on Hellenism and Neohellenism — Problems of Identity. In organising these meetings, the Centre worked in close collaboration with the Australian Society for Byzantine Studies, the Frederick May Foundation for Italian Studies, the Nicholson Museum and universities throughout Australia. An impressive assembly of overseas speakers participated in the four conferences; many of them lectured at other institutions in Australia and some gave lecture tours in New Zealand. Throughout the year, the Centre also ran its regular program of Work-in-Progress seminars, and lunch-time talks and readings.

The Centre welcomed 18 Visiting Fellows in the course of the year: two from within Australia, five from the United States, two from Canada, and nine from Europe. It also brought six overseas conference visitors to Australia (two from England, two from the United States and two from Italy). Six Visiting Scholars were also working in the Centre. As usual the Centre's visitors came from a variety of backgrounds and disciplines. They
worked on topics in cultural, social, and intellectual history, in English, French, Greek (ancient, byzantine and modern) and Latin literature, in philosophy and ethnography, and in architectural history; the nature of this year's theme also produced a particular concentration upon archaeology and the classical tradition.

The Centre continued to publish monographs and collections of papers given at HRC conferences, and to act as a clearing-house of information about current work in the humanities in Australia and New Zealand.

Among works published by members of the Centre during 1985 were I. Donaldson, *Ben Jonson* (The Oxford Authors); I. Donaldson and T. Donaldson (eds), *Seeing the First Australians*; three articles by G. Clarke on archaeological work in Northern Syria published in *Abr-Nahrain*, and a fourth in *Classicum*; three editions deriving from conferences in the Centre: J.C. Eade and R. Sussex (eds), *Culture and Nationalism in Nineteenth-Century Eastern Europe*; J.C. Eade (ed.), *Editing Texts*; and B.M. Rawson (ed.), *The Family in Ancient Rome*.


The Public Policy Program was an entirely new development in 1985 and it had an exciting and satisfying first year. The academic staff, Drs Gerristen and Maddock and Professor Marceau spent much of the year organising the Program’s activities and teaching. New and continuing research was also absorbing.

The Graduate Program in Public Policy is a two-tier course leading to a Graduate Diploma and then the degree of Master of Public Policy. In 1985, the first year of operation, the Program accepted 31 students to the Graduate Diploma course. The students were all practising public servants from a wide range of public service departments and held a great variety of professional responsibilities. Most coped well with the heavy work-load involved in following the Program’s courses part-time and found the work both stimulating and useful. All the Program staff taught on the first-year courses, ably assisted by visitors from other parts of the University, from the Commonwealth and NSW Public Services and from overseas. In particular, the students had an opportunity to hear speakers from the Inner London Education Authority, Business in the Community (UK), the
Commonwealth Department of Education and the Office of Equal Opportunity in NSW. University visitors included speakers from both The Faculties and the Research School of Social Sciences. The Program was particularly fortunate to have as its first overseas visitor Professor Beryl Radin, Director of the Washington Public Affairs Centre of the University of Southern California who was with the Program from mid-July to the end of November. The staff also conducted numerous seminars and training sessions for Commonwealth and State public servants.

The Program staff were also involved in research and publication and in seminars and conference papers. Dr Maddock gave both a keynote and a second paper to the Conference of Economists and presented a paper to the ANU conference on Recovery from the Depression of the 1930s. Dr Gerritsen presented papers to the ANU Federalism Project Conference and the Australasian Political Science Association. These papers are all to be published and both authors have written further papers which are under editorial consideration. Professor Marceau presented papers to conferences on Australia in the 1980s, on policies for hardwood forests, and on Universities: Great Expectations. She was rapporteur for the Royal Australian Institute of Public Administration (RAIPA) autumn seminar on Strategic Leadership in Government for which she was also joint organiser. The last two papers should be published in 1986. Professor Marceau continued to sit on the Editorial Boards of the National Institute of Economic and Industrial Research and the Australian and New Zealand Journal of Sociology and joined the Board of the Journal of Social Issues. She also continues to sit on three committees of the Committee for Economic Development of Australia and the Council of the ACT branch of RAIPA.

The Program staff also began or continued research on subjects as diverse as the processes of budget-making in the Hawke government, prawn fishing, politics in the Northern Territory, large and small enterprises and fiscal policies in the 1980s. Dr Maddock prepared a book of readings on The Australian Economy in the Twentieth Century and Professor Marceau one on A Family Business: The New International Business Elite, both to be published by Cambridge University Press.

NHMRC
Health Economics Research Unit

This Unit has operated as an independent research unit within the University since 1978. It is financially supported by both the NHMRC and the University, with special project grants from other bodies.

The Unit's main interests have been in the economics of health services and their financing. Major projects have included the estimation of Australian health expenditures over a number of years (a series which is now continued by the Department of Health); the economics of the pharmaceutical drugs industry; studies of the use of medical services; and the econometric modelling of the health service sector as a whole.
In 1985 the Unit was reduced in size pending its cessation at the beginning of 1986. During the year its work included a survey of the sources of health-care data in Australia; an analysis of privatisation of the health-care sector; the evaluation of health-care technology; the control of medical fees; and the econometric analysis of the demand for medical services.

This Unit, which is one of four funded by the National Health and Medical Research Council in Australia, is committed to epidemiological studies of mental disorders. During 1985, research continued on the causes of neurotic and other mood disorders. Work was particularly focused on the interaction between vulnerability factors and the effect of the past and current environment. This research program brings important advances in statistical methods to bear upon issues of considerable public health importance.

The second area of study is mental disorders in later life. The Unit, in collaboration with the Department of Psychiatry, University of Tasmania, completed analyses on the mental health of a sample of 274 elderly people living in the community in an Australian city, and also completed the design for a study of Alzheimer's disease in collaboration with the Department of Neurology, Lidcombe Hospital, Sydney. The Unit completed field work in a study examining those who care for elderly relatives with severe disability — particularly dementia — at home. This carefully-conducted inquiry focused on the mental health of these carers: how they cope and at what expense.

The Unit undertook training and consultative work for a large number of individuals, hospitals and university departments throughout Australia and made contributions to the Division of Mental Health, World Health Organization, Geneva, and to the Organization's Regional Office for the Western Pacific, Manila.
Other University Activities

Collection rationalisation and Library automation were the two main issues tackled by the University Library in 1985. During the summer vacation 1984-5 books and serials were moved between the J.B. Chifley, R.G. Menzies and W.K. Hancock Buildings, according to the plan approved by the University in 1984.

Now, for the first time in the Library’s history, materials in particular segments of the Library of Congress classification can be found in one main building instead of two or three. The resulting duplicate issues and subscriptions to serials, particularly in the social sciences and humanities, are now being examined by the various Library Advisory Committees. This process will continue during 1986. The expected cancellation of most of these duplicates will partially help to alleviate the severe effects on the University’s purchasing of books and serials brought about by the severe fall of the Australian dollar in 1985.

Considerable progress has occurred with the implementation of the AWA Urca Library system. By the end of 1985 approximately 610,000 records had been added to the database. The benefits of a large public database will be considerable in spite of the work still to be done in editing the records to achieve uniform and up-to-date entries. Users were able to access the database indirectly via the terminals at readers adviser’s desks. It is expected that the database will become available to users directly via on-line public access catalogues. These were being tested in late 1985.

The 1982 Library Review, which provided the raison d’être for many of the Library’s activities in recent years, was reviewed by the University Library Committee at the request of the Vice-Chancellor. The ‘Review’ of the Review went before the University Council at its October meeting, at which time Council noted the revised structure of the Library Committee, the need for steady growth of the collections and for adequate accommodation in the form of an extension to the R.G. Menzies Building.

The Computer Services Centre is responsible for the provision of general computing services to the University via several independent systems. General academic computing requirements are serviced by a SPERRY 1100/82 system. For specialised academic requirements several additional computers are available: a FACOM M360R for the work of the National Centre for Development Studies and users requiring access to IBM-type facilities, a VAX 11/750 dedicated to graphics and a VAX 11/780 for UNIX users. Administrative computing uses a FACOM M360A —
while undergraduate/teaching requirements are satisfied via a VAX-cluster and a share of the VAX 11/780 UNIX system. Remote access to these hosts is provided by extensive networks around campus. The VAX equipment operated by the Centre is linked, via DECNET, to many other VAX computers in the research schools.

Part of the Centre's role is to provide consulting and educational services to the general University community. Formal courses on the use of Centre systems, programming languages and end-user applications packages are scheduled regularly. Two staff members are dedicated full time to providing a 'consultant programmer' service while other staff members are available to provide specialist advice on mathematical, statistical, graphics, text processing and data handling packages. Centre staff also advise on matters such as terminal acquisitions, word processors and micro-computers — a Micro-computer Information Unit was established in 1985 and is proving to be a heavily sought-after service.

Two MICOM terminal switching units provide users with the ability to switch terminals between the various computer systems available for academic and teaching functions. This facility has been well received by the campus; the interconnecting of research school computers with each other and with Centre computers enables a much higher quality service to be provided.

While the SPERRY 1100/82 system has again performed well throughout the year, the total computational capacity available to ANU research workers continues to fall short of their expectations.

The administrative computing load increased rapidly throughout the year as conversion of old applications and implementation of new applications continued. A very smooth transition from a FACOM M360R to an M360A was made in August. The new M360A provides additional processing power of about 40 per cent. During 1985 software contractors worked with University staff to implement new general ledger, accounts payable, payroll and personnel systems. Another application, the stores and purchasing system, was substantially completed in 1983 but its implementation had been delayed until the availability of the new accounts payable system.

The Division of Educational Services (DES), through regular meetings of the Divisional Board, its Standing Committee and staffing committees, continued to provide oversight of its constituent centres or units, and establish staffing and budgetary procedures which are comparable with other sections of the University. The number of units was increased to eight by the formation of Photographic Services from photographic sections previously within the Instructional Resources Unit, The Faculties and some Research Schools.

During the year the Instructional Resources Unit (IRU) noted an increase
in the number of University teachers and researchers who are now producing their own illustrative materials in the Do-It-Yourself centre after receiving assistance and training from IRU staff.

Investigations and surveys for various sections of the University occupied much of the time of the Office for Research in Academic Methods during 1985. A series of workshops designed to help graduate students improve the presentation of their seminar papers or research reports was well received, as was a short induction program for new teachers in The Faculties.

The University Health Service continued to pursue a preventative approach to three areas of activity, namely primary health care, health education and occupational health. In the occupational health field, shoulder-arm pain continues to pose significant problems for keyboard workers and for some students with heavy writing work loads.

Counselling with individual students was the main thrust of the work in the Counselling Centre in 1985. Issues brought to counsellors covered a wide spectrum of problems relating to studies, personal development or relationships. Counsellors also conducted groups for both students and staff on a variety of topics, including assertion skills, time planning, communication and stress management.

The Careers and Appointment Service continued to provide links between students and prospective employers. There was an increase in the number of clients in most of the programs organised by the Service and an expansion and consolidation of the Internship Scheme which arranges short-term placements of ANU students in industry or commerce.

Students and academic staff maintained their support for the Communication and Study Skills Unit. As in previous years there were requests for assistance with essay and thesis writing, preparation for examinations and statistical applications and an increasing number of clients whose first language is not English sought help from the Unit.

A number of staff changes occurred in the Centre for Continuing Education, the most significant of which was the resignation of the Director, Dr C. Duke, in order to take up a chair at the University of Warwick. Nevertheless the year was a most productive one for the Centre. The National Extension Program was distinguished by the breadth of the work undertaken and the diversity of methods employed and the Local Extension Program continued to attract students to a wide range of courses.

Buildings and Grounds

The built floor area of the University is 285,000 m², which at present average non-domestic building costs of $1300 m² represents a capital stock with a replacement value of approximately $370m. There is a range of opinion in the building industry about the proper level of provision of building maintenance and restoration. An annual provision of 1 per cent
of replacement cost would be on the low side of most estimates. On this conservative basis, the Australian National University should be spending, or transferring to reserves or counting upon special funding for building contingencies, an amount of at least $3.7m annually. The past and present funding of the University has not supported such a level of maintenance provision.

The problem of preserving the fabric and the usefulness of publicly-funded buildings and facilities is not confined to the Australian National University, or indeed to universities. In 1985 the University was host to an important meeting of building officers of Australian universities, directed solely to this problem. The contributions have been published by ANU.

Against this notional desirable annual amount of $3.7m for building maintenance and restoration, the University has received over the last 10 years an annual provision of $0.4m [current values] for minor works (defined as works costing up to $200,000) and has spent an additional $2m per annum from general funds. There has been no special grant for any major building in that decade; new works of all dimensions have had to be provided from within those amounts.

The staff numbers on the direct University payroll have been declining over the past decade at about 1 per cent a year. This decline should free space. However, there are more persons daily on campus [other than undergraduate students] and more pressure for space than ever before. This is explained by: staff on contract funds; the policy of the University to maintain an active visitor program, increasingly directed toward staff from other Australian organisations; and the growth of postgraduate programs in non-science areas [science graduate students fit into laboratories; economics graduate students find no such places].

When space is exhausted, the costs of new construction are now daunting. At $1300/m² in a conventional building mode it costs $2000 to put the floor under a desk to house a computer terminal, $15,000 to build a small office, and in a laboratory (allowing for work areas and circulation space) about $60,000 to house an employee.

In 1984, the University found it could no longer accommodate the expanded programs of the National Centre for Development Studies or of the Australia-Japan Research Centre, and that it had to resolve an accommodation problem in the Department of Computer Science. Construction of a new 3000m² building, the J.G. Crawford Building (see p.15) was started in 1985 and will be ready for occupancy in May 1986. The University's ability further to augment its building stock in this way, is, however, very limited.
The dominant feature on the University landscape is Sullivans Creek, here looking towards Ursula and John XXIII Colleges. William Sullivan came to Australia from Ireland in the 1850s and moved to the Canberra district where he leased land. As Sullivan owned land on either side of Canberry or Canburry Creek, it became known as Sullivans Creek.

University House

Throughout 1985 University House fulfilled its role as graduate residence, faculty and professional club, academic hostelry, conference venue, and cultural centre.

On average 30 graduate students resided in the House. Its club membership rose to about 1700. Academic visitors came from some 20 countries, including Canada, China, Greece, Israel, Japan, Malaysia, and the USSR. The House hosted over 100 conferences and seminars, sponsored by scientific and professional bodies, government departments, and commercial firms. Traditional and innovative social functions were held at intervals, House Dinner was served in Hall every Wednesday.
evening, and regular concerts were presented in association with the Canberra School of Music.

University House was host to the 2nd National Word Festival which was attended, among other well-known writers, by the novelist Doris Lessing. The Shakespearean actor-producer Peter O'Shaughnessy was in residence in November-December as University House Visiting Fellow for 1985.

The Master and members of the House staff were involved in University and community activities. Six members of the kitchen staff won culinary awards, and an exchange of chefs between University House and International House, Tokyo, was successfully instituted.

University House is self-financing, its revenue deriving from trading activities, and is wholly responsible for its staff costs, capital development, maintenance, and depreciation. A major refurbishing of the Bistro restaurant was carried out by House maintenance staff. University House finished the year in a satisfactory financial position.
NEW EDITION OF BENTHAM

J eremy Bentham originally planned his *Constitutional Code*, one of the major works of 19th-century political theory, as a work in three volumes. But Bentham could not complete the work in his lifetime and the text of Bowring’s standard edition of the work was compiled by Bowring’s assistants from printed versions of some parts of it and manuscripts of various dates. As a result the work is somewhat idiosyncratic, and almost unreadable.

Dr L.J. Hume, Reader in the Department of Political Science, is working on a new edition of the *Code* designed to provide a more informative and accessible text and, for the first time, to be published in three volumes. Accessibility will be enhanced by employing a new format and printing conventions, providing historical and other notes and establishing (it is hoped) a more accurate and coherent text than Bowring’s.

The first volume of the new edition, prepared by two English scholars, was published in 1983. To establish the text for the second and third volumes of the work, Dr Hume has examined manuscripts in the British Library and at University College, London. He has had to decide which manuscript should be preferred and how the material should be ordered. This has often meant changing the decisions of the original editors, on the basis of Bentham’s annotations or other clues.

During 1985 some questions were re-opened when Dr Hume examined copies of manuscripts newly obtained from the Netherlands, where Bentham had sent the originals in 1827. These copies revealed new insights into Bentham’s intentions relating to one important section of the work, and forced a new ordering of some of the material. The revisions had implications for other parts of the text and accompanying notes.

Most of the historical and editorial notes drafted by Dr Hume have been directed to explicating Bentham’s many allusions to people, practices and events. He often identified the people rather loosely or, especially in the case of some of his sources of information, left them unnamed. Similarly, he often described practices or events obscurely, and referred to his authorities vaguely or not at all. Filling out the information that he provided, and correcting it where necessary, has absorbed a considerable amount of time and effort.

Dr Hume has also been preparing a collation of variations between the new and original editions, an introduction to the work and an index.
In spite of the variations, Dr Hume does not believe the new edition will change perceptions of Bentham's fundamental arguments. It should, however, make the work available to and read by many students who would be discouraged by the difficulties of using Bowring's edition. The new edition of Bentham's *Constitutional Code* is being published by Oxford University Press.

Understanding cellular metabolism

All living organisms share a necessity to ingest nutrients from their environment and expel metabolic waste products. At the most fundamental, cellular level, these processes are performed by special proteins embedded in the outer membranes of cells. These 'transporter' proteins are found in a wide variety of forms, each more or less specific for conveying a particular type of molecule across the cell membrane.

A particularly important class of transport proteins involves those which transfer salts, in ionic form, across cellular membranes. Such proteins are vital to the function of all known living cells. Despite this, however, the detailed structures and chemical mechanisms by which any of these proteins operate have remained unclear. This is because the traditional method of studying protein structure, through X-ray analysis of the protein molecules in crystalline form, have proved intractably difficult for membrane proteins.

In the Research School of Chemistry a different approach is being employed. Many physiologically important ions have weak magnetic properties which allow their interactions with proteins to be examined using nuclear magnetic resonance (NMR). This technique, coupled with the use of selective chemical modifications of the protein has allowed researchers to deduce the precise steps involved in the ion transporting function of a particular membrane protein, named Band-3. This protein transfers the ions' chloride and bicarbonate into and out of the red cell, by a 'bucket chain'-like process, as carbon dioxide is carried by the blood.

From the knowledge of the detailed mechanism and the sequence of amino acid building blocks in the protein, determined elsewhere, it has been possible to assemble the three dimensional structure of the active portion of Band-3, the first time this has been achieved for a membrane transport protein. It is expected that these techniques will prove useful in studying other membrane proteins, in particular those involved in plant photosynthesis.
From wallabies to 'walking fish'

A young wallaby takes about 200 days to emerge from its mother's pouch — a fact which is of importance in understanding the early development of all mammals. During this time, many of the physiological functions which mature before birth in most mammals, including humans, undergo development. While in the pouch, the joey can be removed for up to 24 hours and when returned it will continue to develop normally. As a result, marsupial pouch young offer considerable advantages for investigating developmental processes in mammals,
because they can be studied without using the invasive techniques which are necessary in the study of embryos in the uterus.

Research in the Department of Zoology, by Dr Peter Janssens and several graduate and honours students, focuses upon the development of physiological functions in marsupials and upon the value of the marsupial pouch young as a model system for investigating developmental processes in mammals. This research is being done in collaboration with the Division of Wildlife and Rangelands Research at the CSIRO and has been funded by grant from the Australian Research Grants Committee and the ANU/CSIRO Collaborative Research Projects Fund.

One aspect of the research has looked at the development of structure and function in the kidney of the tammar wallaby, a macropodid marsupial. Because the joeys remain in the pouch for so long, each stage of development can be clearly distinguished. The development of various functions of the kidney has been correlated with structural changes in a way which has not been possible in eutherian mammals, because renal development is largely complete by the end of the uterine life in many common mammals and occurs much more rapidly than in marsupials.

The researchers are also interested in the ways in which hormones such as insulin and adrenaline produce their effects. For this they use amphibians such as the Mexican axolotl, commonly though inaccurately called Mexican walking fish, and fish such as the common carp. The reason for using such animals is that their hormones use simpler control mechanisms which are easier to unravel than their mammalian counterparts, but which can shed light upon mammalian systems.

The methods used for studying hormone action in these species involve culturing small pieces of liver in culture medium. From one animal, up to 120 culture tubes can be obtained and this both decreases the variability in the results and reduces the number of animals which need to be used. Using these simple methods, the researchers have been able to clarify the way in which hormones such as glucagon and insulin interact in regulating the release of glucose from the liver. Both these hormones are important in regulating blood sugar levels and are involved in diseases such as diabetes.

Influenza control closer

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plague,
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unpleasant,
it is potentially lethal. More than 21 million people died in a world-wide epidemic just after the First World War. If another virulent strain were to arise tomorrow there is little that could be done to stop it rampaging around the world.

Influenza can also be a fatal disease in birds. An influenza virus, isolated from domestic chickens in Pennsylvania in April 1983, caused mild
Crystals of a neuraminidase antibody complex. The O-dimensional structure of this complex will show how antibodies recognise the influenza virus and how the virus changes to escape this recognition.

Crystals of a variant neuraminidase with a sequence change at position 370 of alanine to aspartic acid. This change renders the neuraminidase unrecognisable by antibodies.
respiratory infection and low mortality. In October 1983, it became highly virulent and was responsible for the destruction of about 17 million birds at a cost of more than $60 million.

World research to combat influenza is being spearheaded by Dr Graeme Laver of the Influenza Research Laboratory, at the John Curtin School of Medical Research. As part of his program, Dr Laver has crystallised the neuraminidase (NA), a mushroom-shaped glycoprotein, attached to the surface of the influenza virus. The best crystals were grown from a 'flu virus found in noddy terns on North West Island of the Great Barrier Reef. This indicates that the current research may be applied to combating influenza in poultry, as well as humans.

Crystallisation of the NA has allowed Dr Colman of the CSIRO accurately to determine its molecular structure, which will enable further research on understanding the active centre of the enzyme. It will also allow the three dimensional structure of a number of individual antigenic sites (regions where antibodies bind) on NA to be determined, and the precise way in which the structure of these regions changes during antigenic drift.

Dr Laver's project is directed toward the development of an effective means to control influenza. The information obtained will not only reveal, for the first time, exactly how antibodies recognise the 'flu virus and how the virus changes to escape recognition, but will also show the precise way in which antibodies recognise proteins, information vital to the rational development of synthetic peptide vaccines.

Dr Laver, in collaboration with scientists at the University of Alabama, is involved in protein crystal growth in a microgravity environment, at present using the National Aeronautics and Space Administration (NASA) space shuttle and later, the proposed space station. Large rhombic dodecahedral crystals of one kind of NA, which are suitable for structural analysis, can be grown on earth. Some complexes of NA with antibodies and others form insignificant crystals and it is these Dr Laver hopes to grow to better quality and size in space.

Another aim of the 'flu research program is to construct an influenza virus with a defective NA gene. This virus would infect cells and undergo a single replication cycle, but would not be able to spread in the body and infect other cells. This limited replication should induce an immune response sufficient to protect the individual from reinfection with the same or antigenically-related 'flu virus.

Understanding viruses

Recently developed techniques to decipher genetic codes enable scientists to probe the fundamental biology of viruses and bacteria, with the ultimate aim of finding better ways of controlling disease.
Using techniques of molecular biology, researchers Dr L. Dalgarno and Dr C. Rice have cloned and sequenced the RNA chromosome of the Murray Valley encephalitis virus.

During the last five years, a research project in the Department of Biochemistry, under Dr Lynn Dalgarno, has focused on the molecular structure of the Ross River virus and Murray Valley encephalitis virus. Attention is also about to be given to dengue fever virus, which is the cause of a major health problem in many equatorial countries.

Dr Dalgarno and his co-researchers have cloned the Murray Valley encephalitis virus chromosome almost in its entirety. They have also deciphered the genetic sequence of the chromosome, starting from the end which contains the genes for the structural proteins.

The researchers are in the process of sequencing the rest of the virus genome, which entails sequencing another 5000 or so nucleotides, which
are the links in the RNA chain. These remaining genes code for the non-structural proteins that replicate the RNA, and these should therefore provide clues on how the virus reproduces its RNA chromosomes.

Determining the nucleotide sequence of the viral chromosome should in future assist in diagnosis, and as such complement the use of monoclonal antibodies. In order to prevent infection, it may be necessary to vaccinate with those parts of the viral protein that provoke specific antibodies. To find out what these are the sequence data are essential.

To cure infection after the virus has started replicating itself inside the cell, it is essential to be absolutely specific in targeting the virus itself, to avoid killing the cell. To do this, a detailed study of the unique enzyme which replicates the viral RNA chromosomes is necessary.

Another aspect of the research is studying the pathogenesis of the virus and this may help in understanding, for instance, why it attacks the brain more so than the rest of the body.

With financial assistance from the World Health Organization, the researchers are to embark on a project aimed at sequencing the dengue fever chromosome. The virus causes dengue fever and a more serious disease, dengue shock syndrome, which is frequently fatal in children.

In time it is hoped that there will be a stock of information available on a whole range of the viruses, which should help in the development of preventative treatments.

Expert systems and fire ecology

The link between new developments in an area of artificial intelligence, known as 'expert systems', and the ecological impact of fire on native pastures may not seem immediately obvious.

Research in the School of Biological Sciences (RSBS) is combining these apparently disparate fields of study. To manage successfully the majority of Australia, which is still covered by native pastures and forests, it must be possible to predict the consequences of management actions and the changes they will induce in the vegetation. This is especially true for the management of fire in these ecosystems.

Models of the behaviour of fire and its impact on the vegetation and wildlife have been built, but these are expensive to set up for a particular area and difficult to use, since graziers, foresters and park rangers rarely have the training and equipment necessary to take advantage of them.

A new style of model is being developed which takes advantage of theoretical descriptions of the response of vegetation to fire which were developed in RSBS. These models described the response in terms of a series of logical rules, rather than mathematical equations and, thus, are well suited to take advantage of the new software associated with expert systems.
House posts more than 3000 years old were found on Elaoua Island in the Bismark Archipelago of Papua New Guinea by researchers from the Research School of Pacific Studies.

This software allows users to interact with the computer as though they were consulting an expert. Users can seek explanations for particular recommendations and can provide additional rules appropriate to their situations. The aim is to produce models of the impact of fire which will allow users to set up the models for their conditions, provide them with certain exceptions and additional rules, and then test various management options — all on low cost, portable microcomputers.

Pacific colonists

Prehistorians from around the world joined in a major ANU expedition to the Bismark Archipelago of Papua New Guinea for six months during mid-1985. The aim of the project was to determine whether the area was a long-term staging post from which the initial migration of people across the Pacific Islands began. The National Geographic Society and the ANU’s Research School of Pacific Studies sponsored the expedition. Because of the archipelago’s isolation the expedition was supported by a 20-metre schooner, the Dick Smith Explorer.

Twenty scientists took part, mostly leaders in their particular fields of
Pacific prehistory, from Australia, the USA, New Zealand, Papua New Guinea, The Netherlands and Britain. The expedition was successful in recording 16 new sites, including one of the richest ever found in the Pacific, on Elaoua Island, north of the New Ireland mainland. Researchers found house posts from the Lapita period, preserved for 3000 years by high-level groundwater. There were also many complete, though fragmented, Lapita pots with intricate decorations, a unique figure, shell ornaments and a wealth of food debris.

At a site on Watom Island in East New Britain, researchers found evidence of local evolution of Lapita pottery styles, showing long-lived and changing Lapita occupation in the region. The evidence suggests long-term settlements in the Bismark Archipelago by people associated with Lapita pottery, adding some weight to the argument that the area was the origin of the Lapita colonists. This challenges the previous theory that the people of the Pacific arrived directly from South-East Asia, moving swiftly through Papua New Guinea and the Solomon Islands chain.

Analysis of the material recovered during the expedition is under way and a conference is planned for mid-1986 to present and discuss preliminary findings. This will be the first step in the preparation of a major volume on the study.

**Low-risk strategy needed in Hunter Valley**

Air pollution in the Hunter Valley is a fact of life, high enough in some places to cause discomfort to sections of the population prone to bronchial complaints or to cause nuisance for those living near dust-producing open-cut coal mines. Pollutants of major concern in the region are sulphur dioxide, dust particles and possibly nitrogen oxides, which come from a variety of sources, including open-cut coal mines, power stations, aluminium smelters, heavy industry and traffic.

It was determined after a three-year study by the Centre for Resource and Environmental Studies (CRES) that on average air pollution concentrations were reasonably low but short-term concentrations (up to three hours) occasionally warranted concern. The aim of the study was to identify interactions between coal production and related industries on the one hand and the environment, social values, political priorities and economic forces on the other.

Dr Tony Jakeman, Fellow, and Dr Rod Simpson, a Visiting Fellow from Griffith University, were responsible for the air pollution study, one of the major parts of the project. It examined the Hunter Valley in two sections: the Lower Hunter, dominated by the heavy industry in the Newcastle area,
power stations around the Lake Macquarie area and two aluminium smelters; and mining activities and power stations in the Upper Hunter.

Air pollution around Newcastle was identified as being due to high acid gas concentrations and dust, produced mainly by the local steel works and fertiliser plants. Lead pollution was also observed and appeared to be related more to industrial pollution than motor vehicle emission.

The study suggested a low-risk strategy should be implemented to avoid any significant increase in acid gas emission above the current levels. The wider use of natural gas, replacing oil burning as an industrial energy source would assist such a strategy. Precautions to control fluoride pollution from the aluminium smelters at present levels were also suggested.

The environmental effects of open-cut coal mining were considered to be the primary source of pollution in the Upper Hunter affecting between 40 and 60 per cent of fringe residents who believed they incurred some hardship. However, the worst affected areas contained residents who rated their location highly when compared to former places of living.

A survey analysis revealed no significant differences in health between the mining and non-mining regions in the Upper Hunter Valley. In its summary, the report stated that 'the quality of the Hunter Region's atmospheric environment is not in as poor state as a number of other industrialised regions of the world. Annual average levels of pollutants are not exceeding ambient air quality standards'.

Investigating early societies

The ANU Library has built up an impressive collection of South Sulawesi manuscripts in the Bugis and Macassar languages. This collection, together with supporting printed material, has been invaluable to those in Australia engaged in research into this region of Indonesia, and the library is now an important repository for information on South Sulawesi. The manuscripts, which are on microfilm, are the result of active collection by Dr Campbell Macknight, Department of History, The Faculties. They are drawn both from European collections and, more importantly, from public and private collections in Indonesia.

The manuscripts present a variety of information from sayings and homilies of sages and sage rulers to chronicles of various kingdoms, and provide information for historians on the culture of a pre-European and pre-Islamic society.

Of particular interest to Dr Macknight is the complex nature of the Bugis and Macassar society, which used an Indian-derived system of writing and traded in quantities of ceramics made in China, Thailand and Vietnam. Dr Macknight's research has raised interesting questions on the
origin and function of the writing used, trading patterns and the level of sophistication reached in the South Sulawesi society. These questions, if answered, would help researchers understand social developments in other parts of South-East Asia and the Pacific.

South Sulawesi also provides an opportunity to combine textural studies involving basic philological work with the results of archaeological and anthropological research. This enables an integration of research on Indonesia by Dr Bellwood and others in the Department of Prehistory and Anthropology, and related work elsewhere in the University.

Two doctoral students are preparing interrelated theses on the area: one is editing a series of small Bugis tests in related genres, and the other is collaborating with Indonesian colleagues in a variety of archaeological inquiries in South Sulawesi.

Dr Macknight is editing a major local chronicle with a colleague from Universitas Hasanuddin in Ujung Pandang and has published several preliminary general papers. He also has in preparation a checklist of relevant library holdings, with a view to developing the collection further by filming manuscripts held in South Sulawesi. As further publications appear, scholars will have an increasingly clear picture of the development over several centuries of a major society which was formerly almost completely obscure.

Photographing fusion reactions

Some of the simplest problems encountered in experimental physics are often the most difficult to solve, but a new technique developed by members of the Laser Physics Laboratory during the last few years has provided an elegant solution to one such problem.

For many years scientists have attempted to harness the energy released during a thermonuclear fusion reaction for peaceful purposes and around the world a huge investment has been made in experimental programs to this end. In one approach to the problem lasers are used to compress and heat fuel consisting of a mixture of different isotopes of hydrogen to achieve the conditions needed for fusion.

Only tiny amounts of fuel are used contained in hollow glass spheres less than one millimetre in diameter. Measuring what happens inside these spheres which are irradiated from all sides by enormously powerful beams of laser radiation is a challenging and difficult problem. As the conditions required for fusion are approached this diagnostic problem becomes more and more troublesome since light and X-rays that are produced in the interesting region in the centre of the sphere cannot get out and so 'seeing' what is going on becomes very much more difficult. To overcome this problem it becomes necessary to develop new types of
camera capable of providing images of very penetrating X-rays or the products of the thermonuclear reaction itself: the neutrons.

A simple conceptual development made at the ANU is leading to the development of just the new type of 'camera' that is needed. By rejecting some of the usual preconceptions held about the design of imaging systems, a new and powerful coded-aperture technique capable of imaging very penetrating radiation has been developed.

The important idea, which is the novel feature of the ANU work, is simply that all the information required to reconstruct an image of the source is contained in the shadow it casts of a known object. Specifically the known object can be a large hole drilled in a metal plate. Provided certain conditions are satisfied, computer processing techniques can be used to reconstruct the image of the source from the shadow it casts.

The idea is now receiving serious attention at some of the world's largest laser fusion laboratories including the Lawrence Livermore Laboratory in the USA. To quote Frank Wang, an authority on fusion diagnostics at that Laboratory, 'Imagine when the technique developed for imaging X-rays at the ANU's 1 J laser becomes the only way for imaging neutrons at the world's largest 100,000 J NOVA laser. That would have a real impact on the fusion community. . .'.

New encyclopedia

Researchers in Canberra, Sydney and London are preparing material for inclusion in the Encyclopedia of the Australian People, which is to be published in 1988, to celebrate the Australian Bicentenary. Over 250 scholars and specialists from universities and educational institutions are involved in the joint ANU and Australian Bicentennial Authority Project, costing around $1 million.

Dr James Jupp, the encyclopedia's general editor, has established a unit within the Research School of Social Sciences (RSSS) to co-ordinate and edit text and illustrations. The encyclopedia will be aimed at a general audience and should be a readily available reference work. Dr Jupp believes that it will be acquired by most Australian tertiary and secondary institutions, in addition to libraries in Australia and overseas. It will incorporate many colour and monochrome illustrations and a series of maps, as well as an extensive bibliography.

The encyclopedia will reflect Australia as a continent which has been subjected to successive waves of immigration and settlement, the first occurring at least 40,000 years ago, when Aborigines are known to have been living on the continent. Section One will provide an historical overview of Australian settlement; Section Two will concern Aborigines and include items on history, urbanisation, employment, language,
religion and art; Section Three will discuss Australia’s immigrants, with sections devoted to the English, Scots, Irish, Italians, Germans, Greeks, Lebanese, Dutch, Vietnamese, Croats, Poles, Jews, Chinese, Maltese and some 90 other nationalities. The final Fourth Section will deal with issues in the peopling of Australia, including cultural diversity, family structure, settlement patterns and multicultural policy.

Dating the past

The time consuming process of small sample testing to determine age by radiocarbon dating has put increased pressure on the ANU Radiocarbon Dating Research Laboratory, which handles samples from many fields of research, besides archaeology.

As well as revealing details of prehistoric man, radiocarbon process C-14, can be used to establish chronicles of glaciation and sedimentation, past oceanic levels and ancient climates. C-14 can also provide information on the sources and intensity of man-made pollution of the atmosphere, land and water systems.
Although the Laboratory has attained a high rate of sample processing, the number of determinations has dropped recently, due to the high number of small carbon samples requiring processing. However, it is one of the few C-14 laboratories in the world able to handle relatively small samples. This ability will be enhanced when the new small volume gas proportional counter comes into use in April. The counter was developed by two Finns, Dr Lauri Kaihola of Turku University, and engineer, Hannu Kojola, of the Wallac Oy factory, as well as by Mr Henry Polach, head of the ANU Radiocarbon Dating Research Laboratory.

The device comprises 14 pencil-shaped counters, which register very small amounts of radioactivity, using methane gas as the sample. The volume of the counters is approximately 10 mls and methane is pumped into the counter at five times atmospheric pressure, which results in effectively counting the radioactivity in 50 ml of sample. Because of the low amount of radioactivity in the samples used, counting time is taken over two months. When in use, it will release other machines in the laboratory for faster dating and about 200 more samples will be handled each year.

Black smokers in the laboratory and on the sea floor

Exploration deep under the ocean has given scientists the opportunity to watch the formation of an important class of ore deposit for the first time.

The high grade sulphide deposits found within very old rocks are a rich and important source of copper, lead and zinc. These deposits are believed to have formed around vents of very hot water associated with volcanic activity which occurred on the ancient sea floor. Recent exploration of the present ocean floor by deep-water submersibles has resulted in the discovery of such hot-water vents at volcanic centres on the floor of the ocean. Around the base of those vents, which are called 'black smokers', mounds of iron, copper and zinc sulphides were found. Such mounds are believed to be the modern equivalent of the ancient ore deposits and scientists have been able to observe how they formed.

Effluent from the vents forms a plume of fine particles of metal sulphide (the black smoke). The particles are carried upward by hot buoyant fluid and dispersed widely over the sea floor, rather than being deposited locally. Deposition at the site of the vent appears to be confined to chimneys which grow around the base of the plume. The first mineral to precipitate in the chimneys is anhydrite (CaSO₄) which does so because it has the unusual property that its solubility in sea water decreases with increasing temperature. This forms an outer shell which grows upwards.
Laboratory analogue of a deep ocean 'black smoker' chimney, showing the darker copper salts which have replaced the original (white) potassium nitrate deposited round the plume.

and outwards around the base of the hot plume. The anhydrite shell is replaced first by zinc-rich ores and then by copper-rich ores in a series of dynamic replacement reactions, to produce the zoned structure characteristic of these deposits. Similar processes acting over a wider area are believed to be important in the formation of massive sulphide deposits.

A team in the Research School of Earth Sciences led by Professor Stewart Turner and Dr Ian Campbell has produced structures which are analogous to the black smoker chimneys, in a series of laboratory experiments. These experiments allow the formation of chimneys and the nature of the ore-forming replacement reactions to be studied under controlled conditions. Early experiments, using salts which show a decreasing solubility with increasing temperature, were unsuccessful because the dependence of solubility on temperature for these salts is too small over the range of temperatures which can be achieved in the laboratory. Instead, a plume of cold concentrated potassium carbonate \([\text{K}_2\text{CO}_3]\) at 0°C was ejected downwards into warm \((40^\circ\text{C})\), nearly-saturated potassium nitrate \([\text{KNO}_3]\).
This produced a porous chimney of KNO₃ crystals around the axis of the plume. When the chimney had grown to a length of about 6 cm the inflowing fluid was changed to warm copper sulphate (CuSO₄) which rapidly began to replace the KNO₃ matrix with various copper salts, as shown in the photograph of the resulting crystal column.

During the experiments it was noted that increasing the flow rate through the chimney causes fluid to leak through the porous walls, especially near the base of the chimney. This can result in the formation of secondary chimneys, branching off the primary chimney. Similar branching structures are also a common feature of the natural chimneys of the deep ocean.

Freedom of information

The Commonwealth Freedom of Information Act 1982 is based on the American model, and in practice it has faced similar problems.

Mr P.J. Bayne, a Senior Lecturer in the Faculty of Law, completed the writing of a book on the Act after his return in 1984 from Washington, DC where he had been a Senior Fulbright Scholar. The book entitled Freedom of Information (Law Book Co.) is aimed at alerting people to the legal problems that can arise under the Act. It is a detailed explanation of the background to the Act and its provisions. It deals with the analogous case law in the United States as well as with analogous common law and concepts involving equity.

The most common problem that is encountered in FOI cases is whether it would be contrary to the public interest for a government agency to release a particular document. Another problem is where information involves a third party, for instance, a trade union. The public interest questions have proven to be the most difficult to deal with and the book attempts to indicate to people what may be likely to happen when these questions are considered by the courts.

The book has already been of use to lawyers and judges in Australia who have cited it in cases concerning freedom of information before the Administrative Appeals Tribunal and the Federal Court. Although the book is primarily a legal textbook it contains a guide to the use of the Act by non-lawyers. Mr Bayne has also written a guide to the use of the Act by members of the Commonwealth Parliament which was published by the Parliamentary Library.
Appendices
The Council

Members of the Council
as at 31 December 1985

Members Ex-Officio

The Honourable Sir Richard (Arthur) Blackburn, OBE, BA Adel. & Oxf., BCL Oxf. — Chancellor
Emeritus Professor Sir Rutherford Robertson, AC, CMG, PhD Camb., DSc Syd., DSc ad eundem gradum Adel., HonDSc Tas., Monash & ANU, HonScD Camb., FAA, FRS — Pro-Chancellor
Peter Henry Karmel, AC, CBE, BA Melb., PhD Camb., PhD ad eundem gradum Adel., HonLLD PNG, Melb. & Qld, HonDLitt Flin. & Murd., DUniv Ncle(NSW), FASSA, FACE — Vice-Chancellor
Ian Gordon Ross, MSc Syd., PhD Lond., FRACI, FAA — Deputy Vice-Chancellor
Donald Alexander Aitkin, MA NE, PhD, FASSA — Chairman of the Board of the Institute of Advanced Studies
Douglas John Whalan, LLM NZ, PhD Otago, FAIM — Chairman of the Board of The Faculties
Neil Gerard McFarlane — President of the Australian National University Students’ Association

Members elected by the Senate

Peter Elliot Rae, BA LLB Tas.
Alice Olive Zakharov, BA Melb., ACTT Melb.STC, GradDipEdCouns RMIT, MAPsS

Members elected by the House of Representatives

Richard Emanuel Klugman, BSc MB BS Syd.
Philip Maxwell Ruddock, BA LLB Syd.

Members appointed by the Governor-General

Norman Keith Boardman, MSc Melb., PhD ScD Camb., FAA, FRS
Lisbeth Angelika Brodribb, AM, MA PhD Melb., FAIM
Georgina Margaret Carnegie, BEc Monash, MPA Harv.
Joan Rosemary Ford, BA NSW, DipEd Syd.
Pauline Marcus Griffin, BA DipSocStudies Syd.
Robert Thomas Parfitt, BPharm PhD Nott., CChem, FPS, FRSChem
William Abernethy Park, CBE, BCom Qld, FASA
Russell Jay Rechner, BEc Adel., FASA, ACIS
Evelyn Julia Ryan, BA DipEd Syd.
Stanley Stephen Schaetzel, BSc(Eng) DIC Lond., FRAeS, FTS
Ruth Hilary White, EdD Col., BA
Members chosen by Heads of the Research Schools in the Institute of Advanced Studies
Kurt Lambeck, BSc NSW, DPhil DSc Oxf., FAA
Ralph Gerard Ward, MA NZ, PhD Lond., FASSA

Members chosen from among the Deans of the Faculties in The Faculties
Beryl Marie Rawson, BA Qld, MA PhD Bryn Mawr
Richard Deane Terrell, BBe Adel., PhD

Member elected by the Professors in the Institute of Advanced Studies
George Adrian Horridge, MA PhD ScD Camb., FAA, FRS

Member elected by the Professors in The Faculties
Christopher Bryant, MSc PhD Lond.

Members elected by the non-professorial academic staff in the Institute of Advanced Studies
David Arthur Hume, BSc PhD
Alexander William Rodgers, BSc Syd., PhD, FRAS

Members elected by the non-professorial academic staff in The Faculties
Charles Campbell Macknight, BA Melb., PhD
Benjamin Klaas Selinger, MSc Syd., DrRerNat Stuttgart, DSc, FRACI

Members elected by the non-academic staff
Margaret Carstairs Bremner, BA(Lib) CCAE, ALAA
Margaret Honor Evans, BA NZ, DipPsych Lond.

Member elected by the research students
Shaun Michael Grahame Hughes, BSc NSW

Members elected by the undergraduate students
Glenn Douglas Phillips
Vacancy

Members elected by Convocation
Kenneth Lionel Fry, BA LittB
Dame Leonie Judith Kramer, DBE, BA Melb., DPhil Oxf., HonDLitt Tas., HonLLD, FAHA, FACE
Richard Christopher Refshauge, BA LLB
David Harris Solomon, BA LLB
Members appointed by the Council
Lady [Patricia] Brennan, MB BS Qld
Harold King

Secretary to the Council
The Registrar
University officers

Chancellor

Pro-Chancellor
ROBERTSON, Emeritus Professor Sir Rutherford (Ness), AC, CMG, PhD Camb., DSc Syd., DSc ad eundem gradum Adel., HonDSc Tas., Monash & ANU, HonScD Camb., FAA, FRS

Vice-Chancellor
KARMEL, Emeritus Professor Peter Henry, AC, CBE, BA Melb., PhD Camb., PhD ad eundem gradum Adel., HonLLD PNG, Melb. & Qld, HonDLitt Flin. & Murd., DUniv Ncle/(NSW), FASSA, FACE

Deputy Vice-Chancellor
ROSS, Professor Ian Gordon, MSc Syd., PhD Lond., FRACI, FAA

Assistant Vice-Chancellor
PLOWMAN, Colin George, BEc Syd.

Treasurer
BARTON, Professor Allan Douglas, BCom Melb., PhD Camb., FASA

Dean of Students
BAMBRICK, Susan Caroline, OBE, BEcon Qld, PhD

Registrar
DICKER, George Edgar, BA DipEd Syd. (until 18 April 1985)
DUBS, Rosalind Vivienne, Dr es Sc Lausanne, BSc (from 28 October 1985)

Acting Registrar
WHITE, Patricia Marie, BA Melb. (until 27 October 1985)

Secretary
WILLIAMS, Warwick Raymond, BSc NSW

Master of University House
ELLIOTT, Emeritus Professor Ralph Warren Victor, MA StAnd. & Adel., FAHA

Librarian
STEELE, Colin Robert, MA Liv., DipLib Lond., ALA, ALAA

Director, Computer Services
LANDFORD, Robert Russell, BCom Qld, AAUQ

Chairman of the Board of the Institute of Advanced Studies
NICHOL, Professor Lawrence Walter, PhD DSc Adel., FRACI, FAA (until 10 March 1985)
AITKIN, Professor Donald Alexander, MA NE, PhD, FASSA (from 11 March 1985)

Chairman of the Board of The Faculties
WHALAN, Professor Douglas John, LLM NZ, PhD Otago, FAIM

Head, Buildings and Grounds
ROBERTSON, Allison Alexander, BE Adel. (until 12 April 1985)
Acting Head, Buildings and Grounds  HARRISON, Kenneth William (from 13 April 1985)
Head, Finance and Accounting  JONES, Harvey Alexander, AASA, CPA

Officers for ceremonial occasions

Marshal  WILSON, Susan Ruth, BSc Syd., PhD
Esquire Bedell  RICHARDS, John Robbins, DSc Melb., PhD Durb., FRACI
## University statistics

Full-time staff as at 30 April 1985

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Designation | males | females | total |
---|---|---|---|
Computing staff
professional/administrative staff | 23 | 7 | 30 |
other | 16 | 19 | 35 |
total | 39 | 26 | 65 |
General university services
Administration
chief administrative officer | 7 |
senior administrative officer | 19 | 7 | 26 |
administrative officer | 33 | 12 | 45 |
administrative assistant | 14 | 15 | 29 |
clerical/keyboard staff | 38 | 134 | 172 |
other | 34 | 10 | 44 |
total | 145 | 178 | 323 |
Buildings and grounds
professional | 4 | 1 | 5 |
tradesmen | 42 |
other | 28 | 11 | 39 |
maintenance of grounds | 31 |
cleaning and caretaking | 10 | 24 | 34 |
total | 115 | 36 | 151 |
Other services** | 31 | 32 | 63 |
Independent operations | 51 | 56 | 107 |
Total Staff * | 2023 | 1328 | 3351 |

* rounding discrepancy in totals.
** includes Audio-visual, Health, Counselling, Student employment, Communications skills, and the Centre for Continuing Education.
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<th>senior&lt;br&gt;research fellow</th>
<th>research fellow</th>
<th>postdoctoral&lt;br&gt;fellow</th>
<th>research associate</th>
<th>visitor</th>
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<tr>
<td>Economics*</td>
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<td>Science</td>
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<tr>
<td>Office for Research in Academic Methods</td>
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<tr>
<td>Mathematical Analysis</td>
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| Total Research only staff*** | 66 | 48 | 119 | 45 | 47 | 149 | 97 | 8 | 19 | 597 |

* including NHMRC Social Psychiatry Research Unit (Director shown as professor)
** including Centre for Research on Federal Financial Relations
*** there may be small discrepancies in the total due to rounding

<table>
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<th>Teaching and research staff</th>
<th>professor</th>
<th>associate professor</th>
<th>reader</th>
<th>senior lecturer</th>
<th>lecturer/lecturing fellow</th>
<th>senior tutor</th>
<th>tutor</th>
<th>visitor</th>
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| Centres                     |           |                     |       |                 |                           |             |       |         |       |
| Centre for Mathematical Analysis | —      | —                   | 1     | 1               | —                        | —           | —     | 2       |
| Graduate Program in Public Policy | 1       | —                   | 2     | —               | —                        | —           | —     | 3       |
| total                       | 1         | —                   | 3     | 1               | —                        | —           | —     | 5       |

| Total teaching and research staff | 33 | 72 | 135 | 92 | 20 | 21 | — | 372 |
### Enrolments 1985

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</tr>
<tr>
<td>The Faculties</td>
<td>82</td>
<td>66</td>
<td>148</td>
</tr>
<tr>
<td>University Centres</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>160</td>
<td>78</td>
<td>238</td>
</tr>
<tr>
<td><strong>Graduate diploma courses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute of Advanced Studies</td>
<td>13</td>
<td>4</td>
<td>17</td>
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<tr>
<td>The Faculties</td>
<td>71</td>
<td>236</td>
<td>307</td>
</tr>
<tr>
<td>University Centres</td>
<td></td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>84</td>
<td>270</td>
<td>354</td>
</tr>
<tr>
<td><strong>LittB course</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Faculties</td>
<td>49</td>
<td>58</td>
<td>107</td>
</tr>
<tr>
<td><strong>Bachelor degree courses</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Arts</td>
<td>942</td>
<td>888</td>
<td>1830</td>
</tr>
<tr>
<td>Arts/law</td>
<td>238</td>
<td>24</td>
<td>262</td>
</tr>
<tr>
<td>Asian studies</td>
<td>116</td>
<td>55</td>
<td>171</td>
</tr>
<tr>
<td>Asian studies/commerce</td>
<td>5</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Asian studies/law</td>
<td>19</td>
<td>-</td>
<td>19</td>
</tr>
<tr>
<td>Commerce</td>
<td>237</td>
<td>62</td>
<td>299</td>
</tr>
<tr>
<td>Commerce/law</td>
<td>29</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Commerce/science</td>
<td>25</td>
<td>1</td>
<td>26</td>
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<tr>
<td>Economics</td>
<td>278</td>
<td>151</td>
<td>429</td>
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<tr>
<td>Economics/Asian studies</td>
<td>28</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>Economics [forestry]</td>
<td>5</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Economics/law</td>
<td>110</td>
<td>15</td>
<td>125</td>
</tr>
<tr>
<td>Economics/science</td>
<td>66</td>
<td>6</td>
<td>72</td>
</tr>
<tr>
<td>Law</td>
<td>42</td>
<td>22</td>
<td>64</td>
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<tr>
<td>Law (graduate)</td>
<td>42</td>
<td>60</td>
<td>102</td>
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<tr>
<td>Science</td>
<td>740</td>
<td>225</td>
<td>965</td>
</tr>
<tr>
<td>Science [forestry]</td>
<td>120</td>
<td>6</td>
<td>126</td>
</tr>
<tr>
<td>Science/law</td>
<td>52</td>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3094</td>
<td>1521</td>
<td>4615</td>
</tr>
<tr>
<td><strong>Non-degree courses</strong></td>
<td>39</td>
<td>264</td>
<td>303</td>
</tr>
<tr>
<td><strong>Total undergraduates</strong></td>
<td>3133</td>
<td>1785</td>
<td>4918</td>
</tr>
<tr>
<td><strong>Other courses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal workshop</td>
<td>40</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>Master's preliminary/qualifying</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Non-degree postgraduate courses</td>
<td>13</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59</td>
<td>42</td>
<td>101</td>
</tr>
<tr>
<td><strong>Gross enrolments</strong></td>
<td>4085</td>
<td>2268</td>
<td>6353</td>
</tr>
<tr>
<td><strong>Net enrolments</strong></td>
<td>4079</td>
<td>2257</td>
<td>6336</td>
</tr>
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</table>

### Assisted students

<table>
<thead>
<tr>
<th>Category</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Graduate students</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Government assistance</td>
<td>244</td>
<td>102</td>
<td>346</td>
</tr>
<tr>
<td>University assistance</td>
<td>193</td>
<td>96</td>
<td>289</td>
</tr>
<tr>
<td>Other assistance</td>
<td>66</td>
<td>21</td>
<td>87</td>
</tr>
<tr>
<td><strong>Total assisted students at the University</strong></td>
<td>503</td>
<td>219</td>
<td>722</td>
</tr>
</tbody>
</table>

### Degree and diploma courses completed

<table>
<thead>
<tr>
<th>Year ending 30 June</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctor of Philosophy</strong></td>
<td>81</td>
<td>20</td>
<td>101</td>
</tr>
<tr>
<td><strong>Master</strong></td>
<td>63</td>
<td>30</td>
<td>93</td>
</tr>
<tr>
<td><strong>Graduate Diploma</strong></td>
<td>50</td>
<td>32</td>
<td>82</td>
</tr>
<tr>
<td><strong>Bachelor of Letters</strong></td>
<td>23</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td><strong>Bachelor-honours</strong></td>
<td>108</td>
<td>69</td>
<td>177</td>
</tr>
<tr>
<td><strong>Bachelor-pass</strong></td>
<td>449</td>
<td>418</td>
<td>867</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>774</td>
<td>588</td>
<td>1362</td>
</tr>
</tbody>
</table>

*adjusted by 17 students enrolling in more than one course.
Co-operation with government and other public institutions

The Australian National University encourages members of the academic staff to give specialist advice and assistance to Federal and State Government departments and to other public institutions, both within Australia and internationally. This help takes many forms — consultancies, membership of committees, involvement in particular projects, secondments etc. The following list records such co-operation for 1985. This is not necessarily comprehensive.

**Central Administration**

**Emeritus Professor P.H. Karmel**, President, Australian Council for Educational Research; Chairman, Commonwealth Government's Quality of Education Review Committee; member, Commonwealth Government's Committee to Review the Efficiency and Effectiveness of Higher Education; Chairman, ACT Regional Committee for HRH The Duke of Edinburgh's Sixth Commonwealth Study Conference.

**Professor I.G. Ross**, Chairman, Australian and New Zealand Association for the Advancement of Science.

**Mr C.G. Plowman**, member, Council of Canberra School of Music.

**Professor A.D. Barton**, member, Council on Overseas Professional Qualifications — expert panel in general academic qualifications; member, ACT Third Party Insurance Premiums Advisory Committee; member, ADAB Financial Aid Project Team to Seychelle Islands.

**Dr R.V. Dubs**, member, ACT Schools Authority Council.

**Research School of Biological Sciences**

**Professor G.A. Horridge**, External Examiner in Biology, University of Malaysia.

**Professor R.F. Mark**, member of Council, Australian Academy of Science and Chairman, Regional Group.

**Dr I.G. Morgan**, consultative drug evaluator, Department of Health.


**Professor R.O. Slatyer**, Chairman, ASTEC; member, Board of Management and Policy Advisory Council of Australian Centre for International Agricultural Research; President, Scientific Committee on problems of the environment.
Research School of Chemistry  
Professor A.L.J. Beckwith, President, Royal Australian Chemical Institute; member, Council of the Australian Academy of Science.

Research School of Earth Sciences  
Professor K. Lambeck, member, Advisory Board, Bureau of Mineral Resources; member, Postdoctoral Awards Selection Committee, CSIRO. 
Professor A.E. Ringwood and Dr S.E. Kesson, co-operation with Australian Atomic Energy Commission on development of SYNROC demonstration plant.

John Curtin School of Medical Research  
Professor G.L. Ada, member, World Health Organization; Chairman, Scientific Advisory Committee of Experts, program on vaccine development; temporary adviser, Global Advisory Committee of Medical Research (GACMR); Chairman, sub-committee of GACMR for ‘Transfer of technology to developing countries with special reference to health’; Chairman, task force on vaccines for fertility regulation; Western Pacific Region, member, Advisory Committee on Medical Research; consultant, working group on international co-operation in technology transfer in the health field; member, Science Policy Committee and Royal Society Exchange Committee, Australian Academy of Science; consultant, Commonwealth Serum Laboratories and Australian Genetic Engineering Ltd.

Dr N.G. Ardlie, member, Diet and Heart Disease Committee, National Heart Foundation of Australia.

Dr W.L.F. Armarego, served on the Board of Medicinal Research Reviews.

Dr R.V. Blanden, Chairman, National Committee for Immunology, Australian Academy of Science.

Professor D.R. Curtis, member, AVCC Working Party on Animal Experimentation; Director, Australian Brain Foundation; Chairman, National Committee for Medicine, Australian Academy of Science; member, General Advisory Committee, Australian Association of Neurologists; NHMRC Committee on Animal Experimentation.

Dr M.A. Denborough, member, editorial board, Pharmacology and Therapeutics; medical adviser, ACT Asthma Association and ACT Sudden Infant Death Association.

Professor W.F. Doe, Chairman, Written Examinations Committee, Royal Australasian College of Physicians; member, Board of Examiners, Royal Australasian College of Physicians; Chairman, ACT Working Party on AIDS; member, editorial boards, Australian Prescriber and Cell Biochemistry and Function; member, Council of the Gastroenterological Society of Australia; member, Child Accident Prevention Foundation; external examiner, Faculty of Medicine, University of Tasmania;
Australian examiner in New Zealand for the Royal Australasian College of Physicians.

**Professor P.C. Doherty**, Chairman, Scientific Advisory Committee, Australian Animal Health Laboratory, Geelong; participant, on-site reviews for Sydney University Cancer Research Foundation and the Children’s Medical Research Foundation, Perth; President, Australian Society for Immunology; member, editorial boards, *Journal of Virology*, *Journal of Neuroimmunology*, *Advances in Virus Research* and *Microbial Pathogenesis*.

Dr **A.W. Duggan**, member, Council, Australian Physiological and Pharmacological Society; Vice-President, Australian Pain Society.

Dr **A.F. Dulhunty**, member, Council, Australian Physiological and Pharmacological Society.

**Professor P.W. Gage**, a vice-president, Australian Academy of Science; member, Council of the Australian Academy of Science; member, National Committee for Medicine, National Committee for Pharmacology, National Committee for Physiology, of the Australian Academy of Science; member of editorial board, *Journal of Cellular and Molecular Neurobiology*.

**Professor F.W.E. Gibson**, member, University of Sydney Centenary Institute of Cancer Medicine & Cell Biology Committee; member, Sydney Committee, Ludwig Institute for Cancer Research Scientific Advisory Committee; member, Department of Science and Technology Recombinant DNA Monitoring Committee; Chairman, Department of Science and Technology Recombinant DNA Scientific Sub-Committee; member, editorial boards, *Biochimica Biophysica Acta* and *Biochemical Journal*.

Dr **G.H. Henry**, government representative, ACT Optometrists Registration Board.

**Professor W.R. Levick**, member, editorial boards, *Biological Cybernetics* and *Photobiomodulation and Photobiophysics*; member, National Committee for Medicine, National Committee for Physiological Sciences, of the Australian Academy of Science; member, Executive of the National Vision Research Foundation.

Dr **I.D. Marshall**, member, NHMRC Standing Committee on Communicable Diseases; international adviser, American Committee on Arthropod-borne Viruses.

Dr **J.F. Morrison**, member, editorial boards, *Biochimica Biophysica Acta* and *Bio-organic Chemistry*. 

103
Dr M.C. Ngu, Director of Physician Training, ACT; ACT representative, Board of Continuing Education, Royal Australasian College of Physicians; member, Resident Medical Officer Training Committee, ACT Hospitals.

Professor R. Porter, member, Council of NHMRC; member, Forward Planning Committee, Medical Research Committee; member, Committee to report on a National Medical Cyclotron Facility; Chairman, Scientific Advisory Committee, University of Sydney/Royal Prince Alfred Hospital Centenary Institute for cancer medicine and cell biology; member, Medical Board of the ACT, Board of Directors of Australian Biomedical Corporation Ltd; member, IUPS Commission on Motor Control; an editor of Neuroscience Letters and Trends in Neuroscience; member, Science Policy Committee, Australian Academy of Science; Fellow, Queensland Institute for Medical Research.

Dr I.A. Ramshaw and Dr M.R.C. Banyard, consultants, AIDC; conducted a site visit to Australian Monoclonal Development Company Limited.

Dr S.J. Redman, member, National Committee for Promotion of Science & Technology, Australian Academy of Science; member, Interim Committee, Federation of Australian Scientific and Technological Societies.

Dr H. Rosenberg, member, Department of Health Therapeutic Goods Standards Committee; Chairman, ACT Committee for Fulbright Regional Selection Awards, Australian-American Educational Foundation; member, editorial board, Journal of Bacteriology.

Dr A.B. Roy, member, editorial board, Australian Journal of Experimental Biology and Medical Science; Treasurer, Magellan Society.

Research School of Pacific Studies

Dr B.J. Allen, assistance, Department of Primary Industry, Papua New Guinea.

Dr C. Bell, member, Advisory Committee, Australian Broadcasting Corporation.

Dr J. Bowler, advanced field work in northern Tibet and with Chinese colleagues in Beijing.

Professor G. Daws, member, UNESCO Commission Internationale pour une Histoire Scientifique et Culturelle de l’Humanite.

Mr P. Dibb, consultant to the Minister for Defence in a major review of Australia’s defence capabilities.

Dr P.D. Drysdale, Chairman, National Pacific Co-operation Committee.

Dr D.K. Forbes, member, International Programme Development Committee, Australian Institute of Urban Affairs.
Dr J.J. Fox, assistance, ADAB on aid work in Timor.

Dr R.G. Garnaut, secondment, Economic Adviser to the Prime Minister, and subsequently Ambassador to China.

Professor J. Golson, Chairman, National Committee for Pacific Science.

Professor H. Hughes, member, Policy Advisory Council, Australian Centre for International Agricultural Research; member, Australian Manufacturing Council; member, AUSSAT board.

Dr P. Keal, consultant to the Foreign Affairs Group of the Legislative Reference Service, Parliamentary Library.

Dr C.C. Kissling, assistance to ICAO and ADAB; member, AUSSAT board; member, steering committee, UNDP-SPEC Regional Transport Survey of the South Pacific.

Dr G.J.R. Linge, Chairman, Commission on Industrial Change, International Geographical Union.

Dr P. Loveday et al., studies of service delivery for Federal and Northern Territory government authorities.

Dr T.B. Millar, head, Australian Studies Centre, Institute of Commonwealth Studies, University of London.

Professor J.D.B. Miller, Chairman, Interim Committee for the establishment of an Australian Council for Europe; member, Australian National Commission for UNESCO; member, International Affairs Committee.

Professor Wang Gungwu, Chairman, Australia-China Council; member, University and Polytechnic Grants Committee, Hong Kong; member, Advisory Council, Jinan University, China.

Professor S.A. Wurm, Vice-President, Conseil Internationale de la Philosophie et des Sciences Humaines, UNESCO; member, International Budget Committee, Comite Internationale de la Philosophie et des Sciences, UNESCO.

Research School of Physical Sciences

Professor B.D.O. Anderson, member, OTC R&D Board, ATERB, AIRDIB and ASTEC Working Parties on Higher Education Funding and Public Investment in R&D; co-principal investigator on research agreement with Department of Defence on Maximum Entropy Array Processing and the application of Kalman filtering to Towed Array Shape Estimation.

Professor J.H. Carver, Chairman, United Nations Scientific and Technical Sub-Committee on the Peaceful Uses of Outer Space; Chairman, Anglo-Australian Telescope Board; Deputy Chairman, Australian Science
Professor K.J. Le Couteur, member, Council of the Australian Institute of Nuclear Science and Engineering (AINSE).

Dr L.J. Tassie, member, AINSE Nuclear Physics Committee.

Professor D.A. Aitkin, member, Australian Research Grants Committee; Chairman, Australian Consortium for Social and Political Research Inc.; member, Royal Australian Institute of Public Administration panel of judges; judge, National Press Club/Ford Award for political journalism and Canada Award for journalism relevant to the Pacific region; member, editorial boards of Politics and Electoral Studies (UK).

Dr D.S. Anderson, President, Australian Association for Research in Education; Chairman, ACT Schools Authority.

Dr D.R. Bell, consultant, Central Land Council on the Warumungu Land Claim; member, Science and Technology Committee of Australian Broadcasting Commission; member, Social and Cultural Anthropological Committee of AIAS.

Dr J.B. Braithwaite, member, Economic Planning Advisory Council; member, National Drug Education Committee; delegate, National Taxation Summit.

Professor J.C. Caldwell, member, working group on Population and Education, Department of Immigration and Ethnic Affairs; member, National Population Council; Oceania representative, Board of CICRED; Director, collaborative project with the Bangalore Population Centre, India.

Professor J.C. Caldwell, Dr C.A. Price and Dr L.T. Ruzicka, advisers, 1986 census, Australian Bureau of Statistics.

Dr B.J. Chapman, member, committee for National Clearinghouse for Youth Affairs, Department of Employment and Industrial Relations; technical adviser, Australian Federation of Consumer Organisations; delegate, National Taxation Summit.

Dr C. Cunneen, member, Council of National Trust of Australia, ACT.

Dr D.J. Daley, member, Technical Advisory Committee, ACT Schools Accrediting Agency.

Dr C.H. Fisher, honorary research officer, Australasian Coal and Shale Employees' Federation; assisted in preparing new rules for Queensland Colliery Employees' Union and NSW District Branches of ACSEF; and in preparation of material for amalgamation of ACSEF and Federated Mine Mechanics' Association of Australia; assisted Mining Unions' National
Liaison Committee in its participation in Advisory Committee and National Research Group, Australian Coal Consultative Council.

**Dr P.J. Forsyth**, consultant, Industries Assistance Committee on Fuel Taxation and Efficiency; presented two workshops on Discounting in the Public Sector to Commonwealth Department of Finance; contributor, Senior Economists' Seminar, for senior public service economists, Thredbo.

**Dr S.G. Foster** and **Dr P. Spearritt**, executive co-ordinators, Historic Records Research, based in the National Library of Australia, funded by the Australian Bicentennial Authority.

**Dr A.N. Gray**, consultant, Australian Institute of Health; secretary, Government inter-departmental working party on Aboriginal Health Statistics; consultant, Aboriginal Development Commission.

**Dr R.G. Gregory**, organiser, with Dr V. FitzGerald, of Senior Economists' Seminar on Developments in Macroeconomics and Public Finance, Thredbo; Acting Chairman, Council of the Bureau of Labour Market Research; member, Cabinet sub-committee on Industry Policy; member, Board of the Reserve Bank of Australia.

**Professor F.H. Gruen**, Chairman, Indicative Planning Council for the Housing Industry.

**Dr T.H. Hull**, co-organiser of a training course for 50 Chinese population policy-makers held in Hefei City, Anhui; member, UNFPA Basic Needs Assessment Mission to the Philippines.

**Professor F.L. Jones**, consultant, Bureau of Labour Market Research; member, Australian Studies Delegation, sponsored by the Australia-China Council.

**Dr H.L. Kendig**, collaborated with Ageing Project, South Australian Health Commission; member, steering committee, study on staffing and qualify of care in nursing homes, Commonwealth Department of Community Services; Chairman, Social Research Planning and Practise Committee, Asia/Oceania Region, International Association of Gerontology; member, Policy Committee, Australian Council on the Ageing; Vice-Chairman, ACT Council on the Ageing.

**Dr H.L. Kendig** and **Dr J. McCallum**, editors, monograph on the future of ageing in Australia for Department of Immigration and Ethnic Affairs; consultants in analysing findings from survey of ethnic aged by Australian Institute of Multicultural Affairs.

**Dr A.W. Martin**, member, editorial board, *Documents on Australian Foreign Policy*, Department of Foreign Affairs.

**Dr I. McAllister**, consultant, Australian Institute of Multicultural Affairs.
Dr J. McCallum, participant, workshop on the Aged and Recreation, Commonwealth Department of Sport, Recreation and Tourism.

Dr P.A. Meyer, consultant, ADAB.

Dr R.E. Miles, consulted with Dr Greenwood-Smith of CSIRO Division of Materials Science in connection with a materials analyser marketed by CSIRO.

Dr R.F. Miller, editor, booklet on Yugoslavia for Department of Education's Cultural Background series; participant, briefing sessions on Soviet affairs with Department of Foreign Affairs, defence and intelligence agencies.

Professor G.M. Neutze, member, Australian Research Grants Committee; member, National Population Council; Chairman, Western Australian Government Review of the Corridor Plan and Metropolitan Regional Scheme for Perth.

Mr C.T. Paris, consultant, Consultative Committee of Department of Consumer Affairs (NSW); consultant, Brisbane City Council.

Dr C.A. Price, continued work with AIMA on ethnic origins of the Australian people; member, National Population Council; collaborator with Committee for International Co-operation in National Research in Demography (Paris-based).

Dr T.H.R. Rigby, member, international advisory committee of the journals Soviet Studies (Glasgow) and Studies in Comparative Communism (Los Angeles); member, selection committee for exchange scholars, Commonwealth Department of Education.

Dr D.W. Rawson, organiser and contributor with Dr C.H. Fisher, course on Industrial Relations — Mostly in the Public Sector for assistant research officers and other public servants; lecturer, RAAF Staff College.

Dr L.T. Ruzicka, adviser, ADAB on Third Population Control Project of Bangladesh.

Dr M. Sawer, President, ACT Council of Social Services.

Dr S. Sax, member, steering committees for Survey of Australian Hospitals, Australian Institute of Health, and Review of Pathology Services, Commonwealth Department of Health; member, Board of Management of Calvary Hospital; Vice-President, Australian Council on the Ageing; Chairman, Policy Committee, Australian Council on the Ageing; Censor-in-chief, Australian College of Medical Practitioners.

Professor P.J.O. Self, Chairman, National Population Council; Chairman, National Inquiry into Local Government Finance.

Dr A.G. Serle, member, Council of the Museum of Victoria.
Mr P. Troy, participant, review of Social Justice program, Government of Victoria; member, National Building Technology Centre Management Committee; member, Australian Housing Council; member, Building Research and Development Advisory Committee; participant, training programs for construction industry and Unions at the Trade Union Training Authority; gave seminars to the Public Service Board and Department of Local Government and Administrative Services; adviser, housing for the poor, Sydney City Council; witness, ACT Supreme Court, for low income people seeking housing.

Dr S. Watson, consultant, Matrimonial Property Inquiry, Australian Law Reform Commission.

Dr G. Withers, consultant, Australia Council on the Arts; consultant, OCED on immigration; associate editor, Journal of Cultural Economics; member, government task force on wage flexibility; Chairman, Menzies Scholarship Committee; conducted senior management seminars, Department of Employment and Industrial Relations; participant, ASEAN–Australia Labour Markets Conference in Singapore; participant, hearings before the Australian Broadcasting Tribunal and House of Representatives Standing Committee on Expenditure.

Dr C. Young, consultant, Department of Immigration and Ethnic Affairs; consultant to Regional Director of Health for South-Eastern Region of NSW.

Faculty of Arts

Mr D.M. Adams, lecturer, Joint Services Staff College, Australian Chamber of Commerce, IBM course on Decision-Making in Public Sector; member, Politics Panel of ACT Schools Authority Accrediting Agency.

Dr J.A. Ballard, lecturer, Department of Employment and Industrial Relations.

Dr J.M. Barbalet, member, Behavioural Sciences panel, ACT Schools Authority Accrediting Agency.

Dr R.J. Campbell, Chairman (until June 1985), ACT Schools Authority.

Dr H.N. Collins, lecturer, RAAF Staff College and Political Exchange Program.

Mr R.J. Cooksey, on leave of absence as full-time consultant to Minister for Defence.

Dr C.H. Cull, member, Swiss Government Scholarships selection committee; member, German panel, ACT Schools Authority Accrediting Agency.

Dr R.G. Cushing, consultant, Welfare Branch, Department of Territories.

Dr O.F. Dent, member, Medical Workforce Advisory Committee of Royal Australasian College of Physicians; member, Capital Territory Health
Authority Committee on AIDS; member, Medical Review Panel of
NHMRC; member, Research into Drug Abuse Advisory Committee;
member, Australian Institute of Health.

Ms J. Docker, member, Italian panel, ACT Schools Authority Accrediting
Agency.

Professor J.A.W. Forge, member, Indonesian Textile Committee,
Australian National Gallery and adviser on other acquisitions; adviser on
foreign gifts to Australian Public Service.

Mr J.A. Grieve, member, French panel, ACT Schools Authority
Accrediting Agency.

Mr I.R. Hancock, lecturer, Joint Services Staff College; speaker,
Australian Broadcasting Corporation.

Professor J.P. Hardy, Secretary, Australian Academy of the Humanities.

Dr J. Hart, lecturer, Australian Political Exchange Program delegation to
the US; organiser, IBM course on Decision-Making in the Public Sector.

Dr I.M. Hughes, member, reaccreditation panel of Commonwealth
Institutions Accreditation Committee for Advanced Education; member,
Environmental Studies panel of ACT Schools Authority Accrediting
Agency.

Mr P.R. Ireland, member and Acting Chairman, Russian Syllabus and
Examination Committees, NSW Board of Senior School Studies; ANU
representative, ACT State Assessment Panel for Translators and
Interpreters; member, National Language Panel (Russian) of National
Accreditation Authority for Translators and Interpreters.

Dr L.M. Jansen, member, committee of ACT Languages Forum.

Dr L. Kouzmin, member, Immigration Review Panel of Department of
Immigration and Ethnic Affairs; member, Russian Committee, NSW
Secondary Schools Board; member, National Language Panel (Russian) of
National Accreditation Authority for Translators and Interpreters.

Dr F.W. Lewins, lecturer, RAAF Staff College, Joint Services Staff
College; judge, Canberra Times Golden Quill Award.

Dr I. McBryde, commissioner, Australian Heritage Commission;
member, Willandra Lakes World Heritage Area Plan of Management
Advisory Committee; member, Western Lands Commission, NSW;
member, NSW National Parks and Wildlife Service; member, committee
to review Material Culture Unit, James Cook University of North
Queensland.
Dr C.C. Macknight, member, Northern Territory History Award Committee; member, Northern Territory Department of Community Development.

Mrs J. Mayrhofer, examiner, Alliance Francaise.

Modern European Languages Department, various members, examiners for National Accreditation Authority for Translators and Interpreters.

Dr H. Morphy, Chairman, Arts Advisory Committee, Australian Institute of Aboriginal Studies; member, Research Committee, Australian Institute of Aboriginal Studies; consultant on NE Arnhem Land to Australian National Gallery, Museum of Australia, Film Australia.

Professor D.J. Mulvaney, member, Joint Academies Committee on Protection of Prehistoric Places; member, Council of Australian Institute of Aboriginal Studies.

Dr N. Peterson, Deputy Chairman, Australian Institute of Aboriginal Studies; consultant, Central Land Council, Alice Springs.

Dr W.S. Ramson, member, ABC Standing Committee on Spoken English; member, Commonwealth Institutions Accreditation Committee for Advanced Education.

Dr B.M. Rawson, member, Ancient History Syllabus Committee, NSW Board of Senior School Studies; member, AVCC sub-committee on Academic Standards.

Dr A. Rosenfeld, member, Prehistory Committee of Australian Institute of Aboriginal Studies.

Dr D.T. Rowland, lecturer, Royal Canberra and Woden Valley Hospitals.

Dr A. Saikal, lecturer, Joint Services Staff College, RAN Staff College, Foreign Affairs trainees; commentator, Australian Broadcasting Corporation.

Dr C. Sanders, examiner, Alliance Française; member, Telopea Park School Governing Board.

Dr T.B. Smith, member, Accreditation Review Committee for CCAE.

Mr R.G. Stewart, lecturer, Joint Services Staff College, Public Service Board Policy Workshop.

Dr M.J. Stoljar, member, Narrabundah College Board.

Mr P. Thom, member, ACT Arts Development Board (Chairman, Theatre Committee; member, Music Committee).
Ms M.B. Travers, Chairman, Russian Syllabus Committee, and member, Russian Examination Committee, NSW Board of Senior School Studies; member, Russian Committee, NSW Secondary Schools Board.

Mr S.G. Webb, member, Aboriginal Skeletal Advisory Committee of Museum of Victoria.

Mr I.F.H. Wilson, lecturer, RAAF and RAN Staff Colleges, RMC Duntroon; participant, Soviet Institute of World Economies and International Politics discussions with Research School of Pacific Studies.

Mrs S. Witheridge, member, Serbian and Croatian Syllabus and Examination Committees of NSW Board of Senior School Studies.

Professor J. Zubrzycki, member, Board of Listwan Foundation for Research and Treatment of Pain; member, Council of Australian Institute for Multicultural Affairs; member, Council of CCAE; external assessor for Bureau for Labour Market Research.

Dr R.R.C. de Crespigny, member, selection committee for Australia-China Scholarship Program, Department of Education and Department of Foreign Affairs.

Dr A.V. Diller, assisted in the planning of Radio Australia broadcasts to Thailand; with Mr P. Juntanamalaga provided translation services for Department of Defence, Department of Trade and Department of Social Security.

Dr L.A. Hercus, completed joint work on anthropological survey of Mound Springs in the north-east of South Australia for Department of Environment and Planning, South Australia.

Dr J.T.F. Jordens, member, Commonwealth Department of Education Committee to consider CCAE application for accreditation of its Diploma in Arabic.

Mr P. Juntanamalaga, organiser, three-week intensive Thai course at University of New South Wales in conjunction with special training project of ADAB; examiner for National Accreditation Authority for Translators and Interpreters.

Dr H.H.E. Loofs-Wissowa, Chairman, Indochina Languages Panel, National Accreditation Authority for Translators and Interpreters.

Dr V. Matheson, Chairman, ACT Schools Authority Indonesian Accreditation Panel.

Mr L. Nguyen, produced set of proficiency examinations in Vietnamese for Department of Foreign Affairs; examiner in Vietnamese for National Accreditation Authority for Translators and Interpreters.
Faculty of Economics and Commerce

Dr R.P. Byron, investigated economic conditions of transmigrants in Kalmintan and Sulawesi for the World Bank.

Mr R.B. Cunningham, Professor C.R. Heathcote and Dr D.F. Nicholls, completed study, River Murray Commission project 'Statistical analysis of River Murray Water Quality Data'.

Dr P.G. Hall, member, CSIRO Division of Mathematics and Statistics Advisory Committee.

Mr S. Holmes, financial controller/manager of Environment Centre, waste salvage job creation project, Commonwealth employment program; prepared work examples of effect of changes to tax act on small business for Small Business Research Unit's submission to Economic Planning and Advisory Committee (EPAC); attracted funding from Bureau of Industry Economics to support research into the role of professional accountants in relation to small business management.

Mr P.B. Jubb, member, ACT Division, Joint Professional Development Committee of ASA/ICAA; conducted national course 'Accounting for Leases' for ASA; conducted two seminars for ABS on 'The requirements of AAS17 — Accounting for Leases' and its implications for ABS data collections.

Dr D.F. Nicholls, member, sub-committee on Student Assessment, Canberra TAFE; consultant, Department of Housing and Construction; consultant, Housing Industry Association; consultant, Senate Standing Committee on Finance.

Dr D.F. Nicholls and Mr R.B. Cunningham, consultants, Department of Science and Technology.

Dr P.K. Trivedi, collaborative researcher, World Bank.

Faculty of Law

Mr M.L. Barker, paper on planning and managing Canberra, Australian Institute of Urban Studies (ACT Branch) conference; paper, environmental assessment seminar, Department of Arts, Heritage and Environment; session Chairman, Fourth National Environmental Law Symposium, Hobart.

Mr P.J. Bayne, lecturer, CCAE; convener, South Pacific Legal Studies Interest Group, Australasian Universities Law Schools Association; member, Advisory Panel, Aboriginal Law Research Unit; member, Academic Advisory Board, Ombudsman Forum of International Bar Association; legal adviser, Public Interest Advocacy Centre, Sydney; counsel, Administrative Appeals Tribunal in litigation concerning freedom of information law; adviser, Canberra Community Legal Service.

Mrs R. Burnett, member, Australian–New Zealand Foundation; member, Steering Committee on International Law, Law Council of
Australia; submissions, Senate Standing Committee on Industry and Trade.

Mrs C. Cook, sub-thesis, 'The Australia-Indonesia maritime boundary', used by the Australian delegation to the maritime boundary negotiations; conducted with Mrs R. Creyke and Mr J. McMillan, CCE Legislative Process course; conducted with Mrs R. Creyke, courses on working with legal materials for the Management and Policy Studies Centre, CCAE, the Public Service Board and the Department of Veterans' Affairs; adviser, Canberra Community Legal Service.

Mrs R. Creyke, training courses for volunteers, Citizen's Advice Bureau; paper on Guardianship, Human Rights Commission and Australian Group for the Scientific Study of Mental Deficiency Workshop; submission with Mr C. Rowland on draft Guardianship and Management of Property Ordinance (ACT) for ACT Council on the Ageing; participant, Human Rights Commission meeting to discuss draft Guardianship and Management of Property Ordinance (ACT); adviser, Canberra Community Legal Service; member, Citizen’s Advice Bureau of the ACT.

Mr J.L.R. Davis, legal adviser, Senate Standing Committee for Scrutiny of Bills; member, ACT Schools Authority Legal Studies Accreditation Panel.

Dr P.D. Finn, paper to Epidemiologists Section of NHMRC on the law and confidentiality; paper, Commonwealth Public Service, SEMP Programme, 'The Liabilities of Public Officials'; participant, Victorian Law Foundation project Legal Structures for Executive Government.

Miss H. Gamble, adviser, Canberra Community Legal Service; workshop on legal responsibility of child-care workers for students at Canberra TAFE; lectures to nurses enrolled in post-basic paediatric course at Royal Canberra Hospital.

Professor A.D. Hambly, Commissioner, Australian Law Reform Commission; member, Family Law Council; member, Parole Board of the ACT; papers, 23rd Australian Legal Convention; conference of Australian Family Court Judges; Australian Universities Law Schools Association; conference of the Australian Association of Marriage and Family Counsellors; Law Society of Queensland; Law Society of South Australia; Family Law Practitioners Association of New South Wales; Family Law Practitioners of Western Australia; Family Law Practitioners Association of Tasmania; Victorian Bar Association, Family Law Committee; Ethnic Affairs Commission and Ethnic Communities Council, Victoria.

Mr A. Hogan, Special Magistrate, ACT Court of Petty Sessions; Chairman, Law Reform and Review Committee, Law Society of the ACT.

Mr B. Hull, member, Legal Education Committee, Law Society of the ACT.
Mr J.D. McMillan, Director, Public Law module for Public Service Board Senior Executive Management Programs; speaker on administrative law for Public Service Board, Australian Taxation Office, Department of Trade, Department of Administrative Services and CCAE; co-organiser, conference on the Ombudsman; member, Task Force on Community Participation in Health Care; consultant, Administrative and Clerical Officers Association; adviser, various community and public interest groups.

Mrs J. Nicholson, paper, AULSA Annual Conference property interest group.

Mr P.J. Norman, examiner, commercial law and taxation law, Joint Examinations Board, Supreme Court of New South Wales; lecturer, Law Extension Committee, University of Sydney.

Dr D. O'Connor, member, ACT Consultative Committee on Criminal Law; Special Magistrate, ACT.

Professor D.C. Pearce, Chairman, CTEC Law Review Committee; member, Commonwealth Copyright Law Review Committee; member, AVCC Copyright Committee; legal opinions, Senate Privileges Committee; Public Officer, Copyright Society of Australia.

Mr N. Seddon, part-time Commissioner, Australian Law Reform Commission; member, ACT Consumer Affairs Council; member, Law Reform and Law Review Committee, Law Society of the ACT; board member, CARE credit and debt counselling service; president and treasurer, Canberra Community Legal Service.

Dr J.A. Seymour, adviser, Canberra Community Legal Service; member, Criminal Law Consultative Committee of the ACT.

Mr D.W. Smith, Chairman, Disciplinary Appeals Boards, Australian Telecommunications Commission and Australian Postal Commission.


Ms P. Weeks, lecturer, Family Planning Association (ACT) training courses; executive member, Industrial Relations Society (ACT); adviser, Canberra Community Legal Service.

Professor D.J. Whalan, legal adviser, Australian Senate Standing Committee on Regulations and Ordinances; AVCC member, Australian Nominating Committee, Commonwealth Scholarships and Fellowships Plan; member, inter-University Committee on Research; external consultant, Faculty of Law, University of Papua New Guinea; member, Committee of Chairmen of Professorial Boards for NSW and ACT; member, Federal Government's Recombinant DNA Monitoring Committee; Joint Chairman, ANU-CCAE Liaison Committee.
Professor L.R. Zines, member, Constitutional Commission.

Faculty of Science

Mr A.A. Argyle, Chairman, Canberra Branch, Australian Institute of Science Technology; assistant editor, *Australian Journal of Science and Technology*; member, Organising Committee, ICOPA VI.

Professor E.P. Bachelard, Chairman, Forest Research Advisory Committee, CSIRO.

Professor M.N. Barber, Vice-Chairman, Division of Applied Mathematics, Australian Mathematical Society; associate editor, *Journal of Statistical Physics*.

Dr R.W. Boulton, collaborative research, Australian National Botanic Gardens.

Dr J.H. Bradbury, project leader, ACIAR/ANU Program on Nutrition of Tropical Root Crops in the South Pacific; member, Postgraduate Funding Scheme Committee, ADAB; member, International Developments Program of Australian Universities and Colleges (IDP); Chairman, ACT Division of ANZAAS, editorial board, *Journal of Applied Polymer Science*.

Professor C. Bryant, member, Editorial Advisory Board, *Advances in Parasitology*; correspondence editor, *International Journal for Parasitology*; member, Organising Committee, Sixth International Congress of Parasitology (ICOPA VI); member, Publications Committee, Academy Liaison Committee, Institute of Biology in Australia.

Dr R.A. Bryce, member, Australian Mathematics Competition Problem Committee; ACT convenor of the Australian Mathematical Olympiad; member, Accreditation Advisory Panel, Department of Mathematics, CCAE.

Dr D.G. Byrne, Vice-Chairman, Mental Health Advisory Council of the ACT Health Authority; Vice-President, International College of Psychosomatic Medicine; member, National Heart Foundation, Smoking and Heart Disease, Stress and Smoking.

Dr R.N. Byron, consultant, Forestry Department, United Nations Food and Agriculture Organization; consultant, FAO–FINIDA World Expert Consultation on Appropriate Forest Industries.

Dr L.T. Carron, Chairman, Australian Forestry Council Forest Resources Committee.

Dr K.A.W. Crook, Chairman, Organising Committee and Vice-President, International Association of Sedimentologists; Deputy Chairman, Committee of the Consortium on Ocean Geosciences; Australian representative, Planning Committee, Ocean Drilling Study Group Joint Working Party on South Pacific Tectonics and Resources.
Dr K.A.W. Crook and Dr J.C. Tipper, members, Organising Committee, Congress of the International Association of Sedimentologists.


Dr J.A. Elix, Editor, *Australasian Lichenological Newsletter*.

Dr N.S. Gill, representative, ACT Schools Accreditation Panel for Chemistry course.

Dr W.H. Gladstones, publicity officer, Ergonomics Society of Australia and New Zealand; representative, Editorial Board, also Chairman and branch councillor, Australian Psychological Society, ACT Branch.

Professor D.M. Griffin, Director, Nepal–Australia Forestry Project; Chairman, FAO Advisory Committee on Forestry Education.

Mr K.W. Groves, consultant, ADAB; consultant, High Court of Australia; Chairman, Admissions Committee of the Institute of Wood Science.

Dr P.J. Gullan, ACT Regional Councillor, Australian Entomological Society.

Dr D.C.D. Happold, member, Editorial Board, *Journal of Arid Environments*.

Dr J. Holman, Chairman, Committee to Review Clinical Behaviour Practices of the ACT Health Authority; member, Board of Directors, Handicapped Citizens Association.

Dr A. Howe, Secretary, Bicentennial Australian Mathematical Congress.

Dr M.J. Howell, Vice-President, Australian Society for Parasitology; member, Organising Committee and Congress Editor for ICOPA VI; regional representative, *International Journal for Parasitology*.

Dr A.J. Howells, collaborative research, Division of Entomology, CSIRO, Canberra.

Dr P.A. Janssens, co-ordinator, Biochemistry Section, National Science Summer School.

Dr R.J. Loy, member, ACT Schools Authority Accreditation Panel for Mathematics.

Dr T.G. Marples, member, Biological Advisory Panel, ACT Schools Authority.

Dr W.L. Nicholas, member, Editorial Committee, *Fauna of Australia*; member, Australian Biological Resources Survey; Vice-President, ICOPA VI.
Dr R.M. Pashley, member, Advisory Board, *Journal of Colloid and Interface Science*; ANU representative, General Science Course Panel, ACT Schools Authority.

Dr M. Rasmussen, member, Chemistry Education Group Committee, RACI, Canberra Branch.

Dr M.J. Rickard, member, Geoscience Council of Australia.

Professor W.A. Scott, member, Publications Committee, Australian Psychological Association.

Dr B.K. Selinger, member, Royal Institution of Great Britain; Chairman, ACT Asbestos Advisory Committee; Commissioner (ACT), National Occupational Health and Safety Commission; member, Council of the Australian Consumers Association.

Dr K.R. Shepherd, Silvicultural Consultant, Nepal–Australia Forestry Project.

Dr G.D. Smith, collaborative research, Baas Becking Geobiology Laboratory, Division of Mineralogy, CSIRO.

Dr P.R. Stewart, ANU nominee, Working Party to Review the Accrediting Agency of the ACT Schools Authority.

Mr C.R. Tidemann, Organising Committee, 8th International Bat Research Conference; consultant, ABC Natural History Unit.

Dr J.C. Tipper, member, Editorial Board, *Computer and Geosciences*; member, Education Sub-Committee of the local Division of the Geological Society of Australia.

Professor R.N. Warrener, member, Forensic Science Society of Great Britain; member, Advisory Board, *Synthetic Communications*.

Professor J.F. Williams, collaborative research, The Queen Elizabeth Hospital, Woodville, SA.
Joint research projects undertaken with other universities and CSIRO

**Research School of Biological Sciences**

Studies of the hormonal control of leaf senescence in soybean by Dr D.S. Letham with Professor L.D. Nooden, University of Michigan.

Studies in commissural pathways in the wallaby by Professor R.F. Mark with Dr D. Ehrlich, Monash University.

Research in retinal neurotransmitters by Dr I.G. Morgan with Dr I.W. Chubb, University of Wollongong, Dr P. Dunkley and Dr J. Rostas, University of Newcastle, NSW, Dr M. Epstien and Dr K. Johnson, University of Wisconsin, Dr C. Brandon, Northwestern University, Professor A. Spira, University of Calgary, Professor K. Negishi, Kanazawa University, Japan, and Professor R. Miledi, University of California, Irvine.

Development of neuromuscular connections in locusts by Dr E.E. Ball with Dr C. Goodman, Stanford University, California.

Studies in genetics and biochemistry of nitrogen fixation by Dr B. Rolfe and Dr J. Shine with Professor A. Puhler, University of Bielefeld, West Germany, and Dr R. Carlson, Eastern Illinois University, and Dr R. Roughley, Department of Agriculture, NSW.

Genetic improvement of alcohol production by *Zymomonas*, by Dr M.L. Skotnicki with Professor P.L. Rogers, University of New South Wales.

Automation of taxonomic descriptions and identificatory facilities by Mr L. Watson with Dr M.J. Dallwitz, CSIRO, Canberra.

Studies of variations in grass leaf digestibilities by Dr P.W. Hattersley with Dr J.R. Wilson, CSIRO, Brisbane.

Studies of regulary RNA and carcinogenesis by Dr H. Naora with Professor V. Holoubek, University of Texas, Galveston.

Research on population structure by Dr J.B. Gibson with Professor G.A. Harrison and Dr R.W. Hiorns, University of Oxford.

Research on molecular evolution of *Drosophila* by Dr J.G. Oakshott with Dr W.K. Knibb and Professor J.S.F. Barker, University of New England, Dr S.W. McKechnie, Monash University, Dr B.W. Geer, Knox College, Illinois, and Professor R. Richmond, University of Illinois.

Research on highly repeated DNA in *Caledia captiva* by Mr M. Arnold with Dr R. Appels, Division of Plant Industry, CSIRO.
Studies of the molecular characterisation of heterochromatin polymorphisms in *Atractomorpha similis* by Professor B. John with Dr R. Appels, Division of Plant Industry, CSIRO.

Research on the fluorescence behaviour of heterochromatin by Professor B. John with Dr D. Schweizer, University of Vienna.

Studies of hormone metabolism in relation to dormancy by Dr D.S. Letham with Dr N.G. Smith, University of New England.

Studies of the effect of hormones on legume seed protein composition by Dr D.S. Letham with Dr T.J.V. Higgins and Mr H.E. Schroeder, Division of Plant Industry, CSIRO.

The role of tRNA in the biogenesis of free cytokinins by Dr L.M.S. Palni with Dr R. Horgan, University College of Wales, Aberystwyth.

Studies of induced abscission sites in internodal explants by Dr P.M. Warren Wilson with Professor F.T. Addicott, University of California, Davis, and Mr R.H. McKenzie, Princeton University.

Research on cell division by Professor B.E.S. Gunning with Dr P.K. Hepler, University of Massachusetts.

Studies of regeneration of whole plants from tissue cultures of cereals by Dr W. Wernicke with Dr W.G. Scowcroft, Division of Plant Industry, CSIRO.

Studies of unusual optical systems in peculiar eyes and lower animals by Professor G.A. Horridge with Dr P. McIntyre, Australian Defence Force Academy.

Studies in plant responses to salinity by Professor C.B. Osmond and Dr S. von Caemmerer with Professor Pitman, Director, Institute of Biological Sciences, CSIRO.

Research into ecophysiology of arid plants by Professor C.B. Osmond with the Desert Research Institute, University of Nevada.

Photosynthetic biochemistry studies by Professor C.B. Osmond and Dr G.D. Farquhar with ARC Photosynthesis Unit, University of Sheffield.

Study of photosynthesis in eucalypt foliage by Dr I.R. Cowan with Dr M. Küppers, Division of Forest Research, CSIRO.

Studies of ecological gradients by Dr I.R. Noble with Dr M. Austin, Division of Water and Land Research, CSIRO.

The application of knowledge-based systems to land management by Dr I.R. Noble with Dr B. Walker and Dr M. Stafford-Smith, Division of Wildlife and Rangeland Research, CSIRO.
Modelling of ecological effects of forest fire by Dr I.R. Noble with Dr J. Walker, Division of Water and Land Resources, CSIRO, Dr A.M. Gill, Division of Plant Industry, CSIRO, and Dr J. Hoare, Division of Forest Research, CSIRO.

Studies of water-use efficiency in plants by Dr G.D. Farquhar with Dr R.A. Richards, Division of Plant Industry, CSIRO, and the Australian Centre for International Agricultural Research.

Analysis of surface polysaccharides of *Rhizobium* strains by Dr B. Rolfe and Mr Hancai Chen with Dr J. Redmond and Dr M. Batley, School of Chemistry, Macquarie University.

Studies of plant-derived signals which induce legume root infection by Dr B. Rolfe with Dr A.A.N. van Brussel and Dr J. Wijfelman, Department of Botany, University of Leiden.

Analysis of capsular polysaccharides and lectin binding to *R. trifolii* by Dr B. Rolfe, Dr M. Djordjevic and Dr J. Plazinski with Dr F. Dazzo, Department of Microbiology and Public Health, Michigan State University.

Structural analysis of *R. trifolii* exopolysaccharides by Dr B. Rolfe and Dr M. Djordjevic with Dr R. Carlson, Department of Chemistry, Eastern Illinois University.

Mutagenesis and cloning of *R. trifolii* symbiotic genes by Dr B. Rolfe and Dr M. Djordjevic with Dr P. Keumpel, Department of Molecular, Cellular and Developmental Biology, University of Colorado.

Studies on the molecular biology of Burkitt's lymphomas by Dr H. Naora with Dr N.J. Deacon, University of Melbourne.

Research on the population and molecular genetics of Esterase-6 in *Drosophila melanogaster* by Dr J.G. Oakeshott with Professor R.C. Richmond and Dr C. Collett, Indiana University.

Research on the developmental neurogenetics of *Drosophila melanogaster* by Dr G.L.G. Miklos with Dr G. Lefevre, State University, California, Dr V. Pirrotta, Baylor College of Medicine, Houston, Dr A. Schalet, State University, Leiden, Professor M.M. Green, University of California at Davis, Dr L. Kelly, University of Melbourne, Professor R. Wyman, Yale University, and Dr S. Zusman, Princeton University.

Research on reproduction in the tammar wallaby by Mr S.J. McConnell and Professor R.F. Mark with Dr C.H. Tyndale-Biscoe, Division of Wildlife and Rangelands Research, CSIRO.

Research on behavioural biology by Dr L.R. Marotte with Professor A.W. Spira, University of Calgary.
Classificatory work on grasses by Mr L. Watson with Professor H.T. Clifford, University of Queensland.

Studies of differences in leaf protein amino acid patterns among leguminous plants and monocotyledons by Mr L. Watson with Dr H.H. Yeoh, University of Singapore.

Virus Identification Data Exchange (VIDE) project by Ms K. Boswell and Dr A.J. Gibbs with members of the International Legume Virus Working Group, about 100 overseas virologists, and Dr M.J. Dallwitz and Ms T.A. Paine, Division of Entomology, CSIRO.

Research School of Chemistry

Biosynthetic studies on gibberellins by Professor L.N. Mander with Dr B.G. Coombe, Waite Agricultural Research Institute, University of Adelaide, and Professor R.P. Pharis, Department of Botany, University of Calgary.

Development of radio-immune assays for gibberellins by Professor L.N. Mander with Professor N. Takahashi, Department of Chemistry, University of Tokyo.

Investigation of gibberellin bio-receptors through the application of photo-affinity labelling techniques by Professor L.N. Mander with Dr J.V. Jacobsen, Division of Plant Industry, CSIRO, Canberra.

Studies of polymerisation mechanisms by Professor A.L.J. Beckwith and Mr V. Bowry with Dr G. Moad, Division of Applied Organic Chemistry, CSIRO.

ESR studies of membrane autoxidation by Professor A.L.J. Beckwith with Dr W. Cherry, Chemistry Department, Louisiana State University.

Structure and reactivity of nitroaromatic radical ions by Professor A.L.J. Beckwith with Dr R.K. Norris, Chemistry Department, University of Sydney.

Mechanistic studies of reactions of organic peroxides by Professor A.L.J. Beckwith and Dr B.R. Sanderson with Professor A.G. Davies, Chemistry Department, University College, London.

Structural and mechanistic studies on the oxygen evolving complex of plant photosystem II by Dr R.J. Pace and Dr R. Bramley with Dr J.M. Anderson, Division of Plant Industry, CSIRO.

3-Amino-5-hydroxybenzoic acid in antibiotic fermentation by Mr R.W. Rickards with Dr G. Mavel, Institut national de Recherche Chimique Appliquee, France.

Synthesis of chiral prostanoid intermediates by Mr R.W. Rickards with Dr G. Mavel, Institut national de Recherche Chimique Appliquee, France.
Structure-activity relationships in non-carbocyclic glutarimide antibiotics by Mr R.W. Rickards with Dr T.J. Haig, Riverina College of Advanced Education.

Reactivity of phosphate esters and polyphosphates by Professor A.M. Sargeson, Mr P. Hendry and Dr I.I. Creaser with Professor G.P. Haight, University of Illinois.

Electrochemistry of macrobicyclic cobalt(III) complexes by Professor A.M. Sargeson, Dr G.A. Lawrance and Dr P.A. Lay with Professor A.M. Bond, Deakin University.

Pulse radiolysis studies of co-ordination complexes by Professor A.M. Sargeson and Dr G.A. Lawrance with Dr D.F. Sangster, CSIRO Chemical Physics, and Australian Atomic Energy Commission.

Syntheses and structural studies of macrobicyclic complexes of transition metals by Professor A.M. Sargeson, Dr K.S. Hagen, Dr P. Bernhard, Dr M.B. McDonnell, Dr R.J. Geue, Miss L.L. Martin and Dr I.I. Creaser with Dr J. Harrowfield and Associate Professor A.H. White, University of Western Australia.

Reaction mechanisms in amine cobalt(III) chemistry by Professor A.M. Sargeson with Dr W.G. Jackson, Royal Military College, University of New South Wales.

Photochemistry of macrobicyclic metal complexes by Professor A.M. Sargeson and Dr I.I. Creaser with Dr W. Sasse and Dr A. Mau, Division of Applied Organic Chemistry, CSIRO, Melbourne.

Structural studies of macrobicyclic complexes by Professor A.M. Sargeson, Dr I.I. Creaser, and Dr R.J. Geue with Dr M.R. Snow, University of Adelaide.

Energy minimisation of solvent spheres about metal complexes by Dr R.J. Geue with Dr M. Dwyer, University of Adelaide.

A new approach to crystal chemistry by Professor B.G. Hyde with Professor M. O'Keeffe, Arizona State University.

Crystal structures: descriptions and relationships by Professor B.G. Hyde with Professor S. Andersson, Lund University.

Synthesis and catalytic properties of arene ruthenium complexes by Dr M.A. Bennett with Dr G. Vitulli, Centro di Studio del CNR per le Macromolecole, Stereordinate ed Otticamente Attive, University of Pisa, Italy.

Use of chelating phosphorus-containing ligands in the development and characterisation of olefin oligomerization catalysts based on nickel(II) β-dithiolketonate complexes by Dr M.A. Bennett with Dr K. Cavell, CSIRO Division of Materials Science, University of Melbourne.
Phase behaviour of interaction site fluids by Dr G.P. Morriss with Dr D.J. Isbister, Department of Chemistry, Royal Military College, University of New South Wales.

Theory of molecular liquids by Dr G.P. Morriss with Dr P.A. Monson, University of Massachusetts, and Dr P.T. Cummings, University of Virginia.

Non-ergodic behaviour in gas-phase ions by Dr L. Radom with Professor J.L. Holmes, University of Ottawa.

Rearrangement and fragmentation processes in gas-phase ions by Dr L. Radom and Dr R.H. Nobes with Professor C. Lifshitz, Hebrew University of Jerusalem.

Symmetry breaking in molecular orbital calculations by Dr L. Radom and Dr R.H. Nobes with Professor H.F. Schaefer, Department of Chemistry, University of California at Berkeley.

Diffuse X-ray scattering in molecular crystals by Dr T.R. Welberry with Dr S. Mair, Division of Chemical Physics, CSIRO, Victoria.

Synthesis of novel conducting polymers based on polymer latices by Professor J.W. White with Dr B. Vincent and Mr S. Armes, University of Bristol, and Professor D. Napper and Professor Robert Gilbert, University of Sydney.

Synthesis and structure of pillard clay catalysts by Professor J.W. White with Dr P. Pinnavaia, Michigan State University.

Structural studies on macrocyclic complexes by Dr S.B. Wild with Dr F.S. Stephens, School of Chemistry, Macquarie University.

Electrochemistry of copper complexes of trans-N₂S₂ macrocycles by Dr S.B. Wild with Dr K.P. Wainwright, School of Chemistry, Flinders University of South Australia.

Research School of Earth Sciences

Study of Tasman seamounts by Dr I. McDougall with CSIRO and University of Tasmania.

Study of ocean currents off Western Australia using satellite imagery by Dr R.W. Griffith with CSIRO.

Study of mixing in stratified tidal flows by Dr G.N. Ivey with Centre for Environmental Dynamics, University of Western Australia.

Ion microprobe research projects carried out jointly with the Universities of Western Australia and Adelaide.

John Curtin School of Medical Research

The molecular biology and biochemistry of the energy-transducing ATPase of Escherichia coli by Dr G.B. Cox and Professor F.W.E. Gibson with Dr A.E. Senior and others, Department of Biochemistry, Rochester University.
Comparative molecular biology of the $F_{i}F_{o}$ ATPase by Dr G.B. Cox with Dr P.W. Whitfield and Dr W. Bottomley, Division of Plant Industry, CSIRO.

The slow-binding inhibition of hexokinase by $M(III)$ ATP complexes by Dr J.F. Morrison with Dr W.W. Cleland, University of Wisconsin.

The chemical mechanism of the reaction catalyzed by prephenate dehydrogenase by use of isotope and pH effects by Dr J.F. Morrison with Dr W.W. Cleland and Dr M.O. Leary, University of Wisconsin.

The synthesis of cyclohexadiene derivatives and their effects as inhibitors of chorismate mutaseprephenate dehydrogenase by Dr J.F. Morrison with Dr G. Berthold, Department of Chemistry, MIT.

The crystallization of chorismate mutaseprephenate dehydrogenase by Dr J.F. Morrison with Dr G. Petski, Department of Chemistry, MIT.

Clinical evaluation of Parkinson's Disease by Dr W.L.F. Armarego with Professor W. Jacobsen, Department of Haematology, University of Cambridge.

Identification of intra-cellular structure which takes up fluorescent dye DiOC6 by Dr I.K. Buckley with Mark Terasaki, Department of Anatomy and Cell Biology, Harvard Medical School.

Microinjection of monoclonal antibodies to probe cell motility by Dr I.K. Buckley with Chris Dos Remedios and Brett Hambly, Department of Anatomy, University of Sydney.

Interactions between lymphoma cells and the retroviruses which they produce by Dr H.C. O'Neil with Dr M. McGrath, University of California at San Francisco.

Role of the T-cell receptor in T-cell leukemia induction following retrovirus binding by Dr H.C. O'Neil with Dr J. Allison, University of California at Berkeley.

T-cell recognition of retroviruses by Dr H.C. O'Neil with Professor I. Weissman, Department of Pathology, Stanford University Medical Centre.

Toxic aldehyde production in malaria by Dr N.H. Hunt and Mr G. Buffinton with Dr Herman Esterbauer, University of Graz.

Activity of novel iron chelators in free radical-induced processes by Dr I.A. Clark with Dr H.H. Peter, Ciba-Geigy, Basel, Switzerland, and Dr E. Baker, Department of Physiology, University of Western Australia.

Enhancement of iron-induced free radical generation by aluminium by Dr I.A. Clark with Dr B. Halliwell, Kings College, University of London.
Genetics heterogeneity of SLE by Dr J.W. Serjeantson with Dr P. Gatenby, Clinical Immunology Research Centre, University of Sydney.

Biochemical genetic studies of FXIII in tissue transplantation by Dr P.G. Board with Dr D. Smith, Walter and Eliza Hall Institute for Medical Research, Melbourne, and Dr A. Wolpl, Department of Transfusion Medicine, University of Ulm.

Gamete maturation, transport and interaction in marsupials by Dr J.C. Rodger with Dr L. Selwood, Department of Zoology, La Trobe University.

Synthesis of bovine chimeras by Dr J.N. Shelton with Dr R. Munro, Division of Tropical Animal Science, CSIRO, Rockhampton.

Lipid peroxidation and platelet injury by Dr N.G. Ardlie with CSIRO.

Development of avidin-biotin based immunohistochemical techniques by Dr D.A. Hume with CSIRO.

Immunosuppressive amphiphilic compounds by Dr R.V. Blanden with Professor B. Ninham, Research School of Physical Sciences, ANU, Dr R. Ashman, Department of Microbiology, University of Western Australia, and Dr N. King, ANUTECH, ANU.

Investigations of functions of adenovirus early regions E3 and E4 by Dr A.J.D. Bellett with Dr R.J. Cutt, Department of Microbiology, State University of New York, Stony Brook.

Studies of virus evolution by Dr A.J.D. Bellett with Dr G. Akusjarvi, Biomedical Centre, University of Uppsala.

Poxviruses as vectors for vaccines by Dr D.B. Boyle, Dr B.E.H. Coupar, Dr M.E. Andrew and Mrs Corrigan (CSIRO) with Dr G.W. Both, Dr C. Tyndall, Dr P. Whitfield and Ms L.J. Siegman, Division of Molecular Biology; Dr I.M. Parsonson, Australian Animal Health Laboratory; Dr D. Steward and Dr T.J. Bagust, Division of Animal Health; Dr T. Ellerman, Division of Protein Chemistry, CSIRO; and Professor A.R. Bellamy, Department of Cell Biology, University of Auckland.

Prospective serological survey to determine human arbovirus disease incidence in NSW by Dr I.D. Marshall with Associate Professor C. Broughton and Associate Professor R. Hawker, Department of Microbiology, University of New South Wales.

Effect of complement compounds on tumours by Dr P.D. Cooper with Dr R. Sims, Department of Biochemistry, University of Oxford.

The use of gliotoxin in islet transplantation by Dr A. Mullbacher and Dr R.D. Eichner with Dr K. Lafferty, Barbara Davis Centre for Childhood Diabetes, Denver, Colorado; Dr T. Mandel, Walter and Eliza Hall Institute.
of Medical Research, Melbourne, and Dr B. Tuck, Department of Surgery, University of Sydney.

Effect of gliotoxin on bacteriocidal activity of macrophages by Dr A. Mullbacher and Dr R.D. Eichner with Dr P. Wood, Division of Animal Health, CSIRO, Parkville, Victoria.

Epipolythiodioxopiperazine in avian disease by Dr A. Mullbacher and Dr R.D. Eichner with Dr J. Edgar, Division of Animal Health, CSIRO, Parkville, Victoria.

Effects of gliotoxin on SV49 cells by Dr A. Mullbacher and Dr R.D. Eichner with Dr H. Kaslow, Department of Biophysics and Physiology, University of Southern California.

Role of epipolythiodioxopiperazine in canine aspergillosis by Dr A. Mullbacher and Dr R.D. Eichner with Dr M. Day, Department of Veterinary Science, Murdoch University.

Use of gliotoxin in canine kidney transplantation by Dr A. Mullbacher and Dr R.D. Eichner with Dr R. Shiel, Department of Surgery, University of Sydney.

Use of gliotoxin in rodent kidney transplantation by Dr A. Mullbacher and Dr R.D. Eichner with Dr P. Jablonski and Dr V. Marshall, Department of Surgery, Monash University.

Role of epipolythiodioxopiperazine in human disease by Dr A. Mullbacher and Dr R.D. Eichner with Dr W. Green, Department of Medicine, University of Sydney.

Analysis of cell surface receptors for sulphated polysaccharides by Dr C.R. Parish with Professor I.F.C. McKenzie and Dr M. Hogarth, Department of Pathology, University of Melbourne.

The structure-activity relationships of analogues of gamma-aminobutyric and glutamic acids by Professor D.R. Curtis with Dr P. Krosgaard-Larsen, Royal Danish School of Pharmacy, Copenhagen.

Mode of action of convulsants by Professor D.R. Curtis with Professor C.G. Wermuth, Laboratory of Organic Chemistry, Universite Louis Pasteur, Strasbourg, France.

Identification of enteric neurone peptides by Dr C.E. Hill with Professor J. Furness and Dr M. Costa, Flinders Medical Centre, South Australia.

Synthesis and testing of heterocycles for interaction with central diazepam binding sites and as antagonists of adenosine receptors by Dr G.B. Barlin with Dr L.P. Davies, Department of Behavioural Biology, ANU, and Professor G.A.R. Johnston, Department of Pharmacology, University of Sydney.
Selectivity of ion channels in cell membranes neurons by Professor P.W. Gage with Dr P.H. Barry, School of Physiology and Pharmacology, University of New South Wales.

Chloride channels in pulmonary epithelial cells by Professor P.W. Gage with Professor J.A. Young, Department of Physiology, University of Sydney.

The nature and influence of the visual transcallosal pathway of the cat by Dr G.H. Henry with Dr M.E. McCourt, Department of Psychology, University of Texas, Austin.

The nature of the visual transcallosal painway of the cat by Mrs J. Boyapati with Dr M.E. McCourt, Department of Psychology, University of Texas, Austin.

Co-ordinated optical and retinal development by Ms R. Wong with Professor A. Hughes, National Vision Research Institute, Victoria.

Amplification of bleomycins and phleomycins as antitumour agents by Dr D.J. Brown with Dr G.W. Grigg, Division of Molecular Biology, CSIRO.

Isolation and characterisation of bovine milk lysozyme by Dr H.A. McKenzie, Dr F.H. White and Dr D.C. Shaw with Dr R.J. Pearce, Division of Food Research, CSIRO.

Circular dichroism and optical rotatory dispersion of egg proteins by Dr H.A. McKenzie and Dr F.H. White with Miss Joan Back, Division of Food Research, CSIRO.

Water and proteins by Dr H.A. McKenzie with Dr J.T. Edsall, Department of Biochemistry, Harvard University.

Amino acid sequence studies of Tammam wallaby milk proteins by Dr H.A. McKenzie and Dr D.C. Shaw with Dr K. Nicholas, Wildlife and Rangelands Research Division, CSIRO.

Primary sequence of immunoglobulin chains by Dr D.C. Shaw with Dr A.B. Edmundson, University of Utah.

The role of serotonin-containing neurones in the control of preganglionic sympathetic neurones by Dr J. Lipski with Professor J.P. Chalmers, Dr M. West and Dr P. Pilowsky, Department of Medicine, Flinders Medical Centre, Adelaide.

Local effects of excitatory amino acids injected into the central nervous system by Dr J. Lipski with Professor J.P. Chalmers, Dr M. West and Dr P. Pilowsky, Department of Medicine, Flinders Medical Centre, Adelaide.

Research undertaken by the ASEAN–Australia Economic Relations Research Project with universities in Indonesia, Singapore, Thailand, Malaysia and the Philippines.
Research co-operation with the Australia-Japan Research Centre and several Australian and Japanese universities.


Social change in rural Java by the Department of Political and Social Change with Gadjah Mada University.

Research in low-level radiocarbon dating by the Radiocarbon Dating Research Laboratory with the University of Turku, Finland, and Wallac Oy.

Studies of mangrove coasts and wetlands project by the North Australia Research Unit and Department of Biogeography and Geomorphology with the University of New South Wales (Duntroon) and the Australian Institute of Marine Science, Townsville.

Work on the impact of rapid urbanisation in Kuala Lumpur by the Department of Human Geography with the Institut Pengajian Tinggi, Universiti Malaya.

Languages of the Indonesia project by the Department of Linguistics with the University of Jakarta, the Pusat Bahasa, the Atmaajaya Research Institute in Jakarta, and the University of Leiden.

Influence of English and other extra-Pacific languages in the Pacific project by the Department of Linguistics with the University of Oxford, Centre National des Recherches Scientifique, and British Academy.

Lapita homeland project by the Department of Prehistory with the Australian Museum, the University of Auckland, the Australian Atomic Energy Commission and others.

Study of urbanisation in South-East and East Asia by National Centre for Development Studies held in Honolulu in collaboration with the East-West Center of the University of Hawaii.

Project dealing with the dating of arid zone carbonates from Western Australia has been commenced in collaboration with the State Seismological Bureau, Beijing, China, and the Queensland Institute for Technology.

Study of soil organic matter dynamics from the Brigalow Region of Queensland in collaboration with the Division of Tropical Crops and Pastures, CSIRO.

Research School of Physical Sciences

Collaboration on high resolution electron spectroscopy by Dr S.J. Buckman with the Atomic Collisions Group at Flinders University of South Australia.
Collaboration on the behaviour of the metastables in N2 by Dr M.T. Elford with the Physics Department, University of New England.

The study of low energy electron scattering cross sections by Dr R.W. Crompton with Dr M.M. Morrison of the Department of Physics and Astronomy, University of Oklahoma.

Collaborative program on high resolution spectroscopy of van der Waals clusters by Atomic and Molecular Physics Laboratories with Dr B.J. Orr, University of New South Wales.

Program on PVT measurements on liquids by Atomic and Molecular Physics Laboratories with Dr W.A. Wakeham of the Department of Chemical Engineering, Imperial College, London.

An evaluation of theories of fluid transport by Atomic and Molecular Physics Laboratories with Dr H.L. Friedman, State University of New York, Stony Brook.

Joint studies on Extended X-ray Absorption Fine Structure spectroscopy (EXAFS) of chemical systems by Department of Engineering Physics with the Department of Chemistry, University of Sydney.

Project on producing effective renewable energy systems for rural villages by Department of Engineering Physics with the University of the South Pacific.

Joint project in visual perception by Department of Engineering Physics with the University of Cambridge.

Development of hardware/software techniques for speech synthesizers of Australian English by Department of Engineering Physics with Macquarie University Speech and Language Research Centre.

Evaluation and development of computer-based exercises in reading and handwriting skills by Department of Engineering Physics with Department of Psychology, Case Western Reserve University.

Development of VLSI design tools by Department of Engineering Physics with the Department of Electrical Engineering and Computer Sciences, University of California at San Diego.

Joint research project on ground water research in Perth on the estimation of trends in non-stationary random fields with CSIRO.

Development of parallel algorithms for problems in numerical linear algebra by Department of Engineering Physics with Department of Electrical Engineering, Cornell University.

Development of improved speech processing for cochlear implants by Department of Engineering Physics with Department of Otolaryngology, University of Melbourne.
Coastal zone colour scanner image analysis by Department of Engineering Physics with Division of Oceanography and Division of Fisheries Research, CSIRO.

Collaboration to evaluate use of the 14UD accelerator for 36C1 measurements by Dr T.R. Ophel, Department of Nuclear Physics with Dr R. Bird, AAEC, and Dr G. Allison, Division of Soils, CSIRO, Adelaide.

Project on sub-millimetre wave measurements by Plasma Research Laboratory with CSIRO.

Research project on insulator damage by Plasma Research Laboratory with Department of Electrical Engineering, University of New South Wales.

Collaboration on the physics of metals by Department of Solid State Physics with Physics Department, University of Wellington, New Zealand, Kyoto University, Japan, and the Technical University of Warsaw.

Research project on hydrogen storage in amorphous metals by Department of Solid State Physics with Division of Energy Chemistry, CSIRO.

Investigation of numerical routines for the efficient computer solution of large Toeplitz sets of linear equations by Department of Systems Engineering with Dr G. Allen, James Cook University of North Queensland.

Analysis of adaptive feedback control methods and techniques for improving their applicability by Department of Systems Engineering with Professor P.V. Kokotovic and Dr B.D. Riedle, University of Illinois; Professor C.R. Johnson Jnr, Cornell University; Dr R.L. Kosut, Integrated Systems Inc.; and Dr L. Praly, Ecole des Mines.

A study of dynamic characteristics of simple, implementable digital adaptive filters by Department of Systems Engineering with Professor C.R. Johnson Jnr, Cornell University.

Studies of the very complicated, nonlinear dynamical behaviour of adaptive control by Department of Systems Engineering with Dr A.C. Tsoi, Australian Defence Forces Academy.

Two-dimensional signal processing, as used in picture processing, correcting a long-standing misconception concerning the behaviour of a class of algorithms by Department of Systems Engineering with Dr P. Agathoklis, Victoria University, British Columbia; Dr M. Mansour, ETH, Zurich; and Dr E.I. Jury, University of Miami.

Errors-in-variables, a study of algorithms for producing models from data by Department of Systems Engineering with Dr M. Deistler, Technical University of Vienna.

Research on properties of Riccati equations by Department of Systems Engineering with University of Newcastle, NSW.
A joint project on the design of adaptive observers by Department of Systems Engineering with Dr G. Bastin, Louvain University.

Theoretical studies of Heavy Ion reactions by Department of Theoretical Physics with the University of Munich.

Microscopic theories of nuclear potentials by Department of Theoretical Physics with the University of Melbourne.

Mesonic effects in nuclear processes by Department of Theoretical Physics with the University of Zurich.

The study of critical phenomena by finite size scaling methods by Department of Theoretical Physics with Division of Chemical Physics, CSIRO.

Mount Stromlo and Siding Spring Observatories

The distance to the Hercules Supercluster by Dr R.J. Buta with Dr H.G. Corwin, Jr, University of Texas.

The Automated Patrol Telescope of the University of New South Wales by Dr J.A. Dawe with Dr L. Turtle, University of New South Wales.

The gravitational field of radio galaxies by Dr G.V. Bicknell and Dr D. Carter with Dr R.M. Smith, Royal Greenwich Observatory, UK.

Star formation processes by Dr P.J. McGregor with Dr S.E. Persson, Mount Wilson and Las Campanas Observatories.

The distribution of cooling gas from X-ray data by Dr P.E.J. Nulsen with Professor A.C. Fabian, Institute of Astronomy, Cambridge.


The analysis of radio velocity and photometric data on a large sample of rich clusters of galaxies by Dr P.E.J. Nulsen with Professor A.C. Fabian, Institute of Astronomy, Cambridge.

Long period variables in the local group galaxies M33, IC1613 and NGC 6822 by Dr P.R. Wood with Dr J.R. Mould, Palomar Observatories, and Professor T.D. Kinmann, Kitt Peak National Observatory.

Stellar OH masers in the Magellanic Clouds by Dr P.R. Wood with Dr J.B. Whiteoak and Dr F.F. Gardner, Division of Radiophysics, CSIRO.

Infrared CO spectral line shape in pulsating mira variables by Dr P.R. Wood with Dr R. Wehrse, University of Heidelberg.

Southern Hemisphere measurements of positions and fluxes of weak radio sources by Dr W.L. Peters with Dr D.L. Jauncey, Dr M.J. Batty, Dr G.L. White, Division of Radiophysics, CSIRO, and Dr S. Gulkis, Jet Propulsion Laboratory, Pasadena.
Interstellar microwave spectroscopy observations in the Southern Hemisphere by Dr W.L. Peters with Dr T.B.H. Kuiper, Jet Propulsion Laboratory, Pasadena, Dr J.R. Forster, Dr F.F. Gardner and Dr J.B. Whiteoak, Division of Radiophysics, CSIRO.

Studies of molecular clouds in the galaxy by Dr W.L. Peters with Professor F.N. Bash, University of Texas.

Studies of the velocity field in the local supercluster by Dr W.L. Peters with Professor G. de Vaucouleurs, University of Texas.

Distribution and kinematics of molecular hydrogen in the galactic centre region by Dr A.R. Hyland with Dr I. Gatley, UKIRT, Dr R. Wade, ROEs, UK and Dr T.J. Jones, University of Minnesota.

Studies of blue compact galaxies and infrared measurements of galaxies in clusters by Dr A.R. Hyland with Dr K. Kawara, CTIO, Chile.

Near infrared and far infrared studies of star formation regions in our galaxy and the Large Magellanic Cloud by Dr A.R. Hyland and Mr S. Straw with Dr P. Harvey, University of Texas, and Dr T.J. Jones, University of Minnesota.

An analysis of the infrared light curve of Nova Serpentis 1970 by Dr A.R. Hyland with Dr R. Mitchell and Dr G. Robinson, RAAF Academy, University of Melbourne, and Dr G. Neugabauer, California Institute of Technology.

The spectra of luminous emission line stars by Dr A.R. Hyland and Dr P.J. McGregor with Dr J. Hillier, Anglo-Australian Observatory.

Simultaneous multi-wavelength polarisation measurements of blazars by Dr A.R. Hyland with Dr J. Bailey, Anglo-Australian Observatory, Dr C. Brindle, Dr J. Hough, Hatfield Polytechnic and Dr D. Axon, Jodrell Bank.

Completion of the new infrared array spectrometer for the Anglo-Australian Telescope by MSSSO technical staff and Anglo-Australian Observatory staff.

Identification and study of faint X-ray sources located by the HEAO-1 satellite by Dr I.R. Tuohy and Mr D. Buckley with X-ray astronomers at Massachusetts Institute of Technology.

The proposed Australian X-ray astronomy satellite by Dr I.R. Tuohy with astronomers from the University of Melbourne-ADFA and the University of Tasmania.

The first Southern Hemisphere search for millisecond radio pulsars by Dr I.R. Tuohy and Mr R.J.V. Brissenden with Dr R.N. Manchester, Division of Radiophysics, CSIRO.

The study of the Blue Stragglers in Omega Centauri by Dr J.E. Norris with Dr G.S. Da Costa, Yale University.
A study of Carbon and M. stars in nearby galaxies by Dr J.E. Norris with Dr M. Aaronson and Dr K.H. Cook, Steward Observatory.

Model atmosphere computations of M giants and Mira variables by Dr M.S. Bessell with Dr M. Scholz, University of Heidelberg.

Model atmosphere computations of M dwarfs and M subdwarfs by Dr M.S. Bessell with Dr R. Wehrse, University of Heidelberg.

Photometry and spectroscopy of parallax objects by Dr M.S. Bessell with Dr P. Ianna, University of Virginia.

Standardisation of RI systems by Dr M.S. Bessell with Dr E. Weis, Wesleyan University.

The interpretation of X-ray images of clusters of galaxies by Mr P. Teague with Dr C. Jones, Dr W. Forman and Dr D. Fabricant, Harvard-Smithsonian Center for Astrophysics.

Measuring velocity dispersions of elliptical galaxies in clusters by Dr D. Carter with Dr J.R. Lucy, Anglo-Australian Observatory.

A survey for fast millisecond pulsars by Dr R.J.V. Brissenden with Dr D. Manchester, Division of Radiophysics, CSIRO.

Chromospheres of globular cluster giants by Dr A.W. Rodgers with astronomers from the Harvard-Smithsonian Center for Astrophysics, and the Canadian Dominion Astrophysical Observatory.

Astronomy in and proper motions of globular clusters by Dr A.W. Rodgers with astronomers from the University of Chicago.

Radio OSOs by Dr B.A. Peterson with Dr D. Jauncey, CSIRO.

Correlations by Dr A.J. Kalnajs with Professor Alar Toomre, Massachusetts Institute of Technology.

Research School of Social Sciences

International comparative study of electoral rules and outcomes by Professor D.A. Aitkin with Professor A. Lijphart, University of California at San Diego.

Study of attitudes and experience of Soviet emigres by Dr R.F. Miller with research group, Harvard University.

The Australian Dictionary of Biography by RSSS with contributors and advisers from all Australian universities.

The Encyclopedia of Australian People (editor, Dr J. Jupp) involves joint research with a wide variety of other universities and colleges of advanced education.

Australia 1788–1988: A Bicentennial History, one of the two sections based in RSSS, a co-operative venture involving most Australian universities.
The Australian Family Project by Dr M.D. Bracher with Dr G. Hugo, Flinders University of South Australia.

Research into use of multivariate time-series techniques to forecast Australia's effective exchange rate by Dr D.T. Nguyen with Bureau of Agricultural Economics.

A project on human rights in Australia by History of Ideas Unit with Department of Jurisprudence, University of Sydney.

Participation by Dr K. Haakonsen in the International Thomas Reid Project based in the University of New Brunswick, Canada.

Participation by Emeritus Professor J.A. Passmore, who acts as editor-in-chief in the International Bertrand Russell Project based in McMaster University, Canada.

A project on Wheat and the World Economic Order, 1846–1949, by Dr A. Offer with Dr R.F. Holland, Institute of Commonwealth Studies, University of London, and Professor M. Rothstein, Agricultural History Center, University of California at Davis.

Faculty of Arts
Careers of Australians who studied at Cambridge by Dr L.J. Saha with Professor L. Broom, University of California at Santa Barbara.

Grapevine phenology study by Dr G.N. McIntyre with research agronomists of Division of Water and Land Resources, CSIRO.

Minorities in Australia, Canada and the USA by Dr R.G. Cushing with Professor L. Broom, University of California at Santa Barbara.

National Social Science Survey by Dr R.G. Cushing with Dr B. Headey, University of Melbourne, and Dr J. Kelley, Research School of Social Sciences, ANU.

Sociological research into Australian schooling by Dr L.J. Saha with Dr J. Keeves, University of Melbourne.

Faculty of Economics and Commerce
Impact of privacy regulation on the private sector by Mr R.A. Clarke with Mr G.W. Greenleaf, Faculty of Law, University of New South Wales.

Current cost depreciation rules: estimation and optimisation by Dr M. Tippett with Mr R.J. Craig, University of Newcastle.

Consolidated financial statements: based on inconsistency by Mr P.J. Jubb with Mr R.H. Dagwell, Griffith University.

Education policy in Australia by Dr C.G. Fane with Centre of Policy Studies, Monash University.

Faculty of Science
Analysis of Ross River virus proteins by Dr L. Dalgarno and Dr R.C. Weir with Dr G. Tregear, Howard Florey Institute of Experimental Physiology and Medicine, University of Melbourne.
Isolation of bovine Y-chromosomal DNA by Dr K.C. Reed with Dr J. Wolfe, University College, London, Dr C. Bishop, Pasteur Institute, Paris, and Dr D. Dresser, MRC Unit, Mill, London.

Mechanisms of chemiluminescence in immune cells induced by myxoviruses by Dr M.J. Weidemann with Professor E. Peterhans, Department of Virology, University of Bern.

Human leucocyte metabolism by Professor J.F. Williams with Mrs Berit Knutrud, Orsta Technical College, Novde, Norway.

Metabolic protection against ischemia during experimental and clinical cardiac surgery using orotic acid by Professor J.F. Williams with Dr F. Rosenfeld, Baker Institute, Monash University.

Molecular mechanism of photoinhibition in higher plants and chloroplasts by Dr C. Critchley and Ms R.E. Cleland with Dr O. Bjorkman, Carnegie Institution of Washington, and Dr A. Melis, University of California at Berkeley.

Isolation of mitochondria from male sterile Brassica species by Dr D.A. Day with Dr R.D. Brock and Dr J. Langridge, Division of Plant Industry, CSIRO, Canberra.

The growth response of soybeans to elevated CO₂ by Dr D.A. Day with Dr R.M. Gifford, Division of Plant Industry, CSIRO, Canberra.

The role of pyridine nucleotide redox state in respiratory control in plant mitochondria by Dr D.A. Day with Dr J.T. Wiskich, Dr I.B. Dry and Dr J.H. Bryce, University of Adelaide.

Soyabean breeding studies by Dr A.C. Delves with the Division of Tropical Crops and Pastures, CSIRO, Brisbane.

Induced abscission in explants by Professor J. Warren Wilson with Mr R.H. McKenzie, Princeton University, and Dr P.J. Hall, Michigan State University.

Study of the clays and the sedimentary geology of the Bunyan area by Dr R.A. Eggleton with Dr P. Walker, CSIRO, and Dr G.M. Taylor, Canberra CAE.

Weathering of basalt by Dr R.A. Eggleton with Dr A. Milnes, Soils Division, CSIRO, Adelaide.

Granite in south-eastern Australia by Dr B.W. Chappell with Professor A.J.R. White, La Trobe University.

Geochemical analytical facilities by Dr B.W. Chappell with Dr A. Ewart, University of Queensland, and Professor R.L. Stanton, University of New England.

Geometrical optics by Professor H.A. Buchdahl with staff of CSIRO.
Heat transfer measurements of a biconic model in hypersonic high enthalpy flow by Dr R.J. Sandeman with the Australian Defence Force Academy staff and NASA Langley Research Group, USA.

Shock Tunnel Laboratory thrust measurements on a scramjet model by Dr R.J. Sandeman and Shock Tunnel Laboratory staff and Professor Stalker with University of Queensland.

Laser spectroscopy by Dr R.J. Sandeman and Dr H.A. Bachor with Division of Chemical Physics, CSIRO.

Four wave mixing by Dr R.J. Sandeman with Professor W. Lange, Institut für Quantenoptik, University of Hannover.

Sub-barrier fusion by Professor S. Hinds with California Institute of Technology.

Parasitology and helminthology by Professor C. Bryant with Department of Veterinary Studies, Murdoch University, NSW Department of Agriculture, and Queensland Institute of Medical Research.

Endocrinology and development by Dr P.A. Janssens with Division of Wildlife and Rangelands Research, CSIRO, and Department of Biology, University of Wollongong.

Ecological studies by Dr T.G. Marples with National Parks and Wildlife Service, NSW; National Parks and Wildlife Department, Malawi; Department of Forestry, Malawi; University of Malawi; British Museum of Natural History, London; South Australian Museum; and Alexander Koenig Museum, Bonn.

Rodent ecology by Dr T.G. Marples with Division of Wildlife and Rangelands Research, CSIRO.

Marsupial ecology by Dr A. Cockburn with Departments of Zoology, Monash University, and Boston University.

NHMRC Health Economics Research Unit Research on the effects of National Health Insurance and Privatisation of the Health Care Sector in Malaysia by NHMRC Health Economics Research Unit with the World Health Organization.
Degrees and diplomas conferred

**Bachelor of Arts**

Aitken, B.M.
Allen, B.J.R.
Allen, P.T.C.
Andrews, S.E.
Appudurai, R.
Bailey, G.N.
Balogh, M.P.
Barker, K.E.
Barling, J.A.
Barnes, A.
Barnett, S.
Barrow, D.P.
Barry, F.A.M.
Batten, D.M.
Bell, K.N.
Benson, K.E.
Berkeley, B.A.
Bhatty, L.S.
Bice, J.S.
Biddle, N.V.G.
Biffin, S.M.
Black, E.M.
Blak, J.-J.
Blair, M.L.
Bonic, S.M.
Borgen, M.-L.
Borthwick, F.A.M.
Bouladon, S.G.
Braddock, W.R.
Bradford-Watts, K.S.
Bradshaw, P.J.
Brodtmann, G.M.
Brooks, A.A.A.
Buoro, I.
Burnett, J.R.
Butterfield, P.
Byrne, C.M.
Campbell, H.R.
Carcary, S.M.
Carnicelli, S.P.
Caton, S.L.
Chapman, S.M.
Christie, J.D.
Clark, S.
Clarke, C.H.
Clews, G.J.
Connor, P.X.
Cooley, R.C.
Corcoran, F.A.
Coventry, M.B.
Creglia, E.G.L.
Cringle, A.G.
Darling, I.D.
Davies, M.J.A.
Davis, K.R.
Dickson, J.A.
Dingwall, B.S.F.
Dixon, A.G.
Dowe, S.M.
Downes, M.A.
Duthie, B.H.
Dyos, M.L.
Dyson, F.M.
Earl, P.D.
Elix, J.K.
Eu, V.
Evans, R.E.
Falk, G.E.M.
Falzon, C.F.
Farnan, M.L.
Farrant, K.N.
Fellows, L.M.
Fisher, D.G.
Flint, M.D.
Fogarty, T.J.
Foley, L.E.
Fox, J.McL.
Fox, W.E.
Franchimon, L.
Geddes, A.P.
Geddes, J.M.
Gesini, O.F.
Giles, P.J.
Glover, I.A.
Goodwin, S.-A.
Gordon-Smith, N.M.
Goundar, V.N.
Gresshoff, R.M.
Gronow, S.G.
Guff, E.A.
Haley, P.E.
Hammond, C.H.
Hand, J.L.
Hayden, C.M.
Herd, J.D.
Hickey, J.C.
Hinton, J.
Holloway, T.M.
Hook, M.R.
Hookey, P.F.I.
Hopkinson, D.T.
Hudson, C.
Hume, G.F.
Hutchinson, J.W.
Hyden, J.M.
Ireland, I.A.
Isaacs, M.
Israelachvili, K.I.
Jalayer, A.
James, J.
Jeffery, F.A.
Johannes, G.M.
Johnson, L.C.
Jorgensen, M.A.
Kendall, K.M.
Kent, H.A.
Kidd, R.L.
Kildea, J.M.
King, J.M.
Klemke, M.L.
Landale, K.F.
Lansdown, R.D.
Lanyon, K.A.
Lauchland, R.A.
Leece, K.L.
Lehmann, J.A.
Lenfield, I.
Lester, E.A.
Lewins, M.A.
Lindsey, T.E.
Liow, S.K.
Livermore, M.A.
Lleonart, P.J.
Lumley, B.M.
McCubbin, A.R.
McCurdy, M.A.
MacFfe, S.J.
McGilnay, P.
McInerney, T.A.
McKendry, J.F.
MacKenzie, C.H.
MacKenzie, P.A.
MacPherson, W.E.
McRae, R.
Madsen, P.J.
Malley, M.P.
Marques, G.K.
May, M.F.
Meeker, L.D.
Meldrum, L.J.
Mercieca, P.A.
Merton, C.E.
Miles, R.S.
### Graduate Diploma in Demography

Nou-Taboro, O.

### Bachelor of Letters

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<tr>
<th>Name</th>
<th>Degree</th>
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<td>Bennett, R.L.</td>
<td>Bachelor of Letters</td>
<td>Dawson, B.D.</td>
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<td>Gray, N.</td>
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</table>

### Master of Arts

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
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<tr>
<td>Ahmed, J.</td>
<td>Master of Arts</td>
<td>Gale, M.-A.</td>
<td>Bachelor of Letters</td>
<td>Maley, W.L.</td>
<td>Shava, J.R.</td>
</tr>
<tr>
<td>Akbaruddin, S.</td>
<td></td>
<td>Godfrey-Smith, A.P.</td>
<td></td>
<td>Mzee, O.Y.</td>
<td>Shephard, V.R.</td>
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<td>Amir, L.N.</td>
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<td>Grouya, T.C.</td>
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<td>Needham, J.P.</td>
<td>Smith, M.G.</td>
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<td>Bauni, E.K.</td>
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<td>Katayama, Y.</td>
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<td>Burn, A.E.</td>
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<td>Kristianto, Y.B.</td>
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<td>Rzzaque, A.</td>
<td>Tan, S.H.</td>
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<td>Chakravarty, M.R.</td>
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<td>Kwok, A.K.-T.</td>
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<td>Reeves, T.P.</td>
<td>Waters, B.E.</td>
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<td>Damsani, M.</td>
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<td>Legg, C.Y.</td>
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<td>Welshe, G.</td>
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<td>De Silva, W.I.</td>
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<td>Younis, M.</td>
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<td>Fryar, J.H.</td>
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<td>Mohiuddin, M.A.</td>
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<td>Selth, A.W.</td>
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### Bachelor of Arts (Asian Studies)

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<tbody>
<tr>
<td>Barrie, A.M.</td>
<td>Bachelor of Arts (Asian Studies)</td>
<td>Dureau, S.M.</td>
<td>Bachelor of Arts (Asian Studies)</td>
<td>Lawrie, S.J.</td>
<td>Slater, D.B.</td>
</tr>
<tr>
<td>Borschmann, S.L.</td>
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<td>Filippetto, L.K.</td>
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<td>McCutchan, L.R.</td>
<td>Suzuki, K.</td>
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<td>Borthwick, H.J.L.</td>
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<td>Fraser, H.M.</td>
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<td>McEvoy-Bowe, C.</td>
<td>Verbeek, M.E.</td>
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<td>Chang, C.A.</td>
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<td>Hasell, J.P.</td>
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<td>Musa, M.B.</td>
<td>White, E.S.</td>
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<td>Cole, E.B.</td>
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<td>Herbert, J.A.J.</td>
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<td>Musgrave, P.S.</td>
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<td>Davis, B.E.</td>
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<td>Hodgkinson, J.L.</td>
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<td>O'Callaghan, K.A.</td>
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### Bachelor of Arts (Asian Studies) degree with honours

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<tbody>
<tr>
<td>Johnson, T.C.</td>
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<td>Otter, M.D.</td>
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<td>Powell, J.S.</td>
<td>Rodgers-Chudori, Z.D.</td>
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### Graduate Diploma in Applied Linguistics

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<tbody>
<tr>
<td>Harasawa, I.</td>
<td>Graduate Diploma in Applied Linguistics</td>
<td>Maddess, I.E.</td>
<td>Ogawa, A.</td>
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</tbody>
</table>

### Master of Arts (Asian Studies)

<table>
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<th>Name</th>
<th>Degree</th>
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<th>Degree</th>
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</thead>
<tbody>
<tr>
<td>Groves, K.W.</td>
<td>Bachelor of Arts (Asian Studies)</td>
<td>Moore, H.M.</td>
<td>Ogawa, M.</td>
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### Bachelor of Commerce

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<th>Degree</th>
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<tr>
<td>Abdul-Rahman, M.S.</td>
<td></td>
<td>Garty, R.L.</td>
<td>Bachelor of Commerce</td>
<td>Noor, Z.M.</td>
<td>Tan, P.S.</td>
</tr>
<tr>
<td>Ash, S.A.</td>
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<td>Gibson, G.J.</td>
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<td>Mau, C.W.</td>
<td>Wilson, J.K.</td>
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<tr>
<td>Choi, M.</td>
<td></td>
<td>Inglis, W.A.</td>
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<td>Milligan, C.L.</td>
<td>Winn, P.A.</td>
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<td>De Vries, A.A.</td>
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<td>Kinsella, C.A.</td>
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<td>Overland, T.H.</td>
<td>Young, C.A.</td>
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<td>Dorigo, J.L.</td>
<td></td>
<td>Kirkwood, J.D.</td>
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<td>Razak, R.S.A.B.R.A.</td>
<td>Smith, P.A.</td>
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<td>Dornan, H.W.</td>
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<td>Li, K.C.</td>
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</tbody>
</table>
Bachelor of Economics

Abbey, P.J.  Cooke, P.M.  Kapustin, T.V.  Poulter, D.G.
Adler, R.K.  Cox, H.M.  Karapanagos, C.  Protar, E.E.A.
Anderson, F.M.  Cox, I.D.  Keating, P.J.  Quinlan, J.N.
Aney, S.G.  Davidson, R.T.  Keith, G.J.  Riehmueller, P.F.
Argy, S.J.  Davies, P.G.  Keoy, S.L.  Robertson, W.J.
Au, Y.Y.  Dermatis, I.A.  Khoo, B.C.  Rombola, R.A.
Baird, M.M.  Emerson, M.W.  Kolobaric, M.  Sandhu, H.S.
Baker, J.S.  Ephraums, D.J.  Krepela, I.M.  Scholes, D.K.
Ball, C.D.  Fernon, A.F.  La Barbera, J.  Scolnik, A.J.
Barlin, R.A.  Filipetto, L.K.  Lam, A.C.-M.  Sidebotham, N.A.
Bartlett, S.J.  Gallagher, G.  Law-Smith, C.G.  Smith, C.M.
Besley, D.M.  Gallaway, L.M.  Lawrie, S.J.  Smith, R.K.
Bolton, S.J.  Gaskin, G.L.  Lok, L.W.C.  Southwell, A.J.
Bozza, B.P.  Gerhardt, S.B.  Love, M.  Spark, J.L.
Bradford, K.L.  Gilmour, D.J.  McCann, K.I.  Spink, C.A.
Brennan, M.P.  Glyde, P.J.  McClelland, M.H.  Streeting, M.C.
Briant, K.L.  Goh, H.C.  McElhinney, S.M.  Supomo, S.
Burton, M.T.  Gray, A.  Macourt, M.A.  Thelander, T.H.
Carney, R.M.  Greenwood, M.J.  Marstrand, E.M.  Thongphakdi, T.
Carrick, M.W.  Gregory, A.J.  Martin, G.B.  Walton, G.J.M.
Chen, T.Y.  Griffin, P.M.  Mues, C.J.  Wese, R.
Chiera, D.A.  Harris, C.M.  Ng, K.G.  Wheeler, C.J.
Christensen, P.B.  Hooker, G.R.  Nielsen, R.C.  Wong, G.C.M.
Cirjak, K.  Hoyle, W.J.  Oakley, R.J.  Wou, J.-P.M.-T.
Cita, F.  Hoysted, M.F.  O'Farrell, J.J.  Yang, S.S.-O.
Connolly, P.B.  Jugovac, R.  Phillips, B.  
Conroy, S.M.  Kervin, C.G.  Pippos, P.G.

Bachelor of Economics degree with honours

Barlin, P.C.  Chin, O.Y.  Kang, K.M.  Robertson, A.A.
Chan, Y.M.E.  Clark, I.D.  King, S.P.  Tay, S.H.
Chau, N.M.  Hutson, J.W.J.  Majid, A.A.  Tomkinson, C.D.

Graduate Diploma in Accounting

Blundell, D.J.  Fleming, G.G.  Lee, M.T.

Graduate Diploma in Economic History

Bogutyn, T.M.

Graduate Diploma in Econometrics

Cheung, P.W.F.  Griffiths, G.E.  Ho-Trieu, N.L.
Graduate Diploma in Economics

Alexander, J.N.
Bakalor, J.M.
Brunker, D.M.S.
Budi, C.P.
Clarke, G.N.

Coombs, G.J.
Doherty, D.J.P.
Fleming, K.B.
Gruen, D.W.R.
Halama, V.F.

Lattimore, R.S.
McDonald, D.
Miley, K.J.
Naughten, B.R.
Patterson, W.J.

Ritchie, D.A.
Saxerud, G.T.
Sucharitkul, C.
Sutton, M.E.
Woodward, A.W.

Graduate Diploma in Public Economic Policy

Braunstein, P.R.
Grant, M.

Horn, S.R.T.
Lloyd-Smith, C.W.

Maktar, S.R.
Phillips, M.J.

Rossiter, P.D.

Graduate Diploma in Statistics

Anderssen, H.E.
Belchamber, G.D.
Bright, I.A.
Chan, P.K.L.

Flynn, P.L.
Harding, A.D.
Jubb, C.D.

McLeish, R.A.
Moore, B.K.
Olekalns, N.

Richardson, C.J.M.
Vella, F.G.M.
Weier, A.M.

Master of Economics

Adams, R.J.
Alder, G.T.
Barrow, D.P.
Beresford-Wylie, S.J.
Bierwagen, C.
Bowler, L.
Brown, V.M.
Chai, A.P.-L.
Chappell, B.D.
Christian, L.A.
Clark, J.G.
Coe, I.G.P.
Connors, D.M.
Cooley, R.C.
Coyle, T.O.
Cranfield, D.
Cruise, L.G.
Davies, D.E.
Davies, P.D.
del Rio, A.
Dippelsman, R.J.

Abdalla, A.A.
Alasebu, Y.K.

Coxhead, I.A.
Ghimire, D.

Low, J.
Myint, U.Y.

Woldekidan, B.

Bachelor of Laws

Doepel, C.B.
Dooley, M.J.
Elliot, C.J.C.
Fletcher, S.B.
Foster, G.M.
Gaffey, J.M.
Galloway, L.A.
Gosling, K.A.
Grigor, W.R.
Harris, A.J.
Hayunga, H.F.
Henry, J.G.
Higgs, P.A.
Hodges, C.R.
Hoffmann, B.J.
Holland, T.D.
Howard, L.E.
Iannella, R.
Irvine, T.
Johannes, G.M.
Jones, L.R.

Kellow, P.J.
Koeppen, S.
Krigovsky, V.H.
Lam, A.C.M.
Landford, B.A.
Lee, G.J.
Lee, M.P.
Lee, M.W.
MacDonald, A.
MacDonald, S.D.
Marques, G.K.
Mau, K.P.
McKay, B.D.
McLeod, G.I.
McNeil, B.J.
Menzies, E.C.
Nichols, R.A.
O'Connor, P.G.
O'Sullivan, B.
Ooi, G.C.
Pavey, M.A.

Payne, R.B.
Pearmain, E.A.
Perin, L.F.
Plath, G.D.
Platt, V.N.
Preston, C.P.
Redpath, W.M.
Reis, R.A.
Roach, G.M.
Roberts, A.H.
Robertson, A.J.
Ruschena, L.D.
Saw, M.A.J.A.
Selth, P.A.
Sinderberry, J.E.
Singh, A.F.
Singh, S.
Steins, R.D.W.
Tan, A.K.P.
Tan, J.S.
Tanzler, M.L.M.
Taylor, J.A.  Wan, H.L.  White, N.-J.M.  Williams, S.H.
Vernon, J.F.  Wells, S.C.  Williams, T.B.  Wilson, R.M.
Walsh, L.G.

Bachelor of Laws degree with honours

Agnew, N.R.  Forster, J.  Lombard, G.W.  Pickering, A.M.
Cole, R.J.  Gillatt, D.M.  Mason, B.J.  Power, E.L.
Courtier, D.A.  Hall, L.C.  Northage, M.J.  Steel, T.A.
Donald, W.L.  Hughes, T.R.  O’Meara, J.M.  Sutherland, J.
Duthie, A.L.  Kaney, K.F.  Parsons, B.M.  Taylor, P.T.
Farronato, D.  Kiley, R.P.  Pearson, C.I.  Tsirimokos, A.

Graduate Diploma in International Law

Amendola, G.I.  Hunt, G.L.  Mitchell, D.C.  Ryan, P.B.
Daniel-Alford, M.  Ishikawa, S.  Probert, L.G.

Graduate Diploma in Public Law

Bundock, J.W.  Dawson, P.L.  Ingwersen, D.F.  Littlewood, R.M.
Charles, C.J.

Master of Laws

Gabriel, P.  Lucas, E.A.

Master of International Law

Austin, G.D.  Dirnberger, C.-P.  Grey, V.M.  Mason, D.J.
Cook, C.J.  Geddes, M.A.  Lussenburg, S.M.  Ross, P.G.

Bachelor of Science

Allenby, M.S.  Chiu, T.W.-C.  Fieg, B.  Hassan, A.
Anderson, D.M.  Choi, S.B.  Fleming, J.M.  Heding, A.
Ang, L.-N.  Chow, C.K.  Fodtschuk, J.  Heikkonen, A.G.
Archer, G.B.  Clement, K.T.  Foster, G.R.  Hillermann, J.S.
Baldwin, J.A.  Corey, J.  Francis, D.S.  Hince, B.A.
Birch, C.P.  Cossey, P.J.  Gerahty, N.E.A.  Hockridge, D.A.
Borschmann, G.R.  Cremen, F.A.  Grassia, N.  Holmes, P.C.
Brock, C.J.  Crosbie, R.P.  Gray, A.  Hulse, J.C.
Brock, D.J.  Dale, G.T.  Green, C.W.  Hume, A.M.
Bromhead, D.B.  del Rio, A.  Green, S.T.  Ibrahim, F.B.
Browning, R.A.  Dumancic, J.  Griffin, A.M.  Idraham, N.
Buckham, P.M.  Duncan, A.McL.  Halloran, G.J.  James, D.E.
Budd, J.A.  Dyer, K.L.  Harding, S.A.  Jealous, W.T.
Charles, L.G.  Erskine, J.M.G.  Harris, C.H.  Jensz, K.M.
Chen, T.Y.  Fahy, P.A.  Hartley, D.M.  Johnson, S.N.
Cherryh, J.  Farrant, A.A.

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Bachelor of Science degree with honours

Alexander, G.B.
Alexiou, S.
Atkinson, D.J.
Barnes, D.P.
Barnes, I.S.
Bektas, A.
Boorman, F.J.
Brown, S.C.
Byrne, J.C.
Cahill, G.M.
Campbell, P.M.
Clarke, D.L.
Close, J.D.
Corless, A.G.
Death, D.L.
Ewart, G.D.
Ferrett, S.R.
Flett, D.L.
Grotowski, J.F.
Harris, D.N.
Harrison, S.M.
Heneine, N.
Henry, W.M.
Jones, K.R.W.
Jupp, P.W.
Keany, S.T.
Lawson, K.C.
Legg, G.P.
Magi, E.C.
Maher, F.M.
Maker, P.J.
Maneschi, M.A.
Marchant, A.D.
Mathams, T.
McCook, L.J.
McIntyre, T.J.
Olley, J.M.
Othman, M.D.
Picton-Warlow, J.G.
Pierce, K.D.
Rennex, D.A.
Roberts, J.A.G.
Robinson, N.K.
Ross, E.C.
Schipp, G.R.
Sherwin, W.A.
Sloane, A.M.
Smith, N.C.
Smithies, R.H.
Townsend, P.V.
Udvardi, M.K.
Vidovic, M.
Vranjic, J.A.
Walker, A.R.
Wilkinson, D.M.

Bachelor of Science (Forestry)

Baker, K.N.
Bell, R.E.
Brown, K.L.
Brown, M.D.
Cooper-Southam, F.
Corser, P.H.
Dorrough, G.A.
England, M.L.
Gardiner, C.A.
Grant, A.J.
Gwaze, D.P.
Hedditch, G.W.
Hudson, E.P.
Martinez, J.-M.J.L.
Mayne, A.C.
Mazanec, R.A.
Millerd, A.P.
Naughton, P.R.
Nerrie, K.A.
Ogle, L.M.
Roberts, A.R.
Ross, M.H.
Saunder, G.K.
Schraenkler, T.W.
Sinclair, A.R.
Smethurst, T.A.
Snowdon, B.D.
Stewart, A.G.
Taylor, C.M.
Thomson, A.B.
Webster, D.J.
Wilson, A.J.
Wood, M.B.
Wood, S.T.

Bachelor of Science (Forestry) degree with honours

Benyon, R.G.
Biggs, P.H.
Dieters, M.J.J.
Kaljuste, D.K.
Graduate Diploma in Science

Ajay, K.
Altin, J.G.
Bennett, B.A.
Boyd, M.
Brown, M.E.
Caelli, G.M.
Clarke, D.H.
Douglas, J.E.
Gibbons, A.D.
Glare, T.R.
Golcich, M.A.
Griffiths, A.J.S.
Hakim, A.S.
Hardman, J.A.
Hoffmann, S.K.
Hughes, D.G.
Kitchin, S.M.
Lee, J.S.
Mahadevan, I.B.
Mazenco, C.T.
Montgomery, P.J.
Morris, J.W.
Munshi, A.I.
Patston, K.J.-A.
Pino, A.T.
Pomroy, A.J.
Reinhart, M.I.
Roy, A.B.
Shields, J.M.
Smith, C.S.
Sturesteps, V.A.
Sugani, S.
Tassie, A.M.
Wardlaw, J.H.
Watt, G.L.

Master of Science

Afolayan, M.O.
Banfield, J.F.
Gombya-Sembajjwe, W.S.
Grindrod, J.F.
Hodda, M.E.
Kakudidi, E.K.Z.
Kavalieris, I.
Kilahama, F.B.R.
Kokic, P.N.
Latham, G.A.
Muggleton, A.H.F.
Poletti, S.J.
Pan, X
Pribac, F.
Shrestha, K.B.
Stile, M.A.
Suebsaeng, K.

Master of Clinical Psychology

Fay, P.M.
Golding, T.C.

Master of Resource and Environmental Studies

Baird, I.A.
Read, V.T.
Robertson, I.D.

Doctor of Philosophy

Agostino, M.
Allbrook, M.R.
Arora, K.K.
Batten, G.D.
Bean, C.S.
Beresford, Q.J.
Beresford-Smith, B.
Bond, G.E.
Burton, J.E.
Byrne, A.P.
Camilleri, A.P.
Campbell, S.F.
Cane, S.B.
Chan, M.S.
Charity, R.J.
Choe-Wall, Y.-h.
Christidis, L.
Collins, S.P.
Craig, S.
Cullen, D.J.
Dasgupta, S.
Duggan, J.P.
Durie, M.J.
Feary, D.A.
Foon, A.E.
Fox, M.W.
Frawley, K.J.
Ganguly, I.
Gell, S.M.S.
Glikson, M.V.
Green, A.G.
Ha, J.H.T.
Handmer, J.W.
Henrichson, G.C.
Hotchkis, M.A.C.
Jans, D.A.
Kavalieris, L.
Killeen, N.E.B.
Kirby, M.G.
Kitay, G.B.
Knapman, C.G.
Kuhl, G.M.M.
Lajide, L.
Ledgard, S.F.
Lewis-Hughes, P.H.
Lloyd, C.J.
Lokan, C.J.
Lovell, D.W.
Mackwell, S.J.
Mahat, T.B.S.
Maimunah, M.T.
Malik, R.
McCarthy, M.G.
McConnell, S.J.
McFadden, S.A.
Molinski, T.F.
Mori, K.
Moritz, C.C.
Morrison, N.A.
Nugent, K.A.
O'Mara, L.P.
Orban, J.
Pelling, S.
Pfeffer, A.T.
Phillips, W.R.
Rahman, M.
Readhead, M.L.
Reymond, E.
Riddell, P.G.
Ryan, D.P.
Saito, A.
Schiltknecht, E.
Schofield, P.R.
Seiler, W.M.
Siegel, J.A.
Skinner, I.M.
Small, W.
Suzuki, T.
Tan, P.C.

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Prizewinners

Undergraduate awards

University Medal  Awarded to the top candidates for the degree of bachelor, provided they obtain first class honours of sufficient distinction supported by a distinguished academic record.
Julian Paul England  Physics
Simon Harold Grant  Economics
Anthony Charlton Kable  Mathematics
Andrew James Kirk  Computer Science
Steven Anthony Marshall  Political Science

The Tillyard Prize  Awarded to the student whose personal qualities and contribution to University life have been outstanding, and who has completed a degree of bachelor with honours.
Desmond Robert Manderson

The Alliance Française de Canberra Prizes
Heather Elva Ahern, Patricia Mary Steele  First-year units (shared)
Dorothy Old, Ian Robert Dungavell, Susan Mary Patricia Salojarvi  Second-year units (shared)
Claire Elizabeth Edwards, Anna Heath van de Wiele  Third-year units (shared)

Ampol Prize  Stephen Sheppard

A.N. Hambly Prize  Joanne Elizabeth Evans

Ann Downer Memorial Prizes in Medieval Studies  Pauline Marie Cosgrove, Tamsin Juliana Sowden  Second-year units (shared)
Elizabeth Marie Macpherson  Third-year units

Anthony Seelaf Memorial Prize in Geology  Timothy Andrew Bennetto, Ari Olavi Piirinen  (shared)

ANZ Executors & Trustee Company (Canberra) Limited Prize  David James Ephraums

Applied Probability Trust Prize  Joanne Elizabeth Evans
The Australian–American Association Prize for American Studies

Australian Capital Territory Bar Association Prize

Australian Computer Society (Canberra Branch) Prize

Australian Finance Conference Prize in Company Finance

Australian Finance Conference Prize in Monetary Economics

Australian Institute of Physics Prize

Australian Psychological Society Prize

Australian Society of Accountants' Prize

Australian Society for Microbiology Prize

The B.C. Meagher Prize for Commonwealth Constitutional Law

Botany Prize

The CSR Chemicals Prize

Commercial Representatives' and Agents' Association of Australia Limited Prize

Alexander Virr

Alison Jane Hoyle, Susan Marlene Davies (*shared*)

Seppo Keronen

Philip Damian Kearns

John Francis Hannoush

James Andrew Chamberlain

Judith Sylvia Wall

Philip Damian Kearns

Susan Jane Skinner

Louise Marie Wilson, Alison Jane Hoyle (*shared*)

Jennifer Anne Bolton

John Louis Parker

Michael Gamini Alles
Commonwealth Forestry Bureau Book Prize

Computer Science Honours Prize

Coopers & Lybrand Prize in Accounting

Dante Alighieri Society (Canberra Branch) Prizes

Daphne Olive Memorial Prize in Jurisprudence

David Campbell Prize

Dawson Waldron Prize

E.A. Lyall Memorial Prize

Economic Society Prizes

Ernst & Whinney Prizes

Freehill, Hollingdale and Page Prize for Commercial Studies

Geological Society of Australia Prize

George Knowles Memorial Prize

The Goethe Society Prizes

G.S.L. Tucker Prize

Elisabeth Anne Cavanagh

Andrew James Kirk

Kar Wai Irene Shiu

Monika Oesterreich Italian I

Roger Stanley Magnusson, Christiane Vivanco de Savariss Italian II

( shared)

Barbara Joan Fisher Italian III

Jacqueline Anne Laing

Kathleen Mary Dermody

Susan Marlene Davies

Janice Narelle Wykes

Richard Nicholas Reddan Economics II(H)

Simon Harold Grant Economics IV(H)

Melinda Lee Daly, Philip Damian Kearns Accounting C01 (shared)

David Peter Dennis Accounting C02

Pauline Anne O’Gorman

Geoffrey Robert Hunt

Alison Jane Hoyle

Carolyn Lois Scobie First-year units

Shannon Eileen Cuthbertson Second-year units

Eve Sullivan Third-year units

Lee Andrew Bygrave Fourth-year units

Scott Anthony Austin, Helen Maree Francis, John Francis Hannoush (shared)
Hanna Neumann
Prizes for Mathematics

Institute of Advanced Studies Prizes for Economic History

The Institute of Wood Science Prize

Irene Crespin Prize for Palaeontology

J.B. Were & Son Prize

The Lady Isaacs' Prize

The Law Society of the Australian Capital Territory Prize for Contracts

The Law Society of the Australian Capital Territory Prize for Professional Training in Law

L.D. Pryor Prize

The Leslie Holdsworth Allen Memorial Prize

Macphillamy Cummins & Gibson Prize for Commercial Law

Marie Halford Memorial Prize

The Medishield Prize

National Economic Accounting Prize

Permanent Trustee Company (Canberra) Limited Prizes

Anthony Charlton Kable Pure Mathematics IVH

Susanne Marie Grassia Honours-level Group C Units

Julie Anne Cairns The Australian Economy

Diane Elaine Whiteford Australian Economic History [H]

Peter Charles Ephraums Economic History later-year semester unit — honours level

Glenn Thomas Dale

Kyeelee Jane Driver

Simon Harold Grant

Janet McDonald

Anne Marie Devereux

David Edward Davies

Fiona Veronique Morris, Frances Catherine Quinn (shared)

Simon David Palfrey

Susan Lee McCarthy

Ann Mary Foley

Katherine Ann Lazenby, Fiona Veronique Morris (shared)

Eileen Slattery

Lucinda Louise Snelling Trusts

Joshua Simon Getzler Land Law
Prehistory and Anthropology Prizes
Joan Margaret Shaw  *Anthropology I Prize*
Peter John White  *D.A. Casey Prize*

Price Waterhouse Prize in Accounting
Jacqueline Ann Maycock

Priscilla Fairfield Bok Prize
Susanne Maria Grassia

Prize in Public Economics
Peter William Harper

The Professional Officers’ Association Prizes
Anna Kristina Sands  *Botany A01*
Russell Robert Boyce, Murray Ian Gan  *Chemistry A01 (shared)*

Rachel Dorph Memorial Prize
Dominic Michael Byrne, Julia Signhild Ford  *(shared)*

Richard B. Davis Prize
Timothy Stephen Strong

The Royal Australian Chemical Institute Prize
Janice Ann Stubbings

Scandinavian–Australian Society Prizes
Nicole Suzanne Quantock  *Germanic A units*
Candida Jane Brebner  *Germanic C units*

Schlich Memorial Trust Prize
Gary Inions, Glenn Thomas Dale  *(shared)*

Shell Company Prizes
Antony Stephen Kelly, Jennifer Elizabeth Wilkinson  *Economics (shared)*
Ian Charles Littler  *Science*

The Statistical Society of Australia (Canberra Branch) Prize
Michael Gamini Alles

Stephen Jaques Stone James Prize for Law Studies
Philip Mark Griffin

The Supreme Court Judges’ Prize
Ben Michael Parsons

Timbind Utilisation Prize
Paul Damian Brennan

The W.B. Clarke Prize in Geology
Suzanne Maree Urbaniak
University public lectures

**Single Public Lectures**

- Professor M. Bronfenbrenner  *Japan faces affluence*  25 March
- Professor M.S. Longair  *The origin of the Universe*  26 March
- Mr J. Goldblat  *Arms control and disarmament*  18 April
- Professor R.G. West  *Ice ages, past and future and the practical value of pure science: a view from Europe*  8 May
- Emeritus Professor Liu Ts’un-yan  *The legacy of Confucianism*  26 June
- Mr E. Rolls  *More a new planet than a new continent*  8 August
- Professor R. Farhadi  *The Afghanistan crisis: possible solutions*  12 August
- Professor O.G. MacDonagh  *The Irish in Australia*  28 August
- Dr P. Moore  *Halley’s Comet in history*  30 August
- Professor G. Saxonhouse  *What’s wrong with Japanese trade structure*  12 September
- Professor P.W. Gage and Dr G. de Couet and introduced by Emeritus Professor Sir Rutherford Robertson  *Membranes, the boundaries of life*  12 September
- Dr D. Haynes  *Conceptual models in geology and successful mineral exploration*  10 October

**Panel Discussion**

- Professor E. Wickberg, Professor W.E. Willmott, Dr M. Somers Heidhues, Professor J.A.C. Mackie  *The Chinese overseas today: a forum*  14 June

**1985 Morrison Lecture**

- Professor A. Whiting  *China and the World: dependence versus independence*  31 July

**1985 Florey Lecture**

- Sir Arnold Burgen  *Order and disorder: targets for drug action*  2 August

**1985 Basham Lecture**

- Professor M. Thiel-Horstmann  *Symbiotic antinomy: the social organisation of a North Indian sect*  14 August

**15th John Curtin Memorial Lecture**

- Mr B. Grant  *Australia in the 21st Century*  23 October
Senior staff appointments and promotions

**Institute of Advanced Studies**

Dr G.V. Bicknell  
*Senior Research Fellow (2nd appointment), Mount Stromlo and Siding Spring Observatories, formerly Senior Research Fellow*

Dr R.W. Boswell  
*Fellow, Plasma Research Laboratory, formerly Senior Research Fellow*

Professor P.F. Bourke  
*Professor and Director, Research School of Social Sciences, formerly Foundation Professor of American Studies, Flinders University of South Australia*

Professor R.P. Brent  
*Professor of Computer Science, Department of Engineering Physics, formerly Professor of Computer Science, Faculty of Science*

Dr R. Ceredig  
*Senior Research Fellow, Department of Experimental Pathology, formerly Ludwig Institute, Switzerland*

Dr A.R. Chivas  
*Senior Research Fellow, Research School of Earth Sciences, formerly Research Fellow*

Dr M.A. Collins  
*Senior Research Fellow, Research School of Chemistry, formerly Research Fellow*

Dr P. de Deckker  
*Senior Research Fellow, Department of Biogeography and Geomorphology, formerly Research Fellow*

Dr R.D. Eichner  
*Senior Research Fellow, Department of Microbiology, formerly Research Fellow*

Dr M.T. Esat  
*Senior Research Fellow, Research School of Earth Sciences, formerly Research Fellow, Department of Nuclear Physics*

Dr D.J. Evans  
*Senior Fellow, Research School of Chemistry, formerly Fellow*

Dr C.H. Fisher  
*Senior Research Fellow, Law and Politics of Industrial Relations Project, formerly Research Fellow*

Dr D.K. Forbes  
*Senior Research Fellow, Department of Human Geography, formerly Research Fellow*

Dr K. Haakonssen  
*Senior Research Fellow, History of Ideas Unit, formerly Research Fellow*

Dr C.E. Hill  
*Senior Research Fellow, Department of Pharmacology, formerly Research Fellow*
Dr P.C.L. John  Senior Fellow, Department of Developmental Biology, formerly Reader, Queen’s University of Belfast

Dr Y. Kondo  Senior Research Fellow, Department of Theoretical Physics, formerly Research Fellow

Dr E.R. Krausz  Senior Research Fellow, Research School of Chemistry, formerly Research Fellow

Dr J.D. Love  Senior Fellow, Department of Applied Mathematics, formerly Fellow

Dr B. Luther-Davies  Senior Fellow, Department of Engineering Physics, formerly Fellow

Dr A. Mughan
Senior Research Fellow, Department of Political Science, formerly Lecturer, University College, Cardiff

Dr N.G. Owen  Senior Research Fellow, Department of Pacific and South-East Asian History, formerly Research Fellow

Mr C.T. Paris  Senior Research Fellow, Urban Research Unit, formerly Research Fellow

Mr H.A. Polach  Senior Fellow, Radiocarbon Dating Laboratory, formerly Fellow

Dr J.L. Richardson  Professorial Fellow, Department of International Relations, formerly Professor, Department of Political Science, Faculty of Arts

Dr M. Sawer  Senior Research Fellow, Social Justice in Australia Project, formerly Equal Employment Officer, Department of Foreign Affairs

Dr J.R. Short  Senior Research Fellow, Urban Research Unit, formerly Lecturer, University of Reading

Dr K. Srinivasan  Senior Research Fellow, Department of Demography, formerly Director, International Institute for Population Science

Dr M.V. Srinivasan  Fellow, Department of Neurobiology, formerly Assistant Professor, University of Zurich

Dr T.L. Torgerson  Senior Research Fellow, Research School of Earth Sciences, formerly Research Fellow

Dr T.R. Welberry  Senior Fellow, Research School of Chemistry, formerly Fellow

Professor J.W. White  Professor, Research School of Chemistry, formerly St John’s College, University of Oxford
Dr K.C. Woo  Senior Research Fellow, Department of Environmental Biology, formerly Research Fellow

The Faculties

Dr A.D. Andrews  Senior Lecturer, Department of Linguistics, formerly Lecturer

Dr T.S. Breusch  Senior Lecturer, Department of Statistics, formerly Senior Lecturer, University of Southampton

Mr H.C. Burmester  Senior Lecturer, Faculty of Law, formerly Lecturer

Mr G.G. Cullum  Senior Lecturer, Department of English, formerly Lecturer

Dr S. Dyer  Senior Lecturer, China Centre, formerly Lecturer

Dr E. Etzioni-Halevy  Reader, Department of Sociology, formerly Senior Lecturer

Mr I.S. Farrington  Senior Lecturer, Department of Prehistory and Anthropology, formerly Lecturer

Dr W.A. Foley  Senior Lecturer, Department of Linguistics, formerly Lecturer

Miss H.E.C. Gamble  Senior Lecturer, Faculty of Law, formerly Lecturer

Dr A.D. Hall  Senior Lecturer, Department of Statistics, formerly Lecturer

Dr C. Ifeka  Senior Lecturer, Department of Prehistory and Anthropology, formerly Lecturer

Dr F.W. Lewins  Senior Lecturer, Department of Sociology, formerly Lecturer

Dr C.C. Macknight  Reader, Department of History, formerly Senior Lecturer

Dr D.H. Parker  Senior Lecturer, Department of English, formerly Lecturer

Dr J.R. Piggott  Senior Lecturer, Department of Economics, formerly Lecturer

Dr D.T. Wickramasinghe  Reader, Department of Mathematics, formerly Senior Lecturer
Senior staff resignations and retirements

Institute of Advanced Studies

Dr F.J. Allen  Fellow, Department of Prehistory, to Foundation Chair in Prehistory, La Trobe University

Dr R.B. Ashman  Senior Research Fellow, Department of Microbiology, to Princess Margaret Children's Medical Research Foundation

Mr S.I. Benn  Professorial Fellow, Department of Philosophy

Dr D.J. Brown  Reader, Medical Chemistry Group

Dr R.R. Brown  Professorial Fellow, History of Ideas Unit

Dr J.S. Deeble  Senior Fellow, NHMRC Health Economics Research Unit, to Foundation Director, Australian Institute of Health

Miss A.G. Donnithorne  Professorial Fellow, Department of Economics, Research School of Pacific Studies

Dr G.D.S. Hirst  Fellow, Department of Pharmacology

Professor K.J. Le Couteur  Professor, Department of Theoretical Physics

Professor L.W. Nichol  Professor, Department of Physical Biochemistry, to Vice-Chancellor, University of New England

Dr J.J. Pincus  Fellow, Department of Economic History, to Chair of Economic History, Flinders University of South Australia

Dr C.A. Price  Professorial Fellow, Department of Demography

Dr L.T. Ruzicka  Professorial Fellow, Department of Demography

Professor J.J.C. Smart  Professor, Department of Philosophy

Professor S.J. Stoljar  Professor, Department of Law

Dr E.A. Young  Senior Research Fellow, North Australia Research Unit, to Faculty of Military Studies, University of New South Wales

The Faculties

Dr E.G. Brittain  Senior Lecturer, Department of Botany

Mr H.C. Burmester  Senior Lecturer, Faculty of Law, to Attorney-General's Department

Dr L.T. Carron  Reader, Department of Forestry

Dr T.K. Donaldson  Senior Lecturer, Department of Mathematics

Dr W.A. Heather  Reader, Department of Forestry
Dr N.S. McDonald  Senior Lecturer, Department of Geography, to Commonwealth Department of Resources and Energy

Professor D.J. Mulvaney  Professor, Department of Prehistory and Anthropology

Dr J.R. Piggott  Senior Lecturer, Department of Economics, to University of Sydney

Mr G.M. Tamsitt  Senior Instructor, Legal Workshop
### Principal grants and benefactions

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<tr>
<th>Donor</th>
<th>Purpose</th>
<th>Amount</th>
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