The Australian National University

1976 Report
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Report of the Council for the period
1 January 1976 to 31 December 1976
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To His Excellency the Rt Honourable Sir John Kerr, AK GCMG, KStJ, QC, Governor-General of the Commonwealth of Australia and Commander-in-Chief of the Defence Force of Australia.

May it Please Your Excellency

I have the honour to transmit to Your Excellency the Report of the Council of The Australian National University for the period from 1 January 1976 to 31 December 1976 furnished in compliance with Section 33 of the Australian National University Act 1946–1975.

J. G. Crawford
Chancellor
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 three sections:

1. the Vice-Chancellor's review of significant trends together with summaries by senior academic members of work in progress, and of a selection of developments of particular interest, in the Research Schools, Faculties, Centres and Units;

2. lists of academic publications, which give a fuller indication of the range of research activities in the University; and

3. tabulated information, statistics, and financial statements.

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, or the Calendar which, in addition to general information about the University, contains a full list of the academic staff.

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Organisation to Administer
The Australian National University Act
1946 — 1975

Functions
The Australian National University Act 1946–1975 determines that 'the functions of the University shall include the following:
(a) to encourage, and provide facilities for, postgraduate research and study, both generally and in relation to subjects of national importance to Australia;
(b) to provide facilities for university education for persons who elect to avail themselves of those facilities and are eligible to do so; and
(c) subject to the Statutes, to award and confer degrees and diplomas.'

Council
of the University

Professorial
Board

Institute of
Advanced Studies
Board of the Institute
of Advanced Studies

School of General
Studies
Board of the School
of General Studies

Administration

Research Schools
Biological Sciences
Chemistry
Earth Sciences
John Curtin School of Medical Research
Pacific Studies
Physical Sciences
Social Sciences

Faculties
Arts
Asian Studies
Economics
Law
Science

University Centres
University Library
Residential Halls and Affiliated Colleges
University Union and Sports Union
Student and Staff Associations
Convocation

(1) Centre for Resource and Environmental Studies, Humanities Research Centre, North Australia Research Unit and Survey Research Centre, which are associated with the Institute of Advanced Studies for resource allocation purposes. Other centres and activities include: Computer Centre, Centre for Continuing Education, Office for Research in Academic Methods, Instructional Resources Unit, Counselling Centre, Health Service and ANU Press.

(2) Convocation, which elects four of its members to the University Council, comprises academic staff, graduates of the University and others, who create community links for the University throughout Australia and in many other countries.
The Council

The Council met five times during the year in March, May, July, September and November. The Chancellor presided over all meetings.

Members of the Council as at 31 December 1976

Members Ex Officio
Sir John (Grenfell) Crawford, CBE, MEd Syd., HonDSc Nela(NSW), HonDSc NE, HonDScEcon Syd., HonLLD Tas., PNG & ANU, FAIAS, FASSA — Chancellor
The Honourable Mr Justice Richard Arthur Blackburn, OBE, BA Adel. & Oxf., BCL Oxf. — Pro-Chancellor
Donald Anthony Low, MA DPhil Oxf., FAHA, FASSA — Vice-Chancellor
David Noel Ferguson Dunbar, MSc NZ, PhD Melb. — Deputy Vice-Chancellor
Heinz Wolfgang Arndt, MA BLitt Oxf., FASSA — Deputy Chairman of the Board of the Institute of Advanced Studies

Richard St Clair Johnson, MA DipEd Syd. — Deputy Chairman of the Board of the School of General Studies
Jonathon Bryant Nicholson — President of the Australian National University Students' Association

Members elected by the Senate
James Robert McClelland, BA Melb., LLB Syd.
Peter Elliot Rae, BA LLB Tas.

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
Richard Roderick Andrew, MD BS Melb., FRCP, FRACP
Maurice Hearne Byers, QC, LLB Syd.
Enid Campbell, LLB BEd Tas., PhD Duke
George Austin Colman
Geoffrey Piers Henry Dutton, BA Oxf.
Leonard Thomas Hinde, FIA
Thomas Fulton Coleman Lawrence, BSc BE Syd., FIEAust., FRaeS
Judith Arundell Wright McKinney, DLitt Qld & NE, FAHA
John Mervyn Wark, BA Syd.
Sir Frederick (William George) White, KBE, MSc NZ, PhD Camb., HonDSc Monash, ANU & PNG, FAA, FRS
Arthur John Russel Yencken, MA Camb.

Members chosen by Heads of the Research Schools in the Institute of Advanced Studies
Raymond Leslie Martin, MSc Melb., PhD ScD Camb., FRACI, FAA
Alexander John Youngson, MA Aberd. & Camb., DLitt Aberd., FASSA

Members chosen from among the Deans of the Faculties in the School of General Studies
William Stanley Ramson, MA NZ, PhD Syd.
Douglas John Whalan, LLM NZ, PhD Otago

Member elected by the Professors in the Institute of Advanced Studies
Arthur John Birch, MSc Syd. & Manc., DPhil Oxf., FRIC, FRACI, FAA, FRS

Members elected by the Professors in the School of General Studies
Liu Ts'un-yan, BA Peking, BA PhD DLit Lond., DipEd HK, HonDLitt Yeung-Nam, FAHA

Members elected by the Non-Professorial Academic Staff in the Institute of Advanced Studies
Norma Ruth McArthur, BA Melb., PhD Lond. & ANU
Stuart Ross Taylor, MA Oxf., MSc NZ, PhD Indiana

Members elected by the Non-Professorial Academic Staff in the School of General Studies
Beryl Marie Rawson, BA Qld, MA PhD Bryn Mawr Coll.
Douglas William Smith, BCom LLB Melb.

Members elected by the Non-academic Staff
Peter John Grimshaw
Pamela Morris Kennedy

Member elected by the Research Students
William John Walsh, BA DipEd Macq.

Members elected by the Undergraduate Students
Robert Leslie Arden
Susanne Gai Kopetko

Members elected by Convocation
Bettina Mary Arndt, MPsych NSW, BSc Marie Yvonne Coleman, BA DipSS Syd.
Maxwell Frank Cooper Day, BSc Syd., PhD Harv., FAA
Richard Christopher Refshauge, BA LLB

Members appointed by the Council
Clifford Ormond Dolan
William Joshua Vines, CMG, AASA, FCIS, LCA

Secretary to the Council
The Registrar
How can one convey a faithful impression of the workings of a large, costly, complex, national institution, with a high international reputation?

The Australian National University stands under the eaves of Black Mountain, close to the centre of Canberra city. Its campus now has four large ovals spaced through its north-south axis. Systematic plantings of a great variety of exotic and indigenous trees provide the chief visual links between the wide spread of buildings and the adjacent open spaces.

Spaced across the campus are three main Library buildings, the Menzies, the Chifley, and the new Life Sciences, supported (and complicated) by several more libraries within a wide range of departmental buildings. It is in such buildings that the activities that comprise the University crowd its days.

Depending on how one counts the much welcome part-timers, there were in 1976 about 6000 students — and upwards of 3500 staff, academic and general. All up, this is 5% of Canberra's total population. After the Commonwealth Public Service, they comprise the second largest working complex in the capital city.

Visitors are likely to see first the winding roads, and the (too many) parked cars. A few days' stay will make the University's colourful mini-buses a familiar sight. Astride the east-west axis that runs along University Avenue they will encounter a good many young people, in ones, and twos, and threes, along with a scattering of their elders. Union Court will have its air of busyness; and its dishevelment of worn posters. At lunchtime there will be crowds in the Union refectory. At weekends research workers' cars will be parked outside nearby laboratories.

The university at work
For a good number of those who work at the University, there is a place, and a linkage of tasks, which confine them for the most part to one spot. (I think, at random, of the Accountant's office, the Computer Centre, or one of the Dean's offices; but I might have thought as well of the Central Printery, the Virus Ecology Unit, or the Departments of Political Science). For others (I have students particularly in mind) existence is more multiplex: it centres less on a place, more on a weekly sequence of events. Overall one's impression is of a large number of individuals steadily concentrating on the tasks in hand, generally, and it must be said, understandably oblivious to the extraordinary variety of activities that surround them.

Within a particular department, one will soon encounter its distinctive culture: the relations between people (happily, usually very good) around which its work revolves; and the particular patois that marks its intra-departmental discourse. Though university people are human and gossip like others, one will soon be aware as well of the importance of tea-time and lunch-time for the discussion of 'shop'; sometimes to settle academic business; often, it may quite confidently be said, to pursue an intellectual or scientific discussion.

From all of this comes what? Formally the details are registered in the second half of this Report — in the publications and the degree lists. Both, one knows, need explication for the layman, which can only be provided, inevitably none too satisfactorily by a few examples. This is attempted in the pages which follow.
Contributions

But perhaps some examples can be offered here too. One thinks of the large pieces of work which have been published this past year. To take a tiny proportion at random: the sixth volume of the *Australian Dictionary of Biography*; the first volume of Dr Lo Hui-min’s edition of the correspondence of George Morrison (a major source of information on early twentieth-century China); the first volume of the first major survey of Papua New Guinea’s 500 languages; the new edition of Professor S. A. Barnett’s classic study of *The Rat* (ask anyone concerned with preserving the world’s food supplies for the importance of that). One thinks as well of the large studies now in the press: on the world rubber industry; ‘On Economic Man’; on (if I may write personally) the Indian National Congress.

Of work in progress it is, frankly, difficult to know where to begin. There is fundamental work in train on transplants; on cholesterol; on viruses; on inflammation; on memory; on the precise description, as never before, of crystals; on the monitoring of seismological events in Australia and its environs; on the extensive analysis of pollen, the only remains of prehistoric flora; on the development of computerised models of Third World economies. And so on. (The detailed report to the University Council by the Department of Applied Mathematics in the Research School of Physical Sciences ends by saying: “The year deserves the adjective “frenetic””.

On broader fronts there is the work of the various groups studying the workings of membranes — that vital part of all living systems; continental drift; vision, with its profound implications for understanding the workings of the brain; the
The Vice-Chancellor, Professor D. A. Love, receives the report on The Role of Women in the ANU from one of its authors, Ms Gwenda Bramley.

eighteenth century (another highly successful David Nicol Smith seminar was held this year on aspects of its literature and music).

One thinks too of certain salient public contributions — by several of our senior scientists to national science policy; by Dr Stephen FitzGerald as Australian Ambassador in China; by Dr Clive Edwards' press articles on the implications of South-East Asia's industrialisation for our manufacturing industry and economy; through the lengthening list of the publications of the Botany Bay Project. Again: and so on.

Perhaps enough has been said to explain why it is difficult for a Vice-Chancellor to report adequately on the University's work in a few short paragraphs. There are over 80 departments, centres, or sections in the University. It would be foolish to imagine that all of them are in impeccable running order. A good part of many people's daily task, quietly yet assiduously done, is, however, to see that they are; and one would like to think that there are other large institutions with a record that is as creative.

The School of General Studies
During 1976 the School of General Studies ran into smoother waters, and the some-
times harsh confrontations of the recent past receded. Aside from financial constraints (of which more below), the salient feature of its activities has been hard work. The pressure on staff, from departmental and University business, from teaching and the need to be available to students, and from reading assignments for assessment, has in recent years clearly grown. Students too have had more assignments to complete; and library use has thus been higher than ever.

In a period of little growth in student numbers and in financial allotments, there have been next to no new academic developments; the Department of Computer Science was separated from the Department of Statistics. The year's new initiatives were chiefly in relation to the admission of students. Thus a Schools Liaison Committee began work. There were regular meetings with the principals of Canberra's new secondary colleges. There was widespread participation by University staff in the embryonic ACT Secondary College Accreditation system. An extensive Students Progress and Performance study was mounted (whose results could well be of major importance). It became clear that more attention needed to be given to entry into the job market; and (for reasons to be outlined on another occasion) that we shall need to watch both the numbers doing part-time degrees, and those doing honours. It was interesting to ascertain during the year that, despite contrary appearances, a good deal of teaching of undergraduates by members of the Institute of Advanced Studies is going on, arranged usually, and properly, quite informally.

A more disconcerting picture emerged from a parallel study of the striking extent to which the academic staff during the next two decades is likely to remain unchanged. The implications of this have begun to be recognised; in the growing readiness to contemplate, and effect, reviews of departmental operations; by a recrudescence of concern for time to pursue scholarly and scientific work (if only in the long-run interests of undergraduate teaching itself); in the revival of the Retiring Age Committee; by the establishment of a Promotions Policy Committee; and in a marked switch to non-tenure positions for new appointments. Amid all this the prime need is to ensure that positive attitudes prevail over negative; above all, to build on the fact that great advantages can flow from the greater abundance in future years of a more experienced academic staff.

The Institute of Advanced Studies
The Institute of Advanced Studies has been grasping similar nettles. On carefully considered advice from its General Policy Committee, the Board of the Institute determined this year that Research Schools should hold to the long-established policy that 50% or more of academic appointments be non-tenured. Directors of Research Schools are now to report annually to the Board on the precise position on this matter in their Schools. Only five appointments to full Institute Chairs were made in 1976: in Economics, Mathematics, Philosophy, History and Geophysics; all were of the requisite outstanding distinction.

There was a review of the three research units in the Research School of Social Sciences; and a protracted, indeed year-long, review of the whole Research School
Emeritus Professor Sir John Crawford receives from the Pro-Chancellor, the Honourable Mr Justice R. A. Blackburn, the honorary degree of Doctor of Laws on the occasion of his installation as Chancellor of the University on 10 September 1976.

of Physical Sciences. The latter was no easy task; and after the review committee had completed its report, there were extensive, indeed anxious, discussions in the faculty board, with results which have still to emerge in 1977.

Late in the year a series of University-wide seminars was held on the University’s work in graduate studies; the agenda for 1977 will now include a more systematic survey of these.

New developments

Of other developments two spring most readily to mind. First, the remarkable activation of Convocation as a body holding meetings, largely for ANU graduates, particularly in Canberra, but also elsewhere, at which distinguished members of the University have spoken on their special subjects, to the evident appreciation of overflow audiences. Second, the publication of the Bramley/Ward Report on The Role of Women in the ANU. Its consequences again stand on the 1977 agenda.

There should be mention as well of the encouraging ways in which both the Humanities Research Centre, and the Centre for Resource and Environmental Studies took wing in 1976; of the Bursar’s salutary survey of the University’s internal commercial activities, especially perhaps its large housing operations, which hopefully have now been placed on a self-sustaining basis.

There was optimism too that, with the appointment of a new Director, the ANU Press would develop anew. The munificent gift by Miss Joy London of a field station for the University on the New South Wales south coast commenced to bear fruit as the old buildings on her Kioloa property began to be restored.
We have been particularly gratified as well by the praise for the four-metre Anglo-Australian Telescope, in the construction of which the Department of Astronomy was so closely involved.

**Student finances**

There were two matters during the year which primarily affected students, both in essence financial. Despite serious inflation — and the indexation of emoluments for most other people — allowances for postgraduates as well as undergraduates were not increased during the year; and for far too long there were doubts about the extent to which they might be increased for 1977. It is to be hoped that the Government's announcement in October to review allowances annually, will preclude a recurrence of this situation.

At the same time inflation seriously hit student residences. Early on swift adjustments had to be made to operating costs in both Burton and Garran Halls, and were mooted at the end of the year even in Bruce Hall. A working party under the Dean of Students, which took its cue from the success of the University’s participation in the occupancy of a former government hostel, Narellan House, recommended that from 1977 onwards Garran Hall should be converted to what is termed ‘self-cooking’. This naturally perturbed those understandably dedicated to existing dining hall regimes. They did not, however, include a majority in Garran Hall itself; and in October
Council agreed that the change should be made. The upshot will be watched with quite particular interest.

Industrial matters
Industrial matters came to prominence in 1976 as never before. Most disappointing was the inability to bring to a conclusion the long-standing claims of the University's middle-management staff (represented by the Administrative and Allied Officers Association) for salary increases, due to the introduction of wage indexation and associated guidelines by the Conciliation and Arbitration Commission.

Despite representations by the University including an appearance, with the Association, before an Anomalies Conference called by the President of the Commission in October, the matter has yet to be resolved.

An important step towards the end of the year was the decision by the Public Service Arbitrator to refrain from further hearing of a log of claims which had been formally before him since 1973. The matter will go to the Conciliation and Arbitration Commission at the joint request of the University and the Association.

Financial issues
The central occurrence for the University in 1976 concerned, however, its financial allocations from the Government. Under a decision in 1975 by the Labor Government 1976 was to be an interim year rather than the first year of a new triennium then due. It soon became clear that 1977 was not to see a return to the earlier patterns of growth. Because of continued inflation the new Liberal/Country Party Government laid down in May 'Guidelines' which provided for financial growth for the universities as a whole of 2% per annum. This had, however, to cover the special needs of other universities, particularly the newer ones; 'incremental creep' (the cost of contractual salary increments for staff); and some restoration of grants for new equipment.

The net effect of the decisions by the two Governments, the Universities Commission authoritatively stated later in the year, has been 'to reduce real operating resources per student ... by 1979 ... some 3% below those in 1975': the allocations for the Institute of Advanced Studies evidently followed suit.

The repercussions are manifold. Plans for an undergraduate medical school at this University have been shelved; whether indefinitely remains to be seen. A planned $12 million building program has had to be replaced by a $200,000 minor works program. The time when the University's seven Research Schools can expect to reach their long agreed ceilings on academic staff numbers has been indefinitely postponed. Many other carefully considered objectives have had to be shelved as well.

In weathering this sea-change (for as I said here last year, that is very probably what it is) this University once again displayed exemplary responsibility. The two-tier decision-making process lately introduced, of the Vice-Chancellor's Advisory Group, and separate conclaves for the Institute, the School of General Studies, and the central services, appeared to work effectively. The necessarily widespread financial and staffing readjustments in the School of General Studies attracted particular attention, and were noticeably well conducted.
Overall, the impact on the University, it has to be said, was serious, very possibly seminal, and undoubtedly restrictive. But they could not in truth be said to be actively damaging and destructive — as could, in the form astonishingly proposed, the calls for higher payments to fund the employer's eventual liability for pensions under the new Commonwealth Superannuation Act, which were put to the University by the Government in the year's closing days. On the agenda for 1977 stands this exceedingly worrying item.

Senior appointments
In May the University warmly welcomed Emeritus Professor Sir John Crawford's assumption of office as Chancellor. In June Professor R. L. Martin, FAA, became Dean of the Research School of Chemistry (however, early in 1977 he became Vice-Chancellor of Monash University, where the good wishes and gratitude of the University will go with him). In July the University Council appointed Professor F. W. E. Gibson, FAA, FRS, as the next Director of the John Curtin School of Medical Research in succession to Professor F. C. Courtice, FAA, whose distinguished service with the University is now ending.

1976 saw the completion of Professor Emeritus R. D. Wright's 30-year membership of Council. Council recorded its gratitude to him for his wise counsel and for his outstanding service as one of the founding fathers of the University.

1976 saw as well the ending of Dr H. C. Coombs' Chancellorship, and with it the termination of his unique association with the Council of the University, with whose early decades his name will always be primarily associated. He happily remains with us for a little longer as an actively-engaged Visiting Fellow in the Centre for Resource and Environmental Studies.
The Dean of Students is responsible for the co-ordination and development of student services, which include the University Counselling Centre and Health Service. (The latter two present separate reports.) He has oversight of student accommodation and all matters connected with the welfare of students. A second, and no less, important part of his duties relates directly to the teaching purpose of the University: the promotion of the most fruitful relationships between staff and students in the educational process. In both these functions he is concerned principally with undergraduate students but also with postgraduates.

Student accommodation and increasing costs
The most serious welfare problem in 1976 has arisen in student accommodation, differing from the previous emergency housing of an influx of new enrolments. Now the existing accommodation must be matched to the financial resources and preferences of a stable undergraduate population. Otherwise the needs of students will not be met, unfilled residences will have to raise fees to avoid losses and thereby become too expensive for more students.

The spiral of increasing costs and reduced demand has affected halls and colleges throughout Australia. As this University draws over 40% of its undergraduates from outside the local area, it is crucial that these students be enabled to secure suitable accommodation whilst studying here if the present national character of the University at the undergraduate level is to be sustained. In fact the 2000 residential places which the University has available are sufficient in total, but do not parallel demand. Fifteen hundred of them are in halls and colleges of the traditional type, which are not full, only 500 in self-catering residences, which have waiting lists. A great deal of evidence exists to show that many students cannot afford to live in halls or colleges.

Recognition of the problems of student accommodation led the Council of the University to appoint a Working Party on Halls and Colleges which recommended the conversion of Garran Hall (250 places) to a self-catering residence. The Hall, which will meanwhile continue under a Warden and Governing Body, will offer a new type of economical student living on campus: it will be attractive to students, fulfill a need and develop a character which will contribute to the University.

Relations with community
The establishment of the Schools Liaison Committee in 1976 under the chairmanship of the Dean of Students signified a determination on the part of the University to achieve closer contact with schools, especially in the ACT, to improve and disseminate information about university courses more widely to school leavers in conjunction with careers. These aims are important in the University's relations with the community and in attracting well-informed and well-motivated students.

Many of the activities are already under way. Regular meetings are being held with the Careers Advisers of ACT schools; varied school visits are being systematically arranged; an Open Day at the University for school pupils is planned. Publications about courses are being revised and new methods of publicity planned. Joint university admission centres in the States will be used to distribute
information packs, beginning with New South Wales next year.

The work of the Schools Liaison Committee should be seen as in some respects taking the place of the early admissions scheme and National Undergraduate Scholarships in bringing the University to the notice of potential entrants. Both early admissions and National Undergraduate Scholarships have served a valuable purpose but are no longer appropriate in the changed circumstances of secondary schooling and the Tertiary Education Assistance Scheme (TEAS).

The function of student services, not all of which are enumerated in this report, is to assist students in their University life. The Dean of Students is also directly concerned with the educational objectives of the University, especially in the relationship between staff and students which goes beyond overcoming conflicts between them.

The University has a comprehensive machinery of student participation in academic decision-making, running from student representation on the Board of the School, Faculties, Faculty Education Committees and Departmental Committees, to the discussion between teacher and student in each unit which has been approved by the Board. These arrange-
ments have undoubtedly removed many causes of friction between staff and students, as shown by the spirit of cooperation during 1976. The means are available to reach agreement so long as they are used with goodwill.

**Assessment and work loads**

Two academic areas which deserve serious attention to improve the quality of undergraduate education are methods of assessment and work loads. The general adoption of continuous assessment has resulted in a greater amount of assessable work being required of students, frequently at the same time in different units in which a student is enrolled. The offering of choices in methods of assessment can also lead to uncertainty or confusion on the part of students. The stresses produced are confirmed by the Counselling Centre.

These difficulties should be seen in perspective. They are symptoms of a fluid situation in which new patterns of work load have not yet been fully established. When a compulsory single test was set at the end of the year the annual pattern of effort, with many undesirable features, was plain. Now more complex arrangements have to be devised and accepted. This is a principal task for the Dean of Students in 1977, with first year as critical because here students are least able to fend for themselves and the losses are greatest.

In postgraduate, as in undergraduate education, the University has entered a new era. The responsibilities of the Dean of Students in postgraduate education can now be pursued more easily because of the closer association in this field between Research Schools and Faculties. The seminars initiated by the Vice-Chancellor to review postgraduate degrees, the content of postgraduate courses and career prospects, will result in further appraisals. The changes which are taking place in postgraduate education are especially significant for the Australian National University which has been a leader in this field.
Research Schools

Research School of Biological Sciences

The Research School continues with its main aim of advancing biological knowledge in a wide variety of problems, ranging from the tiniest viruses to higher organisms including man himself. Work on relations between plants and animals in communities is also continuing. The planned establishment of two new groups, one in membrane biology and the other in community biology, has been halted by the present financial restrictions.

The national role of the School is expressed through collaboration with other scientists in Australia, by visits to and from other universities and research institutions (especially CSIRO) and by sharing our equipment for specialised work. Though the aim of advancing biological knowledge involves working with the most suitable organisms for experiments, a large part of the School's work has been concerned with Australian flora and fauna. The whole atmosphere is one of lively investigation with many interdisciplinary interactions.

Magnitude of genetic differences

Although medical science has long been aware that innate differences between people are important factors in susceptibility to disease, it has had no way of distinguishing these effects from those of environmental hazards. Determining the magnitude of these genetic differences is
Mr. S. C. Wong, a PhD student from Singapore in the Department of Environmental Biology, using an infra-red gas analyser to monitor carbon dioxide fixation in photosynthetic studies with Eucalyptus.

an (active) area of research within the Department of Population Biology. For example, its research in Sydney has shown that 10% of a general population sample have the same genetic make-up which in studies in the United States of America was found to make people 30 times more likely to contract lung cancer.

This research also revealed a few individuals who seem likely to be particularly resistant to lung cancer, even if they were heavy smokers. This important new finding is being followed up in special family studies involving collaboration with medical specialists in Canberra, Melbourne and Sydney. These studies aim to quantify the effects of these genetic differences on susceptibilities to various cancers and also on some of the biological factors implicated in heart disease.

Understanding memory mechanism
The Department of Behavioural Biology has been largely concerned with under-
standing the mechanism of memory. Earlier work by members of that Department showed that biochemical inhibitors, like the drug ouabain, can block the short-term memory in animals and man. Drugs of this type are known to block the processes whereby sodium is pumped out of the cells and potassium is pumped in — a process referred to as the sodium-potassium pump. This pump and the balance of sodium and potassium it maintains in the brain cells, seems to be intimately connected with the short-term memory.

More recent work is concerned with long-term memory, the ability to remember over long periods. This kind of memory depends on process of synthesis of proteins in brain cells, so messages are stored away as chemical molecules which can be recalled in the process of remembering. These proteins, like all other proteins, are built up of amino acids. It has been discovered recently that a synthetic substance similar to, but not identical with, a particular amino acid can block establishment of long-term memory. It appears that this amino acid analogue does not act by blocking the protein synthesis reaction as such but by preventing the transport of the essential amino acid (which it resembles) into the cells.

Thus we have the interesting discovery that both kinds of memory are intimately concerned with the transport of substances — sodium and potassium in short-term memory and amino acids in long-term memory — across cell boundaries. What this means in terms of the electrical signalling of nerve cells in the brain is not yet known and will need much future research. But we can say that memory springs from a comparatively simple common chemical process that is reasonably well understood in modern biochemical terms.

**Energy in green plants**

Complete understanding of the chemical mechanism of photosynthesis, the process by which green plants trap energy from sunlight, is important as it may lead to efficient methods of using solar energy for man’s use. It is commonly known that photosynthesis produces oxygen but until recently it was not known that oxygen is also consumed in photosynthesis. Research workers in the Department of Environmental Biology have recently shown how this reaction works.

Consumption of oxygen would reduce the efficiency of photosynthesis in trapping energy but atmospheric oxygen may damage the photosynthetic process by oxidising some of its components (e.g. chlorophyll, which is bleached by oxygen). Oxygen consumption by some substances in the photosynthetic mechanism prevents other essential substances from being oxidised and thereby being rendered ineffective. The central enzyme involved in this oxygen consumption has been studied after extraction from leaf cells but its activity in living systems is best studied by using stable (non-radioactive) isotopes of oxygen.

This technique, as applied in the School, has attracted scientists from Japan, Germany and the United States to collaborate in research using our gas chromatograph-mass spectrometer. Additional mass spectrometer equipment has been constructed with the help of the Research School of Chemistry to further these isotope studies.
Research School of Chemistry

The Research School was created to encourage, and provide facilities for, postgraduate research and study in chemistry. It recognises by its organisation that there are no barriers between branches of the subject: the School is integrated and non-departmental. Its prime purpose is to encourage investigations at the frontiers of chemistry or, better still, to create new ones. It is particularly concerned to stimulate work in rapidly developing areas which bridge the classical disciplines; bioinorganic chemistry, organometallic chemistry, biological chemistry and chemical physics.

Research in these fields is directed towards topics which are timely, relevant to the Australian scene and for which first-class creative workers can be found. Within the School an unusually high proportion of non-tenure to tenure staff ensures a lively and creative intellectual climate and also permits rapid response to sudden and unexpected changes in research directions.

Chemistry of plant growth
Gibberellins form a group of plant-growth hormones which have the most profound and varied effects on plant development. The potential for exploiting these properties in agriculture and horticulture is enormous. Gibberellins, for example, are used extensively in North America for producing seedless table grapes (much larger berries are obtained from the application of gibberellins) and in the citrus industry (fruit may be held on trees for prolonged periods until market demand is optimal). Gibberellins are also used in malting, and a measure of their potency is found in the fact that only one gram of compound is added to each tonne of barley.

These applications, however, are made in an ad hoc manner and, clearly, a fundamental understanding of the manner in which these compounds function is needed. It is not possible at present even to formulate hypothesis. This situation has arisen partly from the molecular complexity of gibberellins and also their rapid metabolism in plant systems. An extensive study of structure-activity relationships based on the synthesis and bioassay of fragments of the basic gibberellin structure has therefore been undertaken by Dr L. N. Mander and his co-workers at the School in collaboration with biologists at the Waite Agricultural Research Institute in Adelaide.

Over the past three years, twenty compounds with a wide range of potencies have been prepared and tested. A significant feature of these synthetic compounds has been their relative simplicity. It has thus been possible to make very systematic changes in molecular structure and to correlate these modifications with varying biological potency on a quantitative basis. The minimal requirements for growth response have been defined and a profile of molecular requirements for higher levels of activity is emerging. It is planned to use these and future compounds to probe the nature of the receptor sites in the plant cell. It is also expected that new hormones with modified and more potent activity will emerge from these studies.

Metal atoms trapped in cages
The biological significance and potential
A typical optical diffraction pattern used to study disorder in crystals. Computers, X-rays and laser beams are used in the Research School of Chemistry to examine crystals and to find out more about other solids.

of ‘cage’ molecules like the macrolides, crown ethers and cryptates comes at least partly from their ability to capture and encapsulate metal ions such as sodium and potassium. Important aspects of such cages are their therapeutic properties, especially as antibiotics, and the possible role they have in the transport of metals in biological systems.

To date relatively few classes of caged molecules have been synthesised, largely because the syntheses are difficult. Notable absences are cages which will encapsulate transition metals such as cobalt, zinc and chromium. A new synthetic strategy has now been developed in the School for such metals where a nitrogen binding cage is built around the metal and the building is assisted by the metal. The trapped transition metal compounds made in this way have vastly different properties compared with the simple metal ions. Exploration of their properties has shown enormous stability for the cages, stabilisation of rare oxidation states and greatly different electron transfer properties from those expected.

There are prospects for incorporating the captured metals into polymers to make new types of ion exchange resins which might also be conducting. Metal atoms might be stabilised in this way, and the cages could be incorporated onto electrode surfaces to produce a new type of electrode.
These practical aspects, along with chemical properties and possible biological activities, are now being examined by Dr A. M. Sargeson and his co-workers.

**Imperfections in crystalline solids**

The way in which atoms scatter a beam of X-rays can be simulated by scattering visible light with objects many thousand times larger than an atom. This fact was utilised in the early pre-computer days of crystallography to aid in solving the structures of crystals. While no longer competitive with the computer for crystal structure determination, this technique is still valuable in certain situations.

One such situation is in the field of disordered crystals (ones in which some of the atoms or molecules are in the wrong locations or orientations). For a perfect crystal the computer need only calculate for one molecule and then use the fact that all other molecules are in the same orientation and spaced regularly, but for disordered crystals each molecule must be treated separately. While the increase in computing time is enormous, the optical technique works just as simply for either situation.

In our present study, a model of what the disordered crystal looks like is first printed on a photographic film (this part of the work is computer-assisted) but then the scattering effect of the atomic arrangement is obtained simply by shining a laser beam through the film and recording the pattern of scattered light. Using this technique, models of the way in which disordered crystals grow are being studied by Dr T. R. Welberry and his co-workers.

These models involve statistical parameters and they give rise to distributions of atoms or molecules whose characteristic scattering patterns can be compared with X-ray patterns of real substances. Interestingly, it turns out that these models are closely related to ones that have been used in other fields — for example, to describe the distribution of disease in wheat crops.

**Distinctions**

Unusual distinctions were conferred on Professor A. J. Birch, FAA, FRS, and Dr Sargeson who were elected to foreign memberships of the USSR Academy of Science, and the Royal Danish Academy of Science and Letters, respectively.

**Research School of Earth Sciences**

As foreshadowed in the 1975 Report the new programs in Economic Geology and Geophysical Fluid Dynamics have begun. The Economic Geology program is directed at understanding the genesis of ore bodies.

Several students with industrial backgrounds will begin their PhD programs in economic geology in 1977. Initially much of this research will be concentrated on geochemical studies of ore bodies which have been thoroughly explored for economic exploitation. The philosophy of the program is that the laboratory program should be directed towards answering the questions posed by the rocks themselves.

Co-operation with the Bureau of Mineral Resources in Isotope Geochemistry and in the determination of the ages of Australian rocks is long standing. Recently this
co-operation has been extended to the construction of an ionmicroprobe, a tool of great potential in geochemical studies.

In addition arrangements were made with the Bureau of Mineral Resources and the Mineral Physics Division of the Minerals Research Laboratory at CSIRO for joint use of the School's Black Mountain Palaeomagnetic Laboratory. It is hoped that this new co-operative program will be as fruitful as that in Isotope Geochemistry has been.

The seismic monitoring network has been extended to cover the dam under construction at Dartmouth, Victoria, and will be extended early in 1977 to cover the area round the new dam to be constructed on the Shoalhaven River, NSW.

The School has been fortunate, as in the past, that a fairly large number of overseas researchers have chosen to spend their sabbatical leaves in the School. It is unfortunate that space limitations will probably necessitate a curtailment of the number of visitors after 1977.

**Cosmochemistry**

Although it is several years since the last of the Apollo landings on the Moon, the School continues its interest in the lunar science program. Professor A.E. Ringwood, Dr W. Compston, Dr D. H. Green and Dr S. R. Taylor are still involved as Principal Investigators and the latter is on the NASA review panel for proposals for lunar science research.

Although detailed studies of samples are still being carried out, enough is known of the geophysics and geochemistry of the Moon to make possible syntheses and interpretation. Professor Ringwood has recently hypothesised that the Moon was not derived by condensation from the solar nebula but instead was derived from the Earth after the Earth's core had separated. He suggests further that material
The ocean bottom seismograph system being operated by the Research School of Earth Sciences in the Timor Sea to obtain data which will help to define the crustal structure in that region.

The buoy being lowered and the tape recording system shortly after retrieval from the ocean floor.

from the Earth’s mantle evaporated and then recondensed to form the Moon. Rejection of the currently more popular hypothesis that the Moon formed as a small planet by condensation and was then captured by the Earth, and the alternative hypothesis that the Earth and Moon formed a binary planet system, is based on a comparison of the relative abundances of the volatile elements in the Moon, the Earth and in the nebula.

Professor Ringwood’s new hypothesis appears to take account of all the known geochemistry of the Moon. However, there is no doubt that it will be examined very critically by supporters of the other explanations of the Moon’s evolution.

Rock mechanics

Measurements of the deformational properties of rocks under stress or strain similar to conditions in the Earth are very difficult because of the need to extrapolate — from experimental measurements in the laboratory over hours and days or, at best, weeks — to phenomena in the Earth taking place over millions of years. The effect of the difference in the time scale can be overcome to some degree by making use of high temperatures in the experiments.

Measurements of the deformational or rheological properties of rocks, especially those of the upper mantle, are fundamental to understanding of the processes by which continents move relative to one another at rates of centimetres a year. Thus even though the deformational experiments are difficult they are significant and the rock mechanics laboratory is devoting much of its time to them. Efforts are now being made to measure very low stresses in olivine-rich and quartz-rich rocks at temperatures of up to 1400°C.
Seismology
Although its level of seismicity is relatively low, Australia is particularly well placed for research in seismology. Earthquakes occur along the Western margin of the Pacific from Papua New Guinea through the Philippines, Japan and the Kurile arc to Alaska. Thus there are earthquakes at distances from stations in Central Australia ranging from a few hundred kilometres to more than 10,000 kilometres. The advantage of a research facility in this region was recognised in 1966 when a seismic array station was installed near Tennant Creek in the Northern Territory in co-operation with scientists from the Blacknest Seismological Research Centre in the United Kingdom.

By the end of 1972 the array was in bad shape because lightning and termites had caused the cables connecting the sensors to the recording station to deteriorate. In 1973 it was decided to re-establish the array using radio telemetry instead of cables. The array became operational towards the end of 1975 and has now functioned satisfactorily for more than a year. Analysis of records from the array is leading to a better definition of the structure of the upper mantle in northern Australia.

In a complementary program, portable seismic stations recording on special magnetic tape recorders have been used in a series of arrays from Melville Island to Mount Gambier in South Australia. North of the South Australia/Northern Territory border the station spacing was 25 kilometres; to the south, 150 kilometres. Analysis of the records from these stations will also lead to improvements in understanding of upper mantle structure and in the precision with which the seismic velocities, especially the shear velocities, in the upper mantle are known.

John Curtin School of Medical Research
The John Curtin School is a broadly-based multidisciplinary research school which attracts individuals with a wide variety of skills and knowledge in medical science. The main emphasis of the School's work is on understanding the basis of human diseases and disorders and their treatment. Much of the work concerns the interaction of man with his environment.

Major projects under study include the effect of diet on coronary heart disease, the mode of transmission of the virus which causes Murray Valley encephalitis, the influenza virus and the production of a vaccine to counteract it, the mechanisms of immunity whereby the body is able to protect itself from foreign antigens, environmental and genetic factors in cancer, and the mechanisms underlying asthma.

Encephalitis and the Nankeen night heron
Murray Valley encephalitis has occurred sporadically in Australia during late summer and early autumn for almost 60 years, sometimes with more than 20 years between epidemics. The eight outbreaks since 1916 usually followed floods and excessive spring rains.

During and since the latest epidemic in 1974 more than 200,000 mosquitoes and
Professor F. W. E. Gibson, appointed as Howard Florey Professor of Medical Research and Director of the John Curtin School of Medical Research on the retirement of Professor F. C. Courtice. Professor Gibson was elected to Fellowship of the Royal Society in 1976.

1800 bird bloods were collected by the Department of Microbiology to help unravel the mystery of the way the virus survives and spreads. The results implicate one species of mosquito, Culex annulirostris, as the main vector responsible for spreading the virus between water-birds and probably to man.

Many different birds are infected but the Nankeen night heron is probably the most important wild-life reservoir of the virus. This finding concurs with the fact that the closely related Black-crowned night heron is an important host of the Japanese encephalitis virus. Several questions arising from this finding are under investigation.

Anaesthesia and sudden death
Malignant hyperpyrexia is a dangerous complication of anaesthesia. Onset is dramatic. During a general anaesthetic an apparently normal patient, who may be undergoing only a minor operation, develops a rapid and sustained rise in temperature, and in 70% of cases the outcome is fatal. Research by members of the Department of Clinical Science has established that individuals who are susceptible to malignant hyperpyrexia have an underlying disease of muscle. Two separate muscle diseases predisposing to malignant hyperpyrexia have been identified and their pattern of inheritance defined.

Use has been made of an animal model to investigate this syndrome as certain breeds of pigs develop a response to general anaesthesia which is very similar, if not identical, to malignant hyperpyrexia in man. Biochemical research on muscle from these animals and from human volunteers who are susceptible to malignant hyperpyrexia, has established that the essential abnormality in malignant hyperpyrexia lies in the muscle cell membrane.

When this membrane is exposed to a variety of physical and chemical stimuli, but in particular to general anaesthetic agents, an excess of calcium is released into the muscle cell. This calcium in turn triggers a series of biochemical events which include a high temperature, rigidity of muscles and acidosis. Unless quickly corrected, these metabolic changes are rapidly fatal.

As a result of this work, a specific test has been developed at the School to identify susceptibility to malignant hyperpyrexia, and a drug has been found to correct the biochemical changes occurring during an episode of malignant hyperpyrexia.
Field work in the swampy areas of the Murray Valley inhabited by water birds which include the Nankeen night heron (13) a nestling heron and (12) snap-frozen mosquitoes collected in the Murray Valley which are used for studies in virus isolation.
Understanding the brain
Research on vision in the Department of Physiology aims to unravel how information in the images formed within the eye is analysed by nerve cells of the eye and brain. The goal is to reveal the principles underlying the functional construction of the visual system in the hope that these same principles may provide a key to the organisation of the brain in general. The visual system presents an outstanding opportunity because we are so dependent upon vision in everyday life. Our language is rich in visual references and our visual experiences are easily accessible to description and measurement. A ready-made framework of concepts and measurement methods is therefore available to guide the examination of the individual nerve cells of the visual system.

Certain classes of visual nerve cells have the capability of abstracting features of the visual environment which correspond roughly with entities in our conscious appraisal of scenes. One such entity is the impression of three-dimensional depth. There is a system of nerve cells in the visual cortex whose function is to provide the internal representation of the depth dimension of visual space. Experiments at the John Curtin School have shown that each nerve cell of this system is specifically sensitive to subtle differences in the images in right and left eyes. Co-operative activity
in a set of such nerve cells may underlie the single vivid three-dimensional view of the world.

Observations on individual nerve cells show that quite small misalignments of the eyes have a profound effect on responses such as to prevent the proper operation of the system. The experiments thus reveal the nature of the handicap in people with squint or ‘turned eye’.

Research School of Pacific Studies

The Research School is primarily concerned with non-Western societies to the north and east of Australia and with pre-Western ones in Australia. There is a component which reaches back to the Quaternary past and to Pacific prehistory, but the bulk of the research deals with modern Asia and Oceania: both regions of flux and changeability.

Much of the work necessitates staff and students staying in the field for several months and this requires considerable financial support. Another essential part of the Research School’s concern is to relate its research to that done in the academic institutions of the countries being studied, including some degree of involvement in the research and training needs of Australia’s neighbours. The School must pay attention to Australia’s foreign policies, and be up-to-date with and react to the rapid developments and sensitivities in the region without sacrificing the quality of its work.

The School’s nine departments and three centres are adjusting imaginatively to the projected ‘steady state’ era of the University. The School still intends, however, to establish a Department of Political and Social Change. It is easy, during a period of financial stringency, to give in to the difficulties surrounding new research programs. The School will have to resist such a temptation if it is to safeguard its fine reputation.

Australia in world politics

The Department of International Relations has combined an interest in the theory of international relations with detailed research in Australia’s foreign policies towards large, small and medium powers both far and near. In support of this work, the Department has sponsored a Strategic and Defence Studies Centre and has provided a home for the Australian Institute of International Affairs. It has also worked in co-operation with members of the Departments of Foreign Affairs and Defence. In addition, its members have contributed towards the work of several major organisations of international studies in the world. The range and variety of its studies have attracted distinguished scholars, and men and women of affairs to the School. From these efforts, important books and monographs and a number of articles have resulted.

Over the past two years, the Department of International Relations has introduced masters courses to attract students from a wider area of disciplines to work in the international relations field. This has given special support to students from neighbouring countries of Asia and the Pacific and prepared them for research
Dr Diana Howlett of the Department of Human Geography and three Papua New Guinean co-authors present their report Chimbu: Issues and Development to Mr Siti Kurondo, Premier, Simbu Province and Mr Jack Bagita of the Simbu Provincial Government, Papua New Guinea. The report, undertaken at the request of the Papua New Guinea Central Planning Office, seeks alternative development strategies for Chimbu Province.

in contemporary international affairs. How these efforts are bearing fruit is reflected in the series of seminars organised by the Department (one on ‘Contending conceptions of moral order in world politics’ and another on ‘The structure of power in world politics’) and the three conferences organised by the Strategic and Defence Studies Centre (‘Relations between Australia, Papua New Guinea and Indonesia’; ‘The defence of Australia: fundamental new aspects’; and ‘The future of tactical airpower in the defence of Australia’).

**Study of developing societies**
The Departments of Economics, Human Geography and Anthropology have, in varying degree, been concerned with the changing non-Western societies of the region. Several of their members are active in the School’s new Development Studies Centre and, together with members of other departments, are keen to see establishment of the Department of Political and Social Change to extend the range of inquiry about neighbouring societies. To this end, the School has worked closely with international and Australian agencies and institutions to interpret and organise the ever-increasing volume of data.

In addition to field research, two other kinds of work have contributed to the School’s reputation as a major centre of development research: these are training programs in agricultural economics to meet practical needs of various developing countries and in the area of theory, notably on migration, marketing systems, transport, international trade, and ethnic minorities; and the larger theme of the
impact of modernisation on human behaviour and on traditional societies.

The dimensions of the study of developing societies have been further extended by the successful work of the Human Ethology Laboratory in the Department of Anthropology. The return of Professor Max Corden to the Department of Economics promises to increase the theoretical aspects of the work on development economics. Dr Stephen Fitzgerald, back from his stint as Australia's first Ambassador to the People's Republic of China, will strengthen the School's Contemporary China Centre, including its concern with the current debate on 'the China model' for developing societies.

Vegetation and agriculture in Papua New Guinea

The Departments of Prehistory, and Biogeography and Geomorphology, have worked together with notable effectiveness. They have been ably supported by the Radiocarbon Dating Laboratory in the Department of Prehistory. Their work in Papua New Guinea illustrates the School's connection with the natural sciences and shows the value of this connection for the work of many members of the School, not least in providing a keener sense of perspective to historians, linguists and anthropologists.

In biogeography, Professor Donald Walker and his colleagues have been investigating alpine and montane sites and have continued with their pollen, chemical and palaeomagnetic analyses on the collected cores. Work has begun to assess the relationship between the stability and diversity of equatorial forests during the past 20,000 years and to determine the histories of the regeneration processes operating at the present day. The work will also extend the vegetation history to lower altitudes and should throw new light on the course of late Quaternary climatic change.

In prehistory, Professor Jack Golson and his colleagues have been investigating the origins and development of agriculture. In the Mt Hagen area, they have found evidence of plant and/or pig husbandry 9000–10,000 years old. Further work has shown that at a later period, from 6000–5500 years ago, there were sophisticated arrangements for swamp management which suggest both the persistence of old cultivation practice and development or acceptance of new practice. That such practices were established so soon after the post-glacial climatic changes suggest that they were already present in the neighbouring lowlands.

Research School of Physical Sciences

In some respects 1976 was a watershed year for the Research School of Physical Sciences; its work was examined by a Review Committee of distinguished scientists, mathematicians and engineers drawn from inside and outside the University. The Committee also obtained opinions and advice of an international group of scientists and others, so that the research programs of the School could be seen in the context of world science and mathematics.
The Review Committee's report was considered and discussed widely by all sections of the School. As a result there is now an agreed set of guidelines for resource allocation to the School's research programs for the next three years.

Another major feature of the year was the completion of a number of equipment construction projects. Most aspects of the planned facilities for the 14UD, the nuclear particle accelerator, were completed. Equipment was installed for the preparation and investigation of metallic specimens for research in solid state physics. An important stage was reached in the construction of a complex device known as LT4 Tokamak, to be utilised in fundamental studies in plasma physics.

**Nuclear Physics**

The new facilities with the 14UD particle accelerator made possible a major effort directed towards greater use of the accelerator. The success of this program is reflected in the sharp increase in annual experimental operating time from 2800 hours in 1975 to 4400 hours in 1976. The installation of the Enge spectrograph proceeded smoothly and it is now being used extensively in experimental programs.

The whole complex of equipment now enables members of the Department of Nuclear Physics to carry out experiments on the structure of the nuclei which are not possible anywhere else in the world at the present time. The installation and commissioning of the many components of
the facility reflect great credit on the technologists and scientists who are responsible for them.

In addition to the use of the equipment for research into the ultimate structure of matter, its utilisation in the preparation of materials of great value in medical diagnoses is being explored.

**Joint projects**
A collaborative research project between the Departments of Nuclear Physics and Solid State Physics is expected to throw new light on the constitution of solid materials. In this project particles accelerated using Nuclear Physics accelerators will bombard solid materials. The observed interaction of the bombarding particles and atoms of the solid will provide information on the arrangement of the atoms and the forces that bind them together in solid materials.

In collaboration with CSIRO, continuing studies have been carried out on the constituents of Sydney's atmospheric haze. Filter samples are bombarded by high energy particles and the identification of the resulting X-ray enables a rapid and accurate analysis of the atmospheric contaminants to be made. Such analyses are necessary for an understanding of the factors which lead to deterioration of the quality of environment.

A further joint project is being undertaken with a major children's hospital in which the chemical analyses of blood samples are established using the techniques of nuclear physics.

**Laser based research**
High power lasers, producing beams of light of intensities which would have been incredible a few years ago, will continue to be used to study phenomena which occur when intense light beams impinge on solids. Rather surprising effects are observed in these experiments. For instance, when a heavy metal such as gold is irradiated, highly charged gold ions move away from the area of bombardment with large energies corresponding to acceleration by many millions of volts. This raises the question as to whether significantly intense beams of high energy particles may be produced in this way.

Again it has been observed in our laboratories and elsewhere that thermonuclear reactions may be induced in the very high-temperatured regions in the immediate vicinity of a laser spot focussed on specially prepared polythene targets. The understanding of this type of phenomenon may well be a step towards the
achievement of controlled thermonuclear reactions as an alternative source of energy.

**Significant contribution**

The School looks forward to a period during which its research can develop and continue its significant contributions to international physics and mathematics. A single institute such as the Research School of Physical Sciences can make contributions to world research efforts only in limited areas. No one institute can hope to cover all the growing points of physics and mathematics and it is of great importance to have a clear definition of research objectives. The School looks forward to a continuation of the individual and collaborative efforts which have proved so successful in the School in the past.

**Research School of Social Sciences**

The foundations of social activity, and the problems to which social activity gives rise, are the concern of the Research School of Social Sciences. Its interests are wide and include such matters as the effects of tariff policy, management in the public service, the relations between science, technology and anti-science, and Australian social history in the 19th century. The School pursues both theoretical and practical styles of inquiry because theory that is out of touch with application may become sterile, and practical inquiry unsupported by active work in theory is likely to be superficial.

The work of the social scientist often involves, besides enumeration and calculation, questions that are social, historical, political, and economic. Thus demography for example, shares many interests with other sections of the School. The Botany Bay Project, directed by Professor N. G. Butlin, Head of the Department of Economic History, and completed in 1976, is a classic example of co-operation by members of several disciplines.

There are other cases of sharing interests too. The study of government economic activity in the Department of Economic History is closely linked to the study of pressure groups in politics in the Department of Political Science; the study of the history of social thought and of legal ideas and of revolutionary ideologies in the History of Ideas Unit is of interest especially to members of the Departments of History and of Philosophy. Social problems almost always have many aspects, and work in the School benefits greatly from the variety of scholarly interests that it contains.

**Greater understanding of fertility transition**

Few would disagree that today's unprecedented rate of growth of world population is a matter of the highest importance; many would say of the greatest concern. It is imperative to understand this phenomenon as thoroughly as possible. The Department of Demography recently organised an international conference in Canberra on 'The Persistence of High Fertility', and Professor J. C. Caldwell presented a paper based substantially on work done in the Department's Changing African Family Project.

In this paper he argues that inadequate
understanding of the circumstances in which birth rates first begin to fall has led 'both to premature gloom about the success of family planning programs and unnecessary hysteria about the likely long-term size of the human race'.

The accepted view is that fertility is high in poor, traditional societies because of high mortality, lack of opportunities for individual advancement, and the economic value of children; that high fertility is sometimes 'irrational' because of the support it receives from religious doctrines, moral codes, customs and family organisation; and that a decline in fertility is a rational response to modernisation, especially to urban industrial living.

Professor Caldwell's argument (here drastically compressed) is that in general fertility behaviour is rational, and the fact that fertility is high or low is a reflection of the economic benefit to individuals, couple or families from its being high or low. And the principal consideration is whether the net flow of wealth is from children to parents (as in 'traditional' societies) or from parents to children (as in 'modern' societies). The flow tends, in the course of time, to be towards children, not simply when economic conditions change, but when the nuclear family has become isolated, emotionally as well as economically and residentially, from the extended family of origin.

The principal implication of the analysis — based on innumerable personal interviews and discussions spread over many years as well as surveys carried out in African and Asian countries — is that fertility decline in Africa, and perhaps in other areas as well, is not dependent on the spread of industrialisation or even on the rate of economic development. It is part of a more complex process of 'westernisation', of the adoption of western life styles and value systems.

**Access to housing**

One project under way in the Urban Research Unit is an analysis of the changes in land use and housing that have displaced many low-income families from inner Sydney. In the post-war period housing has been taken over for, or displaced by, offices, warehouses, factories, hospitals, universities, technical colleges and transport terminals. The growing number of jobs in commerce, government and institutions has also increased the number of white collar workers who compete with the poor for housing close to the city centre.

Flats have replaced older houses in some areas, but these mainly cater for middle or upper income families, and are most suitable for those who do not have young children. It seems likely that unless
more government resources are used, the stock of inner city housing that low income families can afford will continue to decline.

The results of the study suggest that efforts should be made to decentralise jobs and institutions to suburban centres, that public authorities should purchase and renovate some old housing, and that the environment in some of the poorer neighbourhoods should be improved, without making them so attractive that low income tenants are displaced.

The Unit is also carrying out a survey of families who have recently moved house in Adelaide. The objective is to find out how and when people change their housing as the size of their families, their income or their place of work changes. The results will show which kinds of families are able to move, or are forced to move, for example from flats to houses, or from Housing Trust housing or private rental housing, to become owners. The survey should show how many families with children are obliged to live in unsuitable flats because they cannot afford to buy a house, or cannot find a suitable house to rent. The financial aspects of moving, such as the cost of housing and access to different kinds of finance, are being specially studied.

As a result of this research it should be possible to show how families in Adelaide are adjusting to the problems caused by the current very high cost of housing.
During 1976 the Faculty made adjustments in its forward planning which — even given foreknowledge of financial constraints and the interruption of the triennial system — it had not contemplated at the end of 1975. Broadly, the activities and personnel of the Faculty remained as described in the 1975 Report, though the third of the foundation professors mentioned in that Report, Professor L. F. Crisp, announced his retirement from April 1977. There were smaller increases in undergraduate and postgraduate student numbers than in 1975 and it became clear during 1976 that 1977 enrolments were unlikely to show a further increase and that the Faculty could not look to growth in student numbers to facilitate development of its legitimate academic interests.

Two vacant chairs — second chairs in English and Sociology — were not being filled and departments which should have been increasing their staff in response to a manifest student need — Linguistics, Prehistory and Anthropology, and Sociology, in particular — were under considerable strain. The possibility of full departments of Music and Fine Art and of Religious Studies, developments long since approved by the Universities Commission, became remote.

Nonetheless, some movement, essential to the continuing vitality of the Faculty,
has been possible. There is a growing interest in interdisciplinary courses. At the postgraduate level this interest has produced a masters course-work and thesis program in European Studies to be offered in 1977. At the undergraduate level, advanced courses in Fine Art and in Religious Studies are to be offered jointly by the Faculties of Arts and Asian Studies in 1977.

European Studies and Fine Art
The European Studies course is a two-year masters course taught by staff of the English, History, Sociology, and modern European languages departments and consists of a core course, ‘Aspects of European Thought and Society, 1850–1950’, in which the emphasis will be on social and political theory in an historical setting, a thesis on an individual research topic, and additional courses on subjects such as Russian Literary Criticism, Woman in Fiction, and Marxist Literary Theory.

The new course in Religious Studies is described in the Faculty of Asian Studies report. The course in Fine Art is designed to introduce students to painting, sculpture and architecture seen within their historical, cultural and social context. It will cover aspects of art from the early Middle Ages to the present, focussing on areas chosen to illustrate recurring specific problems.

Undergraduate Studies Committees
A sign of the adjustment to changing circumstances in the Faculty is the establishment of Undergraduate Studies Committees in the three major areas of study: the humanities, the mathematical sciences, and the social sciences. These committees are intended to provide expert scrutiny of course proposals from the departments but, in particular, to encourage exchange of ideas, innovation and development. An important feature of these committees is that they will cross present departmental and Faculty boundaries thus bringing together concentrations of expertise which have often in the past been unco-ordinated.

Recent publications
The Faculty’s 1975 report noted the diversity of research activities in the Faculty and described some recent research in the Departments of Geography, Linguistics, Prehistory and Anthropology, and Sociology. This report illustrates the research interests of the Faculty with a commentary on three recently completed books in the areas of classics, history and romance languages.

Professor R. St C. Johnson, with E. L. Burge and the late W. H. Stahl (a Fulbright Fellow at the University in 1963), has completed the first translation of Martianus Capella’s *Marriage of Mercury and Philology*. A fifth century textbook on the seven liberal arts, this became a standard school text from the ninth to the thirteenth centuries and is of great importance in the history of education. It is being published by Columbia University Press in its ‘Records of Civilization’ series.

Dr C. C. Macknight, in *The Voyage to Marege* (Melbourne University Press), described the trepang (beche-de-mer or sea slug) industry carried on in northern Australia between about 1700 and 1907 by fishermen from Macassar in Indonesia. Originally a PhD thesis, it has been rewritten (in part, during regular study leave) for a general audience. While the
The Head of the Department of Classics, Mr K. L. McKay, with the model (22) of Ancient Rome and the artist who constructed it, Mr Errol B. Davis.
theme and approach make it an unusual contribution to Australian history, its revelation of long standing contacts with Indonesia and China, to which the trepang was re-exported, has considerable contemporary interest. It is also relevant to much other research and teaching in the Faculty dealing with the history and prehistory of Aborigines, especially in northern Australia.

Mr J. Grieve has translated for Penguin, Robert Lacour-Gayet's *Histoire de l'Australie*, the first history of Australia written by a French historian. Lacour-Gayet, a specialist in the revolutionary period, had already written popular histories of Canada and South Africa and his book, subsidised by French companies with Australian connections and by the Australian Government, makes an interesting contrast with the work of Australian historians.

**Faculty of Asian Studies**

The work of the Faculty is teaching and research relating to the humanities in the great traditions of Asia and the encounter of these traditions with the modern world. The geographical areas on which the work of the Faculty is focussed are South, South-East and East Asia, which in political terms include the contemporary nation states of Pakistan, India, Bangladesh, Thailand, Malaysia, Indonesia, The People's Republic of China, The Republic of China, and Japan.

The Faculty requires its students to study, at least to the level of a major, a modern or classical Asian language. This language requirement is accompanied by a concern with the methodology of language teaching, and the contribution of applied linguistics to the development of this field.

Areas of special concern to the Faculty are history and historiography, literature, philosophy and religion, and the languages taught are those relevant to these concerns, even when they are not indigenous to the region being studied: for example, Sanskrit for old Javanese culture, Literary Persian for medieval Indian studies, and Arabic for every region in which Islam has established itself.

These traditions are not seen within the limits of contemporary political frontiers, but in terms of their historical distribution. Thus the Chinese tradition has made an immense contribution to the cultural history of Japan, the South Asian religions of Hinduism and Buddhism have had a deep impact on South-East Asia, and the West Asian religion of Islam has played a decisive role in the cultural history of both South and South-East Asia.

Each of the modern states which are heirs to these traditions has adopted a different style of government, has different attitudes to its past, and a different network of relationships with its neighbours. Each has selected and responded to different aspects of Western ideologies and cultural values. In none of the emerging new cultural formations is consistency or continuity to be assumed. Thus, although the Faculty is small and its concerns might appear esoteric, it houses a variety of interests that are relevant to a better understanding of the dynamics and processes of modern Asia.
Dr Helmut Loofs, Reader in Asian Civilizations, with an attentive audience in the course of excavations by the Thai-British Archaeological Expedition at the Khok Charoen site in Central Thailand.
Thai archaeological project
One of the most important research projects undertaken in the Faculty is the study and preparation for publication of the discoveries of the Thai-British Archaeological Expedition at sites in northern Thailand during the five years 1966–70. Dr H. H. E. Loofs of the Department of Asian Civilizations was co-director of this series of digs and has a major responsibility in writing up the results. The discoveries include one of the largest neolithic burial complexes ever found in South-East Asia, and an important pre-Buddhist settlement beneath an early Buddhist site. Dr Loofs is incorporating this material in a wider study of the prehistory of mainland South-East Asia that he is undertaking.
An important proportion of the artifacts discovered has been stored in the Faculty for reconstruction, dating and cataloguing, and under an agreement with the Thai Fine Arts Department this material will eventually be returned to Thailand. There is great value to Australia in active collaboration in archaeological research of this kind with her South-East Asian neighbours, which can only lead to a better appreciation and understanding of their cultures both past and present.

Language teaching programs
The Faculty’s concern for effective teaching is illustrated by the contribution of the Department of Japanese to language teacher training and the preparation of teaching materials. The new unit, ‘Teaching Methodology of Japanese’, offered for the first time in 1976, derives from a concern for a more efficient study of Japanese, and the development of Japanese language teaching as a fully professional activity. Further, the Department has undertaken responsibility for the writing of a series of Japanese language textbooks for Australian and New Zealand high schools.

The most important development is the grant which the Department has received from the Australia-Japan Foundation to support a one-year intensive Japanese language course in 1977. It is an important innovation from several standpoints: its scope, the new dimension it adds to teaching under the aegis of the Faculty, and its concern with Australian-Japanese relations. It aims at achieving in one year of full-time study the level of language competence reached in the regular three-year major. Nine months of the course is to be conducted at this University followed by two months of study in Japan.

Religious Studies
A new development, which although on a small scale, may be of long-term importance, is an attempt to revive Religious Studies. This program was approved in 1968 but as a result of increasing financial constraints was not implemented. It is now planned to introduce an advanced-year unit in Religious Studies as an Arts-Asian Studies venture under the auspices of the Department of Indonesian Languages and Literatures. Subject to approval, the unit is to be offered for the first time in 1977.
This development is significant because it is modest enough to be supported by resources already available without involving commitment to an on-going program until the measure of student interest it attracts can be assessed. Also it cuts across faculty boundaries. Thus it may serve as an example of how educational initiatives may be maintained in the University despite a situation of ‘no growth’.
Faculty of Economics

A recommendation that a separate Department of Computer Science be established in the Faculty of Economics was accepted in March 1976. Those engaged in developing Computing Science within the Faculty are now so organised as to contribute fully to the academic work of the Faculty and the University.

The Faculty now offers three programs leading to a degree of master by course work. Progress in the Master of Economics (MEc) degree by course work and Master of Administrative Studies (MAS) Program was outlined in last year’s report. The number of candidates who should receive the MAS degree as the result of a course-work program and a small thesis completed this year is seven as against two in 1975. A continuation of this steady growth is expected. Introduction of a program leading to a degree of master by course work in Statistics, was approved in 1976. This program is designed primarily as a preparation for honours graduates wishing to pursue a career as statisticians in industry or in organisations such as the Australian Bureau of Statistics or CSIRO.

Administrative changes

In August a review committee of Faculty was set up to consider admission procedures for the MAS program and also to consider how the program had developed and its place within the Faculty of Economics. The committee directed its attention to several issues.

The University and the Faculty have traditionally administered and developed degrees of master involving thesis or course work which build on skills attained in a related honours degree. The MAS is a multidisciplinary generalist degree and the committee wished to see how a degree structured in this way had achieved the aims put to Faculty when the program was approved. Because of the novelty in this University of such a multidisciplinary postgraduate program, the entry criteria allow candidates with a first or second class honours degree or a postgraduate degree to enter directly without regard to the disciplines in which the qualifications were achieved.

Much of the review committee’s time has been occupied with a detailed study of how entry requirements could be designed to support the special nature of the MAS program. It is necessary that each candidate enter the degree program with some background in economics, accounting, statistics, law, psychology and political science. To provide candidates with the necessary background in all these areas, they must complete bridging units in any areas where they are inadequately prepared. The nature of these bridging units and the extent to which they will be provided by staff within the program is under review.

A proposal to group the mathematical science departments in the University and to create a degree structure based on courses offered by these departments has been debated by all faculties. The academic merit of such a grouping is accepted but there are difficult resource questions which would result from the creation of another small faculty. The suggestion to form a Faculty of Mathematical Sciences or, alternatively, a School of Mathematical Sciences within an existing Faculty has been referred to a working party of the
Board of the School of General Studies. A recommendation of either form, which was adopted by the Board, would have a major impact on the Faculty of Economics and in particular the Departments of Computer Science and Statistics.

**Student enrolments and participation**

Student enrolments in the Faculty grew by 8% in 1976. This growth was made up of 22% increase in postgraduate enrolments and 6% in undergraduate enrolments. This resulted in the allocation by the Resources Committee to the Faculty of four non-tenure academic posts. These four posts were used by the Faculty to support the research and teaching activities in economics, econometrics, computer science and administrative studies.

There are now opportunities for students to comment on most aspects of the work of the Faculty and its departments and also the courses they have chosen. It appears that students are being offered ample opportunity to express satisfaction or dissatisfaction with matters of course structure, course content, methods of assessment and many other facets of academic life. It was sometimes difficult this year to obtain sufficient student participation for proper discussion of these questions at all levels.

**Computer-aided instruction**

The Departments of Computer Science and Statistics have been involved in setting up a computer-aided instruction (CAI) laboratory to support teaching in these two departments, particularly in those areas where graphical interaction is important in vividly demonstrating theoretical concepts. An appointment at the level of programmer or assistant programmer will soon be made to support CAI work at three levels. The first will involve development of teaching programs in consultation with academic staff. The second will be the maintenance of hardware associated with this project, and the third will be in assisting staff in tutorial situations to demonstrate teaching packages previously developed for the facility.

A remote job entry location in the Copland Building has been equipped and now awaits completion of the University computing network to allow an effective link with the Univac 1100-42 computer. The Resources Committee has provided programming support staff for 1977 to assist in providing software so that, after the University network is completed, the full potential of the remote job entry station can be used in teaching and research programs.

Recent acquisition of a Burrough’s 1700 computer system by the Department of Computer Science marks the beginning of a number of new research projects associated with programming languages, computer systems software and experimental machine architectures. Fourth year honours, masters and PhD candidates will be involved in projects on this installation as will several academic staff members.

**Faculty of Law**

The Faculty’s main concerns are the teaching of law for the degree of Bachelor of Laws including Bachelor of Laws with honours, and undertaking research into
legal matters. The majority of students enrolling in the Faculty undertake combined degree courses; although this extends their enrolment to five years they emerge as graduates in two disciplines. The Arts/Law combination continues to be the most popular.

The number of applicants to undertake law courses rose to an all-time record of 1515. Despite this increase the Faculty restricted its intake to 125 new students to reduce the student body to the overall limit of 550 set up by Council. The pressure for admission resulted in only the top 6% of school leavers being offered places.

**Students in practice**
A Students in Practice Scheme was initiated during the 1975-76 summer vacation under the aegis of the Faculty of Law, the ANU Law Society and the Law Society of the Australian Capital Territory. The scheme was designed to provide undergraduate students with an opportunity to spend time in the offices of practitioners. A pilot session of the scheme took place in February, involving five students and five different firms of solicitors. Such was the success both from the points of view of the students and practitioners involved, that further sessions were conducted during the May and August vacations. During the 1976-77 long vacation two sessions are being held in December and February involving more than 30 students and some 20 firms.

**Computers in law**
Computers have had a notable impact on most academic fields over the last 15 years or so, but the law has tended to lag behind other disciplines. Currently two members of staff, Professor D. Whalan and Mr L. Pape, are investigating the computer's utility for the lawyer. Mr Pape has been adapting the STATUS I retrieval program for use on the University's Univac computer; the initial work has now been completed and trials have proved successful. Professor Whalan has been working on computers and the law for some 13 years and has published extensively in the field. His work on the implications that computers have for invasions of privacy and on the possibilities for storage and retrieval of land resources and titles information, has been widely recognised. His titles storage ideas are becoming reality in the United Kingdom and some Australian jurisdictions. Professor Whalan's research has now moved on to the possibilities for the use of computers for more efficient planning of usage of land resources and, in work which will complement that of Mr Pape, the impact that computerisation will have on the law, legal reasoning and the legal profession.

**Delegated legislation**
Mr D. Pearce has been undertaking research in the field of delegated legislation and has now completed the manuscript of a book on the subject. Among the matters that he examined was the question of parliamentary review of such legislation. The use of parliamentary committees, particularly the work of the Senate Standing Committee on Regulations and Ordinances, is considered in the text. Mr Pearce concluded that this committee was among the most active and effective of the Australian Parliamentary Committees.

However, he suggests that the Parliament should pay greater heed to the means for
controlling the use of delegated legislation. The House of Commons practice of requiring Parliament's approval of certain regulations prior to their becoming law (the affirmative resolution procedure) should, he suggests, be adopted to supplement the system of parliaments in Australia allowing all regulations to come into operation with the possibility that they will be disallowed.

Faculty of Science

Many departments in the Faculty, during the year, have given consideration to the nature of the undergraduate courses they offer. Frequent adjustments to the courses are necessary to include basic material and yet accommodate important new concepts and facts. At the same time, students must be made familiar with new experimental methods and equipment which are rapidly introduced into research laboratories and industrial enterprises. Course revision may range from rewriting of the content of a lecture sequence to complete restructuring of a department's courses, or of its practical classes. All of these have occurred in the Faculty in 1976.

Revision of courses involves increasing use of sophisticated techniques based on films and television, and a high level of expertise if such teaching aids are to be of an acceptable standard. Preparation of high quality visual aids in a rapidly-changing field is expensive in both financial and manpower terms and necessitates very clear definition of aims and priorities. Alternative methods of course presentation allowing greater freedom in the rate of progress for individual students, such as the Keller plan, have been used in a number of courses. Experience in some departments has shown that such teaching methods are extremely demanding on the time of tutorial staff, thus limiting their general introduction.

Teaching exercises in epidemiology

Epidemics of plant disease caused by population explosions of micro-organisms can have great economic and social significance. Recent epidemiological research has considerably advanced understanding of these population phenomena but this knowledge has been slow to flow through undergraduate teaching. One reason for this seems to be the difficulty of bringing students into meaningful contact with the objects of study; spontaneous epidemics are rarely located or timed to suit the convenience of undergraduate courses. To circumvent this problem, staff of the Department of Botany have constructed a series of exercises based on simplified models of epidemic situations.

In elementary exercises, plants are represented simply by variously coloured press studs or printed diagrams, and the students simulate the development of disease epidemics by transferring the 'parasite' from 'plant' to 'plant' according to simple rules that reflect natural infection processes. The element of chance is introduced by such means as throwing dice to estimate the direction and distance travelled by the 'parasite' as it moves between 'plants'. Each exercise illustrates one or more basic epidemiological principle and provides results which, while simple, are nevertheless suitable for statistical analyses similar to those from a real epidemic.
The more advanced exercises fall into two categories: mathematical models utilising pocket calculators; and miniature laboratory epidemics using real plant seedlings and a fungal parasite. The exercises are readily reproducible and quite inexpensive. They are currently being tried out in plant pathology courses at several other universities and colleges.

**Disease in eucalyptus forests**

Deaths of trees and understory shrubs in native forests have increased dramatically in the post-war era, particularly in southern Australia. Death is frequently associated with the presence of the root-rotting fungus *Phytophthora cinnamomi* and in many cases it is likely that this species is responsible for the disease. No less than 280,000 hectares of jarrah forest are affected in Western Australia and extensive areas also exist in Gippsland and to a lesser extent elsewhere in southern Australia. For some years the Department of Forestry has been investigating particular aspects of this die-back problem in an interdisciplinary study involving the Research School of Chemistry and certain divisions of CSIRO, supported by the Australian State Forest Services and major wood-using industries.

An extensive survey, involving some 15,000 soil samples, has demonstrated the presence of *Phytophthora cinnamomi* in a discontinuous distribution in native eucalypt forests along the east coast of Australia, the western slopes in New South Wales, Tasmania, western Victoria, the Mt Lofty ranges and the south-west of Western Australia. Numerous other *Phytophthora* spp. and *Pythium* spp., previously not recorded from Australian native forests, have been isolated during the survey.

Since 1968 the Department of Forestry has been conducting research into the extensive damage caused in Australian forests by the fungus *Phytophthora cinnamomi*.

(24) A typical disease area and (25) Dr W. A. Heather, Reader in Forestry, with PhD student Mr Bill Blowes, examining lupin roots for infection by the fungus in a baiting experiment.

These organisms are of potential significance in the regeneration of forests.

Preliminary evidence suggests a high inherent variability in the fungus and hence a potential to cause disease in different species in various environments. The fungus appears to have a mosaic type distribution in soil, probably associated with the localised occurrence of susceptible plant roots. In certain situations the fungus and susceptible host species occur in an apparently commensal situation without apparent disease development. This emphasises the importance of environment, and particularly man-induced environmental change, in disease induction. The monocalyptoid species of *Eucalyptus* are generally susceptible to *Phytophthora* root rot, while species of the other subgenera and certain *Pinus* spp. show varying
degrees of tolerance or resistance. Hence, rehabilitation of disease affected areas with eucalypt or pine plantations may be possible.

To assess the potential for spread of the organism from infested to uninfested areas, the Department is initiating a laboratory and glasshouse study on the artificial introduction of the fungus into a variety of forest solids under different environmental conditions.

**Biochemical investigations into human breast cancer**

Breast cancer is the largest killer of women in Australia. Over 50% of women who have a breast tumour removed will have tumour occurrence within two years. Treatment of these patients involves either surgical castration to remove hormones which stimulate tumour growth or the administration of toxic drugs which kill tumour cells. To date, the selection of treatment for patients has been random and has met with variable success. Research within the Department of Biochemistry has been directed towards the establishment of biochemical procedures to distinguish those patients who should respond to surgical castration. Using samples of human breast tumours as well as breast tumours of laboratory animals, techniques have been developed to distinguish those patients who will not respond to surgical castration.

These techniques are now widely used in hospitals in NSW and the ACT and have acted to remove the discomfort of unnecessary surgery in those women who will not respond. Further research to determine the best form of drug treatment for patients is in progress. This research has involved the isolation of tumour cells, the characterisation of those biochemical reaction which are affected by drugs and the comparison of the effects of these drugs on normal cells of the body. These studies should enable earlier and better treatment of this disease and thus greatly enhance the chances of survival of these patients.
There continues to be heavy demand on the services and expertise of the Centre for Continuing Education — an academic and professional unit operating in the broad and future-oriented field of continuing education. This demand is felt from the Asian region as well as from within Australia.

The Centre has made a steady contribution during the year to various forms of reappraisal of the Australian education system, and particularly its adaption in accord with the more far-reaching concepts of recurrent and life-long education, including participation to enhance learning in the community and the work-place. There is little evidence that these concepts have been assimilated into thinking on future directions within the University itself.

The year was marked by a higher level of involvement with adult education and change programs in the Asian region including Papua New Guinea where the Centre conducted a program with the Department of Posts and Telegraphs during the first part of the year. Staff were involved as consultants in a series of workshops with the National Labour Institute in New Delhi, and with the Indian Universities Grants Commission on continuing education in Indian universities.

It became increasingly clear during the year that the Centre has an important role
to play in helping to meet some of the pressing needs of those engaged in non-formal education in parts of the Asian region. The Centre has begun to explore means of responding to this demand, through provision both in Canberra and overseas. In this context it is timely that Australia is taking steps to join the Unesco Asian Programme of Educational Innovation for Development, and that CCE has been identified as one of the three initially proposed Australian Associated Centres in the program.

Centre for Resource and Environmental Studies (CRES)

During 1976 the Centre was allocated sufficient funds to reach a size (12 academic staff) which should ensure its viability, although all its research groups are still well below optimum strength.

Three research groups have developed, concerned with resources (initially minerals and energy), applied systems analysis (especially water basin modelling) and human ecology (as related to urban settlements). The work on resources in Australia’s future was described in last year’s report; this year the major project of the applied systems group is highlighted.

The applied systems group initiated a major systems study of hydrology/water quality/aquatic biology in the Lower Molonglo-Murrumbidgee-Lake Burbinjuck region of the ACT and NSW. The study has two major objectives.

First, it is intended to carry out a systematic evaluation of the factors affecting river and lake water quality, with particular reference to the management of effluent disposal within the region and the operation of the Lower Molonglo Water Quality Control Centre. This evaluation will be based on an integrated program of field data acquisition and mathematical systems analysis, including computer-aided modelling of hydrology and water quality. The second objective is to use the study as a vehicle for the development of a general quantitative approach to environmental systems analysis.

The CRES study will be truly multidisciplinary: the team is comprised of two systems analysts, a physical geographer, an aquatic biologist, a computer programmer, a mathematician and a chemist. Since the study of water quality in a region has social and economic connotations, it is hoped that members of the other major groups within CRES (resources and human ecology) will be taking an active interest in the project as it progresses.

If increasing involvement with the Asian region was one significant trend for the Centre in 1976, another is increasing academic involvement with other areas of the University. Informal involvement with several other groups has long existed but there is more involvement in teaching, particularly in courses such as Sociology and Administrative Studies. There were also preliminary discussions about the possibility of mounting a post-experience diploma course in continuing education.
One of the major projects being undertaken by the Applied Systems Group in the Centre for Resource and Environmental Studies, is a study of water quality management in the lower Molonglo, Murrumbidgee, Burrinjuck region of the ACT and NSW. This study involves a multidisciplinary team and is based on an integrated program of data collection, special field experiments and computer-aided mathematical modelling and systems analysis.

Computer Centre

Two major events of the year were occupation of the new Computer Centre Building, and installation of a new computer — a Univac 1100-42.

Occupation of the new building began in February. The Univac 1108 computer, moved from its previous site in the undercroft of the Menzies Building of the Library, was well established by the end of April; and the commissioning of the new mainframe and the phasing over of the memory and peripherals from the Univac 1108 commenced. Processing on the new system was in full swing by July and initial experience has proved very satisfactory.

Some serious problems with the new building stem from a general lack of accommodation and storage space. It was known that all staff could not be accommodated in it and that the technical group and network programmers would have to stay in the Cockcroft Building.

There are immediate and direct problems stemming from the shortage of accommodation in the computer room. These are already affecting the users. However, there are also definite advantages from the improved facilities and from consolidation of the majority of the staff in one area. Significant development in
teaching and research and development programs of the Centre can be directly attributed to these factors.

Humanities Research Centre (HRC)

The Centre’s interests have spread over the general field of humanities in accordance with its defined objectives. From 1977 the Centre will concentrate on a special theme, translation, though part of its resources will continue to be reserved for those working in other areas of the humanities.

Twenty-two visiting fellows worked in the Centre during the year. Of these, eight came from Australian universities and 14 from overseas. Over half of the visiting fellows worked in literature (English, French, Russian and Scottish) while the interests of the rest extended over history, music, art history, and philosophy.

Most of them gave seminars in the series of work-in-progress seminars arranged weekly throughout the year. Those from overseas, with the help and encouragement of the Centre, also visited other Australian universities, participated in discussions with students and staff, and contributed to teaching programs. This aspect of the Centre’s activities has been widely appreciated and is in keeping with the way it was conceived as an international centre with a special national role.

The Centre was also involved in organising conferences on Old Norse, phenomenology, Shakespearian comedy, parody, and the Fourth David Nichol Smith Memorial Seminar. Two special visitors from overseas were brought to the Old Norse conference and the Fourth David Nichol Smith Memorial Seminar.

NHMRC Social Psychiatry Research Unit

This has been the second year of operation of the National Health and Medical Research Council Social Psychiatry Research Unit. Work has continued on attempted suicide, effort being made to use the technique of cluster analysis, applied to extensive interviews on 350 Hobart and Canberra patients, to look for clinically important types within this general class. Considerable progress has been made, with the emergence of at least three types, each clinically different, each clinically recognisable and each requiring different forms of treatment and after-care. The classification which has emerged will shortly be available for clinical use and for further studies in Australian hospitals and overseas.

A study of the behavioural correlates of coronary artery disease has been designed and is now under way, with the cooperation of patients who have recently suffered a heart attack, together with their physicians and general practitioners. The study looks at those personality characteristics and those life stresses which, in addition to the established risk factors (e.g. obesity, diet, high serum cholesterol,
lack of exercise and smoking), may be related to the development of coronary artery disease. In addition to examining certain biological and psychological variables, a particular strength of the study is that it also looks at certain attributes of the patient’s social or interpersonal environment; and the amount of support derived from social relationships. Social variables may have a place both in the aetiology of, and in the response to having developed, coronary artery disease. The present study is looking at this.

North Australia Research Unit (NARU)

The third year of the Unit’s existence saw conditions in Darwin return to near normal. However, the advantages gained were to some extent offset by staff shortages caused primarily by resignations for reasons of health. Still, both research and service functions continued without major interruption.

Projects continuing were: study of the Northern Territory Legislative Assembly Election of 1974; amenities and facilities in northern Australian towns; the history of the Overland Telegraph Line; the Aboriginal settlement at Djembere (near Mataranka); settlement history of the Katherine-Darwin district and an account of cultivated agriculture in north Australia.

A new program, for which planning has begun, is a study of natural hazards in north Australia. The work will aim at a delineation of those areas most at risk and a fuller understanding of events such as cyclones, droughts, floods and bushfires in the hope that their effects on man may be mitigated.

Another development with considerable potential has been the establishment of the NARU Field Research Grants to enable final-year honours students to undertake limited field work in the north. In 1977, the initial year of its operation, students will be drawn from the University’s School of General Studies and will work on projects within the Northern Territory.

The second number of the Unit’s North Australia Research Directory was issued in November; planning for the North Australia Research Bulletin, the Unit’s principal publication, is well advanced.

Office for Research in Academic Methods
(ORAM)

The growing recognition within the University of the need for the regular evaluation of courses has been reflected in the increased number of requests for ORAM’s assistance in devising appropriate evaluation procedures. Most such requests have centred around development and/or analysis of questionnaires completed by students.

One major undertaking, requested by a department in the Faculty of Arts, involved development of a basic questionnaire
specifically suited to the subject and further adapted to each particular unit offered by the department. These questionnaires were developed in consultation with the head of the department and, through him, the faculty members and students.

A department in the Faculty of Science requested a comprehensive evaluation of its first-year courses. After extensive discussion of the nature and scope of the course with the head of the department and other lecturers involved, the Head of ORAM, Mr A. H. Miller, evaluated the course as a participant observer and a comprehensive report covering the aims of the course, its content and staffing, teaching and assessment methods, was submitted to the department.

On a smaller scale, ORAM developed questionnaires for individuals and departments within the Faculties of Arts and Science, and for a masters program within the Institute of Advanced Studies.

Survey Research Centre (SRC)

During the year the Centre conducted a mail survey in parallel with a National Capital Development Commission interviewer survey of Tuggeranong residents, and methodological comparisons are being made between the two sets of responses; a survey of general practitioners was conducted for the Royal Commission on Human Relationships; and an ANU Reporter readership survey was carried out for the University Information office.

A summer school on survey techniques was conducted jointly with the Centre for Continuing Education. Teaching assistance was again provided in the Department of Statistics (SGS) and in the Master of Administrative Studies Program. SRC staff took sessions at a number of workshops during the year.

A highlight was the formation of the Australian Consortium for Social and Political Research Incorporated (ACSPRI), an association of universities and colleges of advanced education, with the Survey Research Centre as its administrative headquarters. Its principal purpose is to acquire access to, obtain, and share social science data sets for secondary analysis. As a by-product of its membership of the American archive ICPSR (Inter-University Consortium for Political and Social Research), ACSPRI is acquiring a substantial survey archive, which is now being supplemented by the acquisition of Australian data.
The University Library is part of a quiet revolution taking place in Australian libraries generally. This revolution is led by radical and imaginative changes in the National Library's information services and it is supported by librarians who believe that the rapidly growing demand for information services in Australia can be met only by the development of more efficient national resource sharing systems.

Resource sharing as it is understood today, involves the establishment of computer-based systems linking libraries throughout Australia in a manner which would provide high speed access to information data bases, information about the holdings of other libraries, access to a central file of catalogue records and fast communication of the contents of documents held in other libraries. An essential element of a complete resource sharing system is a national lending collection designed to provide fast and efficient document backup to the holdings of libraries in regional networks. Support for a national lending library would be provided by major libraries which agreed to act as 'paranational' libraries in subject areas in which they were particularly strong.

Involvement in resource sharing
The need to prepare for its involvement in resource sharing networks was an important factor in changes which were made during 1976 in the organisation of the Library, and in policies affecting collection building and systems. The Library was
re-organised into five divisions to permit a higher degree of staff specialisation and to enable subject areas to respond directly and efficiently to subject networks being developed in Australia.

The effect of these changes was most clearly demonstrated in the Science Division which worked closely with the recently established Australian National Scientific and Technological Library (ANSTEL) to introduce an on-line information retrieval service and to provide backup services to assist ANSTEL in fulfilling inter-library loan requests. Because of the establishment of ANSTEL, the Library was able to review its scientific serials, cancelling those which were little used and readily available in ANSTEL and, wherever possible, taking account of ANSTEL holdings when ordering new titles or serial backsets.

Other subject divisions in Asian Studies and Social Sciences and Humanities are also co-operating in a similar manner with the National Library and other major Australian Libraries.

Two major difficulties
Introduction of automation into the Library was also seen as a means of improving internal processing operations as well as preparing it for participation in a shared cataloguing scheme and other national resource sharing networks. A mini-computer was purchased and with assistance from libraries of other universities work was begun on program development.
Developments such as those outlined and the prospects for even greater advances in the next few years give reason to be optimistic about the possibility of establishing local and national library services which match increasing demands for fast and comprehensive information services.

Two major difficulties face efforts to improve services. First, like all libraries, this Library is deeply concerned about the effects of inflation and devaluation on the purchasing power of the book vote. It is of utmost importance at this time that supplementary funding to the University continues to take full account of these factors. Second, because of deferment of University building projects, the Library faces a serious space shortage. It shares the concern of governments and universities about the apparently unending demand by libraries for additional space and is committed to finding a solution to this problem.

Yet, at this stage of its development, the Library collection cannot be considered a mature collection either in comparison with the collections of other universities here and overseas, or in terms of its ability to meet a reasonable proportion of the information needs of the university community it serves.
Other University Activities

Instructional Resources Unit (IRU)

Following the establishment of the Instructional Resources Unit in July 1975, audio and production areas were set up in the basement area of the Chifley Building of the University Library. The facilities now provided include photographic services, media services and consultancy.

During 1976 the biggest growth in the services offered by IRU was in the provision of educational television programs. These were produced either in colour in the fixed studio installation in the Chifley basement or in black and white on location in the various departments and schools of the University. To facilitate production, non-technical staff trained in the use of educational media help to bring together the expertise of IRU technical staff and academics.

In addition to the use of tapes for teaching and private study purposes, members of the University staff when travelling have used copies to illustrate some of the work being done at the University. Requests for copies of tapes have been received from outside users and the links with other tertiary and secondary institutions are growing steadily as the work of the IRU becomes known.
Following the appointment of a new Director in July the Press embarked on an active publication policy with emphasis on sales and promotion.

Increasing costs mean that it is no longer possible to produce scholarly works for a limited market in the elegant style of former years. The use of the electric typewriter and the small offset press can produce a work that is still an effective and practical means of communication.

Books of more popular appeal will continue to be produced in the traditional manner. Their sales will be promoted by a team of new representatives who have been appointed in the Australian States, Papua New Guinea, Fiji and New Zealand.

In 1976 the Press published 18 new titles, reprinted five others and distributed 23 new titles on behalf of departments of the University. Perhaps the most influential books published during the year were the first three titles of the Botany Bay Project Reports edited by Professor N. G. Butlin. One of these, The Impact of Port Botany, was reprinted within a month of publication.

The publishing policy of the Press has been revised to the extent that some emphasis will be placed on providing text and reference books for tertiary students and books of cultural, educational and recreational significance to the citizens of the immediate area served by the University.

University House

University House continues to be a major centre for the life of the University and a meeting ground for the University and the people of Canberra. During the year membership rose to about 1500 of which some 250 were not directly associated with the University either as members of staff, research students or members of Convocation.

The number of permanent residents in the House was close to the estimate and it is clear that the House continues to serve one of the most important of its original functions — a residence for staff, for research students and for visitors to the University. The number of short-term University visitors was fewer than estimated in the budget for 1976 but the House maintained its income by increasing its conference business. This has been a successful policy and many organisations have made use of the House for conferences and seminars.
University Counselling Centre

This year was marked by a number of initiatives which marshalled the skills in the Counselling Centre for projects serving the University at large.

The Director of the Centre led an encounter group which was one of a series of experimental workshops forming part of an innovatory course design in the Human Sciences Program. The hope that the students' personal experience of adaptation, change and development would complement their more formal studies of human adaptability was amply fulfilled for most participants. This venture successfully demonstrated the possibility of integrating personal activity with formal study.

Staff from the Part-time Studies Unit, in co-operation with the Office for Research on Academic Methods, have substantially completed the first stage of a longitudinal study of student performance and progress. They have designed research methods and distribution and recovery systems to gather and analyse recurrently, information about student background and demographic characteristics; aims, expectations and plans on entry; subsequent experience of the University; academic record; and destinations after leaving. The usefulness of such information for University planners to formulate policies is obvious.

In recent years the Careers and Appointments office has found it increasingly difficult to cope with the demand for face-to-face advisory work. In 1976 it worked towards establishing an Information Centre where information on course, careers and appointments would be displayed and articulated in such a way as to enable students to help themselves, and to seek personal advice only when absolutely necessary. Both prospective and current students will now be able to find, gathered in one place and clearly labelled, up-to-date information on current job prospects and future career opportunities, study at other institutions in Australia and overseas, and financial assistance and scholarships, as well as directions to the various sources of expert advisory assistance within the University itself.

On the community front, the Communication and Study Skills Unit has worked closely throughout the year with the ACT Schools System as it planned the changeover from the Higher School Certificate to school-based curricula and assessment.

University Health Service

During the year the Health Service continued to promote the principles and practice of social and preventative medicine both within and outside the University environment. There has been an increasing interest in the relaxation training classes held in the health centre and in the exercise testing and prescribing facilities available in the health laboratory at the Kingsley Street Hall.

Both these procedures have proved their value in combating stress and promoting personal well-being in students. To a limited extent they have been avail-
able to University staff members as part of general policy to promote the University community.

During its first year of operation the stress cottage in Balmain Crescent has been a temporary haven of refuge to several students with acute personal problems, sometimes avoiding the need for hospitalisation.

University Union

For the Union, 1976 was a most successful year. Financially it was second only to 1975 despite the difficult economic circumstances in which most students found themselves. The two areas where the Union really moved ahead during the year was in Union development and activities. It also increased the money available to be used for students on student activities.

A Student Services Officer was appointed and the results of her efforts soon became apparent. This appointment is in line with the effort that the Union is making to become increasingly a centre for student recreational and social activity on the campus.

The Union assumed responsibility for the 'K' Block Canteen, a canteen for staff and students adjacent to the Law and Asian Studies buildings, during the year and spent a considerable amount of money renovating the building before re-opening it. It now provides a useful decentralised service for the Union's members and University staff at the centre of the campus.

Additions and renovations to the Union's premises were begun. These were: the foyer was extended into the colonnades — a move which was unpopular with some on aesthetic grounds, but once accomplished is now seen to be worthwhile; the ground floor areas were rearranged; the refectory was extended into the undercroft; and a balcony was created extending out from the bar. These additions have been greeted with enthusiasm by members and have proved useful as the Union now provides food and refreshments for 35% of the on-campus population daily.

In addition to lectures given to undergraduate students in the Human Sciences and Biochemistry courses, Health Service members have been involved in organising and participating in seminars on preventive aspects of health care.
ANU Students’ Association

The Students’ Association is a body to which all undergraduate students belong. Its policies and activities are determined at general meetings at which every student member has a right to vote.

The Association continued to run Lennox House to provide a limited amount of low-cost accommodation for students. It also became in large part responsible for “The Cottage” which is a refuge for students in need of care and assistance. The University has made available a cottage on its site; the day to day running and maintenance of “The Cottage” is in the hands of a student collective. The Association also helped to consolidate and continues support for the Parents on Campus Co-operative Creche — a child-minding facility for students with children on the site; and supports CHAPS (Childrens Holiday Activity Program by Students), a program designed and carried out by students, performing an essential service over the summer holidays, providing holiday activities for children (5–12 years) over a period of six weeks. The program received commendation from the ACT Social Welfare Section of the Department of the Capital Territory. CHAPS was run over December 1976–January 1977, and MAYHAPS is planned for the 1977 May holidays.

The Student Loan Fund continued lending money at low interest to students in need, with the help of the Bank of New South Wales and the University Credit Union.

The Association played a large role in discussions which led to the conversion of Garran Hall to a self-catering arrangement — an important addition to the style of student residences within the University.

It continued to play an active part in the political affairs of the campus and the wider community; maintained a continuing concern in sexism and racism; and engaged actively in the various national debates on education, especially tertiary education, and worked hard to maintain the levels of allowances paid by the government to students.

Overall, the Association successfully maintained its position both as a guardian of student welfare and a voice for student opinion.

ANU Research Students’ Association

Two major issues have absorbed much of the Association’s time in the past year, namely scholarship allowances and the proposed inquiry into student loans. At a time when there is a stated need to limit public spending there is inevitably some pressure to reduce the level of financing in fields such as postgraduate education. This association maintains that an adequate level of postgraduate awards is
necessary, both to ensure the greatest long-term benefit of the postgraduate system to society as a whole and to free postgraduates themselves from undue hardship. The Association has consistently acted in support of this policy, especially in relation to the loans inquiry and to the level of scholarship allowances.

On the national level, the Association co-operated with other sections of the University in bringing postgraduates from all over Australia to attend a series of seminars on postgraduate education conducted on campus. A meeting of delegates from postgraduate associations was held in association with the seminars and resulted in steps being taken to reconstitute the Federation of Australian Postgraduate Associations as a national voice on postgraduate affairs.

The Association has continued to operate a family day-care centre for the benefit of its members and of other sections of the community.

During the year many aspects of tertiary education were subjected to critical questioning. This Association has endeavoured to contribute to the broad issues of this discussion as well as continuing to work for the welfare of its members.

Sports Union

If a measure of financial success is reflected in a series of balance sheets, the Sports Union is not an exception. Its surpluses over the past three years, derived from fees and trading operations, have been accumulated to facilitate the development of a Sports Recreation Hall. During the next year this long-awaited project will be completed, together with additional facilities which will complement the proposed model of a total sports complex at this University.

In the daily operations, benefits to members have been increased through a wider range of services and additional grants to affiliated Sports Union clubs. Noticeable increases in costs reflected in the annual reports of the Sports Union for 1976/77 for wages and equipment purchases have been largely offset by members and staff providing skills, assistance and personal services in organising and operating the activities and facilities. Without these services it would not have been possible to achieve the results reflected in the annual reports, or the stage of development now reached.

In conclusion, the Sports Union's direction and activities appear to have met with the University's satisfaction and approval. Without the support of the University community, the long-term objectives could not have been realised and achieved. However, if suggestions of further self-sufficiency are not met with a balanced contribution from other areas, it is not a foregone conclusion that the Sports Union can continue in its present direction.
In 1976 all remaining major projects approved for the 1973–75 triennium were finished. The year was a standstill one for capital development except for a small minor works grant, and reintroduction of the triennial system was on a rolling basis rather than the traditional basis in operation between 1958 and 1975.

The Computer Centre and Solid State Physics building was finished in March. Included in the building is the 230-seat Leonard Huxley Lecture Theatre named after Sir Leonard Huxley who was Vice-Chancellor from 1960 to 1967.

The external form of the Arts Centre was completed during the year and funds are being sought to provide the internal finishes necessary before the building can be used.

Tenders for the Molonglo Arterial, which cuts through the Acton Ridge section of the campus, were called towards the end of 1976 by the National Capital Development Commission. Protracted consultations over the years led to changes in the landscaping, design and size of the Arterial and to the availability of enclosed space above the tunnel section for University purposes such as storage or parking.

The special attention given to the landscaping program in recent years is now bearing fruit and is enhancing the beauty of the site. The planting pattern is emerging clearly with planned areas of predominantly Australian natives, deciduous exotics, mixed planting with no special dominant character, and conifers.
Sullivans Creek, which flows through the campus, continues to cause pollution and to be uncertain hydraulically, a situation likely to remain until control measures upstream of the University boundary are taken.
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Theoretical Physics


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* Former member


Instructional Resources Unit

Educational Video Programs produced jointly with members of staff —

Crystal Optics — Plane Light, October.

Crystal Optics — Interference, October.

Crystal Optics — Optical Indicatrix, October.

Crystal Optics — Conoscope Uniaxial, October.

Crystal Optics — Conoscope Biaxial, October.

(Eggleton, R. A., Dept Geology)

Mr Dong Guo Meets the Wolf, September.

(Hong-Fincher, B., Dept Chinese)

July the Fourth — A Study in Rhetoric, June.

Three Colonies: Three Roads to Independence, July.

Thirteen Colonies Unite 1765-1775 — Massachusetts Leads the Way, September.

Meet Gordon Wood, August.

Meet J. P. Greene, August.

(Kinloch, H. G., Dept History, SGS)

Teaching Japanese in Schools — Campbell High School — Professor Alfonso, November.

(Pulvers, S., Dept Japanese)

Packing to go on Holidays, June.

The Exhibition, November.

(Travers, M. B., Dept Slavonic Languages)

Sorvall RC2B Refrigerated High Speed Centrifuge, February.

Balances and Weighing — The Mettler Semi-Micro Balances, Models H6 and H10, February.

Scintillation Counting Using the Beckman Model LS-100 Scintillation Counter, May.

Care and Use of the High Speed Centrifuge MSE HS-25, October.

Ultracentrifugation, November.

(Thorpe, B., Dept Biochemistry, SGS)

NHMRC Social Psychiatry Research Unit

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Survey Research Centre

Degrees conferred

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<th>Bachelor of Arts</th>
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<td>Watte, E. L.</td>
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<td>Young, P. V.</td>
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### Bachelor of Laws degree with honours

| Blackman, L. M. | Faure, J. E. | Komor, C. J. | Smith, D. R. |
| Blowes, R. W. | Featherston, J. R. | Lazarides, L. M. | Stone, M. T. |
| Danson, J. E. | Harrison, G. M. L. | Pascoe, M. A. | Wood, R. S. E. J. |
| Darling, J. H. | Hartstein, V. A. | Rossiter, N. E. L. | |

### Master of Laws

| Coward, P. M. | Maher, L. W. |

### Bachelor of Science

| Annus, H. | Eustace, K. N. | McAndrew, R. M. | Scotland, D. J. |
| Baker, A. M. | Féles, S. S. J. | McRae, P. D. | Shepherd, P. D. |
| Balderson, J. | Flood, S. M. | McWilliam, A. D. | Simpson, B. C. |
| Banens, F. A. | Gittins, S. V. H. | Miles, J. A. | Smavatkul, D. |
| Blair, J. A. | Golnhow, B. I. | Millar, S. J. | Smith, D. J. |
| Blowes, A. G. | Gray, L. M. | Miller, A. A. | Snell, S. M. |
| Bowden, D. S. | Greed, I. R. | Minuti, B. A. C. | Stanborough, W. R. |
| Bowman, G. W. | Greed, P. R. | Moorhouse, D. J. | Stockman, Y. M. |
| Brewer, H. J. | Hamilton, C. M. | Moorhouse, P. R. | Stokes, A. |
| Colebrook, J. M. | Hanrangan, L. M. | Nikiel, C. | Stucken, R. J. |
| Colless, C. W. | Hardy, N. | Patterson, I. D. | Sturrock, M. L. |
| Conron, A. F. | Hegarty, A. E. | Percival, P. J. | Sunderland, D. M. |
| Dahlenburg, C. R. | Herlt, A. J. | Phillips, J. E. | Tooth, A. M. |
| Davey, P. N. | Howes, T. A. | Preston, W. D. | Trigg, R. J. |
| David, L. J. | Jellie, B. J. | Pryszak, A. P. J. | Tweddle, A. F. |
| Dodg, G. W. | Kaye, P. E. | Rad, G. R. | Weisback, G. J. |
| Douglass, J. E. | Kelly, G. P. | Roberts, S. J. | Whaite, L. J. |
| Drijver, S. | Laity, K. J. | Robinson, J. R. | Whittaker, L. K. |
| Epps, R. G. | Latham, M. A. | Rothenanivibhata, A. | Young, E. K. |
| Esquerra, J. V. Jr | Laurence, C. E. | |

### Bachelor of Science degree with honours

| Batho, P. T. | Ezzy, D. M. | Lee, T. S. | Simpson, M. A. |
| Beaver, B. F. | Franklin, J. B. | Leedman, C. R. | Smith, R. L. |
| Boon, D. J. | Griffiths, K. M. | Leedman, P. A. | Snowden, K. J. |
| Bowman, K. L. | Griffiths, R. W. | Levy, I. W. | St George, I. H. |
| Bryan, A. J. | Harris, C. M. | Palmer, D. H. | Stevens, M. K. |
| Carron, P. L. | Hibberd, M. F. | Pham, T. H.-M. | Talsma, P. |
| Cayzer, R. S. | Hill, R. I. | Philip, J. M. | Tan, R. Y. S. |
| Chappell, P. J. C. | Hume, D. A. | Phillips, M. A. | Thayer, J. W. |
| Colgan, D. J. | Jittertrum, K. | Poulis, M. I. | Williams, A. J. |
| Cooke, J. A. | Karoly, P. F. | Price, C. J. | Wiritaywit, Y. |
| Creese, B. R. | Kelemec, J. A. | Reed, J. | Wormald, N. C. |
| Dravnieks, J. R. | Killen, P. D. | Richards, A. J. | Wright, B. J. |
Bachelor of Science (Forestry)

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<th>Name</th>
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<td>Adamczewski, N. G.</td>
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Bachelor of Science (Forestry) degree with honours

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<tr>
<td>Dawson, M. P.</td>
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Master of Science

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Doctor of Philosophy

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Doctor of Science

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<tr>
<td>Izumi, M.</td>
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Prizewinners

The University Medal
Adrian John Baddeley  Pure Mathematics
Helen Mary Griffith  Bahasa Indonesia & Malay
Ian Norman Walter Jennings  Zoology
Ian Malcolm McKenzie  Economics|Statistics
Anton Paul Muller  German|Philosophy
Peter John Parsons  Law
Helen Dorothy Slattery  Botany
William Roy Young  Theoretical Physics

The A.N. Hambly Prize
Jeffrey Robert Reimers
Charles Graham Young  shared

The Alliance Francaise de Canberra Prizes
Russell James Patrick  French Language & Literature I
Helen Parker  French Language & Literature II (shared)
Jeanette Rae Tremayne  French Language & Literature III
Margaret Joan Sparke  French Language & Literature IV
Cheryl Lesley Fletcher  shared

The Ansett Air and Space Law Prize
Michael Kingsbury Carr

The Australian-American Association Prize for American Studies
Jonathan Graham Brown  American History

The Australian Capital Territory Bar Association Prize
Ellis Sinnott Magner

The Australian Computer Society Prize
Robert Charles James Edmondson

The Australian Federation of University Women—Australian Capital Territory Prize
Helen Mary Griffith

The Australian Institute of Physics Prize
Nicholas Philip Warner
Stephen Mark White  shared

The Australian Psychological Society Prize
Robyn Jessie McClelland

The Australian Psychological Society Prize for Pure Mathematics
Barry John Gleeson  3rd year Pure Mathematics
Iain Murray Johnstone  units (Honours) (shared)
Adrian John Baddeley  Pure Mathematics IV

The Australian Psychological Society Prizes for Pure Mathematics
Barry John Gleeson  units (Honours) (shared)
Iain Murray Johnstone  units (Honours) (shared)
Adrian John Baddeley  Pure Mathematics IV

The B. C. Meagher Prize for Commonwealth Constitutional Law
Peter, John Parsons

The B. C. Meagher Prize
John Richard Evans  Botany A01

The CSR Chemicals Prize
Peter Anthony Harrison

The Commonwealth Forestry Bureau Book Prize
Victor Paul Jurakis

The Dante Alighieri Society (Canberra Branch) Prizes
Frances Mary Fitzpatrick  Italian I
Geoffrey Graem Eade  Italian II (shared)
Joan Constance Longmore  Italian III
Margaret Joan Sparke  Italian IV

The E. A. Lyall Memorial Prize
Eleanor Iris Margaret Hancock
Iain Ronald Jones
Paul Robilliard

The Economic Society of Australia and New Zealand (Canberra Branch) Prizes
Ian Edward Davidson  Economics II
Ian Malcolm McKenzie  Economics IV

The Freehill, Hollingdale and Page Prize for Commercial Studies
Peter John Parsons

The Geological Society of Australia Prize
Robyn Margaret Johnston

The George Knowles Memorial Prize
Peter John Parsons

The Geotechnique Prize
Mark John Durie  German Language & Literature I
Patricia Hackett  German Language & Literature II
Anton Paul Muller  German Language & Literature IV

The Hanna Neumann Prizes for Pure Mathematics
Barry John Gleeson  3rd year Pure Mathematics
Iain Murray Johnstone  units (Honours) (shared)
Adrian John Baddeley  Pure Mathematics IV

The Institute of Advanced Studies Prizes in Economic History
Neville Robert Bruce Tompkins  Economic History I
Peter Julian Grant  Economic History IIH

J. G. Crawford Prizes
Roland Alexander Sammut
Judith Anne Sleee

The L. D. Pryor Prize
Susan Elizabeth Newton  Botany Group C units/s

The Lady Isaacs' Prize
Peter Anderson  shared

The Law Society of the Australian Capital Territory Prize for Contracts
Christopher Scott Gerrard

The Leslie Holdsworth Allen Memorial Prize
Louise Josephine Fitzpatrick

The Marie Halford Memorial Prize
Angela Mary Sherry

The Permanent Trustee Company (Canberra) Limited Prizes
Vincent Thomas Robinson \textit{Trusts}
Ian Robert Johnson \textit{Property II (shared)}
Ellis Sinnott Magner

Priscilla Fairfield Bok Prize
Linda Andrus

The Professional Officers' Association Prizes
John Richard Evans \textit{Botany}
Brenton John LeMesurier \textit{Chemistry}

Rachel Dorph Memorial Prize
Hilary Jessie Louisa Borthwick \textit{shared}
Judith Elizabeth Quinn

The Ramsay Prize
Linda Andrus

The Royal Australian Chemical Institute Prize
David Alwyn Charles Evans

The Scandinavian-Australian Society Prizes
Judith Elizabeth Quinn \textit{Swedish}
Raymond Laurence Field \textit{Old Norse}

Schlich Memorial Trust Prize
Allan William Melmoth \textit{shared}
Graham Richard Wilkinson

The Shell Company Prizes
Colin Ross McKenzie \textit{Economics}

The Statistical Society of Australia (Canberra Branch) Prize
John William DeRavin \textit{2nd year Statistics units}
Iain Murray Johnstone \textit{3rd year Statistics units (Honours)}

The Supreme Court Judges' Prize
Peter John Parsons

The Tillyard Prize
Hilary Ruth Penfold \textit{shared}
Kevin John Hart

The Timbind Utilisation Prize
Alan William Melmoth

The Trustees Executors (Canberra) Limited Prize
Geoffrey Charles Lindsay

The United Commercial Travellers' Association Prize
Douglas Francis McTaggart
University lectures

**University Lectures 1976**

*Dr J. A. L. Matheson*

Australian universities in transition 2, 9, 16 June

**‘Origins’ series**

*Prof. G. Isaac*

Human cultural origins: recent discoveries in East Africa 7 July

The consolidation of culture: elaboration and geographic expansion in the middle Pleistocene 14 July

*Prof. D. J. Mulvaney*

Origins of Australian Aboriginal creativity 21 July

*Dr A. G. Thorne*

The origin of the Australians 28 July

*Dr D. E. Yen*

The origins of horticulture in Southeast Asia 4 August

*Prof. J. Golson*

New Guinea and the origins of horticulture 11 August

**Morrison Lecture 1976**

*Dr Lo Hui-min*

The tradition of prototypes of the China watcher 27 October

**John Curtin Memorial Lecture 1976**

*Prof. R. A. Gollan*

The labour movement and equality: 1890 and 1980 17 November

**Single public lectures**

*Prof. A. J. Youngson*


*Dr P. Reddaway*

The dissident movement and the defence of human rights in the Soviet Union 29 March

*Dr N. Yalouris*

The classical tradition in European art from the middle ages to modern time 31 March

*Prof. A. P. Merriam*

The anthropology of music 14 April

*Prof. L. B. Gustafson*

Economic geology at ANU — why and wither? 31 May

*Prof. F. Fenner*

Target zero: global eradication of smallpox 29 September
**Institute of Advanced Studies**

<table>
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<tr>
<th>Name</th>
<th>Position and Previous Affiliations</th>
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<tbody>
<tr>
<td>Dr F. J. Allen</td>
<td>Fellow in Prehistory, formerly Research Fellow.</td>
</tr>
<tr>
<td>Dr N. G. Ardlie</td>
<td>Senior Fellow in Clinical Science, formerly Senior Research Fellow.</td>
</tr>
<tr>
<td>Mr T. Asch</td>
<td>Senior Research Fellow in Anthropology, formerly Lecturer in Anthropology, Harvard University.</td>
</tr>
<tr>
<td>Dr J. N. Burnell</td>
<td>Research Fellow in Physical Biochemistry, formerly Doctoral Scholar, Oxford.</td>
</tr>
<tr>
<td>Dr P. J. Cook</td>
<td>Senior Research Fellow, Research School of Earth Sciences, formerly Senior Geologist, Bureau of Mineral Resources.</td>
</tr>
<tr>
<td>Professor W. M. Corden</td>
<td>Professor of Economics, Research School of Pacific Studies, formerly Nuffield Reader in International Economics, Oxford.</td>
</tr>
<tr>
<td>Dr R. L. Dewar</td>
<td>Senior Research Fellow in Theoretical Physics, formerly Research Fellow.</td>
</tr>
<tr>
<td>Dr D. M. Etherington</td>
<td>Fellow in Development Studies Centre, formerly Senior Research Fellow, Agricultural Development Economics Program, Economics, Research School of Pacific Studies.</td>
</tr>
<tr>
<td>Dr S. A. FitzGerald</td>
<td>Professorial Fellow in Far Eastern History, formerly Australian Ambassador to The People's Republic of China.</td>
</tr>
<tr>
<td>Mr S. L. Goldberg</td>
<td>Senior Fellow in History of Ideas Unit, formerly Wallace Professor of English, Melbourne University.</td>
</tr>
<tr>
<td>Dr I. A. Hendry</td>
<td>Senior Research Fellow in Pharmacology, formerly Queen Elizabeth II Fellow.</td>
</tr>
<tr>
<td>Dr J. Higley</td>
<td>Fellow in Sociology, formerly Assistant Professor, Department of Sociology, University of Texas at Austin.</td>
</tr>
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<td>Dr F. W. Irons</td>
<td>Senior Research Fellow in Engineering Physics, formerly Research Fellow.</td>
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<td>Dr S. K. Jain</td>
<td>Research Fellow in Demography, formerly with the Department of Sociology, University of Cape Coast, Ghana.</td>
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<td>Dr M. V. A. Jarvillehto</td>
<td>Research Fellow in Neurobiology, formerly Acting Associate Professor, Department of Physiology, University of Oulu.</td>
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<td>Dr A. Kalnajs</td>
<td>Senior Fellow in Astronomy, formerly Senior Research Fellow.</td>
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<td>Dr L-g. Liu</td>
<td>Fellow in Research School of Earth Sciences, formerly Research Fellow.</td>
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<tr>
<td>Dr R. K. Meyer</td>
<td>Senior Research Fellow in Philosophy, formerly Postdoctoral Fellow.</td>
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<tr>
<td>Dr H. R. P. Miller</td>
<td>Senior Research Fellow in Immunology, formerly Research Fellow.</td>
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<tr>
<td>Dr H. N. Nelson</td>
<td>Fellow in Pacific and Southeast Asian History, formerly Senior Research Fellow.</td>
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<tr>
<td>Dr C. S. Newton</td>
<td>Research Fellow in Nuclear Physics, formerly PhD Scholar.</td>
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<tr>
<td>Dr B. Q. Niestchmann</td>
<td>Senior Research Fellow in Human Geography, formerly Associate Professor of Geography, University of Michigan.</td>
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<tr>
<td>Dr J. E. Norris</td>
<td>Fellow in Astronomy, formerly Research Fellow.</td>
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<td>Dr I. Noy-Meir</td>
<td>Senior Research Fellow in Environmental Biology, formerly Senior Lecturer, Department of Botany, Hebrew University of Jerusalem.</td>
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<td>Dr C. D. Ollier</td>
<td>Senior Research Fellow in Biogeography and Geomorphology, formerly Research Fellow.</td>
</tr>
<tr>
<td>Dr R. T. Pidgeon</td>
<td>Senior Research Fellow in Development Studies, formerly Senior Lecturer in Charge of Isotope Geology Laboratory.</td>
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<td>Dr L. J. Rogers</td>
<td>Senior Research Fellow in Behavioural Biology, formerly Senior Teaching Fellow, Department of Physiology, Monash University.</td>
</tr>
<tr>
<td>Dr M. M. Saad</td>
<td>MADE Fellow, Development Studies Centre, formerly Director, Consultancy and Economic Methods Branch, IAC.</td>
</tr>
<tr>
<td>Dr S. R. Shaw</td>
<td>Senior Research Fellow in Neurobiology, formerly Assistant Professor, Department of Zoology, University of British Columbia.</td>
</tr>
<tr>
<td>Professor J. J. C. Smart</td>
<td>Professor of Philosophy, formerly Reader in Philosophy, La Trobe University.</td>
</tr>
<tr>
<td>Dr E. J. Steele</td>
<td>Postdoctoral Fellow in Microbiology, formerly PhD Scholar, Adelaide.</td>
</tr>
<tr>
<td>Dr A. G. Thorne</td>
<td>Fellow in Prehistory, formerly Research Fellow.</td>
</tr>
<tr>
<td>Dr B.R. Trenbath</td>
<td>Senior Research Fellow in Environmental Biology, formerly Research Fellow.</td>
</tr>
<tr>
<td>Mr L. Watson</td>
<td>Senior Fellow in the Taxonomy Unit, formerly Fellow.</td>
</tr>
<tr>
<td>Dr T. H. Williams</td>
<td>Senior Research Fellow in Sociology, formerly Research Associate, National Institute of Education, Washington, DC.</td>
</tr>
<tr>
<td>Dr S. R. Wilson</td>
<td>Fellow in Statistics, formerly Research Fellow.</td>
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**School of General Studies**

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<tr>
<th>Name</th>
<th>Position and Previous Affiliations</th>
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<tbody>
<tr>
<td>Miss J. P. Adams</td>
<td>Lecturer in English, formerly Doctoral Student ANU.</td>
</tr>
<tr>
<td>Dr A. D. Andrews</td>
<td>Lecturer in Linguistics, formerly</td>
</tr>
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</table>
Research Assistant MIT.
Dr R. K. Barz Senior Lecturer in Hindi, formerly Lecturer.
Dr W. P. Bellingham Senior Lecturer in Psychology, formerly Lecturer.
Mr P. S. Bellwood Senior Lecturer in Prehistory, formerly Lecturer.
Dr G. Benjamin Senior Lecturer in Anthropology, formerly Senior Lecturer in Sociology, University of Singapore.
Mrs R. Burnett Senior Lecturer in Law, formerly Lecturer.
Dr F. L. Bygrave Reader in Biochemistry, formerly Senior Lecturer.
Mr W. G. Craven Lecturer in History, formerly Senior Tutor.
Dr A. Curthoys Lecturing Fellow in Women's Studies, formerly Research Worker, National Research Programme on Women.
Dr J. J. T. Evans Senior Lecturer in Human Sciences Program, formerly Lecturing Fellow in Human Ecology.
Dr C. G. Fane Senior Lecturer in Economics, formerly Senior Research Officer, National Institute of Economic & Social Research, London.
Mr W. A. Foley Lecturer in Linguistics, formerly Archivist, Stanford University Phonological Universal Project.
Dr R. A. Gollan Professor of History, formerly Professorial Fellow in History, RSSS.
Miss H. E. Gamble Lecturer in Law, formerly Senior Tutor.
Mr M. R. Gray Lecturer in Economics, formerly Postdoctoral Fellow GSIA, Carnegie Melbourne University.
Dr A. D. Hall Lecturing Fellow in Statistics, formerly part-time Tutor, Department of Economics, London School of Economics.
Dr D. C. Happold Lecturer in Zoology, formerly Reader in Zoology, University of Ibadan.
Dr T. J. Harper Senior Lecturer in Japanese, formerly Assistant Professor, Yale University.
Mr W. E. Holder Reader in Law, formerly Senior Lecturer.
Dr M. J. Howell Senior Lecturer in Zoology, formerly Lecturer.
Dr C. A. Jeffcott Lecturer in Asian Civilizations, formerly Lecturer in History, La Trobe University.
Mr G. C. Kratzmann Lecturing Fellow in English, formerly Doctoral Scholar, Edinburgh University.
Dr G. M. Lloyd Senior Lecturer in Philosophy, formerly Lecturer.
Dr R. J. Loy Senior Lecturer in Mathematics, formerly Lecturer.
Dr N. S. McDonald Senior Lecturer in Geography, formerly Lecturer.
Mr W. F. Mandle Reader in History, formerly Senior Lecturer.
Dr T. J. O'Neill Lecturer in Statistics, formerly PhD candidate, Stanford University.
Dr R. F. Pascal Lecturer in English, formerly Lecturer in English at Canterbury, NZ.
Mr B. Pollock Lecturer in Accounting & Public Finance, formerly Senior Tutor.
Dr K. C. Reed Queen Elizabeth II Fellow in Biochemistry, formerly Postdoctoral Fellow, Department of Biology, City of Hope Medical Centre, California.
Dr A. Rosenfeld Lecturer in Prehistory, formerly Senior Tutor in Department of Prehistory and Anthropology.
Dr W. D. Rubenstein Research Fellow in Sociology, formerly Research Associate, Department of History, University of Lancaster.
Dr P. Ryckmans Reader in Chinese, formerly Senior Lecturer.
Mr N. C. Seddon Lecturer in Law, formerly Lecturer, University of Papua New Guinea.
Mr E. R. Skrzypczak Lecturer in Japanese, formerly Research Assistant, Pontifical Institute of Medieval Studies.
Dr T. B. Smith Senior Lecturer in Political Science, formerly Lecturer, CCAE.
Dr S. Soehardi Reader in Indonesian, formerly Senior Lecturer.
Dr R. B. Stanton Fellow in Computer Science, Faculty of Economics, jointly with Computer Centre, formerly Senior Lecturer in Computer Science.
Dr P. R. Stewart Reader in Biochemistry, formerly Senior Lecturer.
Mr C. J. H. Thomson Senior Lecturer in Law, formerly Lecturer in Law.
Dr D. T. Wickramasinghe Lecturer in Applied Mathematics, formerly Research Fellow in Astronomy, University of Cambridge.
Dr A. Wierzbicka Senior Lecturer in Linguistics, formerly Lecturer.
Dr Y. W. Wong Lecturer in Chinese, formerly Senior Lecturer, University of Auckland.
Mr W. D. Woolf Senior Lecturer in Italian, formerly Lecturer.

University Academic Centres
Dr R. P. Brent Senior Fellow in Computer Centre, formerly Fellow.
Mr P. Duncan-Jones Senior Research Fellow in NHMRC Social Psychiatry Research Unit, formerly Senior Research Fellow in Sociology, RSSS.
Mrs M. Emery Lecturer in Centre for Continuing Education, formerly Research Assistant.
Professor G. K. W. Johnstone Professor and Deputy Director, Humanities Research Centre, formerly Professor of English, Royal Military College, Dunrobin.
Mr D. I. Smith Senior Fellow in Centre for Resource and Environmental Studies, formerly Reader in Geography, University of Bristol.
Dr R. B. Stanton Fellow, jointly in Computer Centre and Computer Science, Faculty of Economics, formerly Senior Lecturer in Computer Science, Department of Statistics, Faculty of Economics.
Dr R. O. Watts Senior Fellow in Computer Centre, formerly Fellow.
Senior staff resignations and retirements

Institute of Advanced Studies
Dr D. G. Beswick Fellow in Education Research Unit, to Director (Professor), Centre for the Study of Higher Education, University of Melbourne.
Professor L. Broom Professor in the Department of Sociology.
Dr W. P. Caton Senior Research Fellow in History of Ideas Unit, to Chair of Humanities, Griffith University.
Professor F. C. Courtice Director of John Curtin School of Medical Research and Howard Florey Professor of Medical Research.
Dr H. R. F. Gollnow Senior Fellow in Astronomy.
Dr D. H. Green Professorial Fellow in Research School of Earth Sciences, to Professor of Geology, University of Tasmania.
Dr C. L. Hollas Research Fellow in Nuclear Physics, to Postdoctoral Fellow Los Alamos National Laboratories, New Mexico.
Dr G. E. Kron Senior Research Fellow in Astronomy, to return to Arizona.
Professor J. A. La Nauze Professor and Head, Department of History.
Dr R. C. Liebermann Senior Research Fellow in Research School of Earth Sciences, to State University of New York.
Dr P. J. Nestel Professorial Fellow in Clinical Science, to Deputy Director of the Baker Medical Research Institute, and Head of Department of Cardiovascular Metabolism and Nutrition.
Professor D. C. Peaslee Personal Professor in Theoretical Physics, to Department of Physics, Brown University.
Dr W. J. Perram Senior Research Fellow in Applied Mathematics, to Chair of Applied Mathematics, University of Odense.
Dr K. M. Rangaswamy Senior Research Fellow in Mathematics, to Senior Reader, Department of Mathematics, Madurai University.
Professor O. H. K. Spate Professor in Department of Pacific History.
Mr J. G. Starke Senior Fellow in Law.

Dr J. Stone Senior Research Fellow in Physiology, to Senior Lecturer in the Department of Anatomy, University of New South Wales.
Dr F. C. Teiwes Senior Research Fellow in International Relations, to Lecturer, Department of Government, University of Sydney.
Dr J. R. S. Wallis Senior Research Fellow in Mathematics, to Lecturer in Applied Mathematics, University of Sydney.
Dr F. J. West Professorial Fellow in Pacific and Southeast Asian History, to Dean of Social Sciences and Professor of Deakin University.

School of General Studies
Dr R. P. Byron Reader in Econometrics, to World Bank.
Dr J. O' Donovan Lecturer in Law, to Senior Lecturer, University of Queensland.
Dr J. M. Haiman Lecturer in Linguistics, to Associate Professor, University of Manitoba.
Dr J. Y. Henderson Senior Lecturer in Accounting and Public Finance, to Principal Lecturer, Tasmanian College of Advanced Education.
Mr W. E. Holder Reader in Law, to Senior Legal Counsellor, International Monetary Fund.
Mr W. R. C. Jay Reader in Accounting, Department of Accounting and Public Finance.
Professor W. Milgate Professor of English, Faculty of Arts.
Dr M. G. Porter Senior Lecturer in Economics, to Chair of Economics, Monash.
Professor L. D. Pryor Professor of Botany, Faculty of Science.
Dr C. W. Tyndale-Biscoe Reader in Zoology, to Division of Wild Life Research, CSIRO.

Obituary
Dr E. P. Adams Senior Fellow in Immunology, died 10 December 1976
Professor G. K. W. Johnston Professor and Deputy Director of the Humanities Research Centre, died 21 December 1976.
University statistics

Full-time staff as at 30 April 1976

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<th>Designation</th>
<th>males</th>
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<td><em>Teaching and research staff (a)</em></td>
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<tr>
<td>professor</td>
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<tr>
<td>associate professor/reader</td>
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<td><strong>Total</strong></td>
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<td><strong>Research only staff (a)</strong></td>
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<td>senior research fellow/research fellow/post-doctorial fellow</td>
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<td>junior research staff</td>
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<td><strong>Total</strong></td>
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<td>staff supporting academic activities</td>
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<td><strong>Total</strong></td>
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<td>702</td>
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(a) Staff in the Computer Centre and the Centre for Continuing Education being shown under other services, are excluded here.

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<th>Designation</th>
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<th>females</th>
<th>total</th>
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<td>other</td>
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<tr>
<td><strong>Total</strong></td>
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<td>clerk/typist</td>
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<tr>
<td>other</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>Building planning and maintenance staff</strong></td>
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<td>other</td>
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<td><strong>Total</strong></td>
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<td>200</td>
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<td><strong>Other services</strong></td>
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<td>Independent operations</td>
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<tr>
<td><strong>Grand total—all staff</strong></td>
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<td>1418</td>
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### Research only staff

#### Academic activities

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<tr>
<th>Faculty/Unit</th>
<th>Professor</th>
<th>Research Fellow, Reader</th>
<th>Senior Fellow</th>
<th>Senior Research Fellow</th>
<th>Research Fellow, Postdoctoral Fellow</th>
<th>Research Assistant, Research officer</th>
<th>Visitor</th>
<th>Total</th>
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<td>Centre for Resource and Environmental Studies</td>
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### Teaching and research staff

#### Academic activities

<table>
<thead>
<tr>
<th>Faculty/Unit</th>
<th>Professor</th>
<th>Associate Professor, Reader</th>
<th>Senior Lecturer</th>
<th>Lecturer, Lecturing Fellow</th>
<th>Senior Tutor/ Demonstrator</th>
<th>Tutor/ Demonstrator</th>
<th>Visitor</th>
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138
### Assisted students

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<td>assistance</td>
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<td>51</td>
<td>146</td>
</tr>
<tr>
<td>State Government assistance</td>
<td>60</td>
<td>114</td>
<td>174</td>
</tr>
<tr>
<td>University assistance</td>
<td>42</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>other assistance</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Net total* assisted students at the University</td>
<td>728</td>
<td>325</td>
<td>1053</td>
</tr>
</tbody>
</table>

*Adjusted by 9 for students counted in more than one category of assistance.

### Degrees conferred

<table>
<thead>
<tr>
<th></th>
<th>males</th>
<th>females</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor of Letters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(honoris causa)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>82</td>
<td>11</td>
<td>93</td>
</tr>
<tr>
<td>Master</td>
<td>58</td>
<td>23</td>
<td>81</td>
</tr>
<tr>
<td>Bachelor</td>
<td>530</td>
<td>294</td>
<td>824</td>
</tr>
<tr>
<td>Total</td>
<td>670</td>
<td>329</td>
<td>999</td>
</tr>
</tbody>
</table>

### Enrolments 1976

<table>
<thead>
<tr>
<th></th>
<th>full-time</th>
<th>part-time</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute of Advanced Studies</td>
<td>325</td>
<td>3</td>
<td>328</td>
</tr>
<tr>
<td>The Faculties</td>
<td>156</td>
<td>29</td>
<td>185</td>
</tr>
<tr>
<td>University Centres</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>490</td>
<td>34</td>
<td>524</td>
</tr>
<tr>
<td>Master degree courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute of Advanced Studies</td>
<td>7</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>The Faculties</td>
<td>118</td>
<td>165</td>
<td>283</td>
</tr>
<tr>
<td>University Centres and other courses</td>
<td>30</td>
<td>—</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>172</td>
<td>327</td>
</tr>
<tr>
<td>Bachelor degree courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Faculties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arts</td>
<td>1230</td>
<td>756</td>
<td>1986</td>
</tr>
<tr>
<td>arts/law</td>
<td>258</td>
<td>20</td>
<td>278</td>
</tr>
<tr>
<td>Asian studies</td>
<td>189</td>
<td>85</td>
<td>274</td>
</tr>
<tr>
<td>Asian studies/law</td>
<td>14</td>
<td>—</td>
<td>14</td>
</tr>
<tr>
<td>economics</td>
<td>419</td>
<td>352</td>
<td>771</td>
</tr>
<tr>
<td>economics/Asian studies</td>
<td>29</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>economics/law</td>
<td>125</td>
<td>11</td>
<td>136</td>
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<tr>
<td>law</td>
<td>76</td>
<td>102</td>
<td>178</td>
</tr>
<tr>
<td>science</td>
<td>683</td>
<td>141</td>
<td>824</td>
</tr>
<tr>
<td>science (forestry)</td>
<td>272</td>
<td>5</td>
<td>277</td>
</tr>
<tr>
<td>Total</td>
<td>3295</td>
<td>1473</td>
<td>4768</td>
</tr>
<tr>
<td>Non-degree courses</td>
<td>23</td>
<td>267</td>
<td>290</td>
</tr>
<tr>
<td>Total undergraduates</td>
<td>3318</td>
<td>1740</td>
<td>5058</td>
</tr>
<tr>
<td>Other courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>legal workshop</td>
<td>26</td>
<td>—</td>
<td>26</td>
</tr>
<tr>
<td>master's preliminary/ qualifying</td>
<td>53</td>
<td>138</td>
<td>191</td>
</tr>
<tr>
<td>courses of research not leading to a degree</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>139</td>
<td>225</td>
</tr>
</tbody>
</table>

Net enrolments—total enrolments | 4043 | 2059 | 6102

*Adjusted by 32 for students counted in more than one course.
Principal benefactions

Special purpose grants and bequests to the University during the year ended 31 December 1976

ACT Asthma Association, $884 for medical research equipment Department of Clinical Science; Ampol Petroleum Ltd, $1,500 for scholarship Department of Geology.
Anonymous $905 for general purposes; $10,000 for research Department of Population Biology.
Australian Cancer Society, $14,710 for fellowship Department of Biochemistry, SGS.
Australian Commission on Advanced Education, $3,000 for research Education Research Unit.
Australian Development Assistance Agency, $1,000 for grant-in-aid for postgraduate research students Research School of Social Sciences; $11,500 for grant-in-aid for postgraduate research students School of General Studies; $3,500 for grant-in-aid for postgraduate research students Research School of Physical Sciences; $72,862 for Masters Degree Course in Agricultural Development Economics; $5,673 for assistance of overseas projects Department of Forestry; $8,896 for the Nepal Forestry Project Department of Forestry; $6,678 for Laos-Australian Reafforestation Project Department of Forestry; $20,750 for support of Masters Degree Program Department of Demography; $1,987 for purchase of research equipment Department of Forestry; $6,000 for support for Conference on the Economic and Social Support for High Fertility Department of Demography.
Australian Freedom from Hunger Campaign, $6,583 for scholarships Masters Degree Course in Agricultural Development Economics.
Australian Institute of Aboriginal Studies, $2,144 for research Department of Prehistory and Anthropology; $824 for scholarship Department of Chemistry.
Australian Institute of Nuclear Science and Engineering, $6,200 for research Department of Engineering Physics; $14,693 for research Department of Nuclear Physics.
Australian Meat Research Committee, $830 for grant-in-aid Department of Economics, RSSS.
Australian and New Zealand Banking Group Ltd, $250 for research Department of Economics, RSSS.
Australian Research Grants Committee, $2,510 for research general purposes; $6,693 for research Department of English; $7,387 for research Department of History; $150 for research Department of Germanic Languages; $2,683 for research Department of Linguistics, SGS; $17,318 for research Department of Economics, SGS; $84,961 for research Department of Chemistry; $31,324 for research Department of Forestry; $41,526 for research Department of Biochemistry, SGS; $2,430 for research Department of Pure Mathematics; $25,094 for research Department of Prehistory and Anthropology; $10,759 for research Department of Statistics, SGS; $34,073 for research Department of Physics; $1,498 for research Department of Psychology; $15,320 for research Department of Zoology; $15,095 for research Department of Political Science, SGS; $15,203 for research Department of Asian Civilizations; $1,048 for research Department of South Asian and Buddhist Studies.
Australian Tobacco Research Foundation, $6,507 for research Department of Biochemistry, SGS; $10,481 for research Department of Population Biology.
Australian Vice-Chancellors' Committee, $38,000 for fellowships Department of Demography; $5,200 for research Department of Forestry.
Bank of New South Wales, $1,000 for research Department of Economics, RSSS.
BHP Company Limited, $1,000 for research Department of Economics, RSSS.
Bougainville Copper Limited, $30,000 for support for Council for Pacific Development Studies Research School of Pacific Studies.
Canada Council, $7,666 for research Department of Sociology, SGS.
Capital Territory Health Commission, $2,000 for grant-in-aid for Postgraduate Committee in Medicine.
Criminology Research Council, $4,000 for research Department of Economics, RSSS.
CSIRO, $187 for grant-in-aid for students Research School of Social Sciences; $279 for grant-in-aid for students Research School of Physical Sciences; $1,139 for grant-in-aid for students School of General Studies; $18,000 for research Department of Zoology; $9,633 for scholarship Research School of Biological Sciences; $450 for grant-in-aid for students The John Curtin School of Medical Research.
CSR Limited, $1,000 for research Department of Economics, RSSS.
Dr A. Cymons, $500 for travel support Department of Physics.
Danish Embassy in Thailand, $8,980 for scholarship School of General Studies.
Darwin Community College, $4,000 for research Education Research Unit.
Department of Aboriginal Affairs, $28,921 for fellowship Department of Anthropology; $5,000 for research Department of Demography; $1,000 for research North Australia Research Unit; $30,564 for Community Development Research Projects, Centre for Continuing Education.
Department of Defence, $25,483 for fellowships Strategic and Defence Studies Centre.
Department of Education, $7,411 for research Department of Sociology, RSSS; $16,930 for research Education Research Unit; $8,772 for research Department of Psychology; $8,297 for feasibility study of Undergraduate Medical School; $145,462 for English/Malay Dictionary Faculty of Asian Studies; $38,886 for Japanese teaching materials project, Department of Economics, SGS; $2,750 for grant-in-aid for postgraduate research students School of General Studies; $2,000 for grant-in-aid for postgraduate research students Research School of Biological Sciences; $500 for grant-in-aid for postgraduate research students Research School of Pacific Studies; $750 for grant-in-aid for postgraduate research students Research School of Physical Sciences. Department of Foreign Affairs, $7,688 for assistance in the Development of Australian Studies University of Venice Research School of Social Sciences; $25,000 for research on Japan, Australian and Western Pacific economic integration Research School of Social Sciences.
Department of Health, $15,930 for research Department of Pharmacology; $26,958 for research Department of Biochemistry, SGS; $7,690 for research Department of Microbiology; $6,037 for research Department of Sociology, SGS; $3,670 for research Department of Developmental Biology; $83,363 for NHMRC Social Psychiatry Research Unit.
Department of Immigration and Ethnic Affairs, $92,811 for research Department of Demography. Department of National Resources, $14,100 for research Department of Biochemistry, SGS.
Department of Primary Industry, $12,282 for research Department of Population Biology; $1,262 for research Department of Physical Biochemistry; $4,300 for scholarship Department of Zoology; $10,037 for research Department of Biochemistry, SGS; $2,200 for research Department of Environmental Biology; $370 for research Department of Statistics, SGS.
Department of the Prime Minister and Cabinet, $120,600 for Centre for Research on Federal Financial Relations; $50,000 to support intensive Japanese language course Department of Japanese; $8,294 to support work for Grants Commission Department of Accounting and Public Finance; $2,500 for research Australia/Japan Project.
Department of Science, $36,045 for fellowships The John Curtin School of Medical Research; $49,002 for fellowships Research School of Physical Sciences; $10,565 for fellowships Department of Biochemistry, SGS; $39,063 for fellowships Research School of Chemistry; $21,304 for fellowships Research School of Biological Sciences; $8,514 for fellowships Department of Biogeochemistry and Geomorphology; $70,787 for National NMR Centre.
Department of Social Security, $6,000 for research, Department of Economics, SGS.
Department of Transport, $9,495 for research Department of Chemistry.
Department of Urban and Regional Development, $3,000 for research Department of Prehistory.
FM Forests Pty Ltd, $250 for general purposes Department of Botany.
Ford Foundation, $32,031 for research Research School of Pacific Studies; $32,262 for research Department of Demography.
Hammersly Holdings Ltd, $1,000 for research Department of Economics, RSSS.
Hospitals and Health Services Commission, $2,000 for research Department of Administrative Studies; $15,230 for research Department of Demography.
Life Insurance Medical Research Fund of Australia and New Zealand, $9,280 for research Department of Clinical Science; $7,294 for research Department of Biochemistry, SGS.
Lions NSW-ACT Save Sight Foundation, $2,000 for travel Department of Physiology.
Medical Research Council, Canada, $1,683 for research Department of Biochemistry, IAS.
Merk, Sharp & Dohme (Australia) Pty Limited, $1,978 for research Department of Zoology.
National Geographic Society USA, $6,206 for research Department of Biogeochemistry and Geomorphology.
National Heart Foundation of Australia, $6,293 for fellowship Department of Biochemistry and Geomorphology.
National Heart Foundation of Australia, $6,293 for research Department of Clinical Science.
Nigeria High Commission London, $3,990 to support study of the Chimbu District Development Studies Centre.
Papua New Guinea Central Planning Office, $3,990 to support study of the Chimbu District Development Studies Centre.
Reserve Bank of Australia, $6,000 for research Urban Research Unit; $8,257 for research Education Research Unit; $12,736 for research Department of Economics, SGS; $6,100 for research Department of Forestry.
Rothman's University Endowment Fund, $11,527 for fellowships Department of Genetics; $12,960 for fellowships Department of Pure Mathematics.
Sir John Crawford, $750 for general purposes Development Studies Centre.
St Jude's Children's Research Hospital, $5,733 for research Department of Microbiology.
Telecom Australia, $5,000 for research Department of Applied Mathematics, IAS.
The Jane Coffin Childs Memorial Fund for Medical
Research, USA, $798 for research expenses Department of Microbiology.
The Leverhulme Trust Fund, $3,110 for fellowships School of General Studies.
The Myer Foundation, $3,000 to assist the development of the Asian Studies Association of Australia.
The National Foundation March of Dimes USA, $8,017 for research Department of Genetics.
The Population Council USA, $14,081 for research Department of Demography.
UNESCO, $7,920 for support of ecology work in Hong Kong Department of Human Biology.
United States of America — Department of Health Education and Welfare, $12,196 for research Department of Population Biology; $2,417 for institution allowance Department of Microbiology.
United States Air Force, $32,326 for research Research School of Earth Sciences.
University of Southampton, $2,000 for research Department of Physics.
Utah Foundation, $10,000 for support for the World Congress on Philosophy of Law and Social Philosophy.
Western Mining Corporation Limited, $2,900 for research Department of Geology.
World Health Organization, $11,981 for research Department of Microbiology; $1,255 for research Department of Population Biology.
Auditor-General's Report

The Vice-Chancellor,
Australian National University,
Canberra, ACT 2600

Dear Sir,

Financial Statements
Year ended 31 December 1976

In compliance with a request by the Treasurer in terms of section 33(1) of the Australian National University Act 1946, the accounts of the University have been audited for the year ended 31 December 1976.

The Statements listed hereunder and the Explanatory Notes accompanying and forming part of the Financial Statements have been examined and are in agreement with the accounts and financial records of the University —

- Statement of Net Assets as at 31 December 1976.
- Statement of Receipts and Payments (excluding Ancillary Trading Activities) for year ended 31 December 1976.
- Ancillary Trading Activities — Consolidated Operating Statement for Postgraduate Residences and Other Trading Activities (excluding Undergraduate Residences and Housing Operations) for the year ended 31 December 1976.
- Ancillary Trading Activities — Operating Statement for University Housing Operation for the year ended 31 December 1976.

Yours faithfully,

(D. R. Steele Craik)
Auditor-General

19 August 1977
The accounts of The Australian National University for the year ended 31 December 1976 are presented in the following statements:

1. Statement of Net Assets at 31 December 1976
2. Statement of Receipts and Payments (excluding Ancillary Trading Activities) for year ended 31 December 1976
3.1 Statement of Changes in Assets and Liabilities (excluding Ancillary Trading Activities) for year ended 31 December 1976
3.2 Analysis of Changes in Non-Current Assets (excluding Ancillary Trading Activities) for year ended 31 December 1976
4.1 Statement of Changes in Assets and Liabilities (Ancillary Trading Activities) for year ended 31 December 1976
4.2 Analysis of Changes in Non-Current Assets (Ancillary Trading Activities) for year ended 31 December 1976
5.1 Ancillary Trading Activities — Consolidated Operating Statement for Undergraduate Residences for year ended 31 December 1976
5.2 Ancillary Trading Activities — Consolidated Operating Statement for Postgraduate Residences and Other Trading Activities (excluding Undergraduate Residences and Housing Operations) for year ended 31 December 1976
5.3 Ancillary Trading Activities — Operating Statement for University Housing Operation for year ended 31 December 1976
5.4 Ancillary Trading Activities — Operating Statement for Siding Spring Housing Operation for year ended 31 December 1976

Explanatory Notes (accompanying and forming part of the Financial Statements)

All amounts are rounded to the nearest $1,000.

D. A. Low
Vice-Chancellor

N. G. MacDonald
Accountant
Explanatory Notes Accompanying and Forming Part of the Financial Statements for the Year Ended 31 December 1976

Note 1 — Investments
University investments (consisting of public securities, debentures, mortgages, real estate and shares in listed companies) are reported at acquisition cost. At 31 December 1976, the acquisition cost of shares in listed companies exceeded their market value by $9,003. In the opinion of the University's officers, the market value at 31 December 1976 (or value at redemption, where applicable) of all other investments exceeded their acquisition cost.

Note 2 — Non-Current Assets
With the exception of (a) donated assets and (b) leasehold land and dwellings, the University's non-current assets are generally reported at acquisition cost. Donated assets are reported at University officers' valuation. Leasehold land and dwellings are reported at their replacement value of $13,644,702, being equivalent to their current replacement cost of $18,605,983 less accumulated depreciation (based on the expected life of the assets concerned) totalling $4,961,281.

Note 3 — Trust and Agency Funds
The trust and agency funds include the 1966 Supplementary Benefits Fund. At 30 June 1974, the past service benefits of members of that fund exceeded the value of the assets held on behalf of the fund by an actuarially estimated amount of $13,640,000. The rates of contribution to the fund have been based on official advice.

Note 4 — Contingent Liabilities
Guarantees have been given (i) under the University's Staff Members' House Purchase Scheme to secure bank loans totalling $779,987 to University employees and (ii) to secure an overdraft facility of $250,000 negotiated by the University Union for building purposes.

Note 5 — Reserve for Employer's Superannuation Liability
Unless the University is otherwise notified, the University contributes to its Commonwealth Superannuation and Provident Account Reserve at officially recommended rates. Consistent with this practice and following the adoption of an official recommendation received during the year concerning rates of contribution, contributions to the reserve in 1976 exceeded, by $648,000, the amount which the University was able to set aside for such contributions from the Government's grant for running expenses.

Note 6 — Balances and Receipts
The balances brought forward include $4,800,000 received in December 1975 in respect of 1976 recurrent expenditure. Australian Government grants received in 1976 include $4,700,000 received in respect of 1977 recurrent expenditure.

Note 7 — Overspent Balances
Recurrent funds were overspent in 1976 by (i) $648,000 in respect of contributions to the Commonwealth Superannuation and Provident Account Reserve (see note 5) and (ii) $1,016,785 in respect of cost increases occurring in 1976 for which supplementation was received after 31 December 1976.

Note 8 — Profits/Losses from Sale of Dwellings
Profits or losses from the sale of dwellings are excluded from the operating statement of the University Housing Operation.

Note 9 — Leasehold Land and Dwellings
The value of leasehold land and dwellings excludes land let to the University in the Australian Capital Territory and the Northern Territory, whether in perpetuity or otherwise, and used primarily for the University's academic activities.
I Statement of Net Assets as at 31 December 1976

<table>
<thead>
<tr>
<th>Current</th>
<th>Non-Current</th>
<th>Reserve for Employer's Liability for Superannuation</th>
<th>Restricted Purpose Recurrent Funds</th>
<th>Total University General Funds</th>
<th>Ancillary Trading Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash on deposit</td>
<td>1,733</td>
<td></td>
<td>721</td>
<td>2,133</td>
<td>4,587</td>
</tr>
<tr>
<td>Cash on hand</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade debtors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other debtors and prepayments</td>
<td>503</td>
<td></td>
<td>120</td>
<td></td>
<td>623</td>
</tr>
<tr>
<td>Materials in stores and service pools (at cost)</td>
<td>584</td>
<td></td>
<td></td>
<td></td>
<td>584</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td><strong>2,857</strong></td>
<td><strong>721</strong></td>
<td><strong>2,253</strong></td>
<td><strong>5,831</strong></td>
<td><strong>1,554</strong></td>
</tr>
<tr>
<td>Investments (note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Non-Current Assets</strong></td>
<td><strong>2,610</strong></td>
<td><strong>17,846</strong></td>
<td><strong>44</strong></td>
<td><strong>20,500</strong></td>
<td><strong>21</strong></td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td><strong>2,857</strong></td>
<td><strong>15,379</strong></td>
<td><strong>18,567</strong></td>
<td><strong>2,297</strong></td>
<td><strong>138,913</strong></td>
</tr>
<tr>
<td>Less: Liabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade creditors and accruals</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other creditors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans from superannuation reserve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td><strong>187</strong></td>
<td><strong>570</strong></td>
<td><strong>187</strong></td>
<td><strong>570</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Net Assets</strong></td>
<td><strong>2,670</strong></td>
<td><strong>115,379</strong></td>
<td><strong>18,567</strong></td>
<td><strong>2,297</strong></td>
<td><strong>138,913</strong></td>
</tr>
</tbody>
</table>

$000

Trust and Agency Funds (Note 3) 7,419

To be read in conjunction with the accompanying notes
## Statement of Receipts and Payments (excluding Ancilliary Trading Activities)

for the year ended 31 December 1976

<table>
<thead>
<tr>
<th></th>
<th>Recurrent Funds</th>
<th>Capital Works and Services</th>
<th>Reserve for Employer’s Liability for Superannuation</th>
<th>Restricted Purpose Recurrent Funds</th>
<th>Total University General Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Balances Brought Forward</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved (note 6)</td>
<td>6,432</td>
<td>105</td>
<td>19</td>
<td>1,451</td>
<td>8,007</td>
</tr>
<tr>
<td>Uncommitted</td>
<td>242</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Balances Brought Forward</strong></td>
<td><strong>6,674</strong></td>
<td><strong>105</strong></td>
<td><strong>19</strong></td>
<td><strong>1,451</strong></td>
<td><strong>8,249</strong></td>
</tr>
</tbody>
</table>

### Receipts

**Australian Government Grants:**

Standing appropriation (vide section 30(1) of The Australian National University Act 1946)

For running expenses (vide Appropriation Act (Nos 1 & 2) 1975–76 Division 279.1 and Appropriation Act (No. 1) 1976–77 Division 279.1) (note 6)

Research grants (vide Appropriation Act (No. 1) 1975–76 Division 540.3.03 and Appropriation Act (No. 1) 1976–77 Division 540.3.03)

Approved capital program (vide Appropriation Act (No. 2) 1975–76 Division 835.1.01 and Appropriation Act (No. 2) 1976–77 Division 835.1.01)

|                                |                |                           |                                                   |                                  |                               |
|--------------------------------|----------------|---------------------------|---------------------------------------------------|                                  |                               |
| Tuition and examination fees   | 32             |                           |                                                   |                                  |                               |
| Subsidies and donations        | 530            | 143                       | 4,094                                             | 2,967                            | 7,061                         |
| Other receipts                 |                |                           |                                                   |                                  |                               |
| **Total Receipts**             | **65,602**     | **1,228**                 | **4,094**                                         | **3,282**                        | **74,206**                    |

|                                |                |                           |                                                   |                                  |                               |
| **Total Balances and Receipts** | **72,276**     | **1,333**                 | **4,113**                                         | **4,733**                        | **82,455**                    |

### Payments

|                                |                |                           |                                                   |                                  |                               |
|--------------------------------|----------------|---------------------------|---------------------------------------------------|                                  |                               |
| Salaries                       | 42,833         |                           |                                                   |                                  |                               |
| Payroll tax, workmen’s compensation and superannuation provision | 7,839 |                           |                                                   |                                  |                               |
| Materials and supplies         | 3,020          |                           |                                                   |                                  |                               |
| Field and research expenses    | 454            |                           |                                                   |                                  |                               |
| Scholarships and fellowships   | 2,108          |                           |                                                   |                                  |                               |
| General expenses               | 6,515          | 138                       |                                                   |                                  |                               |
| Equipment                      | 3,906          | 106                       |                                                   |                                  |                               |
| Library books                  | 998            |                           |                                                   |                                  |                               |
| Buildings and site services    | 240            | 992                       |                                                   |                                  |                               |
| Payments from Australian Government research grants |                     |                           |                                                   |                                  |                               |
| Fund disbursements             | 585            |                           | 2,645                                             | 3,230                            |                               |
| Net investments                | 2,807          | (327)                     |                                                   |                                  |                               |
| Other payments                 | 117            |                           |                                                   |                                  |                               |
| **Total Payments**             | **68,030**     | **1,236**                 | **3,392**                                         | **2,600**                        | **75,258**                    |

|                                |                |                           |                                                   |                                  |                               |
| **Balances Carried Forward**   |                |                           |                                                   |                                  |                               |
| Reserved (note 6)              | 5,669          | 97                        | 721                                               | 2,133                            | 8,620                         |
| Overspent (note 7)             | (1,423)        |                           |                                                   |                                  | (1,423)                       |
| **Total Balances Carried Forward** | **4,246**      | **97**                    | **721**                                           | **2,133**                        | **7,197**                     |

To be read in conjunction with the accompanying notes
### Statement of Changes in Assets and Liabilities (excluding Ancillary Trading Activities) for the year ended 31 December 1976

<table>
<thead>
<tr>
<th></th>
<th>Balances as at 1 January 1976 (1)</th>
<th>Net Increases (2)</th>
<th>Net Decreases (3)</th>
<th>Balances as at 31 December 1976 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td><strong>Current Assets and Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash holdings (including restricted funds)</td>
<td>8,249</td>
<td>3,662</td>
<td>4,587</td>
<td>37</td>
</tr>
<tr>
<td>Cash on hand</td>
<td>37</td>
<td></td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Debtors and prepayments</td>
<td>492</td>
<td>131</td>
<td></td>
<td>623</td>
</tr>
<tr>
<td>Materials in stores and service pools</td>
<td>519</td>
<td>65</td>
<td></td>
<td>584</td>
</tr>
<tr>
<td>Liabilities (sundry creditors, etc.)</td>
<td>(629)</td>
<td></td>
<td>128</td>
<td>(757)</td>
</tr>
<tr>
<td></td>
<td>8,631</td>
<td>233</td>
<td>3,790</td>
<td>5,074</td>
</tr>
<tr>
<td><strong>Non-Current Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building and site services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-residential</td>
<td>54,389</td>
<td>1,756</td>
<td></td>
<td>56,145</td>
</tr>
<tr>
<td>Halls of residence</td>
<td>7,549</td>
<td>32</td>
<td></td>
<td>7,581</td>
</tr>
<tr>
<td>Land and dwellings</td>
<td>444</td>
<td></td>
<td>184</td>
<td>260</td>
</tr>
<tr>
<td>Equipment and furniture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-residential</td>
<td>37,947</td>
<td>4,099</td>
<td></td>
<td>42,046</td>
</tr>
<tr>
<td>Furniture in dwellings</td>
<td>2</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Library books</td>
<td>6,436</td>
<td>869</td>
<td></td>
<td>7,305</td>
</tr>
<tr>
<td></td>
<td>106,767</td>
<td>6,756</td>
<td>184</td>
<td>113,339</td>
</tr>
<tr>
<td>Investments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>130,808</td>
<td>12,079</td>
<td>3,974</td>
<td>138,913</td>
</tr>
</tbody>
</table>

To be read in conjunction with the accompanying notes.
### 4.1 Statement of Changes in Assets and Liabilities (Ancillary Trading Activities) for the year ended 31 December 1976

<table>
<thead>
<tr>
<th></th>
<th>Balances as at 1 January 1976 (1)</th>
<th>Net Increases (2)</th>
<th>Net Decreases (3)</th>
<th>Balances as at 31 December 1976 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td><strong>Current Assets and Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,052</td>
<td>178</td>
<td></td>
<td>1,230</td>
</tr>
<tr>
<td><strong>Non-Current Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Building and site services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land and dwellings</td>
<td>12,086</td>
<td>201</td>
<td></td>
<td>13,645</td>
</tr>
<tr>
<td>Leasehold land and dwellings</td>
<td></td>
<td>1,559</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and furniture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halls of residence</td>
<td>1,260</td>
<td></td>
<td>109</td>
<td>1,151</td>
</tr>
<tr>
<td>Furniture in dwellings</td>
<td>622</td>
<td>67</td>
<td></td>
<td>689</td>
</tr>
<tr>
<td></td>
<td>15,020</td>
<td>2,005</td>
<td>109</td>
<td>16,916</td>
</tr>
<tr>
<td><strong>Investments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21</td>
<td></td>
<td></td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15,041</strong></td>
<td><strong>2,005</strong></td>
<td><strong>109</strong></td>
<td><strong>16,937</strong></td>
</tr>
</tbody>
</table>

To be read in conjunction with the accompanying notes.
3.2 Analysis of Changes in Non-Current Assets (excluding Ancillary Trading Activities) for the year ended 31 December 1976

<table>
<thead>
<tr>
<th>Increases and acquisitions</th>
<th>From Recurrent Funds (1)</th>
<th>From Capital Works and Services Funds (2)</th>
<th>From Other Sources (3)</th>
<th>Total Acquisitions (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buildings and site services</strong></td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>Non-residential</td>
<td>208</td>
<td>992</td>
<td>622</td>
<td>1,822</td>
</tr>
<tr>
<td>Halls of residence</td>
<td>32</td>
<td></td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td><strong>Equipment and furniture</strong></td>
<td>3,906</td>
<td>106</td>
<td>384</td>
<td>4,396</td>
</tr>
<tr>
<td>Non-residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Furniture in dwellings</td>
<td>998</td>
<td></td>
<td></td>
<td>998</td>
</tr>
<tr>
<td><strong>Library books</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5,144</td>
<td>1,098</td>
<td>1,020</td>
<td>7,262</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Acquisitions (from above) (4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
</tbody>
</table>

**Buildings and site services**
- Non-residential: 1,822 (26) 40 1,756
- Halls of residence: 32
- Land and dwellings: 14 (198) (184)

**Equipment and furniture**
- Non-residential: 4,396 42 339 4,099
- Furniture in dwellings

**Library books**
- 998 42 129 869

| Total | (182) | 508 | 6,572 |

To be read in conjunction with the accompanying notes.
4.2 Analysis of Changes in Non-Current Assets (Ancillary Trading Activities) for the year ended 31 December 1976

<table>
<thead>
<tr>
<th></th>
<th>From Recurrent Funds (1)</th>
<th>From Capital Works and Services Funds (2)</th>
<th>From Other Sources (3)</th>
<th>Total Acquisitions (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td><strong>Buildings and site services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land and dwellings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leasehold land and dwellings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and furniture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halls of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Furniture in dwellings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Decreases</th>
<th>Asset Revaluations</th>
<th>Asset Transfers</th>
<th>Decreases and Disposals</th>
<th>Net Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Acquisitions (from above) (4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td><strong>Buildings and site services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land and dwellings</td>
<td>3</td>
<td>198</td>
<td>201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leasehold land and dwellings</td>
<td>428</td>
<td>1,414</td>
<td>267</td>
<td>1,559</td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and Furniture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halls of residence</td>
<td>88</td>
<td>197</td>
<td>(109)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Furniture in dwellings</td>
<td>81</td>
<td>14</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>600</td>
<td>1,414</td>
<td>182</td>
<td>478</td>
<td>1,718</td>
</tr>
</tbody>
</table>

To be read in conjunction with the accompanying notes
## Ancillary Trading Activities

### Consolidated Operating Statement for Undergraduate Residences for the year ended 31 December 1976

<table>
<thead>
<tr>
<th>Income</th>
<th>Bruce Hall</th>
<th>Burton* Hall</th>
<th>Garran* Hall</th>
<th>Toad Hall</th>
<th>Bruce Hall Annex</th>
<th>Corin Dam Huts</th>
<th>Lennox House 'A' Block</th>
<th>Narellan House</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>Tariffs received</td>
<td>463</td>
<td>367</td>
<td>367</td>
<td>151</td>
<td>12</td>
<td>21</td>
<td>10</td>
<td>18</td>
<td>1,409</td>
</tr>
<tr>
<td>Membership and registration fees</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual meals and catering</td>
<td>89</td>
<td>21</td>
<td>21</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canteen and beverage sales — gross profit</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>1</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution from University Subsidy based on Universities Financial Assistance Act 1966, Section 8</td>
<td>35</td>
<td>38</td>
<td>38</td>
<td>111</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundry income</td>
<td>6</td>
<td>13</td>
<td>13</td>
<td>1</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Expenditure

#### Operating Expenses

<table>
<thead>
<tr>
<th>Bruce Hall</th>
<th>Burton* Hall</th>
<th>Garran* Hall</th>
<th>Toad Hall</th>
<th>Bruce Hall Annex</th>
<th>Corin Dam Huts</th>
<th>Lennox House 'A' Block</th>
<th>Narellan House</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>Foodstuffs</td>
<td>119</td>
<td>88</td>
<td>88</td>
<td>295</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel, light, power and heating</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>23</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Cleaning, laundry and sundry materials</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>Domestic staff wages</td>
<td>275</td>
<td>158</td>
<td>158</td>
<td>37</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Other operating expenses</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>1</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Operating Expenditure | 449 | 291 | 291 | 64 | 7 | 10 | 5 | 9 | 1,126 |

#### Administrative Expenses

<table>
<thead>
<tr>
<th>Bruce Hall</th>
<th>Burton* Hall</th>
<th>Garran* Hall</th>
<th>Toad Hall</th>
<th>Bruce Hall Annex</th>
<th>Corin Dam Huts</th>
<th>Lennox House 'A' Block</th>
<th>Narellan House</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>Administrative salaries</td>
<td>57</td>
<td>48</td>
<td>48</td>
<td>18</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Payroll tax, workmen's compensation insurance and superannuation provision</td>
<td>36</td>
<td>32</td>
<td>32</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>109</td>
</tr>
<tr>
<td>Other administrative expenses</td>
<td>21</td>
<td>23</td>
<td>23</td>
<td>25</td>
<td>5</td>
<td>17</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Administrative Expenses | 114 | 103 | 103 | 50 | 9 | 21 | 6 | 4 | 410 |

#### Property Maintenance and Service Expenses

<table>
<thead>
<tr>
<th>Bruce Hall</th>
<th>Burton* Hall</th>
<th>Garran* Hall</th>
<th>Toad Hall</th>
<th>Bruce Hall Annex</th>
<th>Corin Dam Huts</th>
<th>Lennox House 'A' Block</th>
<th>Narellan House</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>Total Operating Expenditure</td>
<td>611</td>
<td>435</td>
<td>435</td>
<td>144</td>
<td>19</td>
<td>34</td>
<td>11</td>
<td>16</td>
</tr>
</tbody>
</table>

#### Net Operating Profit/(Loss) transferred to Accumulated Profits/(Losses)

<table>
<thead>
<tr>
<th>Bruce Hall</th>
<th>Burton* Hall</th>
<th>Garran* Hall</th>
<th>Toad Hall</th>
<th>Bruce Hall Annex</th>
<th>Corin Dam Huts</th>
<th>Lennox House 'A' Block</th>
<th>Narellan House</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
<tr>
<td>(8)</td>
<td>18</td>
<td>18</td>
<td>11</td>
<td>4</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Operated jointly

To be read in conjunction with the accompanying notes.
5.2 Ancillary Trading Activities
Consolidated Operating Statement for Postgraduate Residences and Other Trading Activities (excluding Undergraduate Residences and Housing Operations) for the year ended 31 December 1976

<table>
<thead>
<tr>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
</tbody>
</table>

**Income**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariffs received</td>
<td>313</td>
<td>104</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>480</td>
</tr>
<tr>
<td>Membership and registration fees</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>236</td>
</tr>
<tr>
<td>Admissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Food and beverage sales—gross profit</td>
<td>295</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>423</td>
</tr>
<tr>
<td>Book sales—gross profit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>77</td>
</tr>
<tr>
<td>Contribution from University</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>122</td>
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<tr>
<td>Sundry income</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td></td>
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<td></td>
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</tbody>
</table>

**Expenditure**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foodstuffs</td>
<td>29</td>
<td>18</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57</td>
</tr>
<tr>
<td>Fuel, light, power and heating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning, laundry and sundry materials</td>
<td>19</td>
<td>9</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>Domestic staff wages</td>
<td>331</td>
<td>27</td>
<td>17</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
<td>452</td>
</tr>
<tr>
<td>Other operating expenses</td>
<td>30</td>
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<td>9</td>
<td>22</td>
<td>4</td>
<td></td>
<td></td>
<td>67</td>
</tr>
</tbody>
</table>

**Administrative Expenses**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative salaries</td>
<td>153</td>
<td>10</td>
<td>13</td>
<td>28</td>
<td>131</td>
<td>51</td>
<td></td>
<td>386</td>
</tr>
<tr>
<td>Payroll tax, workmen's provision and superannuation provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other administrative expenses</td>
<td>50</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>39</td>
<td>7</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>34</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>50</td>
<td>99</td>
<td>247</td>
</tr>
</tbody>
</table>

**Property Maintenance and Service Expenses**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>72</td>
<td>31</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>220</td>
<td>157</td>
<td>747</td>
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</table>

**Total Expenditure**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>733</td>
<td>104</td>
<td>71</td>
<td>31</td>
<td>158</td>
<td>229</td>
<td>157</td>
<td>1,483</td>
</tr>
</tbody>
</table>

**Net Operating Profit/(Loss)**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(48)</td>
<td>(7)</td>
<td>(5)</td>
<td>1</td>
<td>(62)</td>
<td>8</td>
<td></td>
<td>(113)</td>
</tr>
</tbody>
</table>

**Less: Abnormal Items**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book stock write-down</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for long service leave</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Net Profit/(Loss) transferred to Accumulated Profits/(Losses)**

<table>
<thead>
<tr>
<th>Description</th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
<th>Centre for Continuing Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(48)</td>
<td>(7)</td>
<td>(5)</td>
<td>1</td>
<td>(150)</td>
<td>8</td>
<td></td>
<td>(201)</td>
</tr>
</tbody>
</table>

1Centre for Continuing Education operating statement refers to conference, seminar and workshop activities. To be read in conjunction with the accompanying notes.
### 5.3 Ancillary Trading Activities

*Operating Statement for University Housing Operation (note 8) for the year ended 31 December 1976*

<table>
<thead>
<tr>
<th>Income</th>
<th>$000</th>
<th>$000</th>
<th>$0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rentals—Dwellings</td>
<td></td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>Rentals—Furnishings</td>
<td></td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>Rental Subsidies</td>
<td></td>
<td>80</td>
<td>890</td>
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</table>

#### Less: Expenditure

*Operating Costs*

<table>
<thead>
<tr>
<th>Expenses</th>
<th>$000</th>
<th>$000</th>
<th>$0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rents—Department of the Capital Territory</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Rates—General</td>
<td></td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>—Water</td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>—Sewerage</td>
<td></td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Gardening</td>
<td></td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Electricity, oil and gas</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cleaning</td>
<td></td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Laundry and dry cleaning</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Storage and freight</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Provision for maintenance of dwellings</td>
<td></td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Provision for maintenance of furnishings</td>
<td></td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Alterations to furnishings</td>
<td></td>
<td>3</td>
<td>352</td>
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</table>

*Administrative Costs*

<table>
<thead>
<tr>
<th>Expenses</th>
<th>$000</th>
<th>$000</th>
<th>$0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative salaries</td>
<td></td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>Payroll tax, workmen’s compensation insurance and superannuation</td>
<td></td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Printing, stationery and telephones</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Accounting service fee</td>
<td></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Provision for long service leave</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Valuation fee</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Other administrative expenses</td>
<td></td>
<td>3</td>
<td>182</td>
</tr>
</tbody>
</table>

*Loan Repayment and Provisions*

<table>
<thead>
<tr>
<th>Expenses</th>
<th>$000</th>
<th>$000</th>
<th>$0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment of property loan interest</td>
<td></td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Provision for insurance—dwellings</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Furnishings</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Provision for replacement of—furnishings</td>
<td></td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Motor vehicles and office equipment</td>
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<td>2</td>
<td></td>
</tr>
<tr>
<td>Provision for replacement of—dwellings</td>
<td></td>
<td>262</td>
<td></td>
</tr>
<tr>
<td>Leasehold land</td>
<td></td>
<td>48</td>
<td>418</td>
</tr>
</tbody>
</table>

**Net Loss—Transferred to Accumulated Profits/(Losses)**

<table>
<thead>
<tr>
<th>($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(62)</td>
</tr>
</tbody>
</table>

*To be read in conjunction with the accompanying notes*
### 5.4 Ancillary Trading Activities

**Operating Statement for Siding Spring Housing Operation for the year ended 31 December 1976**

<table>
<thead>
<tr>
<th></th>
<th>$000</th>
<th>$000</th>
<th>$000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rentals</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff subsidy</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Rental subsidies</td>
<td>12</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Less: Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rates—General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>—Water and sewerage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for maintenance of dwellings</td>
<td>8</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>Administrative Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other administrative expenses</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Property and Expense Provisions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for dwellings—replacement</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>insurance</td>
<td></td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td><strong>Net Operating Profit—Transferred to Accumulated Profits/(Losses)</strong></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To be read in conjunction with the accompanying notes
Sources of Income and Distribution of Expenditure

Income

- Australian Government and other restricted purpose research grants 4.3%
- Other 0.7%
- Australian Government capital expenditure grants 1.6%
- Australian Government recurrent expenditure grants 93.4%

Expenditure

- Restricted purpose research 4.3%
- Other 6.0%
- Library books 1.3%
- Buildings and site services 1.6%
- Teaching and research equipment 5.2%
- Teaching and research materials and expenses 15.5%
- Salaries, wages and related costs 66.1%