The Australian National University

1977 Report
To His Excellency Sir Zelman Cowen, 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 1977 to 31 December 1977 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;
(2) 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; 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. Lists of academic publications of departments in the Research Schools and Faculties, which give an indication of the range of research activities in the University, are available in the Parliamentary Library and to individuals on request.

The address for such inquiries is:
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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

Institute of Advanced Studies

Board of the Institute of Advanced Studies

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

School of General Studies

Board of the School of General Studies

Faculties
Arts
Asian Studies
Economics
Law
Science

University Centres
University Library
Residential Halls and Affiliated Colleges

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 Services 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 1977

**Members Ex Officio**

Sir John (Grenfell) Crawford, AC, CBE, MEc Syd., HonDSc Nele (NSW) & Orissa, HonDEc 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

Ian Gordon Ross, MSc Syd., PhD Lond., FRACI, FAA—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

Peter Cardwell—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**

Maurice Hearne Byers, QC, LLB Syd.
Enid Campbell, LLB BEc Tas., PhD Duke
George Austin Colman
Alfred Charles Copeman, BEng Qld, MA Oxf., FIMMMAust.
Leonard Thomas Hinde, FIA
Thomas Fulton Coleman Lawrence, AM, BSc BE Syd., FIEAust., FRAeS
Judith Arundell Wright McKinney, DLitt Qld & NE, FAHA
Laurence Macdonald Muir, VRD, LLB Melb.
William Abernethy Park, BCom Qld, FASA
Sir Frederick (William George) White, KBE, MSc NZ, PhD Camb., HonDSc Monash, ANU & PNG, FAA, FRS
Arthur John Russell Yencken, MA Camb.

Members chosen by Heads of the Research Schools in the Institute of Advanced Studies
David Parker Craig, MSc Syd., PhD DSc Lond., FRIC, FRACI, FAA, FRS
Sir Rutherford (Ness) Robertson, CMG, PhD Camb., DSc Syd., DSc ad eundem gradum Adel., HonDSc Tas. & Monash, HonScD Camb., FAA, FRS

Members chosen from among the Deans of the Faculties in the School of General Studies
David Michael Griffin, MA PhD ScD Camb.
William Stanley Ramson, MA NZ, PhD Syd.

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

Member elected by the Professors in the School of General Studies
Liu Ts’un-yen, BA Peking, BA PhD DLitt 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
Michael William McElhinny, BSc PhD Rhodes, FIP

Members elected by the non-professorial academic staff in the School of General Studies
James Alexander Grieve, BA Belf., MA
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
Alan William Thomas, BA WAust.

Members elected by the undergraduate students
John Ball
Susanne Gai Kopetko, BA

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

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

Secretary to the Council
The Registrar
1977 was a year for adjustments. I made it plain when I became Vice-Chancellor in 1975 that universities were entering a new era, that the period of expansion had ceased, and that we had still to learn how to adapt to the changed circumstances we would now encounter. I made it plain too that there was not merely an administrative, but a much more broadly intellectual challenge in all this, which would be even more testing than that which faced universities two decades or so ago when they embarked upon their period of expansion.

The task calls for positive, not negative, attitudes, along with the ingenuity which we know came our way in other circumstances. 1977 was the first year when there was a significant decline in real resources for the University. It proved moreover to be the last year in which we received financial supplementation during the course of the year for increased costs due to inflation in respect of non-salary items. It soon became clear that for 1978 there would not be the increase in the national Budget of 2% for tertiary institutions as a whole that had been expected, and a good deal of anxious effort had therefore to be expended in the latter part of the year on framing estimates for 1978 when it became apparent that for this University a likely cash increase of 1.25% in fact involved a cut in real operating resources of 4.3%.

The turnaround was largely due to the cessation of supplementation for inflationary cost increases in non-salary expenditure; to a substantial increase in our statutory obligations in respect of the membership of many of our staff of the Commonwealth Superannuation Scheme, and to ‘incremental creep’ (the increased cost each year of the same staff because of the University’s contractual obligation to pay many of them annual salary increments).

It is none too easy to strike the right balance of comment on these developments. There is no doubt that the reduction in real resources which has occurred is having real effects. They are felt particularly severely in the non-salary, non-equipment budgets, i.e. in relation to those innumerable items which people and equipment need, in order to do the work they are set up to do. The Director of the John Curtin School of Medical Research has warned the University Council that his School is in danger of losing its leading position in international medical research if the decline in real resources available to it continues; and others would speak similarly.

But there is no doubt that at the same time there has been a notable display of responsibility in practically every area of the University—indeed it is difficult to think of examples to the contrary—in acknowledging that there are quite understandable reasons why the financial position in which the University operates has significantly changed.

Budgetary readjustments

One major problem encountered during the year stemmed from the enactment of the new Commonwealth Superannuation Act in 1976. The University had not been consulted about its provisions. They entailed, however, substantial increases in the University’s contributions to the reserve fund it is obliged to maintain in respect of those employees for whom benefits are provided under the Commonwealth Superannuation Scheme. (These include most of the general staff, and a number of the academic staff, including all those who have been appointed since 1 July 1976.) Most of the ‘approved authorities’ which maintain their own reserves under the Act are essentially trading and income-earning organi-
The Vice-Chancellor, Professor D. A. Low, discussing with members of staff in June 1977 implications of the financial guidelines for 1978 which had recently been announced by the Government.

The University is not. Moreover, its employer's contributions are not paid, as they are in respect of Government departments, out of consolidated revenue as they are required; they have to be funded (sometimes many years) in advance, and have to be hedged against inflation.

No increased Commonwealth grant was forthcoming to provide for the substantially increased burdens which inflation and the new Act laid upon the University. By mid-year there had been no progress in the protracted discussions with the Government on the arrangements that might be made for ensuring that the increased contributions, for which no additional grant had been provided, did not seriously damage the University's operations. Accordingly in June I gave notice that unless some new arrangements were effected at an early date, even the budget for the remainder of 1977 would have to be seriously reconsidered.

In the event the University was then advised, in accordance with the statutory provision, to seek a renewal of advice from the Government Actuary upon the issue, and this resulted in the recommendation of a new formula, which, while increasing significantly the previous burden on the University's budget in respect of superannuation payments, nevertheless relieved, though at considerable cost to the University's activities, the immediate crisis.

Of the many other financial adjustments which were made during the year, one of the most significant related to what are now called the University's 'trading operations'. These include such diverse concerns as University House, the Staff Centre, the Halls of Residence, and the ANU Press. Their budgets have now been placed on a wholly commercial basis (even where, as with the ANU Press, there is good reason for granting them a University subvention). These are
now to be considered by the Finance Committee separately from the University's teaching and research budget and a common set of rules is to be applied to them.

Of the many budgetary rearrangements made in the academic areas, those in the School of General Studies would provide one example. The ratio of non-academic, including technical, staff to academic staff in the Science departments has now been restructured and in some departments significantly reduced. Although the corresponding reconsideration of academic staff allocations has presented serious problems for particular individuals and some significant difficulties for particular departments, a degree of equity between departments, which earlier cuts had upset, was re-established, and upwards of 25% of academic posts are now held on short or fixed terms so that a degree of flexibility has been established in this area. There are certainly still related problems. For example, because so few new tenured appointments are being made, promotions policy had to be reconsidered by the Board of the School of General Studies, and it was decided that the number of promotions in 1977 would have to be significantly less than in previous years.

The newly converted Garran Hall dining room came into operation during this year. This involved installing in the dining room area a series of kitchen units—stoves, cupboards, refrigerators, sinks—each complex of which is shared by upwards of a dozen students who cook for themselves and eat at adjacent tables. For my own part I found ‘dining’ in Garran Hall under its new arrangements with a group of students one of the highlights of my year. The social interaction over the kitchen sink has brought a new dimension to Hall life. The kitchen/dining area seems to be kept remarkably clean. The costs for students of these arrangements are significantly less than those incurred before; and although there was quite a high turnover of students in the Hall, Garran remained unusually full.

This is not to say that there is now a case for all student residences converting to Garran-type accommodation. On the contrary all the evidence suggests that a range of types of accommodation is called for, which should include a certain number of student residences of the more traditional kind. The chief problem would seem to be to find the right balance between the different types of accommodation which the University has to offer, particularly during a period when accommodation costs have risen so steeply.

I decided therefore towards the end of the year to invite the Assistant Vice-Chancellor to undertake a study of these matters. If this turns out to be yet one more study on top of several previous ones, that is in no way surprising. The student accommodation scene changes with great rapidity. In 1975 it was argued that we were entering a period when we would be short of accommodation for students. By 1977 it was clear that oversupply had become the problem. The University is greatly indebted to the Heads of its halls and colleges and others involved who have to fend with the difficulties which a rapidly changing situation entails, and it will seek to do all it can to assist them.

One notable event of the year was that for the first time in the history of the Federal Conciliation and Arbitration Commission an interim award was brought down in respect of a university. This was the end result of the service of a log of claims on this University by the Administrative and Allied Officers' Association—the organisation which consists largely of the University's upper-middle-ranking administrative officers. Given the difficulties which the University faced in proceeding with the recommendations of its industrial consultants (Winter Whalen) on the appropriate
salary levels for these categories because of the Arbitration Commission's Wage Indexation Guidelines, the Association felt it had no alternative but to seek an award from the Commission. The case aroused concern in other universities because of its possible adverse implications for their position, and amongst some other categories of ANU staff, and the need to appear before the Commission presented many of the relevant University officers with a new experience. The University is indebted to them for their service in the matter, and also to Council's Industrial Policy Committee, which the Pro-Chancellor (Mr Justice Blackburn) has been good enough to chair.

In view of the budgetary readjustments of some magnitude which the academic areas of the University were having to undergo, it seemed to me timely in the middle of the year to establish an inquiry to advise on the levels of expenditure in the University's Central Administration. Professor A. J. Youngson, Director of the Research School of Social Sciences, who has a wealth of experience in such matters, kindly agreed to chair a small committee, which reported to me in very good time for its recommendations to be available when the 1978 budget for the Central Administration came to be prepared. This latter task required even larger reductions—of up to 9%—than the Youngson Committee had recommended, and since further consideration will be given to the residue of the Youngson recommendations, there can be little doubt that the Central Administration will have been pared to the point where its ability to provide services to the University as before will have been significantly reduced. The effect of these reductions will have to be carefully monitored.

Reviews

One of the most notable developments during the year was the increasingly widespread acceptance in the University of the policy of establishing review committees, more particularly of Schools and Departments. A protracted and often anxious review of the Research School of Physical Sciences, by a committee of whom all but one came from outside the School, and nearly half from outside the University, was brought to a conclusion by the adoption by the Faculty Board of the School of 'Guidelines' for the allocation of staff and of funds for future work. These guidelines suggested changes such as the separation from the Department of Engineering Physics of a new Plasma Physics Group, to whose headship Dr S.M. Hamberger was then appointed, and the development of additional work in Solid State Physics in a new Unit under the Director's aegis.

In the light of this review and its more general consideration of the issues, the Board of the Institute of Advanced Studies adopted during the year a policy paper on School reviews, and arrangements were then made for the establishment of review committees of the three other original Research Schools during 1978. The notable fact is that in each case these Schools took the initiative in calling for committees of four outside experts. In the case of the John Curtin School of Medical Research, all four are scientists of great international distinction; all of them from outside Australia. Similar arrangements have been made in the two other cases, of the Research Schools of Social Sciences and of Pacific Studies, except that because of their somewhat greater local associations one of the four committee members will be an Australian. It may be suggested that there are not many national institutions which have taken the initiative to have their work adjudged by such international specialists.

A number of departmental reviews have
meanwhile been in progress in the School of General Studies. As Vice-Chancellor I have chaired most of these myself—of the Departments of Philosophy, Slavonic Languages, History, Germanic Languages, and Romance Languages. Further reviews of the Departments of Chemistry, English, Geography, Classics, and (chaired by the Deputy Vice-Chancellor) Accounting and Public Finance are in train. Professor Arthur Birch is chairing as well a review of the Centre for Continuing Education, on which, among others, the Vice-Chancellor of Deakin University (Dr F. R. Jevons) has been good enough to serve.

Departments themselves have made substantial preparations for these reviews. The committees have been largely composed of members from outside the department concerned, and have always included one or two people of distinction from outside the University.

It is clear that the final reports of these committees are usually of less intrinsic importance than the discussion which the reviews themselves set on foot within the Departments concerned. At the same time it may well now be desirable to institute some brief checkback upon the consequences of a review a little while after it has occurred. It should perhaps be emphasised that no-one imagines that such reviews can stand alone. But there is a good deal of evidence to suggest that they can provide important take-off points for redirections, when, as is now the case, these can no longer be looked for primarily as before from additions to departmental budgets.

If I may offer one personal impression from my own participation in such reviews, it would be this. During the 1960s there was a tendency in a period of University expansion for departments to concentrate on enlarging their range of courses, sometimes to the point where the discipline concerned came close to being broken up into several unrelated sub-disciplines. Nowadays there is by contrast a much greater readiness to see some convergence in a department's activities, not so much upon a single consensus as to what its disciplinary concerns should be, but more creatively, upon a more concerted interest in the major educational benefits which it can offer to the students working in it. It would seem to me that there is a good deal here on which we can build further in the future.

Appointments
There were a large number of other notable events during the year which it would be desirable to note, but of which only a selection can be mentioned here. The Chancellor (Emeritus Professor Sir John Crawford) was re-elected as from May 1978 for a further term of two years, while in accord with a new statute the pro-Chancellor (Mr Justice Blackburn) was re-elected for a further term of three years. Professor A.E. Ringwood, FAA, FRS, who began at the University as a senior research fellow was appointed to succeed Professor Anton Hales as Director of the Research School of Earth Sciences on the latter's retirement in May 1978. Professor John Coates became the first graduate of the School of General Studies to take up a chair in a research school, as Professor and Head of the Department of Mathematics in the Research School of Physical Sciences. Professor W. A. Scott took up the Chair and Headship of the Department of Psychology in the School of General Studies. Professor J.E. Richardson vacated the Robert Garran Chair of Law on his appointment as the first Commonwealth Ombudsman. Professor O. J. Eggen moved to the Cerro Tololo Interamerican Observatory in the Chilean Andes after ten years of distinguished service as the University's Professor of Astronomy.
Professor P. O. Bishop, Head of the Department of Physiology in the University’s John Curtin School of Medical Research, who was elected to Fellowship of the Royal Society in 1977 in recognition of his research into the neurophysiology of vision.

It was gratifying that the Government undertook to provide special funding on a continuing basis for the Centre for Research on Federal Financial Relations under Professor Russell Mathews’ directorship. Elections to learned Academies included Professor Noel Butlin’s as a Corresponding Fellow of the British Academy, and Professor Peter Bishop’s to the Fellowship of the Royal Society of London. Professor Arthur Birch chaired the Government’s Independent Committee of Enquiry into the Commonwealth Scientific and Industrial Research Organization. Professor George Zubrzycki was appointed Chairman of the National Ethnic Council. Professors Sir Rutherford Robertson and Robert Street were appointed members of the Australian Science and Technology Council. Professor Richard Johnson was appointed Chairman of the Australian Territories Accreditation Committee for Advanced Education. Professor Russell Mathews was appointed Chairman of the Advisory Council for Intergovernmental Relations. The University is glad that the
services of its members are called on in the national interest in this way.

Perhaps the most notable of such developments occurred in the office of Deputy Vice-Chancellor. Professor Noel Dunbar completed an unusually distinguished ten years as the University's Deputy Vice-Chancellor on his appointment as a Commissioner of the newly established Tertiary Education Commission and Chairman of the Universities Council. The University has benefited greatly from his dedication, judgment, knowledge and good humour, and wishes him every good fortune in his new, and vitally important, national office. In his place the University has been singularly fortunate to secure the services of Professor Ian Ross, FAA, who has served as Professor of Chemistry since 1968, and for a year recently as pro-Vice-Chancellor. At the beginning of 1977 Professor Ross also became Chairman of the Australian Research Grants Committee. The University's good wishes go to him in both these capacities.

Teaching and Research

The remainder of this report focuses more directly on the University's teaching and research. From a myriad of possible examples of this only two can be selected here.

Professor Butlin was deeply involved in the, at one stage, seemingly abortive Botany Bay project. It is pleasing to state that three volumes reporting on the work that was done in connection with this were published by the ANU Press, with two more still to come. They represented a major contribution not merely to the understanding of circumstances in the Botany Bay area itself, but to the development of the still all too small literature on environmental issues in this country. The enthusiasm of the team who did this work was a pleasure to behold, and its outcome is a salutary lesson to those tempted to write off a research enterprise prematurely.

It is then a pleasure to note as well that this year saw the culmination of the institution of a full major in Aboriginal Studies as part of the BA degree. Total enrolment during 1977 for the courses making up this major was 191. All the courses involved were taught by people whose major research interests in Australia lie in this area. It is gratifying to note too that a small but increasing number of Aborigines have shown some interest in these courses. The University hopes that further developments of this and other kinds that will be of value to them can now occur.
Dean of Students’ Report

The Dean of Students has two main areas of responsibility. The first relates directly to the teaching purposes of the University, in the promotion of the most fruitful relationships between staff and students in the educational process. The second is the oversight and coordination of student services within the University.

Student participation in decision-making
The Australian National University has a comprehensive system of student participation in academic decision-making, ranging from student representation on the Board of the School, Faculties, Faculty Educational Committees and Departmental Committees to the discussion between teachers and students in each unit which is enjoined by instruction of the Board. During the year this machinery has been extended by enlarged student membership of Faculties and has in practice worked adequately as procedures are now familiar and accepted. The means are available to ensure cooperation between staff and students and should be maintained.

Work loads and methods of assessment
The unsettled questions in practice concern work loads and methods of assessment. 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 the student is enrolled. Work loads are sometimes unduly onerous in total and often in their incidence during the year, producing stresses on students and militating against the best learning. With the adoption of a new University calendar in 1978, the Board has accepted the recommendations of its Committee on Examining which will, so far as possible, fix assessment periods at more convenient times. Deans of Faculties have also initiated discussions with staff, especially first-year teachers, which are directed towards a scrutiny of work loads in the light of educational objectives. These moves should bear fruit in 1978. Within each unit a serious discussion between teacher and students of objectives and requirements remains essential.

Choice within degree structures
Despite reduced resources the School of General Studies continued to revise its courses, to offer new ones, to develop interdisciplinary studies and to widen the scope for choice within degree structures.

Review of postgraduate studies
In postgraduate studies a review of the University’s aims and ways of achieving them is being undertaken by a working party chaired by Professor Wang Gungwu, Director of the Research School of Pacific Studies, following discussions initiated by the Vice-Chancellor last year.

Reviews of student services
The student services provided by the University have also undergone comprehensive reviews during this year. The examination of the Counselling Centre has resulted in recommendations being presented to the Vice-Chancellor for his consideration. The Communication and Study Skills Unit, which has proved its value in assisting students, should reach full strength in 1978 with the appointment of a Counsellor in Mathematical Methods. The Careers and Appointments Unit remains seriously understaffed at a time when the demand for its services by students during their courses and on leaving has greatly increased.

The review of the Health Service has endorsed the policy which it has followed of
positive encouragement of health maintenance, promotion of health education and voluntary support groups on campus.

Support to students

Financial as well as academic stresses and uncertainty about their future have impinged more strongly on students, calling for a strengthening of student services in order to avoid the public and private loss of abandonment of studies.

Some categories of students need special facilities. Aid given to overseas students is well developed, drawing on community help as well as of the student services of the University. Assistance to part-time students is the particular concern of a Part-time Student Counsellor. The growing number of mature-age students entering the University need preparation in skills and confidence, which is also provided by the student services of the University. During 1977 six aboriginal students were enrolled for degree courses and plans have been prepared to increase this number.

Relations with secondary schools

The Schools Liaison Committee, of which the Dean of Students is Chairman, has strengthened its ties with ACT schools, revised its introductory booklet to the University, arranged visits to schools, taken part in combined career and tertiary study sessions for school leavers and plans an information day for potential students during 1978. The Committee has consulted frequently with careers advisers in ACT schools and has joined with New South Wales universities in providing joint information about university entry.

Co-ordinating committee for residential accommodation

Student accommodation is a matter of vital concern to the University if it is to maintain
its character as a national undergraduate university drawing students from throughout Australia. The University is fortunate that it has in its affiliated colleges, halls and non-collegiate residences 2000 places, but these must be used to best advantage. With the approval of Council in December, the Vice-Chancellor established a Co-ordinating Committee for University Student Residential Accommodation which will report during 1978.

The range of responsibilities of the Dean of Students is shown in the matters mentioned above. His position within the administrative structure of the University both in the making and execution of policy concerning student participation and services has lately been somewhat uncertain, and attention will be given to clarifying this situation during 1978.

I would like to record my appreciation of the co-operation which I have received from Mr J. Nicholson, President, and the officers of the ANU Students’ Association. An effective Students’ Association is essential to the functioning of a teaching University.
Research Schools

Research School of Biological Sciences

The first ten years
In reporting on the year 1977, when the School celebrated its tenth birthday, it is interesting to quote an extract from the original submission to the Australian Universities Commission—'The University is impressed with the case for the urgent establishment of a Research School of Biological Sciences. Moreover, the need to establish a centre of research into problems of basic biological concern, which have largely been neglected in Australia, is widely recognised. Such a School could be expected to attract distinguished Australian and overseas biologists and would train men of promise for the challenges of the future.' How far has the School achieved the purpose stated by the University at that time? Though it would be presumptuous to say that all expectations have been met, the School believes it is living up to the aspirations of its founders. It has attempted from the beginning to be in the forefront of advances in biology and to work on the more difficult problems, particularly those of importance to Australia. For instance, the School has been heavily involved in seeking better understanding of Australian environments, ranging over such different areas as deserts, Snowy Mountains, Great Barrier Reef and others. Its population studies have ranged from those on Australian grasshoppers to inherited health problems of the
people of Sydney. It is much involved in research leading to better understanding of how bacteria fix nitrogen from the atmosphere and so provide nitrogenous fertiliser for plants. Many of its ventures have worldwide significance and recognition: many have required collaboration between scientists of different disciplines, and often from other institutions; and the School has been much helped by bringing visiting fellows from overseas and from other Australian universities to contribute their own expertise to its programs. At the same time, the School’s own members have visited other laboratories, sometimes to learn, sometimes to pass on their knowledge thereby helping to fulfil the University’s national role.

Aiming to maintain its position in the front of those advances in biological knowledge which fit within its scope, the School has proposed the establishment, in the next triennium, of a group to work on membrane biology, now a key area for outstanding advances in understanding basic biological processes of living cells. Along with its intrinsic importance, membrane biology will also provide background knowledge and techniques essential to most other departments in the School.

It is fair to say, then, that its first ten years have established the School on a sound basis, both in the quality of its research and in its adaptability to progress in its disciplines.

During the year the School tried to show its activities to the general public with specially arranged exhibits which were open for inspection on several days attracting about 1000 people, including a number of high school students. Many expressed interest in the work, some examples of which are described below.

Membrane study in the eyes of Dinopis

It has been known for over a decade that the membranes in eyes responsible for trapping light, and using its energy to give electrical signals which the nervous system can interpret, are not completely stable structures. Components of these photoreceptive membranes are gradually lost with the passage of time, and have to be replaced. It is not clear why, but it has been suggested that such membranes may deteriorate with either age or damage by light. The replacement processes are best understood in the rods of vertebrate eyes, including our own, but in all cases analysis is made difficult by the fact that degradation of membrane proceeds simultaneously with its renewal.

The Department of Neurobiology has recently found that the nocturnal net-casting spider, Dinopis, destroys and resynthesises the greater part of its photoreceptor membrane daily. The spider hides during the day, coming out at dusk to spin a framework within which it hangs head-down, and a special net which it holds with
5 A cross-section of a Dinopis receptor during the day. Most of the receptor is "empty"; the photoreceptor membrane is present as a thin boundary at the border of the cell and (6) a similar receptor at night: the whole of the cell is now filled with photoreceptor membrane.

its first two pairs of legs. An insect passing beneath the spider is trapped by the net, which is stretched and hurled over it. The spider sees its victim with a pair of extremely large, forwardly-directed eyes with an enormous light-gathering capacity, and prey can be captured on moonless nights in places where our own eyes can see nothing at all.

Dinopis makes the photoreceptor membrane in the eyes, which it will need at night, very rapidly indeed over a period of some 1-1½ hours at dusk, and break-down of the membrane at dawn is equally brisk. Because manufacture and break-down are so well separated in time, the way in which the retina of the eye sets about the two processes can be studied more easily than in other eyes.

Other nocturnal spider retinae undergo similar, but less dramatic cycles, while those of diurnal groups such as jumping spiders, which locate their prey exclusively by sight, have a membrane which seems to be remarkably stable, and lack any cellular machinery capable of sustaining rapid turnover.

At present, there is no satisfactory explanation for the difference between nocturnal and diurnal receptors; part of the difficulty is that it is not known whether the synthesis and destruction of membrane in Dinopis is, for example, just one of a number of mechanisms used to adjust the sensitivity of the eye, or whether the daily replacement of membrane is a necessity imposed by some
special property, which makes it suitable for night vision. A study is being made of the electrical responses of single *Dinopis* receptors to light in order to evaluate the usefulness of a number of such preliminary hypotheses. It is, however, already clear that spider eyes are very diverse in their physiology. It is hoped that by surveying spider eyes an understanding of why photoreceptor membrane must be replaced and how this is done will be gained. This will throw light on the enigmatic patterns of membrane synthesis found in many vertebrate photoreceptors, including our own.

**New insights into mechanisms and control of plant growth**

Microscopical and biochemical techniques are the main approaches being used in the Department of Developmental Biology in efforts to understand the basic mechanisms of plant growth, and to discover how these mechanisms are controlled. One important problem which has not yet been understood is what governs the shape and size of plants. When reduced to its fundamentals, the shape of a plant, whether it be a tree, a cereal, a moss, or a simple alga, depends upon the shape and size of its constituent cells. Both shape and size are governed largely by the cell walls composed of cellulose (like paper or cotton). The morphology of the cells depends upon the way in which fibres of this cellulose, so small as to be visible only with the electron microscope, are deposited in the walls which surround each cell. Ultra-microscopic microtubules which occur in plant cells are thought to function as templates for orienting the deposition of cellulose. Painstaking surveys involving the use of conventional electron microscopes in the School and visits to the High Voltage Electron Microscope Laboratory at the University of Colorado, USA (there is no such instrument in Australia), have for the first time enabled the distribution of the microtubules in higher plant cells to be accurately mapped. This dis-
covery of sites from which the microtubules arise on the outer membrane of the cell adjacent to the cell wall is particularly significant. It seems that plant cells may be able to control their wall deposition by activating and de-activating their microtubule initiation sites. A new technique of isolating microtubules attached to the cell membrane has also been developed and these two breakthroughs foreshadow new insights into the mechanisms and control of plant growth.

Living membranes, two molecules thick
Both the foregoing examples, like many others in the School, are concerned with important properties of membranes which are around and within living cells. These membranes, which are so thin that they can be seen only with electron microscopy, are often only two molecules in thickness. Their molecules are very specialised, some being fatty-type substances called lipids and others being proteins, some of which are the enzymes or catalysts for cell reactions which they can carry out only if they are in the membrane. Though only two molecules in thickness, these membranes, having the characteristics of a layer of fatty substance between the water on each side, are highly efficient as electrical insulating systems and are very impermeable to substances which dissolve in water. This, as has been known for many years, allows them to regulate what enters and leaves cells and also the different compartments within cells. Recent work overseas has shown that because of the peculiar properties of lipid molecules, the centre of these two-molecule-thick membranes may be virtually like a liquid, i.e. like an oil, while the surface on each side of the membrane is virtually solid, i.e. like a fat. Theoretical work in the Bioenergetics and Active Transport Unit, reinterpreting existing experimental evidence, has emphasised the importance of this property of membranes. It has now been postulated that small oil-soluble molecules, which can enter the oily parts of the membrane, may be trapped in the middle. There they can move laterally to react with enzyme catalysts in the absence of water which does not mix with the oily centre of the membrane. Thus living cells, like chemists in a laboratory, can carry out reactions, some of which are best in water and some of which are best in non-aqueous solvents. Our theory also suggests that some lipid molecules have the special property of combining with molecules in the water and then releasing them in the oily centre of the two-molecule-thick membrane. Different kinds of lipids mixed in different proportions with many kinds of proteins, account for the wide variety of membrane properties. Thus membranes are adapted to suit all the many requirements of different living organisms, ranging from merely protecting the inside of a cell from the outside, to trapping a small amount of light in the spider’s eye and sending a signal to its nervous system.

Research School of Chemistry

Chemical research of timeliness and promise
The School has as prime aims the pursuit of fundamental chemical research and the training, through research, of students and postdoctoral workers. Its fields of work are usually chosen in newly developing areas, often bridging the classical disciplines: chemical physics, bio-inorganic chemistry, organometallic chemistry and biological
chemistry. They include research into problems of immediate Australian importance, such as Jarrah die-back, side by side with others where the aim is to advance basic knowledge in which the benefits may not be felt for many years. For these tasks the School continues to attract first-class young scientists on non-tenured appointments and an increasing number of research students, working together in a stimulating environment and with the backing of well-equipped and well-supported laboratories. This program involves 71 academic staff and 17 research students supported by a technical and administrative staff of 116. Three researches taken from current programs are briefly described.

**Catalysts, hydrogenation—and practical purposes**

There is an intense world-wide search for good, cheap catalysts which can be used in the process for enabling the condensed aromatic hydrocarbons in coal to react with hydrogen—a hydrogenation process—and so convert them to convenient sources of material for chemical industry as well as fuels. Basic work in this School on the chemistry of compounds of the transition metal ruthenium has given some important leads towards this broad objective.

Chemists have for many years sought catalysts which do their work when dissolved in the solution containing the substance to be hydrogenated. Such homogeneous catalysts are often much better than expensive solid catalysts which rely for their effect on highly active surfaces: these surfaces are easily contaminated and the material must then be replaced or reactivated.

In the past few years, work on ruthenium by Dr M. A. Bennett and colleagues has produced compounds in which a benzene-like molecule, and another molecule con-

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8 A computer-drawn picture of the atomic arrangement in one of the ruthenium complexes being studied by Dr M. A. Bennett’s group. The structure has been determined by a single-crystal X-ray diffraction experiment. The ellipsoids represent the atoms and the way in which they vibrate in the crystal lattice; the lines represent bonds between the atoms. Typically the distance between bonded atoms is about a one hundred millionth of a centimetre.
taining phosphorus, nitrogen or sulphur, are attached to the metal. A discovery in this School is that an atom of hydrogen can be made to attach itself to the metal also, in a reaction with the simple chemicals isopropanol and sodium carbonate. This hydrogen atom can readily transfer itself, producing the hydrogenation of a molecule present in the system and leaving its former host available to do the same work again in the normal cyclical pattern of a catalyst. There may well be the prospect of developing, along similar lines, a homogeneous catalyst for hydrogenation of the more highly condensed aromatic hydrocarbons such as those found in coal.

**Chemical reactions caused by light**

Interest in chemical changes caused by light is strongly linked to possibilities of converting sunlight into other useful forms of energy. There is the search also for cheap ways of making commercial chemicals using light as the energy source. Understanding of the photochemical processes has been slow to come, because of a lack of definitive experimental research. New experimental techniques are required and much work in this School by Dr. J. Ferguson and his co-workers has pivoted on finding and developing new procedures. These have been applied to one of the oldest unsolved problems in photochemistry, which is how two anthracene molecules combine to form a double molecule—dianthracene—when exposed to light. Although this remarkable process has been known for more than a century, only now is it beginning to be understood.

The most important new technique uses a specially designed microspectrophotometer, constructed in this School, which enables combined spectroscopic and photochemical studies of single crystals so small that ten would fit on the head of a pin. The temperature can be changed smoothly from minus 268 degrees (close to absolute zero) up to room temperature. A series of measurements can be made without moving the crystal.

Crystals of double molecule dianthracene can be photochemically split up. The products are two anthracene molecules. The new discoveries in the School have been possible because molecules have been made with chemical bridges joining the anthracenes. These bridges have been designed to prevent the fragments from moving far apart. The splitting up by light has thus given products which have molecular arrangements, normally unstable, intermediate between dianthracene and anthracene. Probing the nature of these intermediate species is providing, for the first time, an understanding of the changes of electronic structure which occur along the photochemical pathway between reactant and product in this fundamentally important chemical reaction.

**Mass spectrometry and plant growth substances**

Mass spectrometry, the process of determining the weight of molecules and hence their atomic composition, plays two roles in the School. On the one hand, it is a service technique providing vital spectroscopic data for many research projects. On the other hand it is an area of fundamental research in itself, which studies the way molecules break up when hit by high energy electrons in the mass spectrometer. Dr. J. K. MacLeod and his co-workers use mass spectrometry in both these roles. Cytokinins are natural plant growth substances which play a major role in cell division and cell differentiation. The various members of this group of compounds differ in their molecular structure, and exhibit different biological activities. Mass spectrometry has enabled the development of a sensitive, quantitative method for the
Professor Lew Gustafson and PhD student Leigh Schmidt, from Electrolytic Zinc Corporation, examine diamond drill core at the Elura lead-zinc-silver deposit in the Cobar district, NSW. The study of processes of ore formation is the focus of activity of the Economic Geology group in the Research School of Earth Sciences.

Research School of Earth Sciences

New programs in operation
The new programs in Economic Geology and Geophysical Fluid Dynamics were operational during the year. In the Economic Geology program the thrust is not in the direction of finding new ore bodies, for this is the function of other agencies and industry. It is instead directed towards understanding why ore bodies occur where they do, and the nature of the process by which elements usually only present in rocks in parts per million become concentrated in parts per hundred or thousand and thus significant economically. It is therefore not surprising that three of the students in this program should have come from industry and be investigating problems relating to ores ranging from the nickel ores of Western Australia to stratiform lead, zinc and copper deposits of Queensland and the world-wide deposits of phosphates. Dr P. J. Cook of this group is the Project Co-ordinator for an International Geological Correlation Program (a UNESCO-IUGS program) on phosphorites, an important mineral resource from the point of view of the food supply of the world.

Assay of natural cytokinins which, in general, are present only in the minutest quantities in plant tissues. Several individual cytokinins have been synthesised in which deuterium, a heavy isotope of hydrogen, replaces the normal hydrogen atoms at certain sites in the molecules. These isotopically labelled compounds are added to the plant tissue and act as carriers for the tiny quantities of unlabelled natural cytokinins during the extraction and purification process. Using this and other radioactive labelling techniques, valuable prospects are in sight for the study of a range of plant systems during their growth stages.
Large crystals of stishovite, a high pressure form of quartz, have been synthesised for the first time in Professor A. E. Ringwood's laboratory as part of experimental studies aimed at understanding the structure of minerals in the Earth's mantle. A stishovite crystal (magnified 650 times) is shown in this photomicrograph, taken with a scanning electron microscope.

The other new program in Geophysical Fluid Dynamics is concerned with laboratory studies of the kind of mixing processes which occur in the oceans. It turns out that, difficult as it may be to devise and carry out relevant model experiments on the laboratory scale, it is even more difficult to model these processes theoretically, at least until the nature of the solution has been indicated by experiment. This program has been fortunate in attracting a number of visiting scientists even although it is still fairly new.

Composition of the Earth—a new proposition
Understanding the evolution and composition of the Earth was a major early interest of the Department of Geophysics and Geochemistry from which the Research School of Earth Sciences evolved. That interest continues. It has long been known that the Earth has a dense core, which implies that it is mainly composed of iron. However, high pressure studies have demonstrated that its density is distinctly smaller than that of pure iron, so that a substantial proportion of light elements must also be present. Sulphur, silicon have been the most popular choices. However, Professor A. E. Ringwood this year proposed, and offered convincing evidence for, the proposition that this additional component is oxygen, which dissolves extensively in iron at very high pressures. This suggestion has the further merit of accounting for some anomalies in the chemical composition of the Earth. On the experimental side, Professor Ringwood's group succeeded in growing sizeable crystals of stishovite, a high pressure modification of the common mineral, quartz. In this case, sizeable means all of one-tenth of a millimetre. However, the crystals are large enough for accurate measurements of the crystal parameters, and physical properties of this important lower mantle material.

Professor Ringwood, leader of this group for almost 20 years, will become Director of the Research School when Professor Hales retires in mid-1978.

Australian seismological studies and the plate tectonics theory
The retiring Director's interest also lies in the properties of the mantle. In one sense,
Professor Ringwood’s group is concerned with experiments and observations relating to the chemical and mineralogical properties of the mantle, whereas Professor Hales is concerned with observations which relate to the physical properties of the real Earth at depth. The two programs are complementary because it is only by comparing the physical properties of possible mantle materials with those inferred from the seismological measurements that the constituents of the mantle can be identified. It turns out, in fact, that Australia is extraordinarily well situated for this kind of seismological research. There are no other stable continental areas immediately adjacent to a subduction zone in which earthquakes occur with great frequency. It is possible therefore to make observations in Australia which will contribute to understanding of a major unresolved problem of the now generally accepted theory of plate tectonics; namely, the depth at which continental blocks slip over the underlying mantle as Australia is doing today at the rate of about 5 cms a year. Australia’s situation is equally advantageous for the solution of other problems, such as the accurate
measurement of seismic wave velocities at great depths within the Earth. It is hoped therefore that the seismology program will expand considerably in the next few years.

**New methods for measuring the ages of rocks**

Another early major interest of the Department of Geophysics and Geochemistry was the determination of the ages of the rocks of the Australian continent. Broadly speaking, these ages are now fairly well-known. Until a few years ago the oldest rocks known on Earth had ages of about 3200 million years, but recent measurements on rocks from Greenland has resulted in ages estimated at 3800 million years. This discovery has stimulated a new study of the ancient rocks of Western Australia, and has resulted in the discovery there of rocks of age 3450 million years. The main thrust of the isotope geochemistry group has, however, turned from reconnaissance studies on the ages of rocks throughout the Australian continent to more detailed studies of rocks from carefully selected smaller areas. The trend is toward applying a number of different isotopic dating methods to rocks from restricted regions in order to determine their age of formation, emplacement and subsequent cooling history, as well as to obtain insight into the origin of the rock bodies being studied.

**John Curtin School of Medical Research**

In the field of medical research there are three areas which can be distinguished. Firstly, there is work which is aimed at improving existing techniques or applying existing knowledge directly to specific diseases, with an expectation of immediate results. Secondly, there is research into aspects of fundamental knowledge but with a particular disease process in mind and the hope that the information gained will, in the medium term, be applied in medical practice. Thirdly, there is that research which aims at gathering basic information about normal and abnormal cells to build up the store of fundamental knowledge on which all research depends. While immediate results from the last-mentioned type of research cannot be taken for granted, experience has shown that such work forms the basis of medicine.

In the John Curtin School of Medical Research a very wide range of research projects are in progress but, as is appropriate for a School in the Institute of Advanced Studies, the emphasis lies towards the non-applied end of the spectrum. As an example of a project which is aimed at a specific disease, the work on influenza virus could be mentioned. The structures of the molecules comprising these are being studied with a view to determining how new and virulent strains arise and cause epidemics. If this can be achieved, then it is a major step forward in being able to predict epidemics and understanding how to produce more and efficient vaccines. Projects such as the study of how enzymes co-operate to carry out sequences of reactions in cells, or studies of the way in which cells produce energy, are intended to further our basic knowledge of normal cells so that it will be possible to understand, and eventually treat, individuals in which these processes are disordered.
Drugs and the nervous system
Many disorders of the human nervous system stem from defects involving the chemical substances with which the various cells of the brain communicate. These transmitter substances, of which there are many, are released in minute amounts from terminal endings of nerve fibres and regulate the activity of brain cells. Some are excitatory and some are inhibitory in nature. As a prerequisite for the rational design of drugs for the relief of pain, and for the treatment of illnesses such as epilepsy, tetanus, Huntington's chorea, Parkinson's disease and some psychiatric disorders, it is necessary to elucidate the nature of these transmitters. The effect of reduced release of a transmitter may be corrected by drugs which specifically mimic or enhance its activity. In contrast, the effect of abnormally excessive transmitter action may be corrected by compounds which reduce the synthesis or the effectiveness of the particular transmitter substance.

A multidisciplinary research program, which has involved the participation of chemists, biochemists, physiologists and pharmacologists, has successfully identified some of these substances at a number of sites in the brain, and several synthetic compounds based on these findings are being evaluated for clinical use. A very significant finding has been the importance of simple amino acids as major transmitters in the brain.

Simulation of the urea cycle and diagnostic procedures
The urea cycle is a sequence of four reactions in the body and is a process in which enzymes, acting as catalysts, convert ammonium ions produced by other reactions in the body into urea, a compound excreted in the urine. Accordingly, the urea cycle is an important detoxification pathway and defects in its operation are associated with a variety of disorders including epilepsy, spastic diplegia and mental retardation: indeed,
In a research program supported by the Australian Meat Research Committee, the Department of Immunology, John Curtin School of Medical Research, is studying methods of identifying disease-resistant animals, and part of the program focuses on infections of the bovine eye. This research involves the collection of tears over an extended period, which is achieved by placing a plastic tube into the tear duct. The volume of tear fluid continuously obtained in this way makes it possible to isolate and purify some of the components of tears that may play a role in preventing infections in the eye.

In cases where hyperammonemia is severe, early death may result.

The study of the urea cycle begins with steps to isolate from mammalian liver the individual enzymes involved in the process, and to understand their macro-molecular and catalytic properties. Many research groups have been involved in this work and the Department of Physical Biochemistry has made its contribution by studying three of those enzymes. It has found a way to correlate this basic information in a mathematical form which describes the operation of the cycle, and then, with the aid of a computer it can estimate concentrations of certain key metabolites in the pathway of the cycle. The simulations have been repeated in order to study what changes in the ‘normal’ metabolite pattern will arise if one or more of the enzymes in the cycle is defective due to an inborn error. The metabolite patterns obtained from these studies offer a firmer basis than physical reasoning in diagnostic procedures aimed at relating biochemical observations of metabolite concentrations in the blood, urine and cerebrospinal fluid to possible lesions in the pathway of the urea cycle.

**Transplantation biology and disease resistance in livestock**

The Department of Immunology is studying various aspects of disease susceptibility in economically-important breeds of livestock, with the aim of identifying genetic markers which can be used to select animals for their capacity to resist disease. The basis of this research program stems from discoveries made in transplantation biology. Research has shown that most cells in the body carry specific protein molecules on their surfaces which are characteristic for an individual and unique. These tissue antigens are similar to the blood group substances and are used clinically to determine the degree of compatibility between a graft and its recipient in kidney transplantation. Physically coupled with the genes that determine the characteristics of the tissue antigens are genes which decide the way in which the individual’s immune system reacts to infections—so-called immune response genes. Because of this association the possibility exists that patterns of tissue antigens could be used as genetic markers for selecting animals that are more or less resistant to particular diseases that have important economic consequences.

A research program supported by funds from the Australian Meat Research Committee has begun in the Department of Immunology to look into methods of identifying disease resistant animals. The first
part of this program is concerned with the production of reference antisera directed against the major tissue antigens of cattle of different breeds. The idea is that some particular pattern of tissue antigens may be associated with a resistance to some of the important diseases that limit animal production in a given area.

In the second part of the program a study is being made of responses of susceptible and resistant breeds of cattle to infections of the eye to test whether or not it may be possible to select for resistance to this condition.

The third aspect of the research concerns the synthesis of two types of chimaeric animals which will be used as experimental models to study the basis of disease resistance. The first type of chimaera is one in which the lymphoid cells, which are involved in immune responses, are derived from two different animals. Such chimaeras occur naturally in cattle with twin pregnancies as a consequence of the placental circulations becoming joined at an early stage of development. They can be created synthetically between two different breeds by taking embryos from say a Brahman and a Hereford cow and transplanting these embryos into a surrogate mother. The second type of chimaera is created by the fusion of two embryos in a test tube which are then transplanted into a recipient cow. These chimaeras will be used to study the reaction of cells of different genetic constitution to infections and parasitic agents within the same animal.

Research School of Pacific Studies

Review and redeployment of resources

After being in existence for over a quarter of a century, during which the School has performed an important role in stimulating research on societies and cultures along the whole length of the Western Pacific seaboard (Australia, the Southwest Pacific and much of southern and eastern Asia), the time has come for the School to look at itself critically and consider its role for the next quarter of a century. During the year, all departments made careful preparations for the formal review to be conducted in 1978 of the School as a whole and, in particular, of its future plans.

While the review is proceeding, the School has not hesitated in filling the Foundation Chair in the new Department of Political and Social Change. This is a field which the School has long wanted to start working in and it was delighted when Professor J. A. C. Mackie, Research Director of the Centre for Southeast Asian Studies, Monash University, accepted the offer of appointment. Professor Mackie will arrive in July 1978. By launching the new department during a period when University funds are being cut back in real terms, the School has in fact begun the redeployment of its resources. In order to enable this department to get going, the School has had to envisage some changes in its range of activities. The details concerning the redistribution will have to await the results of the School Review, but the School is ready to make the necessary changes to ensure a successful department.

The School has had another active year. The following may be of some special interest, but they have to be read in the context of other examples which have been outlined in previous annual reports.
The shores of Australia were seen by the 18th-century sea-borne explorers as being the epitome of the 'natural landscape'. Yet those columns of smoke from Aboriginal-lit fires were themselves, and had been for thousands of years previously, profound agents of ecological change. This eastern Tasmanian shore drawn by C. A. Lesueur in the summer of 1802 shows the smoke rising from fires lit by the Aboriginal Tasmanians.

Mannalargenna, a senior man of an eastern Tasmanian tribe was drawn by the convict artist Thomas Bock in 1831 holding a fire stick made from a roll of bark. The Tasmanian Aborigines could not make fire, but had to transfer the precious flame from one torch to the next through the 12,000 years of their isolation from the rest of mankind. Yet with this vulnerable tool they had a profound effect on the landscape of eastern Tasmania, creating open parklands which enabled British settlers to spread their sheep like a grazing sea. (Reproduced by courtesy of the National Library of Australia.)

Contemporary Arnhemlanders still burn the bush as their ancestors have done for millennia, a controlled fire management of the countryside. Early in the season, they are careful to burn around the hollow log coffins of dead people first in order to protect them from the more general grass fires which follow. Such burning encourages the growth of young grass in the mid-dry season.
Early man in Australia
One of the most distinctive achievements of recent academic research in this University has been to push backwards in time the known human occupation of Australia. Between them, prehistorians (of this School, and of the Department of Prehistory and Anthropology, Faculty of Arts), biogeographers and geomorphologists have revolutionised concepts of the antiquity of man in our quarter of the world, tripling and quadrupling the best informed estimates of only a decade ago. Now they firmly believe that man has inhabited this continent for at least 40,000 years.

The earliest ground stone axes known anywhere in the world, some 25,000 years old, were discovered in Arnhem Land; the oldest known boomerangs, made just under 10,000 years ago, were excavated from a peat-bog in South Australia; and a cremation burial of a woman—of definitely modern physical type—at Lake Mungo in the Riverina, has been carbon-dated to 24,500–26,500 years ago. Recently a date of about 23,000 years before the present has been obtained for human occupation of what is now Hunter Island, at that time a hill rising out of the plains which were later covered by the waters of Bass Strait. This finding has solved the old problem of how the Tasmanian Aborigines reached their island: they walked there, on dry land exposed by the low sea-levels of glacial times, when much ocean water was locked up in the great polar ice-caps.

When man first set foot on this empty continent more than 40,000 years ago he must have had an immense ecological impact. Perhaps his most significant agent of change during these millennia has been use of fire-stick farming. Early European explorers commented that everywhere they went horizons were clouded with smoke from fires lit by Aborigines as they travelled and hunted—the 'peripatetic pyromaniacs' as they were once called. Recent ethnographic field work with contemporary Aborigines in Arnhem Land has documented the systematic use of fire—to clear the ground, as an aid in hunting, to stimulate the growth of green grass, and to maintain ecological diversity. Its use is not random; it is a controlled program deeply embedded in the hunting way of life. Before the arrival of the white man, most of Australia was subjected to such burning off.

In Tasmania botanists have shown that fire frequency is a crucial factor in the distribution of various forest and scrub types. Frequent fires can reduce dense rain forest to a mosaic of wet scrubs, eucalypt coppices and open plains—the country seen in the 1830s in the northwest. Such land with its complex ecology was rich in vegetable food such as bracken and had a high density of wallabies and other game. Removal of the fire pressure as the Aborigines themselves were moved resulted in scrub growing over the plains and the encroachment of the rain forest. The hunters by applying their fire technology had affected the land so as to increase the total food supply available to them—precisely as farmers do.

Extending modern China studies
The Department of Far Eastern History has been the main centre for China research within the Research School of Pacific Studies for some years, but since 1975, when the Contemporary China Centre became a School centre, there has been new scope for extending China studies. The first head of the Centre, Miss A. G. Donnithorne, had the difficult task from 1969 until 1976 of encouraging research on a small budget dependent on mainly outside resources, but managed even so to sustain the growing interest in China in the University. Her successor, Dr S.A. FitzGerald, receives...
Filming a discussion about a pig-exchange (Tee) in the Enga Province, Papua New Guinea. The Department of Anthropology, Research School of Pacific Studies, is developing and refining techniques with film, videotape and sound recordings to make more detailed analyses of all aspects of social behaviour than is possible with traditional means of observation and recording, and which preserve primary records for use in future studies. See 'Human Ethology and Ethnographic Film Laboratory', p. 50.
direct support from School resources but still looks to the University as a whole for academic assistance with the Centre’s efforts to focus research on China.

Having a firm base within the School has enabled the Contemporary China Centre to bring more visiting fellows from overseas and to organise a specialist international conference in 1977. It has also been able to introduce meetings of specialists from Australian universities where current issues on China of public interest may be fully debated. This is in addition to the active program of seminars and discussion lunches the Centre has always had. During the year, the Centre also opened its own reading room, providing its members and visitors with a meeting place and a collection of up-to-date materials from and on China.

Strong support for the Centre comes from modern historians and scholars of Chinese language and literature. Political scientists, including those specialising in foreign policy studies, and economists also contribute to its work; and the Centre is actively encouraging other social scientists and more young scholars in economics and political science to take part.

**Human Ethology and Ethnographic Film Laboratory**

The newly established Human Ethology and Ethnographic Film Laboratory of the Department of Anthropology brings the highly sophisticated technology of film, video tape and sound recording to bear on human behaviour in diverse cultural settings. A major theoretical concern of the Department is to study the interplay between human biological propensities, learned cultural rules and customs, and individual choice, in shaping behaviour. Traditional means of observation and recording are often inadequate to capture the complexity and subtlety of human action: a sequence can be observed only once and is too fleeting and contextually complex to be recorded fully. By using ‘iconic’ technology—film, video, sound—one can record and preserve unique and spontaneous behaviour sequences in natural settings and analyse them repeatedly and systematically. Different observers using different techniques and theoretical frameworks—ethological, anthropological, socio-linguistic, etc.—can analyse and reanalyse these preserved primary records.

A study of children’s play among Malaysian hunter/gatherers (jointly funded by the United States National Institute of Mental Health) has used video tape, and subsequently computers, to study the development of motor skills (especially hand dexterity), comparing human childhood play with that of non-human primates. Another study has filmed sequences of greeting behaviour in Australian Aboriginal and Papua New Guinea populations and compared them with similar sequences filmed in the United States, using frame-by-frame analysis of gesture, speech, facial expression, etc., to seek both cultural differences and common, perhaps universal, patterns. A pilot study using video tape and film examined ritual behaviour in Eastern Indonesia; video tapes of rituals were played back to native participants whose interpretations and analyses constitute part of the behavioural record.

Development and refinement of such techniques will be an important goal of the Laboratory. So too will creation of a body of iconically-recorded data that can be drawn on in future studies and used to sharpen observational and analytical skills of those, in anthropology and other disciplines, who study human behaviour in natural settings.
Dr A. H. Morton,
Fellow in the Plasma Research Laboratory,
Research School of Physical Sciences, with the LT4 Tokamak device which has been designed for fundamental studies of high temperature plasma to provide basic information relating to the utilisation of fusion processes. LT4 is undergoing commissioning, using the School’s homopolar generator to energise its magnet. When fully operational it is expected to produce plasma at temperatures of several million degrees.

Research School of Physical Sciences

Deciding priorities
At the end of 1976 specific guidelines for the allocation of financial resources available to the School were established. They were based on the report of an expert committee set up to review the research programs and activities of the departments and units within the School. As a consequence, some programs have been discontinued or are proceeding with decreasing support, and resources previously allocated to them are being redirected.

New emphasis on plasma physics
During the year arrangements were made to establish plasma physics as an independent autonomous group directed by Dr S.M. Hamberger. Plasma physics provides basic information for the possible utilisation of fusion processes which, in the years to come, may provide the world with a virtually inexhaustible source of energy. It is possible that our present initiative may become the basis for research and development in plasma physics as a national enterprise. Towards the end of the year it was possible to demonstrate the feasibility of utilising the output of the homopolar generator as an energy source for our latest plasma physics installation known as the LT4 Tokamak device. This equipment has been designed in order to carry out fundamental studies of high temperature plasma. The toroidal magnet of LT4 was energised for the first time using the homopolar generator and the initial tests proved to be highly successful. When fully operational it is confidently expected that temperatures of several million degrees will be obtained within LT4 as a
matter of routine. Later stages of development will be aimed at extending the range of attainable plasma conditions utilising most fully the large energy outputs available from the homopolar generator.

Successful production of radioactive isotope for medical diagnosis

A valuable cross-disciplinary enterprise during the year directly involved the Department of Nuclear Physics. An approach was made to the School by a group of medical practitioners and scientists to explore the possibility of utilising the facilities in the Department of Nuclear Physics for the production of a radio-active isotope Thallium-201. This material when injected into the body provides a means of rapid diagnosis of active myocardial infarction and is also extremely useful in the diagnosis of chronic coronary artery disease. The isotope has a relatively short half-life and at the present time is available in Australia at considerable cost by import from overseas. It has been established, using a beam of 26 MeV protons produced by the cyclotron in the Department of Nuclear Physics, that we can produce high purity sources of Thallium-201 with very small amounts of deleterious contaminants. A pilot study has been undertaken in conjunction with the Department of Nuclear Medicine at Canberra Hospital: useful amounts of Thallium-201 have been produced successfully, chemically separated and used in organ distribution studies and myocardial imaging in rats and sheep, and so our ability to produce this valuable diagnostic agent in Australia has been established. The University’s cyclotron is the only accelerator in Australia which is capable of producing Thallium-201 in useful amounts. The ways in which the cyclotron may be used for the production of this and other radio isotopes of medical importance are being explored.

Fibre optics and high speed communication systems

Work on fibre optics has been continued in the Department of Applied Mathematics. There is great interest in the development of optical fibres which are in effect highly flexible glass rods of very small diameter along which light rays may be propagated and so be used as the basis of very large capacity high speed communication systems. There is a need to understand the underlying theoretical nature of light wave propagation along these fibres so that they may be produced, installed and used in the most efficient way. The results of the theoretical studies of the members of the optical physics and visual sciences group of the Department of Applied Mathematics are embodied in a series of definitive reports to Telecom and provide a means of choosing optical fibres which will have optimum information-carrying capacity. It is interesting to know that the organs responsible for
reacting to light in the eyes of mammals and insects—the photoreceptors—also behave very much like tiny optical fibres. Thus the fundamental mechanisms on which vision is based are very similar to those involved in operation and performance of optical fibres.

Research School of Social Sciences

Theory and application
The foundations of social activity, and the problems to which social activity gives rise, are the concern of this Research School. The interests of the School 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 role of money in economic systems and policies
The work of the social scientist is very likely to arise from practical issues of the times. Thus for the Department of Economics, this year was marked by concentrations upon the links between money, spending and prices in the Australian economy. It was part of a new flowering (not only in Australia) of scholarly debate about the role of money in economic systems and policies and especially in the course and control of inflation.

What part does money play in transmitting economic fluctuations from abroad to Australian activity and prices? How do money markets—bond markets, share markets—work in terms of supplies and demands, interest rates, and exchange rates? Are interest rates and the volume of money primarily instruments, objectives or by-products of policy? In which respects can the effects of a budget deficit be offset by sales of bonds to the non-bank private sector or by the restriction of bank lending? How quickly—with what pattern of time-lags—does a rise in import or export prices show up in the shops? If the use of now idle resources were to increase, what would happen to the balance of payments? These questions are not new nor are their answers easy. Whether we like it or not, political decisions of great moment depend upon them.

During the year most of the staff of the small Department of Economics, with two distinguished visiting fellows, were engaged in varying degree on pieces of research relevant for this purpose, ranging from a major history and analysis of Australian monetary policy over the last two decades to, for example, an econometric paper on ‘the predictability of estimated relationships between alternative instruments and monetary aggregates’. In this research, theory, history and institutions must set the framework; econometric techniques often serve to bring together, or confront, the theories and the facts, insofar as both can be specified and observed in a statistical form.

Measuring the benefits of medicine and sanitation: an historical approach
In the Department of History, Dr F.B. Smith’s work on the social history of health and ill-health in Britain in the Victorian age is nearing completion for publication. It is conceived on a wider, more questioning scale than standard medical history, and as a survey that might encourage historians to study similar developments in Australia,
where British precedents have been normative.

The survey ranges from maternal mortality to the management of the old and infirm, and hinges upon measuring the benefit accruing from the huge investment in the medical profession and in sanitary improvement. In general, it is found that, apart from vaccination against smallpox, and anaesthesia, and antisepsis after 1880, medical science had little impact upon the health and life-chances of 19th-century people. Improved nutrition, better housing and working conditions probably achieved a great deal more. Similarly, despite a large investment in lying-in hospitals and obstetric training for doctors, maternal and infant mortality rates remained at an appallingly high level until the first decade of this century. The fall that then began was a consequence of diminution in family size resulting from contraception, which official medical opinion opposed, rather than from improvements in medical care.

Sanitary development has also been too readily accepted as lowering the death and morbidity rates. Dr Smith has shown that piped water and sewerage systems came to wealthy suburbs a generation before they were introduced among the poor. Indeed, the channelling of the refuse of the rich into the rivers which supplied water for the poor may have maintained the high typhoid, cholera, diphtheria and gastroenteritis rates among the latter.

Dr Smith concludes that the costs and benefits of health care and sanitary improvement were unequally allocated between classes, and that alternative forms of investment in nutrition, housing, water supply and health education might well have brought better health for the same amounts of money, and bequeathed more tractable problems of health policy to the 20th century.

Impact of science and technology on human life and society

One of the interests of the Department of Philosophy has continued to be the impact of science and technology on human life and human society, insofar as that raises moral, political and metaphysical issues. The Department has become an acknowledged centre for work in the new area of environmental ethics, the moral problems which arise out of man's dealings with inanimate nature. It has also explored the moral responsibility of the scientist, not only for the technological innovations which flow from his work but, more broadly, for the attitudes to life and society which the growth of the scientific attitude has encouraged. No less of concern to the Department are the political problems which arise out of the need to reconcile the traditions of academic freedom with the growing recognition of the risks inherent in scientific and technological development. These problems have particularly occupied the attention of Professor J. A. Passmore, who has been invited to advise a number of major American universities and institutions which are paying more and more attention to similar themes, and to be chairman of the section 'The mastering of scientific and technological progress' at the next World Congress on Philosophy.
Faculties

Faculty of Arts

Change and reassessment
Like other sectors of the University the Faculty of Arts has had, in a time of general constraint, to accept a changing complexion. Areas of new development, like the interdisciplinary Masters program in Modern European Studies and the program in Fine Art introduced in 1977, have attracted good student numbers.

A Chair of Ethnomusicology, to be funded for the first three years by the Institute for Aboriginal Studies, has been established in the Department of Prehistory and Anthropology. Other older areas of study, like classics, English, philosophy and political science, have suffered some decline. It has been possible to staff the areas of growth, but only at some expense: four departments—English, Political Science, Slavonic Languages and Sociology—have chairs which, because of financial restraints, cannot be filled.

With no major planned additions to the Faculty other than in Fine Art, where a proposal for a full department has been made to the Universities Council, development within the Faculty has become less a process of growth than of reassessment and, in some cases, redefinition. Two examples of this, at either end of the undergraduate program, are the identification of difficulties...
and the consequent changes to first year as the first intake from the ACT secondary colleges approaches, and a reassessment, in the light of changing student needs, of both the Masters qualifying and the Masters programs. There have also been in accordance with University procedures, reviews of the Departments of Germanic Languages, History, Philosophy and Slavonic Languages, as well as a Faculty review of the recently introduced Women’s Studies course. The departmental reviews have been intensive and the response to the reports is likely to result in substantial change, not only in the departments reviewed but across the Faculty.

Changes in composition of the Faculty

The Faculty has undergone two major changes in composition during the year, one of loss and one of gain. The Departments of Applied Mathematics and Pure Mathematics are assigned to the Faculty of Science from the beginning of 1978, as part of a process of rationalisation aimed at bringing together the two mathematics departments, Computer Science, and Statistics (which, whilst retaining membership of the Faculty of Economics, will become associated with the Faculty of Science). Units offered by these departments will of course remain accessible to students enrolled in the Faculty: indeed, Faculty has a policy of openness and allows units offered in the Faculties of Asian Studies, Economics and Science to make up a substantial part of an Arts degree. The Undergraduate Studies Committee in the Mathematical Sciences will remain in existence and is likely to be more genuinely inter-faculty than the Committees in the Humanities and the Social Sciences yet are, though these are already proving very effective in dealing with internal matters, i.e. course changes and approvals, and with some broader matters of policy.

The Faculty gains through the affiliation of the Humanities Research Centre with the Faculty. Relations have, of course, always been close but the affiliation should encourage greater interaction and cooperation between the Centre and the Faculty. In particular, the Centre is proposing to develop its interest in modern European studies and has indicated its willingness to assist with the planning and implementation of both postgraduate and undergraduate programs in this area.

Research interests

The research interests of the Faculty are as varied as is the composition of the Faculty. Most research is the work of individuals and most members of Faculty must meet the increasing demands on their time of intensive teaching methods, patterns of continuous assessment and extensive consultation processes, and still find the necessary blocks of time for work on their research projects. It was possible, in 1977, to free some members of Faculty of some or all of their teaching commitments for limited periods and to compensate the departments with part-time teaching help. Some assistance was also provided towards publication, either from the Faculty Publications Fund or by subsidy. The following examples are of course only representative of the Faculty’s research activity.

With some lightening of his teaching load, Dr A. Markus was able to complete his book, Fear and Hatred. Purifying Australia and California, 1850-1901. The study is undertaken from the perspective of the European settlers, with attention being placed on day to day reality. The evolution of attitudes in the general community is traced with the popular pressure for discriminatory legislation being examined in detail. The main body of the work focuses on the experience of Chinese immigration though attention is devoted to relations with other non-European groups.
The Head of the Department of Linguistics in the Faculty of Arts, Professor R. M. W. Dixon, with (left) Jarrmay and Marrji, two of the last speakers of an Australian language (Dyirbal) on which he has been doing extensive linguistic field work for the past fifteen years.

and also certain classes of European immigrants to determine whether treatment of one group influenced relations with other groups. A comparative study of California is undertaken to facilitate the identification of peculiar characteristics of the Australian experience.

Professor R.M.W. Dixon received some assistance from the Faculty in the form of a subsidy to Cambridge University Press, who are publishing his book *A Grammar of Yidip*. This, like his earlier book *The Dyirbal Language of North Queensland*, is a comprehensive account of an ancient, and now almost extinct, Australian Aboriginal language. But the two languages have striking and fundamental differences in each area of grammar (while still both belonging to the Australian language family). In the phonology, there is a preference for each word to consist of an even number of syllables, in order to satisfy the stress targets of *Yidip*. This and other special features of *Yidip* have a crucial bearing on several current theoretical inquiries into linguistic universals.

**Faculty Publications Fund**

The Faculty's Publications Fund was established in 1976 with the intention of making possible the publication of book-length works by members of Faculty which, though of scholarly distinction, are unlikely for one reason or another to be attractive to commercial presses or to the ANU Press. During this year the Faculty published *Readings in Social Research and the Life Cycle for Australia and New Zealand*, edited by O. F. Dent, P. Kringas and S. K. Mugford, a collection of research articles, mostly previously published, which examine such aspects of the life cycle in Australian and New Zealand society as demographic structures, socialisation, the work force, and class structure. The editors' intention is to make available for teaching purposes a range of information previously widely scattered, under one cover and in a form suitable for use with an existing introductory text. They plan also to update and revise the collection, in the light of teaching experience, before proceeding to a further edition.

A second book, M. D. Woolf's *The Concept of the Text*, which is now in press, comprises critical studies of a small number of poems by four major Italian lyric poets—Petrarch, Leopardi, Gozzano and Montale. These studies reflect a common method of analysis whose theoretical foundations are discussed in the final chapter. The thesis is that lyric poetry can be understood in the same way as any other form of expression, that is, that the logical conception of meaning has application here as elsewhere. Criteria for the appraisal of poetry, stemming naturally from these considerations, are also provided.
Faculty of Asian Studies

Faculty's role and function
Although 1977 was a year of financial constraint and reduced student intake, the Faculty maintained its level of enrolments relatively well, and was able to continue every significant area of its activities. It was also a year of uncertainty with two overriding concerns: the planning for a full review of the whole Faculty in 1978, and further consideration of the national role of the Faculty in the teaching of Asian languages in lesser demand. Faculty appointed a committee, which will report early in 1978, to look into the implications and possibilities of this role. Within its terms the teaching of Thai is already guaranteed until 1981.

The Faculty review is taking as its starting point internal reviews of the individual departments, and is to make a detailed examination of the structure and work of the Faculty.

There has been no fundamental change in the work of the Faculty and the areas of its concerns from 1976. The student enrolments for first degrees and the demand for the supervision of higher degrees all show that the Faculty is meeting a need in the community. In meeting this need the Faculty is well aware that its responsibilities are two-fold: by a vigorous research program, to add to the corpus of knowledge; and by effective teaching, to ensure that the study of Asian languages and cultures finds a place in general University education.

New developments in Religious Studies and Literary Arabic
There are, nevertheless, new developments which are worth noting. The unit, Religious Studies A, foreshadowed in the 1976 Report, had a successful first run. The cross-faculty arrangements necessary to administer it encountered no difficulties, and the results were encouraging enough to secure approval for a second unit, Religious Studies B, for 1978. If the present momentum is maintained, Religious Studies may look forward to establishing itself in the University within the next few years. Literary Arabic III was offered for the first time, thus making a new language major available in the Faculty.

Research on the Islamic education system
An important research project in the Faculty now beginning to take shape is represented by two concerns in the Department of Indonesian Languages and Literatures. One is Dr S. Soebardi's continuing study of the Islamic education system in West Java, with special reference to the religious formation and aspiration of students; the other is Professor A. H. Johns' work on local scholarship in Arabic at various centres of religious education in Malaysia and Indonesia which may provide a useful index of the integration of the various Muslim groups of the region within the broader community of Islam. Such studies may well supplement and even furnish a corrective to the work of social scientists.

Language course initiative meets community needs
Most significant is the year-long intensive course in Japanese which demanded careful planning throughout the year and is to be taught in 1978. Apart from its immediate, practical value, this course, made possible by generous grants from the Australia-Japan Foundation and the Japan Foundation, is an example of what a university or faculty at a time of no growth can do to meet the needs of a broader community than that of the
traditional intake of school leavers without detriment to academic standards.

Appreciation of support from other countries

There is one further trend in 1977 which requires both noting and an expression of appreciation. This is the interest shown by several Asian countries in encouraging and supporting the teaching of their languages and cultures. This support and encouragement has taken various forms: it includes the presentation of air tickets to Indonesia by the Indonesian Embassy to outstanding students taking courses at the University, the contribution of the Royal Thai Government to the teaching of Thai, the teacher exchange scheme of The People's Republic of China, and the award of an Egyptian Government scholarship to a student of the Department of Indonesian Languages and Literatures to study Arabic in Egypt for a year. Such support, and the international co-operation that it implies, is both a great help to the Faculty and a recognition of its aspirations: it is gratefully acknowledged.

Faculty of Economics

New enrolments and admissions policy

New enrolments in the Faculty fell by almost 30% during the year and re-enrolment percentages were also lower this year, with the result that the overall enrolment in the Economics degree was down by 9%. The Faculty office is exploring reasons for this
fall-off in student demand. Approaches have been made to the University’s Admissions Committee to consider a more flexible admissions policy so that reasonably qualified students are not excluded from admission in future years.

**Public Economics**
Given Professor Mathews’ involvement with the Centre for Research in Federal Financial Relations and his assistance to government, and because of several resignations, the Department of Accounting and Public Finance has been virtually depleted of staff in the area of Public Economics. Faculty has brought this situation to the attention of the Board of the School of General Studies, and has strongly recommended that a senior appointment in Public Economics should be made in the near future. It is felt that in the Canberra environment the study of the economics of the public sector should be given considerable importance.

**Econometric Research Group**
Faculty has approved in principle the establishment of an Econometric Research Group which it is hoped will support and stimulate applied econometric work. The aim is to encourage staff from several departments to work in a co-operative way on empirical testing of economic theories, and to enhance the teaching and project work of advanced undergraduates and postgraduates, a good many of whom are from the public service, by providing a more interesting, relevant and effective framework.

**Faculty rearrangements**
There have been a number of developments in the Faculty relating to affiliation of departments. In particular, the Department of Computer Science will become a member of the Faculty of Science and the Department of Statistics, whilst retaining membership of the Faculty of Economics, will become associated with the Faculty of Science. These moves are related to the planned closer association of mathematically-orientated departments within the School of General Studies. At the same time, the foundation Chair of Computer Science has been advertised.

Faculty is continuing to explore the place of the Master of Administrative Studies Program in the School of General Studies, and has implemented new rules for admission of students. At the moment a committee of the Board of the School is examining the future affiliation of the Program, which comprises prerequisite bridging courses, followed by a year of interdisciplinary studies which cover issues of policy analysis, and decision-making and implementation.

An acute problem arose with respect to future teaching of Law subjects to students in the Faculty of Economics. These students are mainly accounting students, and discussions between the Department of Accounting and Public Finance and the Deans of Economics and Law were successful in ensuring that new staff would be added to the Faculty of Law to lecture in these units.

At the beginning of the year the Faculty established the position of Associate Dean, and this move has proved to be of very great benefit to the efficient running of Faculty business. The Associate Dean has tended to specialise in student matters and in particular has served on the Graduate Degrees Committee. This assistance has enabled the Dean to concentrate on tasks associated with financial matters and general academic policy.

**Faculty library**
Faculty has approved in principle the notion of amalgamating the small departmental
libraries into a Faculty library and of building up a collection of economics statistics. A Faculty centre such as this would be of great benefit to staff and students, but space has yet to be found in the Copland Building to accommodate this venture.

Faculty of Law

Combined courses in favour
The Faculty's main concerns are the teaching of law for the degree of Bachelor of Laws (LLB), including the LLB with honours, and pursuing research into legal matters. The majority of students enrolling in the Faculty undertake combined courses; although this has had the effect of lengthening their enrolment, they emerge as graduates in two disciplines. The Arts/Law combination continues to be the most popular.

Host to AULSA conference
In August the Faculty was host to the Thirty-second Annual Conference of the Australasian Universities Law Schools Association. AULSA is the professional body of university law teachers and law librarians for Australia, New Zealand and Papua New Guinea. The objects of the Association include the furtherance of legal education, the encouragement of legal research, the maintenance of close relations between universities and the legal profession and cooperation with other bodies in the work of law reform. Twenty-three papers were given on various areas of the law, the plenary sessions being delivered by Professor R. Heuston of Trinity College, Dublin, who was a visiting fellow to the Faculty in 1977 and Mr Justice Brennan, President of the Administrative Appeals Tribunal.

Commemorative work on the Australian constitution
One major line of research pursued by a number of members of the Faculty came to fruition during the year with the publication of the commentaries written to commemorate Emeritus Professor G. Sawyer's retirement, *Commentaries on the Australian Constitution*. The book's editor was Professor L. R. Zines and he, Professor J. E. Richardson, Mr D. Pearce and Mr G. Lindell from the Faculty each contributed a chapter. Other chapters were written by authorities outside the Faculty.

Concerns for the Law Library
The Faculty is being faced with problems of accommodation. Shortage of staff offices has been solved temporarily by the loan of two rooms by the Faculty of Asian Studies. More harmful to the Faculty's interests is the fact that the Law Library which is of key importance to the Faculty's teaching and research programs, remains inadequate and its service is in danger of declining. During the year the library's loans to staff and students increased, as did the number of people using the library as a work place and as an educational resource. The number of students using the Law Library will increase as more students from the Faculty of Economics undertake law subjects either as part of their BEd degree or for professional accounting qualifications.

Increased use of the library presents staffing and space problems. This year the library was, for the first time for some years, fully staffed. It is understood that the staff numbers may be reduced from six to four in 1978. Such a drastic reduction will obviously result in a most unfortunate decline in
service in what is a growing and heavily used library. Further, the library is at present cramped for space, and it has a lower ratio of seats per users than other libraries in the University. A greater proportion of the library's holdings are in compactus shelving than elsewhere in the University. A comparison with other law school libraries in Australia shows the ANU library in an unsatisfactory light. Although it is marginally better off than those with the worst amenities, it is far less well provided for than those, particularly in the newer law schools, which have made or are making provision for more ample accommodation. If the Faculty is to maintain its position among the first rank of Australian law schools, its library facilities will need to be upgraded.

Faculty of Science

Effect of reductions in support staffing

For the Faculty of Science this has been a year of consolidation. Numbers of students and academic staff have changed little, but many departments have suffered reductions in their general staffing. This reduction in numbers of support staff has occurred rapidly because of financial constraints and so has resulted in many anomalies within departments. With time these will no doubt be resolved but short-term disruption to teaching and research has been experienced. To utilise its reduced general staff with the greatest efficiency, the Dean of the Faculty has established a committee to maximise collaboration between departments in the use of technical staff and equipment.

The numbers of postgraduate students have fallen slightly in many departments, no doubt due to the fewer scholarships available, and the Faculty has expressed concern that the combined effects of fewer general staff and fewer research students will inevitably affect the extent of research brought to completion. Methods of teaching and assessment have changed rapidly in recent years, often too rapidly for the full implications of changes to be fully appreciated. Many departments are now reassessing their programs in the light of experience gained.

Research on energy sources

Three departments in the Faculty of Science are involved in projects concerning energy sources. One such source is the nuclear fusion reactor, which is attractive because of its relative cleanliness and the cheapness of its fuel source. Among the problems associated with the development of fusion reactors are those of the interaction between the plasma energy source and the walls of the containing vessel. Some researchers believe this interaction may ultimately be the main problem in successful production of a sustained energy source. The interaction leads to erosion of the containing wall and, since this erosion is often in the form of ejection of foreign atoms into the fusion reactor plasma, the interaction can lead to quenching of the fusion reaction.

Several years ago, a facility to study the interaction between charged particles, similar to those in the reactor plasma, and solid surfaces was established in the Department of Physics by Dr R. J. MacDonald. Since then the group has engaged in an intensive study of the atomic physics involved in collisions between energetic particles and solid surfaces. The work has led the group into areas involving not only the fusion reactor problem, but also those associated with quantitative and qualitative analysis of sur-
The Tribhuvan Rajpath, the major north-south road link between Kathmandu and India, winds its way tortuously over "hills" 2000 metres high. The terrain is difficult but typical of the country where foresters with the Nepal-Australia Forestry Project, in which the University's Department of Forestry is involved, have been working with the Nepalese to establish trial plots and small plantations of eucalypts and indigenous tree species.

In the Department of Biochemistry, Dr G. D. Smith has initiated a project to study the production of hydrogen by blue-green algae. These organisms potentially provide an economic source of this attractive, gaseous fuel, as was recognised by the Australian Academy of Science in its report on Solar Energy Research.

In the Department of Forestry has for some years been involved, in association with the Australian Development Assistance Bureau, in a project in Nepal to increase the area of forested land. Most of the trees will eventually serve as fuel but during their growth also provide protection to the land and forage for livestock.

Research on parasitic worms

The parasitology group in the Department of Zoology is studying the host-parasite relationships involving all the major classes of parasitic worms, some of which are of great economic, as well as of veterinary and medical, importance in Australia. The biochemistry, physiology, immunology and pathology of the parasites are being studied. Significant results have been obtained in the elucidation of differences between metabolism of parasitic worms and their hosts, and in the nature of the hosts' immunologi-
Dr C. M. Bryant, Reader in Zoology, and Mr M. Sandeman, PhD scholar, taking a blood sample from a sheep infected with liver fluke. Dr Bryant and Dr M. J. Howell, Senior Lecturer in Zoology, are conducting research aimed at the control of liver fluke infestation, a major parasitic disease of sheep in Australia, which results in great financial loss to primary industry each year. Dr Bryant is working on new approaches to the design of drugs for treating intestinal worms; Dr Howell's studies concentrate on a better understanding of immunological responses. Their research is supported by the Australian Wool Corporation.

This research is being applied to problems of importance to primary industry and veterinary and medical parasitology. Progress is being made in chemotherapy, the nature of drug resistance in parasites, and the development of vaccines.
Centre for Resource and Environmental Studies (CRES)

Master of Environmental Studies course begins

The academic staff of the Centre remained at the same strength (12) in 1977 as in 1976, but there were more visiting fellows (6), and research assistant support was augmented by using outside funds. The first group of ten students began courses for the two-year full-time degree of Master of Environmental Studies. An important change during the year was the appointment of a bibliographer-librarian and the transfer of the CRES book collection to the Centre from the Life Sciences Library Building.

The research interests continue to be concentrated in three areas: resources (particularly minerals and energy), water quality modelling, and the ecology of man in cities. All sections are below optimum strength, a particularly unfortunate situation in relation to the Resources Group considering the vital and continuing national and international importance of resource developments and the absence of any other substantial academic groups examining their long-term implications.
Ecological studies of Hong Kong and Lae

In 1975 and 1976 the work of the Resources and Applied Systems Analysis Groups was briefly described; this year we feature the main activities of the Human Ecology Group. The work of this group has involved the development of a new conceptual approach to the study of interactions between human societies and the other components of the ecological systems of which they are a part, and the application of this conceptual approach to the study of human settlements and of various socio-environmental problems. The Group has just completed an ecological study of Hong Kong, and is now engaged in a study of the township of Lae and its hinterland in Papua New Guinea. Both these projects are part of UNESCO’s Man and the Biosphere (MAB) Program, Project Area No 11 (intergrated ecological studies of human settlements), the Hong Kong study being the first pilot project under the UNESCO program. Members of the Group are closely associated with MAB 11 projects in other parts of the world.

The field studies in Hong Kong and Papua New Guinea involve the integration of existing information from different areas of specialism, as well as the gathering of new data and collaborative work with a number of specialist groups in the respective countries and in Australia. Another feature of the MAB 11 program is that close interaction between research workers and decision-makers in government departments and agencies is deliberately promoted as part of the program.
Humanities Research Centre (HRC)

**Major seminars on translation**

It is now recognised that translation involves problems of central interest to literary criticism, linguistics and to certain areas of the social sciences, and the theme nominated by the Humanities Research Centre for this year was literary translation. Over half of the visiting fellows working in the Centre had interests in the theory and practice of translation; most of them had themselves published translations of foreign works of prose or poetry into English.

Three major seminars on translation were held throughout the year; one of these extended for a week, and two others for three days each. They were attended by a representative group of scholars from this and other Australian universities, and about 40 papers were delivered and discussed.

The seminars were concerned, broadly, with three aspects of the subject. The first is the nature of translation itself. To what extent is real translation possible? In an absolute sense it is impossible, because a poem like any work of art, is a unique creation, and it cannot be reproduced in any medium, for example in any words other than those in which it was written. Nevertheless translations exist, and theories of translation are concerned with the relationship of a translation on the one hand to the original work, on the other to the language and literary conventions of the new readers and with comparisons of the process of translation with that of original composition.

These general questions of the nature of translation led to the second aspect of translation discussed in the seminars—a consideration of the practical problems encountered in the translation of poetry, of drama for the stage, and of other works. The range of problems varies. While a translation of a poem must seek to preserve as many as possible of the qualities of the original, some would hold that the translation of a play should be primarily concerned with producing a good play in the new language, the relationship of the new work to the original being secondary. Different criteria again may be applied to the translation of a political speech, of official documents, or of a scientific treatise.

Thirdly, the seminars considered the use of translations in teaching. As the knowledge of foreign languages diminishes, it is becoming more important to devise means of bringing students into contact with other literatures, and translations used for this purpose must be judged on different standards from those applied to translations considered as works of literature in themselves.

North Australia Research Unit (NARU)

**Research, seminars and publications of special interest to the North**

In several important respects the position of the North Australia Research Unit at Darwin improved markedly during this year, at the end of which staff stood approximately at the planned level for 1975 (three academic, two research, four support), and although more support staff are sorely needed, both research and service functions of the Unit
The Field Director of the North Australia Research Unit, Dr F. H. Bauer, during a visit to Tipperary Station, Northern Territory in August 1977, as part of a NARU seminar on cropping in northern Australia. Inaugurating a series of major seminars on topics of relevance to the North, this four-day session took a deliberate look backward to explore reasons for the success or failure of some of the serious attempts at crop raising.

A major research project on tillage in North Australia has been actively prosecuted, utilising the services of a consultant and newly appointed postdoctoral fellow and research officer. Planning for a new program on natural hazards in the North is well advanced under the direction of a research fellow who joined the staff late in December. In 1978 this project will also benefit greatly from the presence of a senior Fulbright scholar who will develop a framework for the conduct of natural hazard research in the North. Other projects in which research has continued are the history of settlement in the Katherine-Darwin region and the history of the Overland Telegraph Line.

The organisation and hosting of major seminars on topics of relevance to the North was early established as a part of NARU’s brief. The series was inaugurated in August when over 60 persons with wide experience in matters concerning cultivated agriculture met in Darwin for a four-day session to discuss ‘Cropping in North Australia: anatomy of success and failure’. The Vice-Chancellor and Dr H. C. Coombs were among those present to hear papers and discussion. The proceedings of the seminar will be published early in 1978.

The initial year of the NARU Field Research Grant program which enables BA or BSc honours students to conduct field work in the North was also a marked success. Nine students from six departments of the
School of General Studies engaged in research on subjects ranging from the sociology of the Humpty Doo district to the relationships between harvester termites and cattle. The program will continue in 1978, when a limited number of the grants will be made to other than ANU students. The Unit's major publication, the North Australia Research Bulletin, made its appearance in September with an issue containing four articles on North Australian politics; four numbers annually are planned. Compilation of the third issue of the North Australia Research Directory has also been completed.

Benefits from new quarters
In February the Unit moved from quarters it had long occupied in the CSIRO Forest Research building at Berrimah into offices in the Australian Archives Repository in Nightcliff. The new quarters permit Unit staff to work together more effectively, while proximity to documentary materials required for its research undertakings is a distinct advantage. Demountable units at Naru Park have served as accommodation for an increasing number of visiting research workers. It is hoped to begin construction of permanent quarters in the 1979–81 triennium.

Centre for Continuing Education (CCE)

Diverse interest of search conferences
The Centre for Continuing Education recorded a very successful year for its local Continuing Education Program and, as a major academic activity, conducted a variety of residential workshops, search conferences, training courses and policy seminars in all States and Territories and contributed to others overseas. Search conferences—closely directed and planned studies in which all participants contribute to some formulation of guidelines, future purposes or recommendations—were again a prominent part of the Centre's own teaching effort in 1977, and these techniques were applied to good effect to problems as diverse as those presented by North Sea Oil and Gas and the peach industry in the Murrumbidgee Irrigation Area.

The Centre's work in Asia a special interest
Work with neighbouring countries in the Asian region has been a part of the Centre's brief since 1969 but an area only recently taken up in any substantial way. The Centre's international standing was reaffirmed by invitations to participate in overseas and international activities, not all of which it was possible to accept. Three members of the Centre assisted at ILO rural workshops in India arranged by the Centre's sister institution, the National Labour Institute, with which the Centre has been closely linked. Visits to Jawaharlal Nehru University for discussions and a seminar in April and October have established possibilities for some form of co-operation with its non-formal education unit which is to start in 1978. Co-operation with the UNESCO...
An intensive Vietnamese language course, administered by the Centre for Continuing Education, enabled two specialists, Mr Ron Atkinson and Mr Bill Dunning of the Australian Agricultural Consulting and Management Company, to obtain language training at short notice before leaving for Vietnam under an aid project sponsored by the Australian Development Assistance Bureau. They are seen here with CCE tutor, Mr Tran Minh Guong and (standing) Dr David Marr, Fellow in Pacific and South-East Asian History, who was largely responsible for developing the course.
Ms Ros Delaney, whose appointment in 1977 as coordinator of the LINK (learning information network) program, providing full information on all further education courses in the ACT, was jointly sponsored by the Centre for Continuing Education and the Department of Education.

Regional Office for Education in Asia has continued, and the Centre is now one of three Australian Associated Centres in the Asian Program of Educational Innovation for Development. During the year, the Director served as President of the Asian-South Pacific Bureau of Adult Education and convened a programmatic workshop for the East and South-East Asian Regions in Thailand which determined program priorities for the next five years. The Bureau’s Courier Service, edited and produced within the Centre for Continuing Education, has proved successful in establishing a network of Asian scholars and practitioners, and was highly praised at an international editors’ workshop in Tehran. These developments are assisted by the Director’s position as Chairman of the Australian UNESCO Commission’s Education Committee, which in turn enhances the Centre’s capacity to foster understanding of Asian educational developments within Australia.

Office for Research in Academic Methods (ORAM)

**ANU Student Performance and Progress Study**

This Study, jointly directed by Dr D. J. Bennett of ORAM and Mr G.W. Mortimore of the University Counselling Centre’s Part-time Studies Unit, is designed to explore the effects of institutional factors on student performance and progress, including both academic aspects such as course planning, assessment methods and attitudes of teaching staff, and non-academic aspects such as accommodation and financial provisions, counselling facilities, and the demands of employers, families and other interests which may conflict with those of study.

The design of the Study has therefore been dictated by two considerations: first, the need to inquire whether the University’s institutional arrangements have adversely affected study progress and performance; second, the need to develop a continuing system of data collection and analysis that will give ready access to specific information required by particular faculties, departments or individuals.

All enrolling students are asked to complete a ‘Study and Career Information Sheet’, which yields information about career objectives, background, and similar
sociological questions. This information is combined with academic record data from the University's student record sheets on a confidential computer file. Questionnaire surveys of withdrawing students have been carried out at various stages during the academic year, and there has been a limited interview and case study program of some withdrawing students and a matched sample of continuing students.

The Study began to yield organised data towards the end of 1976, and since October of that year six reports have been produced for discussion with a group called by the Vice-Chancellor.

With the object of supplying the University with a constant index to the relationship between its provisions for students and the changes in student needs and expectations, it is proposed that there will be a continual input of data collected by the methods which have been developed. The progress of the Study during 1977 indicates that it has potential utility for planning at both academic and administrative levels.

Survey Research Centre (SRC)

New lines of communication between social scientists
During this year the Survey Research Centre started to implement a program designed to facilitate the lines of communication between social scientists in Australia. This program is a logical development from the establishment in 1976 of the Australian Consortium for Social and Political Research Incorporated (ACSPRI) with its secretariat located in the Centre.

Part of the program is bibliographical in nature and involves the compilation of two research directories of Australian surveys. They will be published in book form and the information stored on a computer for ease of updating the access. The first is based on extracts from social science journals and the second (the Inventory of Australian Surveys) is a more detailed summary of all recent and ongoing surveys for which information can be located.

The second part of the program involves the acquisition of important Australian social science data sets for the ACSPRI archive. Data collected from surveys often has a potential for analysis way beyond that which is carried out at the time. Because of the large costs involved in conducting surveys, it is far more economical if researchers are able to re-use existing data. It is for this reason that the archive is being developed.

At present, ACSPRI is dependent on the Inter-university Consortium for Political and Social Research at the University of Michigan for certain data maintenance facilities. It is hoped that eventually it will have the funds and personnel to carry out the normal activities of a national social science archive.
NHMRC Social Psychiatry Research Unit

Studies of psychiatric illness and coronary heart disease
In the third year of its operation, with a scientific staff of seven, the National Health and Medical Research Council Social Psychiatry Research Unit has undertaken a large study of psychiatric illness in the adult population. An attempt is being made to identify some of the causes in the social environment for psychiatric disorders, particularly depression and morbid anxiety, and how these might be modified. This work represents a substantial contribution to psychiatric epidemiology and may provide a new framework for treatment and prevention. It is particularly relevant to urban living conditions in times of rapid social change.

Two of the staff are also engaged in a study of behavioural factors in coronary heart disease, how these are related to its cause and to the individual's ability to adjust to having had a heart attack.
Full re-examination of the use of Library space
For the Library, this has been a year of consolidation and reappraisal in the context of the prevailing economic climate. The prospects for a projected new Library building for the research collections in the social sciences and humanities receded when the guidelines for higher education funding were announced by the Minister for Education in the middle of the year. The proposed building would have constituted a fourth major library building on the campus (in addition to the R. G. Menzies, J. B. Chifley and Life Sciences Library Buildings) and would have necessitated considerable additional staffing and some duplication of resources. The Library has decided, therefore, in consultation with the Vice-Chancellor and the Library Committee, to re-examine in 1978 the whole question of Library space, with particular reference to a possible extension to the Menzies Library and the transfer of certain collections to the Life Sciences Library. Such questions have assumed pressing importance following the location of the University's language laboratories in the basement of the J. B. Chifley Building. The allocation of the basement of the A.D. Hope Building for library use is only a temporary solution and, since it is yet another library building, one which involves considerable extra staffing costs.

Forward planning study
In this context the Vice-Chancellor in September requested the University Librarian to undertake a study of the problems of forward planning of university libraries, with particular reference to the planning and development of the Australian National University Library. This research into such questions as book storage, national loan policy and information retrieval is expected to have significant bearing on the future development of the Library system. The University Librarian will also be analysing and reporting on similar developments within Australia and overseas. As a result of these arrangements the administration of the Library is now the responsibility of the Deputy Librarian.

New organisational pattern
In general terms 1977 has seen the consolidation of the Divisional structure. All Divisions now have their full complement of Divisional and Assistant Divisional Librarians except for the Social Sciences and Humanities Divisions, for which an appointment is expected in 1978. Collection building statements are being drawn up in all Divisions to reflect this new organisational pattern and to link more rationally the future development and location of collections to the existing pattern of buildings.

High cost of library materials
The Library was able to meet nearly all of its requests for monographs and serials in 1977; but the picture will be much gloomier in 1978, when there will be no increase in the financial allocation to the Library, while the cost of required scientific serials is increasing by 25% annually. Further reduction of serial subscriptions will be inevitable and, while economies can be borne for a short period, the Library's ability to service research and teaching will deteriorate unless increased financial assistance to the Library can be made available.

Progress has been made in the field of automation. The automated catalogue program has now been established on a regular production basis and coverage will be extended to Social Sciences and Humanities material in 1978. The decision was taken to move to COM (Computer Output Microform) fiche catalogues for financial and technical reasons and to this end special fiche
The University Library has introduced an automated catalogue program and Computer Output Microform (COM) fiche catalogue equipment has been installed in the main library centres. Mrs Mary Pollard of the Library reference staff is seen using the microfiche catalogue in the R. G. Menzies Building.

equipment will be installed early in 1978 in all libraries of the system. Considerable work has also been undertaken on the development of the automated circulation system, which is based on the University of Western Australia 'LOANLY' system. It is hoped to introduce the system in the Life Sciences Library late in 1978. Such automated developments ultimately will allow access to central records from any service point within the University Library system, which should prove of immeasurable benefit to users in what is, for historical reasons, a somewhat over decentralised system.

More communication with Library users
The Library has also recognised the need to communicate more effectively its developments and decisions to its clientele. New liaison committees have been or will be set up with the Research Schools of Pacific Studies and Social Sciences, the Faculty of Arts, Science users and the Students’ Association. Library Information Sheets are now issued on a regular basis, while the full Library Committee meets more frequently than it has done in the past. Communication is costly in staff terms but is even more important in times of economic stringency in order to explain more effectively where and why cuts have to be made.
Other University Activities

Computer Services Centre

During the year the staff of the Australian National University Computer Centre were divided into a Computer Services Centre and an academic Computing Research Group whose future has still to be determined.

The Computer Services Centre is responsible for the provision of general computer services to the University and the presentation of lecture courses, seminars, and colloquia on various aspects of computing. The Centre’s staff is available to assist members of the University in the planning and execution of computing projects.

The main service offered by the Centre is based on the use of a Univac 1100/42 computer. Remote access facilities are being provided by means of a campus network controlled by a PDP-11/45 computer which acts as a front-end processor to the Univac 1100/42. The Centre makes available an extensive library of language processors, applications packages, and sub-routines, and provides on-line documentation and consultative services in support. The major computing language is FORTRAN, but use of others is growing especially for Computer Science teaching, and for special activities such as Simulation. Computing facilities are available to all staff and research students of the University subject only to approval by the head of the user’s department. Projects which are in receipt of external funding are charged for computer time used.

Instructional Resources Unit (IRU)

The Instructional Resources Unit continues to have as its main objective the provision of audio-visual facilities and resources to increase the effectiveness of teaching and learning within the University.

Details of the services available from the Unit were published in the handbook issued to all departments and section heads in August. This internal publication coming at a time when many areas of the University have had to make reductions in the range of services available within departments, resulted in an increasingly high level of activity for the centralised facilities of IRU.

During the year the language laboratories, previously in two separate locations, were relocated with Media Services within the basement area of the J.B. Chifley Building. This move has enabled considerable savings to be made in the cost of replacement equipment and the closeness of the new language centre to the audio-visual area of the Chifley Library gives easy access to private study facilities.

Australian National University Press

In 1977 the Press published 30 new titles and distributed 26 titles on behalf of departments of the University. Six important books were held up by delays at the printers and will now be released in 1978.

During the year the Director attended the
London and Frankfurt Book Fairs and visited the leading university presses in the United States. Rights or options for more than 50 titles were bought or sold. Distributors were appointed for North America and for Britain and Europe. These arrangements will ensure that the Press' publications will now be readily available in the major literary market places of the world.

Among the most successful books were Dr S.A. FitzGerald's Convocation lectures which were published in November in paperback format under the title *China and the World*. More than two-thirds of the edition was sold on publication.

University House

Throughout the year University House continued to serve both the University and the Canberra community in its several roles: as a residence for academic visitors, for University staff, and for postgraduate students; as a centre for conferences and seminars, for cultural and social functions, and for Convocation activities which have brought many former members of the University back on campus; and as a club for graduate members of the University and for graduates of other universities living in Canberra. Membership continued to be about 1500 and includes present and past members of the University, politicians and public servants, professional men and women, and members of the diplomatic corps.

During the year the House accommodated on average 80 permanent residents, of whom half were postgraduate students. The House arranged 99 conferences in 1977 for academic bodies, government departments, and other organisations. The income from these conferences, from functions and the various trading activities, contributed sufficiently to balance the continuing cost increases, and enabled the House to maintain its tariffs and subscriptions at the January 1976 level throughout this year, with the sole exception of a 5% increase in North Wing room tariffs.

Supported by a grant from the Music Board of the Australia Council, University House sponsored twelve public concerts, with a total attendance of about 1000 people.

University Counselling Centre

Over the past few years there has been a gradual but clear tendency for the four units which comprise the University Counselling Centre to assume greater control over, and responsibility for, their own specialised services to students. During the year this tendency continued and was officially recognised in the recommendations of the Counselling Centre Review Committee, which met throughout the year. Its work involved counsellors in a year-long appraisal of the level and effectiveness of their services to students. The severe budget restrictions, which are projected for 1978 and which threaten the continuance of some important developments made in 1977, will require a
continuous internal review of the Centre's resources, staffing and methods of delivery of student services throughout 1978.

Significant developments during this year included considerable expansion of the Information Centre/Careers Library in the Careers and Appointments unit; extension of the area of responsibility of the Part-time Studies Unit to cover mature students, many of whose concerns and interests coincide with those of part-time students; participation by staff of the Counselling Unit in a range of academic and community activities; establishment of closer links with ACT schools and colleges through the expanded role of the Schools Liaison Committee and through the work of Communication and Study Skills Unit staff in in-service programs for teachers and consultancy on curriculum development; and continued development of the joint Student Performance and Progress Study by the Part-time Studies Unit and ORAM.

University Health Service

The number of medical consultations in the University Health centre has remained constant over the past three years at about 9300, out of a total student population in the region of 6000, giving a doctor-student ratio of about 1:3000. In addition there have been numerous unrecorded contacts between students, nursing sisters and a physiotherapist for the treatment of minor illnesses and injuries and for health counselling.

A Health Service Review Group appointed by the Vice-Chancellor endorsed the philosophy of the preventative approach to health care and recommended the development of more comprehensive facilities for health education.

In the face of limited economic resources, encouragement of a policy of personal responsibility for health, together with peer group support may be seen as rational alternatives to depending on traditional medical treatment. The success of this approach has become apparent through the development of a health promotion program, including practical advice on nutrition, exercise testing and prescribing and instruction in relaxation techniques. Information on this program has been available mainly to students, but to a limited extent also to staff members and outside groups, including members of the Health and Welfare Committee of Parliament.

University Union

The University Union, a community centre for students and staff, saw a number of changes during the year. First, the new student Board of Management took a greater interest in the running of the Union by deciding to appoint a full-time chairman and to introduce changes in the categories of membership by including students from the School of Music, the Canberra School of Art and other tertiary bodies. The extension of membership is intended to widen the cultural perspective of the Union.

Second, the Board undertook to complete the renovations of the previous year and to
alter the upstairs bar lounge area. This had the effect of bringing large numbers of student members back into the Union as a social and cultural centre on campus.

Third, whilst the Union ended the financial year on a sound footing, the Board undertook reviews of the Union's administration, bar and refectory facilities with a view to further reducing unnecessary costs in these areas. The main recommendation brought forward was to abolish the position of Deputy Secretary. At first such actions by the Board were unpopular, but have clearly produced benefits.

ANU Students’ Association

During 1977 the Association was much concerned with the effects of the reduction in effective spending which stemmed from the government's guidelines for educational expenditure.

The year saw a change of emphasis for the Association with the establishment of a low-cost food co-operative, the institution of a program of lunch-time theatre and music and an increase in spending on clubs and societies. There was also an increased commitment to the student-originated Radio Station 2xx and its transition from being a student-run station to an independent community facility.

The student self-employment group, CHAPS (Children's Holiday Activities Program by Students) received official support from the Association and three successful programs were run.

'The Cottage', a refuge for students under stress, managed and staffed by a student collective, again proved that it had an important role to play within the community. The work of the collective received commendation both on and off campus, and 'The Cottage' gained recognition from courts and government agencies as a refuge.

The more established activities of the Association—support for the Parents-on-Campus Creche; Childers Street Theatre; publication of Woroni; the maintenance of low-cost accommodation at Lennox House, were all continued, and during Bush Week $2500 was raised for local charity.

The level and quality of debate at general meetings of the Association remained low.

The Association had to spend considerable time in defending itself against what it saw as important challenges to its existing level of autonomy. On July 8 the Council of the University was presented with recommendations that proposed a change in the way in which the fees for compulsory membership of the various student bodies were collected and disbursed and that power to grant a student exemption from membership of such bodies should be given to a delegate of the Council who would operate without consultation. In the opinion of the Association and other student bodies these proposals would have weakened the position of student bodies to fix fee levels. The Association was fearful that the proposed arrangements would therefore threaten its ability to guarantee funds for affiliated clubs and societies and to maintain the effective independence of action by those clubs. Students strongly opposed those recommendations. University Council was sensitive to this opposition and reaffirmed its belief in the maintenance of effective student bodies within the University and its belief
that they should have as much autonomy as possible and that compulsory membership was essential to their viability.

The approved constitution of the Students' Association allows members to contest the Association's policies, including its right to make payments to bodies outside the Association. During the year a student who was a member of the Australian Liberal Students Federation challenged payments by the Students' Association to the Australian Union of Students (AUS) and challenged the AUS with respect to payments they had made. The student also challenged other payments made by the Association in 1976 and 1977 as being beyond the powers of the Association. His challenge has now become a legal one and remains as yet undetermined.

The Association continues to represent its members both individually and collectively within the University, particularly in the maintenance of student housing provisions and the reassessment of university student fees. This year saw a major realignment of objectives for the Association to meet the changing mood of its members, and the Association will continue to attempt to represent its members as an essential component of University life.

ANU Research Students' Association

This year was a particularly busy one for the Association and its executive. Transactions with the Registrar of Companies were completed and, with appropriate amendments to its constitution, the Association became an incorporated body; this arrangement will give the Association greater freedom of operation.

There was considerable concern amongst students during the year about the erosion in the real value of stipends and allowances due to the continuing rapid increase in the cost of living. The imposition of a limit on supplementation by the Government meant that, once the limit had been taken up, the question of further increases was no longer in the hands of the University. The last Federal Budget increased the amounts of the Commonwealth Postgraduate Research Awards to take effect in the new year, and this increase has been passed on to university award and scholarship holders. Cost of living increases, however, continue to outstrip the real value of increases in stipends.

The Association prepared a detailed submission to the committee appointed by Government to investigate the question of student finance by means of loans. The submission advanced a number of arguments against total or partial replacement of awards and grants by loans. The Government took no action on this matter in the last budget.

Following the rent increases introduced by the University during the year, extensive discussions were held between the executive and the administration concerning rental accommodation. As a result, the Association carried out a questionnaire survey to examine the need for material improvements in housing accommodation. A report on this survey will be completed early in 1978.

Other matters in which the Association was involved during the year included clarification of the Medibank provisions for students, consultation with the University administration on academic matters, and the continued operation of the Family Day-care Centre and the RSA Emergency Welfare Fund.
The recently completed Sports Recreation Centre, fully financed by members of the University Sports Union, will accommodate sporting events conducted at international standard as well as providing for a very wide range of physical recreation and leisure activities.

The new Sports Recreation Hall and a link between the Hall and the squash courts, comprising stages 2 and 3 of the University Sports Union complex, were completed this year. These projects are worthy of special note as the funding for their construction will be met by members of the Sports Union.

The development of these areas will permit the Sports Union to offer a wider range of sports and physical recreation activities to students and staff of the University alike, and thus be of considerable benefit to the University generally.

Although the construction of these facilities has placed an additional financial responsibility on its members, the Sports Union continues to meet heavy demands for its activities and the expenditure this involves. Additional staff have been employed to cater for the special needs and interests of members and in the year ahead several new ventures intended to complement the Sports Union’s existing facilities and activities are to be considered.

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Site and Buildings

Elimination of a major building program for the 1976–78 triennium left the University with no large buildings in train or completed during 1977. Accommodation shortages resulted.

Within a modest minor works capital program it proved possible to convert the shelled lower ground floor of the A. D. Hope Building for use by the Library. The undercroft of the R.G. Menzies Building was enclosed to meet further the needs of the Library. In the lower ground floor of the J. B. Chifley Building the previously scattered language laboratories and support services were consolidated as part of the Instructional Resources Unit. Work began on an extension of the electron microscope laboratory of the Research School of Biological Sciences. Temporary accommodation was provided for the North Australia Research Unit at Naru Park, Darwin.

The Arts Centre was brought into limited use early in the year and arrangements made for the remainder of the building to be completed to a usable if somewhat spartan standard.

Construction of the Molonglo Arterial, including the Acton Saddle Tunnel section passing through the campus, started at the beginning of the year.

The Sports Union provided funds for construction of a major indoor sports facility and the Union financed the completion for refectory purposes of an undercroft and an extension for recreation and storage.
Degrees conferred

Bachelor of Arts

Abbey, D. R.                        Clark, E. V.                        Gan, S. L.                        Johnson, L. F.
Abrahmsen, S. G.                    Clark, P. A.                        Ghazali, M. A.                    Johnston, J. A.
Ahmet, S.                           Clarke, H. R.                        Gibson, J. R.                    Johnston, S. E.
Amos, R. W.                         Clewley, K. R.                      Giles, T. S. E.                  Jones, G. E.
Arber, P. A.                        Colia, M. T.                        Gillespie, J. C.                 Kapiris, M. J.
Baksh, Z.                           Collett, L. D.                       Glajz, J.                        Keal, M. E.
Ball, V. L.                          Condon, J. E.                       Green, A. J.                     Keating, R. W.
Ballard, V. M.                      Conrick, R. J.                      Greenup, J. A.                   Keely, J. M.
Banson, C. J.                       Conroy, A. M.                       Grundy, M. T.                    Kershaw, J. S.
Barber, H. C. E.                    Cooze, C. M.                        Hall, C. J.                      Kiek, E. J.
Barton, Y. M.                       Cornish, M. A.                      Halstead, B. A.                  Kilsby, D. J.
Baxendell, N. C.                    Cosford, V. L.                      Hammond, B. B.                  Kopetko, S. G.
Beattie, C. E.                      Coulter, B. R.                      Hansen, B. J.                    Kurtz, V. J.
Beattie, K. R.                      Crowe, R. L.                        Hansen, I. A.                    Lamb, N. J.
Belle, C. D.                        Cruden, J. F.                       Haritos, A. E.                   Langham, H. A.
Bennetts, M. F.                     Dallas, P. L.                       Harris, J. H.                    Langham, R. A.
Bergersen, F. R.                    Daly, C. V. P.                      Harris, M. R.                    Lawson, R. L.
Black, A. J.                        Davidson, E. J.                     Hartstein, D. B.                 Lay, K. P.
Black, P. R.                        Davies, E. A.                       Hartwig, L. A.                   Leeson, G. C.
Blackburn, J. S.                    Davis, B. J.                         Hauff, P. A. C.                  Lewis, W. A.
Bloomfield, G. K.                   Davis, I. R.                         Hearne, A.                       Lindsay, J.
Body, C. M.                         Dawkins, S. J. B.                  Henne, K. C.                      Lines, S. E.
Bolton, M. W.                      Denburg, J. D.                      Hill, A. H.                      Lloyd, A. M.
Boundy, C. A. G.                    Dewar, D. H.                         Hobson, P.                       Lolicato, J. M.
Bozic, M. I.                        Dooley, G. M. A.                     Hocking, A.                      Lombard, G. W.
Brabin, N. L.                       Downie, D. B.                       Holwell, M. A.                   Lowth, T. S.
Brown, E. C.                        Doyle, S. G.                        Hone, M. E.                      MacCann, T. J.
Brown, J. G.                        Dredge, R. G.                       Hopkins, C. A.                   MacDonagh, M. C.
Brown, T.                           Durston, J. E.                       Hudson, J. M.                    MacDonagh, O. G. H.
Bruce, A. F.                        Dyson, B. J.                        Hulands, D. A.                   McDonald, J. G.
Bulbeck, F. D. D.                   Eade, J. D. J.                       Hume, P. M.                      McDonald, S. C.
Burgess, A. D.                      Easter, D.                           Hunt, J. M.                      McDonnell, D. A. W.
Bylo, R. J.                         Edwards, J. M.                      Hurley, A. C.                    McEwan, C. T.
Calaby, D.                           Elder, R. J.                         Huxley, S. P.                    McGregor, W. B.
Callaghan, D. N.                    Farrelly, M. E.                      Ind, L. M.                        McKay, W. C.
Callan, D.                           Feldman, P. M. V.                    Ippoliti, C. A.                   McLeod, J. M.
Campbell, C. A.                      Ferguson, D. J.                     Irwin, R. E.                      McPetrie, S.
Carberry, M. J.                     Field, R. L.                         Isbel, J. M.                      McRae, I. S.
Carmody, M. G. J.                   Fileul, R. L.                        Jackson, B. J.                   Madden, J. S.
Carpenter, P. N.                    Fisher, G. C.                        Jackson, L. M.                   Madsen, K. D.
Carter, J. D.                       Fitzpatrick, F. M.                   Jacobs, A. P.                    Mandle, C. S.
Carter, R. C.                        French, N. K.                        James, B. P.                     Marcus, W. J.
Casson, W. J.                       Frewin, E. F.                        Jasper, M. R.                    Marjoram, J. D.
Cayzer, L. C.                       Fuary, M. M.                         Jockel, P. M.                     Marshall, J.
Chedorowski, J. F.                  Game, A. M.                         Johnson, C. R.                   Masinello, S. G.

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<td>Wallensky, E. P.</td>
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### Bachelor of Laws

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### Master of Laws

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### Bachelor of Science

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Bachelor of Science degree with honours

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Master of Science

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Cook, M. G.  Huenek, K.  Muller, V. J.  Yang, F. Y.
Davoren, P. J.  Kanchanabarangura, C.  O'Brien, B.  Zeenat, U.N.
Forsyth, P. A.  Konovalov, C. A.  Revora, H. L.

Bachelor of Science (Forestry)

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Baker, L. R.  Chuk, M.  Jurskis, V. P.  Roberts, E. R.
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Bachelor of Science (Forestry) degree with honours

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<td>Dick, H. W.</td>
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<td>Pickard, D. K.</td>
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<td>Pollacco, E. C.</td>
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<td>Williams, I. S.</td>
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<td>P proudfoot, I. M.</td>
<td>Wilson, A. C.</td>
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Prizewinners

The University Medal
Linda Andrus Zoology
Rosina Braidotti Philosophy
Barry John Gleeson Pure Mathematics
Iain Murray Johnstone Pure Mathematics/Statistics
Margaret Veronica Sampson History
Graeme Hayward Smith Physics
Leonie Rae Stickland Japanese
A.N. Hambly Prize
Carol Ann Soloff

The Alliance Française de Canberra Prizes
Rene Thea Melman French Language & Literature I
Liselotte Andree Kanis French Language & Literature II (shared)
Keith Calder Chaffey French Language & Literature III

The Ampol Prize for Geology
Gary Russell Mangold

The Australian-American Association Prize for American Studies
Vicki Robin Shepherd (shared)

Australian Capital Territory Bar Association Prize
Geoffrey Gray

The Australian Computer Society Prize
Geoffrey Ian Huston

The Australian Federation of University Women—Australian Capital Territory Prize
Leonie Raw Stickland

Australian Institute of Physics Prize
Chris Michael McElhinny

The Australian Psychological Society Prize
Kathleen Anne Firestone

Australian Society of Accountants' Prize
Ian Edward Davidson

The B.C. Meagher Prize for Commonwealth Constitutional Law
Geoffrey Gray

The Botany Prize
Jennifer Lynne Barnes Botany Aot

The CSR Chemicals Prize
David Alwyn Charles Evans

The Commonwealth Forestry Bureau Book Prize
Kenneth Harold Nethercott

Dante Alighieri Society (Canberra Branch) Prizes
Miriam Lucy Gani Italian I
Catherine Anne Doherty Italian II (shared)
Jose Rafael Ramiro Pintos-Lopez Italian III

Joan Constance Longmore Italian III

Daphne Olive Memorial Prize in Jurisprudence
Phillipa Christine Weeks

The E. A. Lyall Memorial Prize
David John Ellerman

The Economic Society of Australia and New Zealand (Canberra Branch) Prizes
Colin Ross McKenzie Economics II
Douglas Francis McTaggart Economics IV

The Freehill, Hollingdale and Page Prize for Commercial Studies
Lee John Wallace Aitken

Geological Society of Australia Prize
Ian James Ferguson

George Knowles Memorial Prize
Ian Robert Johnson

The Goethe Society Prizes
Francesca Mary Beddie German Language & Literature I (shared)
Rene Thea Melman German Language & Literature II (shared)
Mark John Durie German Language & Literature III (shared)
Gerardus Theodorus Petrus Van Dooren German Language & Literature IV (shared)
Patricia Hackett German Language & Literature III

The Hanna Neumann Prizes for Pure Mathematics
Bryan Beresford-Smith Pure Mathematics (Honours) (shared)
Nicholas Piers Buchdahl Pure Mathematics (Honours) (shared)
Barry John Gleeson Pure Mathematics IV

Institute of Advanced Studies Prizes for Economic History
Warren John McCann Economic History III
Gregory Fook Hin Seow Economic History IV

J. G. Crawford Prizes
Gary Stewart Da Costa
Howard William Dick

The L. D. Pryor Prize
Sandra Pullen Botany Group C unit/s

The Lady Isaacs' Prize
Jennifer Ruth Gleeson (shared)
Pamela Margaret Van der Sprengel (shared)

The Law Society of the Australian Capital Territory Prize for Contracts
Thomas Alured De Laune Faunce

The Leslie Holdsworth Allen Memorial Prize
David Thomas Sampson
Gordon William Turnbull (shared)

70
Marie Halford Memorial Prize
Catriona Alice MacKenzie Walton

Permanent Trustee Company (Canberra)

Limited Prizes
Peter Charles Achterstraat  
Lee John Wallace Aitken  
Robert Leslie Arden  

Priscilla Fairfield Bok Prize
Alison Margaret Leitch

The Professional Officers’ Association Prizes
Ian James Ferguson  Geology
Michael Charles Brewster Ashley  Mathematics

Rachel Dorph Memorial Prize
David Roy Braddon-Mitchell  
Catriona Alice MacKenzie Walton  

The Ramsay Prize
Sandra Pullen

The Royal Australian Chemical Institute Prize
Charles Graham Young

The Scandinavian-Australian Society Prizes
Andrew Colin Byrnes  Icelandic IA
Mark John Durie  Icelandic IB

Schlich Memorial Trust Prize
Jerome Klaas Vanclay

The Shell Company Prizes
Nicholas Philip Warner  Science
Michael Gerard Rombouts  Economics

The Statistical Society of Australia (Canberra)

Prize
Peter John McBurney  2nd year Statistics
Colin Ross McKenzie  units (shared)
John William De Ravin  3rd year Statistics units (Honours)

The Supreme Court Judges’ Prize
Vincent Thomas Robinson

The Timbind Utilisation Prize
Kenneth Harold Nethercott

The Trustees Executors (Canberra) Limited

Prize
Peter William Hopkins

United Commercial Travellers’ Association Prize
Ian Edward Davidson

The W. B. Clarke Prize in Geology
Robyn Margaret Johnston
University public lectures

Single Public Lectures
Prof. R. Keesing
Anthropological illusions and the tribal world 9 March
Prof. H. Schwarz
China in central Asia 16 March
Prof. S. Rose
Biology or ideology: science or biosociology? 4 May
Prof. Yuan-Li Wu
Economic prospects of the Western Pacific: a view from America 13 July
Sir Edward Bullard
Nuclear Power: the Faustian bargain? 23 August

1977 University Lectures
Prof. O. MacDonagh
Ireland and England: past and present. Time's Re­venges and Revenge's Time 1 June
Patterns of Thought and Deed 8 June
The Grooves of Change 15 June

Human Rights series
Prof. E. Kamenka
Human rights: the progress of an idea 20 July
Senator E. McCarthy
Human rights and the conduct of foreign policy 27 July
Prof. N. Glazer
Human rights vs group rights: the future of affirmative discrimination 3 August
Prof. R. F. V. Houston
Human rights under the Irish Constitution 10 August

1977 Yencken Memorial Lectures
Dr S. FitzGerald
China and world politics
Chinese World Views 20 April
China, the United States and the Soviet Union 21 April

1977 Morrison Lecture
Prof. R. Hofheinz
People, places and politics in Modern China 17 August

Inaugural Stan Kelly Memorial Lecture
Sir John Crawford
Some problems of freer trade: Australia under pressure 6 September

1977 John Curtin Memorial Lecture
Mr T. Fitzgerald
An education for Labor leadership: the case of Curtin 28 September
Senior staff appointments and promotions

**Institute of Advanced Studies**

Dr C. M. Bell  
*Senior Research Fellow in International Relations*, formerly *Professor of International Relations*, Sussex University.

Dr A. D. Blest  
*Senior Research Fellow in Neurobiology*, formerly *Senior Lecturer in Zoology*, University of Canterbury.

Dr J. M. Bowler  
*Senior Fellow in Biogeography and Geomorphology*, formerly *Fellow*.

Dr G. D. Clarke-Walker  
*Senior Fellow in Genetics*, formerly *Fellow*.

Professor J. H. Coates  
*Professor of Mathematics and Head of Department*, formerly *Associate Professor*, Stanford University.

Dr H. Cohn  
*Senior Research Fellow in Statistics*, formerly *Research Fellow*.

Mr W. A. Coppel  
*Professorial Fellow in Mathematics*, formerly *Senior Fellow*.

Dr R. W. Crompton  
*Professorial Fellow in Electron and Ion Diffusion Unit*, formerly *Senior Fellow*.

Dr G. D. Dracoulis  
*Senior Research Fellow in Nuclear Physics*, formerly *Research Fellow*.

Dr F.-H. Gildner  
*Senior Research Fellow in Behavioural Biology*, formerly *Scientific Collaborator*, Max Planck Institut für Biophysikalische Chemie, Göttingen.

Dr S. M. Hamberger  
*Professorial Fellow in Plasma Physics*, formerly *Group Leader*, United Kingdom Atomic Energy Authority, Culham Laboratory.

Professor K. S. Inglis  
*Professor in History*, formerly *Professorial Fellow*.

Dr J. N. Israelachvili  
*Senior Fellow in Applied Mathematics*, formerly *Fellow*.

Dr E. Joffe  
*Senior Research Fellow in Contemporary China Centre*, formerly with the Institute of Asian and African Studies, Hebrew University of Jerusalem.

Professor K. Lambeck  
*Professor of Geophysics*, formerly *Professor of Geophysics*, University of Paris.

Dr D. G. Marr  
*Fellow in Pacific and Southeast Asian History*, formerly *Research Fellow*.

Dr J. I. Martin  
*Senior Fellow in Sociology*, formerly *Senior Research Fellow*.

Dr G. L. G. Miklos  
*Fellow in Population Biology*, formerly *Research Fellow*.

Dr R. J. O'Neill  
*Professorial Fellow in International Relations*, formerly *Senior Fellow*.

Mr H. A. Polach  
*Fellow in Radiocarbon Dating Laboratory*, formerly *Research Officer*.

Dr R. W. Richardson  
*Professorial Fellow in Mathematics*, formerly *Professor*, Department of Mathematics, University of Durham.

Dr I. J. Ryrie  
*Senior Research Fellow in Bioenergetics and Active Transport Unit*, formerly *Research Fellow*.

Dr S. M. Simkin  
*Senior Research Fellow in Astronomy*, formerly *Assistant Professor*, Department of Astronomy and Astrophysics, Michigan State University.

Dr R. Tonkinson  
*Senior Research Fellow in Anthropology*, formerly *Associate Professor*, Department of Anthropology, University of Oregon.

Dr R. S.-T. Yu  
*Senior Research Fellow in Developmental Biology*, formerly *Research Fellow*.

**School of General Studies**

Dr M. J. Aston  
*Senior Lecturer in Botany*, formerly *Lecturer*.

Mr S. C. Bennett  
*Senior Lecturer in Political Science*, formerly *Lecturer*.

Dr B. W. Chappell  
*Reader in Geology*, formerly *Senior Lecturer*.

Dr J. M. A. Chappell  
*Reader in Geography*, formerly *Senior Lecturer*.

Dr W. A. Heather  
*Reader in Forestry*, formerly *Senior Lecturer*.

Dr R. A. Jarvis  
*Reader in Computer Science*, formerly *Senior Lecturer*.

Dr H. G. Kinlock  
*Reader in History*, formerly *Senior Lecturer*.

Dr H. J. Lally  
*Senior Lecturer in Sociology*, formerly *Lecturer*.

Dr I. McBryde  
*Reader in Prehistory and Anthropology*, formerly *Senior Lecturer*.

Dr C. M. Macknight  
*Senior Lecturer in History*, formerly *Lecturer*.

Dr C. M. Mayrhofer  
*Senior Lecturer in Classics*, formerly *Lecturer*.

Dr A. R. Pagan  
*Senior Lecturer in Statistics*, formerly *Lecturer*.

Dr N. Peterson  
*Senior Lecturer in Prehistory and Anthropology*, formerly *Lecturer*.

Mr R. S. Pulvers  
*Senior Lecturer in Japanese*, formerly *Lecturer*.

Dr B. M. Rawson  
*Reader in Classics*, formerly *Senior Lecturer*.

Professor W. A. Scott  
*Professor of Psychology and Head of Department*, formerly *Professor of Behavioural Sciences*, James Cook University.

Mr D. W. Smith  
*Reader in Law*, formerly *Senior Lecturer*.

Professor J. Warren Wilson  
*Professor of Botany and Head*
of Department, formerly Head of Plant Physiology Department, Glasshouse Crops Research Institute, Littlehampton.
Dr R. A. G. Weber Senior Lecturer in Accounting and Public Finance, formerly Instructor and Teaching Associate, Departments of Management Science and Accounting, Minnesota.

University Academic Centres
Dr K. J. Dalton Research Fellow in Centre for Resource and Environmental Studies, formerly Postdoctoral Fellow in the Education Research Unit.
Dr J. C. Eade Research Fellow in the Humanities Research Centre, formerly Research Assistant in English.
Dr D. J. Evans Research Fellow jointly in the Computer Centre and Electron and Ion Diffusion Unit, formerly Postdoctoral Fellow in the School of Chemical Engineering, Cornell.
Dr G. Pickup Research Fellow in the North Australian Research Unit, formerly Lecturer in Physical Geography, University of Papua New Guinea.
Dr H. D. W. Saddler Research Fellow in Centre for Resource and Environmental Studies, formerly Research Officer, Ranger Uranium Enquiry, Australian Public Service.
Dr L. T. Sin Fai Lam Research Fellow jointly in the Computer Centre and Electron and Ion Diffusion Unit, formerly Visiting Maître de Recherche, Observatory de Paris, France.
Dr G. P. Steele Research Fellow in NHMRC Social Psychiatry Research Unit, formerly Staff Psychiatrist, Woden Valley Hospital.
Senior staff resignations and retirements

Institute of Advanced Studies
Dr D. A. Buckingham Senior Fellow in Research School of Chemistry, to Second Chair of Chemistry, University of Otago.
Professor H. N. Bull Professor of International Relations, to Montague Burton Professor of International Relations, Oxford.
Mr J. S. Coombs Electronics Engineer (Senior Fellow) in Physiology.
Dr A. J. Cunningham Senior Research Fellow in Microbiology, to Associate Professor, Division of Biological Research, Ontario Cancer Institute.
Dr E. M. Curley Senior Fellow in Philosophy, to Professor, Northwestern University, Evanston.
Dr R. L. Dewar Senior Research Fellow in Theoretical Physics, to Research Staff, Plasma Physics Laboratory, Princeton.
Professor O. J. Eggen Professor of Astronomy.
Dr N. H. Fidge Senior Research Fellow in Clinical Science, to take up an appointment at the Baker Medical Research Institute, Melbourne.
Dr R. B. Goldrick Senior Fellow in Clinical Science, to take up private practice.
Mr P. D. Hastings Senior Research Fellow in Strategic and Defence Studies Centre, to Sydney Morning Herald.
Dr J. N. Jennings Professorial Fellow in Biogeography and Geomorphology.
Dr W. E. Kasper Senior Research Fellow in Economics, Research School of Social Sciences, to Professor of Economics, Faculty of Military Studies (University of New South Wales), Duntroon.
Professor R. L. Martin Professor of Inorganic Chemistry and Dean of Research School of Chemistry, to Vice-Chancellor, Monash University.
Dr P. J. Nestel Professorial Fellow in Clinical Science, to Deputy Director, Baker Medical Research Institute, Melbourne.
Dr I. Noy-Meir Senior Research Fellow in Environmental Biology, to Senior Lecturer, Department of Botany, Hebrew University of Jerusalem.
Dr L. J. Rogers Senior Research Fellow in Behavioural Biology, to Department of Pharmacology, Monash University.
Dr K. A. Tucker Fellow in Economic History, to Assistant Director, Bureau of Industry Economics, Department of Industry and Commerce, Australian Public Service.
Dr E. M. Whitcombe Senior Research Fellow in Economics, Research School of Pacific Studies, to undertake further study, University of Otago.
Professor H. M. Whyte Professor of Clinical Science and Head of Department, to Co-ordinator, Alcohol and Drug Dependence Unit, Capital Territory Health Commission.

School of General Studies
Dr C. Christensen Senior Lecturer in Pure Mathematics.
Professor L. F. Crisp Professor of Political Science.
Professor R.G.A. de Bray Professor of Slavonic Languages and Head of Department.
Professor D.N.F. Dunbar Professor of Physics and Deputy Vice-Chancellor, to Chairman of the Universities Council and Commissioner of the Tertiary Education Commission.
Dr D. J. Prentice Senior Lecturer in Indonesian Languages and Literatures, to a position at the University of Leiden.
Professor J. E. Richardson Robert Garran Professor of Law, to become Commonwealth Ombudsman.
Dr R. J. Stalker Reader in Physics, to Professor of Mechanical Engineering, University of Queensland.
Dr P. E. M. Standish Reader in Accounting and Public Finance.
Dr E. E. Tory Senior Lecturer in Romance Languages.

University Academic Centres
Dr J. E. Bern Postdoctoral Fellow in North Australia Research Unit, to Lecturer in Sociology, University of Newcastle, NSW.
Dr F. R. de Hoog Research Fellow in Computer Centre, to Research Scientist in the Division of Mathematics and Statistics, CSIRO.
Dr B. Lam Research Fellow in Computer Centre.
Dr A. Mant Research Fellow in NHMRC Social Psychiatry Research Unit, to University Department of Psychiatry, Royal Adelaide Hospital.
Dr D. M. Nessett Research Fellow in Computer Centre.
### Full-time Staff as at 30 April 1977

#### Designation

<table>
<thead>
<tr>
<th>Academic activities</th>
<th>males</th>
<th>females</th>
<th>total</th>
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<td>Teaching and research staff (a)</td>
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<tr>
<td>professor</td>
<td>45</td>
<td>—</td>
<td>45</td>
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<tr>
<td>associate professor/reader</td>
<td>58</td>
<td>5</td>
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<tr>
<td>senior lecturer</td>
<td>113</td>
<td>14</td>
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<td>lecturer</td>
<td>76</td>
<td>18</td>
<td>94</td>
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<td>senior tutor/demonstrator/assistant lecturer</td>
<td>24</td>
<td>14</td>
<td>38</td>
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<tr>
<td>tutor/demonstrator/teaching fellow</td>
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<td>18</td>
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<tr>
<td>visitor</td>
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<tr>
<td><strong>Total</strong></td>
<td>336</td>
<td>69</td>
<td>405</td>
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<th>Research only staff (a)</th>
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<th>females</th>
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<td>professor</td>
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<tr>
<td>professorial fellow/reader/senior fellow/fellow</td>
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<td>6</td>
<td>209</td>
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<tr>
<td>senior research fellow/research fellow/post-doctoral fellow</td>
<td>232</td>
<td>20</td>
<td>252</td>
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<tr>
<td>junior research staff</td>
<td>70</td>
<td>133</td>
<td>203</td>
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<tr>
<td>visitor</td>
<td>22</td>
<td>6</td>
<td>28</td>
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<tr>
<td><strong>Total</strong></td>
<td>587</td>
<td>165</td>
<td>752</td>
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<tr>
<th>Non-academic administrative staff supporting academic activities</th>
<th>males</th>
<th>females</th>
<th>total</th>
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<tr>
<td>180</td>
<td>486</td>
<td>666</td>
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<th>Technical staff</th>
<th>males</th>
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<th>total</th>
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<tr>
<td>technical officer</td>
<td>311</td>
<td>45</td>
<td>356</td>
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<tr>
<td>technical assistant</td>
<td>223</td>
<td>169</td>
<td>392</td>
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<tr>
<td>Total</td>
<td>534</td>
<td>214</td>
<td>748</td>
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#### Designation

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<th>Library staff</th>
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<td>professional</td>
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<td>40</td>
<td>61</td>
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<tr>
<td>other</td>
<td>28</td>
<td>80</td>
<td>108</td>
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<tr>
<td><strong>Total</strong></td>
<td>49</td>
<td>120</td>
<td>169</td>
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<table>
<thead>
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<th>Administrative staff</th>
<th>males</th>
<th>females</th>
<th>total</th>
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<tr>
<td>chief administrative officer</td>
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<td>7</td>
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<tr>
<td>senior administrative officer</td>
<td>13</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>administrative officer</td>
<td>25</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>administrative assistant</td>
<td>31</td>
<td>14</td>
<td>45</td>
</tr>
<tr>
<td>clerk/typist</td>
<td>89</td>
<td>196</td>
<td>285</td>
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<tr>
<td>other</td>
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<td><strong>Total</strong></td>
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<th>Building planning and maintenance staff</th>
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<th>females</th>
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<td>professional</td>
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<tr>
<td>tradesmen</td>
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<td>66</td>
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<tr>
<td>other</td>
<td>82</td>
<td>40</td>
<td>122</td>
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<tr>
<td><strong>Total</strong></td>
<td>159</td>
<td>41</td>
<td>200</td>
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<th>Other services (b)</th>
<th>males</th>
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<tr>
<td>Independent operations</td>
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<td>55</td>
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<tr>
<td><strong>Total</strong></td>
<td>59</td>
<td>51</td>
<td>110</td>
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#### Grand total—all staff

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<th>Designation</th>
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<th>females</th>
<th>total</th>
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<td></td>
<td>2110</td>
<td>1426</td>
<td>3536</td>
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</table>

(a) Staff of the Computer Centre and the Centre for Continuing Education are shown under Other services.

(b) Includes staff of the Computer Centre, Audio-visual and Language Laboratory, Health Services, Counselling and Accommodation and the Centre for Continuing Education.
<table>
<thead>
<tr>
<th>Research only staff</th>
<th>Professor</th>
<th>Research Fellow, Postdoctoral Fellow</th>
<th>Research Fellow, Senior Research Fellow</th>
<th>Research Fellow, Senior Research Fellow</th>
<th>Research Fellow, Senior Research Fellow</th>
<th>Research Fellow, Senior Research Fellow</th>
<th>Research Fellow, Senior Research Fellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic activities</td>
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<tr>
<td>Centre for Resource and Environmental Studies</td>
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<td>—</td>
<td>—</td>
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<tr>
<td>Humanities Research Centre</td>
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<td>North Australia Research Unit</td>
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<tr>
<td>Office for Research in Academic Methods</td>
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<td>—</td>
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<td>Survey Research Centre</td>
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<td>—</td>
<td>1</td>
<td>2</td>
<td>—</td>
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<tr>
<td>The Faculties</td>
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<td>—</td>
<td>—</td>
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<td>The Research School of Social Sciences</td>
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<td>Analytical Services Unit</td>
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<td>Observatory Services Unit</td>
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<td>Centre for Continuing Education</td>
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<td>61</td>
<td>47</td>
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<td>37</td>
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77
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<thead>
<tr>
<th></th>
<th>Associate Professor</th>
<th>Reader</th>
<th>Senior Lecturer</th>
<th>Lecturer, Lecturing Fellow</th>
<th>Senior Tutor/Demonstrator</th>
<th>Tutor/Demonstrator</th>
<th>Visitor</th>
<th>Total</th>
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<td><strong>Teaching and research staff</strong></td>
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<tr>
<td>Office for Research in Academic Methods</td>
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<td>—</td>
<td>—</td>
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<td>Women’s Studies</td>
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<td>—</td>
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<td>—</td>
<td>—</td>
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<td>Faculty of Arts</td>
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<td>23</td>
<td>47</td>
<td>49</td>
<td>14</td>
<td>14</td>
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<td>Faculty of Asian Studies</td>
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<td>10</td>
<td>7</td>
<td>3</td>
<td>2</td>
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<td>17</td>
<td>20</td>
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<td>Faculty of Law</td>
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<td>11</td>
<td>10</td>
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<td>—</td>
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<td><strong>Total teaching and research</strong></td>
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### Enrolments 1977

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<th>full-time</th>
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<td>302</td>
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<td>The Faculties</td>
<td>179</td>
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<td>208</td>
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<tr>
<td>University Centres</td>
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<tr>
<td><strong>Total</strong></td>
<td>494</td>
<td>34</td>
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<tr>
<td><strong>Master degree courses</strong></td>
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<td>The Faculties</td>
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<td>University Centres</td>
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<tr>
<td><strong>Total</strong></td>
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<td>156</td>
<td>360</td>
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<td><strong>Bachelor degree courses</strong></td>
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<td>The Faculties</td>
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<td>717</td>
<td>1936</td>
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<td>315</td>
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<td>science (forestry)</td>
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<td>263</td>
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<td><strong>Total</strong></td>
<td>3197</td>
<td>1401</td>
<td>4598</td>
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<td><strong>Non-degree courses</strong></td>
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<td>260</td>
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<td><strong>Total undergraduates</strong></td>
<td>3217</td>
<td>1641</td>
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### Assisted Students

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<th>total</th>
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<tr>
<td><strong>Postgraduate students</strong></td>
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<td></td>
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<tr>
<td>Australian Government assistance</td>
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<td>72</td>
<td>328</td>
</tr>
<tr>
<td>University assistance</td>
<td>244</td>
<td>71</td>
<td>315</td>
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<td>other assistance</td>
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<td><strong>Undergraduate students</strong></td>
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<td>State Government assistance</td>
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<td>113</td>
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<tr>
<td>University assistance</td>
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<td>11</td>
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<tr>
<td><em><em>Net total</em> assisted students at the University</em>*</td>
<td>720</td>
<td>303</td>
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*Adjusted by 2 for students counted in more than one category of assistance.

### Degrees Conferred

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<tr>
<td><strong>Doctor of Science</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(Honoris causa)</td>
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<tr>
<td><strong>Doctor of Philosophy</strong></td>
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<td>Master</td>
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<td>422</td>
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<tr>
<td>Bachelor</td>
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<td>544</td>
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<tr>
<td><strong>Total</strong></td>
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<td>1128</td>
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*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 1977

Aboriginal Arts Board of the Australia Council, $2,500 for research and travel Department of Anthropology.

Academy of the Social Sciences in Australia, $1,000 support for World Congress on Philosophy of Law and Social Philosophy History of Ideas Unit.

Anonymous, $3,15 for general purposes.

APM Forests Proprietary Ltd, $750 for research Department of Forestry.

Australia Council Literature Board, $7,528 for fellowship Department of English.

Australia-Japan Business Co-operative Committee, $1,500 for Japan/Australia Research Project Department of Economics, RSSS.

Australian Catholic Relief, $5,000 for scholarship program leading to Masters Degree in Agricultural Development Economics.

Australian Development Assistance Bureau, $14,916 for Nepal-Australia Forestry Project Department of Forestry; $60,681 for program leading to Masters Degree in Agricultural Development Economics; $46,892 for support of masters degree program Department of Demography; $2,250 for grant-in-aid for postgraduate research students Research School of Physical Sciences; $1,000 for grant-in-aid for postgraduate research students Research School of Social Sciences; $500 for grant-in-aid for postgraduate research students Research School of Pacific Studies; $9,250 for grant-in-aid for postgraduate research students School of General Studies; $3,500 for support Department of Forestry.

Australian Freedom from Hunger Campaign, $5,769 for scholarship program leading to Masters Degree in Agricultural Development Economics.

Australian Institute of Aboriginal Studies, $2,125 for research Department of Anthropology.

Australian Institute of Nuclear Science and Engineering, $5,442 for research Department of Nuclear Physics; $11,839 for research Department of Engineering Physics.

Australian National Parks and Wildlife Service, $11,610 for research project Centre for Resource and Environmental Studies.

Australian and New Zealand Banking Group Ltd, $1,500 for Japan/Australia Research Project Department of Economics, RSSS.

Australian Research Grants Committee, $684 for research general purpose; $9,812 for research Department of English; $20,605 for research Department of History, SGS; $19,128 for research Department of Political Science, SGS; $1,359 for research Department of Pure Mathematics; $5,050 for research Department of Linguistics, SGS; $11,453 for research Department of Sociology, SGS; $14,784 for research Department of Prehistory and Anthropology; $54 for research Department of Statistics, SGS; $16,444 for research Department of Asian Civilizations; $1,781 for research Department of South Asian and Buddhist Studies; $93,306 for research Department of Chemistry; $76,904 for research Department of Physics; $3,087 for research Department of Zoology; $24,759 for research Department of Biochemistry, SGS.

Australian Tobacco Research Foundation, $12,064 for research Department of Population Biology; $7,574 for research Department of Biochemistry, SGS.

Australian Vice-Chancellor’s Committee, $26,000 for fellowship Department of Demography; $11,000 for training course in the economics of agricultural production Brawijaya University, Indonesia Development Studies Centre; $4,000 for travel support Department of Forestry; $2,000 for travel support Department of Demography.

Australian War Memorial, $6,895 for research Department of History, IAS.

Australian Wheat Board, $12,190 for scholarship program leading to Masters Degree in Agricultural Development Economics.

Bank of New South Wales, $1,500 for Japan/Australia Research Project Department of Economics, RSSS.

BHP Company Limited, $1,500 for Japan/Australia Research Project Department of Economics, RSSS.

Burroughs Wellcome & Co (Australia) Limited, $8,000 for fellowship Department of Clinical Science.

Canada Council, $5,670 for research Department of Sociology, SGS.

Clive & Vera Ramaciotti Foundations, $1,624 for travel support Research School of Chemistry.

Comalco Limited, $500 for Japan/Australia Research Project Department of Economics, RSSS.

Commonwealth Secretariat (London), $18,000 for support of international conference Development Studies Centre.

Community Aid Abroad, $10,000 for support for the Third World Radio Service Centre for Continuing Education.

CRA Services Limited, $1,000 for Japan/Australia Research Project Department of Economics, RSSS.
CSIRO, $10,143 for research Department of Population Biology; $11,450 for research Department of Zoology; $2,000 support costs for visiting fellowships Department of Environmental Biology; $15,000 for research Biosenergetics and Active Transport Unit; $450 for grant-in-aid for students The John Curtin School of Medical Research.

CSR Limited, $3,000 for Japan/Australia Research Project Department of Economics, RSSS.

Department of Aboriginal Affairs, $15,000 for research Development Studies Centre; $53,263 for community development research projects Centre for Continuing Education; $16,500 for Aboriginal Population Record Project Department of Demography.

Department of Administrative Services, $29,690 to support work for Grants Commission Department of Accounting and Public Finance.

Department of Education, $6,920 for research Education Research Unit; $54,630 for English/Malay Dictionary Faculty of Asian Studies; $500 for grant-in-aid for postgraduate research students Research School of Pacific Studies; $500 for grant-in-aid for postgraduate research students Research School of Physical Sciences; $2,000 for grant-in-aid for postgraduate research students Research School of Biological Sciences; $2,250 for grant-in-aid for postgraduate research students School of General Studies; $4,971 for feasibility study of Undergraduate Medical School; $39,821 for Japanese Teaching Materials Project School of General Studies; $89 for grant-in-aid for postgraduate students Research School of Earth Sciences; $1,124 for school-work relationships project Education Research Unit.

Department of Foreign Affairs, $11,290 for assistance on the development of Australian studies, University of Venice Research School of Social Sciences; $10,000 for research on Japan, Australian and Western Pacific economic integration Research School of Social Sciences.

Department of Health, $30,500 for research Department of Demography; $312,744 for NHMRC Social Psychiatry Research Unit; $3,000 for research Department of Psychology; $17,506 for research Department of Biochemistry, SGS; $3,902 for research Department Developmental Biology.

Department of Immigration and Ethnic Affairs, $2,563 for research Department of Demography.

Department of National Resources, $6,070 for research Department of Zoology.

Department of Primary Industry, $7,833 for scholarship Department of Zoology; $17,104 for research Department of Biochemistry, SGS; $4,500 for research Department of Zoology; $26,470 for research Department of Population Biology; $12,500 for research Department of Immunology.

Department of the Prime Minister and Cabinet, $129,100 for Centre for Research on Federal Financial Relations; $20,000 to support intensive Japanese language course Department of Japanese; $15,000 for exchange of visitors between Japanese and Australian universities School of General Studies; $256 for Japan/Australia Research Project Department of Economics, RSSS.

Department of Science, $83,165 for National NMR Centre; $1,587 for travel support Department of Inorganic Chemistry; $3,014 for travel support Department of Immunology; $61,884 for fellowships The John Curtin School of Medical Research; $21,507 for fellowships Research School of Biological Sciences; $22,986 for fellowships School of General Studies; $62,372 for fellowships Research School of Physical Sciences; $4,665 for fellowships Research School of Pacific Studies; $7,862 for fellowship Research School of Chemistry; $4,662 for US/Australia Cooperative Science Program Department of Engineering Physics; $8,158 for travel support Research School of Biological Sciences.

Department of Transport, $3,181 for research Department of Chemistry.

Electricity Supply Association of Australia, $1,750 for research Department of Engineering Physics.

Esso Australia Ltd, $600 for scholarship Department of Geology; $600 for assistance Department of Geology.

Food and Agricultural Organisation, $987 for program leading to Masters Degree in Agricultural Development Economics.

Forests Commission, Victoria, $500 for research Department of Forestry.

Government of South Australia, $500 for research Department of Forestry.

Government of Western Australia, $2,000 for research Department of Forestry.

Hospitals and Health Services Commission, $48,701 for research Department of Demography; $5,700 for research project Department of Economics, SGS.

Dr C. A. Hughes, $3,000 to support work on West Indian government and politics Department of Political Science, IAS.

ICI Australia Limited, $1,200 for research Department of Clinical Science.

Malaysian National Institute of Technology, $1,740 for program leading to Masters Degree in Agricultural Development Economics.
Merck, Sharp and Dohme, $3,000 for research Department of Zoology.
Mount Isa Mines Limited, $1,100 for research in Geophysics Research School of Earth Sciences.
National Capital Development Commission, $2,458 for research Department of Chemistry.
National Heart Foundation of Australia, $10,234 for research Department of Biochemistry, SGS; $10,879 for research NHMRC Social Psychiatry Research Unit; $1,424 for research Department of Clinical Science.
National Parks and Wildlife Service (NSW Government), $1,100 for survey Department of Geography.
Nigeria High Commission, London, $1,132 for scholarship Department of Forestry.
Queensland Department of Forestry, $1,000 for research Department of Forestry.
Radio Research Board, $11,500 for fellowship Department of Applied Mathematics, IAS.
Reserve Bank of Australia, $13,000 for data bank construction Department of Statistics, SGS; $59,901 for fellowship Department of Economics, RSSS; $6,000 for research Department of Economics, SGS; $32,228 for fellowship Centre for Resource and Environmental Studies.
Rothmans University Endowment Fund, $13,387 for fellowship Department of Genetics; $5,900 for fellowship, Department of Applied Mathematics, IAS; $10,538 for fellowship Department of Pure Mathematics; $7,400 for fellowship Department of Linguistics, SGS.
Royal Danish Embassy, $25,559 for scholarship School of General Studies.
Schools Commission, $3,704 work on computer assisted development of basic skills Department of Engineering Physics.
South Australian Government, $8,000 for research Education Research Unit.
State University of New York, $2,645 for research Research School of Chemistry.
St Jude's Children's Research Hospital, $5,254 for research Department of Microbiology.
Sunshine Foundation, $629 support for overseas conferences Department of Physics.
Tasmanian Forestry Commission, $1,000 for research Department of Forestry.
The Ford Foundation, $44,452 for research Research School of Pacific Studies; $6,331 for research Department of Demography.
The Ian Potter Foundation, $1,000 for travel support Department of Genetics; $200 for support for overseas conferences Department of Physics; $1,000 for travel support Study Tour in the USA.
The International Rice Research Institute, $12,000 for research Department of Chemistry.
The Jane Coffin Childs Memorial Fund for Medical Research, $881 for research Department of Microbiology.
The Leverhulme Trust Fund, $3,759 for visiting fellowships Department of Economics, SGS.
The Life Insurance Medical Research Fund of Australia and New Zealand, $8,000 for grant-in-aid Department of Biochemistry, SGS.
The Meyer Foundation, $750 for travel support Study Tour in the USA.
UNESCO, $8,360 for support for work in writing up a Fiji project Development Studies Centre; $2,670 for fellowship Development Studies Centre; $17,800 for support of the ecological studies of human settlements in Lae, PNG Centre for Resource and Environmental Studies; $8,900 for support of ecology work in Hong Kong Centre for Research and Environmental Studies.
United States Agricultural Development Council, $5,515 for support of international conference Development Studies Centre.
United States of America—Department of Health, Education and Welfare, $4,497 for research Department of Anthropology; $9,983 for research Department of Population Biology; $2,651 for fellowship Department of Zoology.
Western Australia Department of Conservation and Environment, $24,920 for research project Centre for Resource and Environmental Studies.
Western Mining Corporation Limited, $400 for research Department of Geology; $9,000 for Japan/Australia Research Project Department of Economics, RSSS.
World Health Organisation, $3,527 for research Department of Microbiology.
Vice-Chancellor,  
Australian National University,  
CANBERRA  A.C.T.  2600

Dear Sir,

Financial Statements  
Year ended 31 December 1977

In compliance with a request by the Minister for Finance under 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 1977.

The Statements listed hereunder and the Explanatory Notes accompanying and forming part of the Financial Statements, received in final form on 10 October 1978, have been examined and are in agreement with the accounts and financial records of the University -

. Statement of Net Assets at 31 December 1977
. Statement of Receipts and Payments (excluding Trading Activities) for year ended 31 December 1977
. Consolidated Operating Statement for University Trading Activities (except Housing Operations) for year ended 31 December 1977
. Consolidated Operating Statement for University Housing Operations for year ended 31 December 1977

Yours faithfully,

(T.R. REES)  
Acting Auditor-General
Financial
Statements

The Australian National University
Financial Statements for Year Ended
31 December 1977

The accounts of The Australian National University for
the year ended 31 December 1977 are presented in the
following statements:
1  Statement of Net Assets at 31 December 1977
2  Statement of Receipts and Payments (excluding
   Trading Activities) for year ended 31 December
   1977
3  Consolidated Operating Statement for University
   Trading Activities (except Housing Operations) for
   year ended 31 December 1977
4  Consolidated Operating Statement for University
   Housing Operations for year ended 31 December
   1977
Explanatory Notes (accompanying and forming
part of the Financial Statements)

All amounts are rounded to the nearest $1000.

D. A. LOW
Vice-Chancellor

N. G. MacDONALD
Accountant

Canberra
28 September 1978
## Statement of Net Assets as at 31 December 1977

<table>
<thead>
<tr>
<th>Principal Assets &amp; Liabilities</th>
<th>Reserve for Employer’s Liability for Superannuation</th>
<th>Restricted Purpose Assets</th>
<th>Sub-Total</th>
<th>Trading Assets &amp; Liabilities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$000</strong></td>
<td><strong>$000</strong></td>
<td><strong>$000</strong></td>
<td><strong>$000</strong></td>
<td><strong>$000</strong></td>
<td><strong>$000</strong></td>
</tr>
</tbody>
</table>

### Current Assets

- **Cash at call and on deposit (net)** (note 2)
  - **10,524**
  - **2,013**
  - **1,859**
  - **14,396**
  - **509**
  - **14,905**

- **Cash on hand**
  - **47**
  - **47**
  - **3**
  - **50**

- **Trade debtors and prepayments**
  - **627**
  - **82**
  - **709**
  - **454**

- **Other debtors**
  - **630**
  - **366**
  - **996**

- **Materials in stores and service pools (at cost)**
  - **630**
  - **312**
  - **2**
  - **474**

- **Investments (note 3)**
  - **11,828**
  - **2,325**
  - **1,943**
  - **16,096**
  - **1,492**
  - **17,588**

### Non-Current Assets (note 4)

- **Buildings**
  - Non-residential and service installations
    - **57,104**
    - **57,104**
    - **57,104**

- **Halls of residence**
  - **7,579**
  - **7,579**
  - **7,579**

- **Land and dwellings**
  - **291**
  - **291**
  - **349**
  - **640**

- **Leasehold Land and Dwellings (note 4)**
  - **13,414**
  - **13,414**

- **Equipment and Furniture (note 5)**
  - Teaching and research
    - **39,305**
    - **39,305**
    - **39,305**
  - Central areas
    - **1,902**
    - **1,902**
    - **1,902**
  - Residential
    - **707**
    - **707**
  - Trading activities
    - **523**
    - **523**

- **Books and Publications**
  - **8,534**
  - **1,545**
  - **19,977**
  - **1,539**
  - **23,061**
  - **863**
  - **23,924**

- **Investments (note 3)**
  - **116,260**
  - **19,977**
  - **1,539**
  - **137,776**
  - **15,856**
  - **153,632**

### Total Assets

- **128,088**
- **22,302**
- **3,482**
- **153,872**
- **17,348**
- **171,220**

### Less: Liabilities

- **Trade creditors and accruals**
  - **370**

- **Other creditors**
  - **109**
  - **109**

- **Loans from superannuation reserve (note 6)**
  - **511**
  - **511**
  - **511**

- **620**
  - **620**
  - **370**
  - **990**

### Net Assets

- **127,468**
- **22,302**
- **3,482**
- **153,252**
- **16,978**
- **170,230**

### Agency and Trust Funds (note 7) 8,853

To be read in conjunction with the accompanying notes
2 Statement of Receipts and Payments (excluding Trading Activities) for the year ended 31 December 1977

<table>
<thead>
<tr>
<th>Recurrent Funds</th>
<th>Capital Works and Services</th>
<th>Reserve for Employer's Liability for Super-annuation</th>
<th>Restricted Purpose Recurrent Funds</th>
<th>Total University General Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
<td>$000</td>
</tr>
</tbody>
</table>

**Balances Brought Forward**

- **Reserved (note 9)** 5,669 97 721 2,133 8,620
- **Overspent** (1,423)

**Total Balances Brought Forward** 4,246 97 721 2,133 7,197

**Receipts**

*Australian Government Grants:*

- Standing appropriation (vide section 30 (1) of The Australian National University Act) 650
- For running expenses (vide Appropriation Act (Nos. 1 & 3) 1976–77 Division 279.1 and Appropriation Act (No. 1) 1977–78 Division 279.1) (note 9) 80,585
- Research grants (vide Appropriation Act (No. 1) 1976–77 Division 540.3.03 and Appropriation Act (No. 1) 1977–78 Division 540.3.03) 288
- Approved capital program (vide Appropriation Act (No. 2) 1976–77 Division 835.1.01 and Appropriation Act (No. 2) 1977–78 Division 835.1.01) 212
- Tuition and examination fees 38
- Contributions and investment income 4,578
- Subsidies and donations 2,652
- Other receipts 464

**Total Receipts** 81,737 212 4,578 3,931 90,458

**Payments**

- Salaries 46,959 1,408 48,367
- Payroll tax, workmen's compensation insurance and superannuation provision 8,108 1,185 8,293
- Academic visitors 734 61 795
- Scholarships and fellowships 2,171 96 2,267
- Field research expenses 418 55 473
- Materials and supplies 3,358 207 3,565
- Library books 1,198 2 1,200
- Equipment 4,004 1 116 4,121
- Fuel and power 1,208 883
- Postages and telephones 875 883
- Buildings and site services 139 175 137 451
- Maintenance of buildings, equipment and furnishings 1,501 15 1,516
- General expenses 2,069 446 3,216
- Grants and subventions 422 422
- Fund disbursements 844 5 849
- Net investments 4,394 1,599 5,993
- Other payments 188

**Total Payments** 73,952 277 5,208 4,210 83,647

**Balances Carried Forward**

- **Reserved (note 9)** 12,465 32 91 1,854 14,442
- **Overspent (note 10)** (434) (434)

**Total Balances Carried Forward** 12,031 32 91 1,854 14,068

To be read in conjunction with the accompanying notes
3 Consolidated Operating Statement for University Trading Activities  
(except Housing Operations) for the year ended 31 December 1977

<table>
<thead>
<tr>
<th></th>
<th>University House</th>
<th>Graduate House</th>
<th>Siding Spring Lodge (note 11)</th>
<th>Siding Spring Exhibition</th>
<th>Staff Centre</th>
<th>ANU Press</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariffs and admission fees</td>
<td>387</td>
<td>119</td>
<td>61</td>
<td>25</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Membership and registration fees</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and beverage sales (gross profit)</td>
<td>374</td>
<td>1</td>
<td></td>
<td>8</td>
<td>133</td>
<td>109</td>
</tr>
<tr>
<td>Book sales (gross profit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidy based on Universities Financial Assistance Act 1966, Section 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>University contribution</td>
<td>19</td>
<td>13</td>
<td></td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Sundry income</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Expenditure</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Operating expenses</td>
<td>685</td>
<td>30</td>
<td>46</td>
<td>28</td>
<td>94</td>
<td>12</td>
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<tr>
<td>Administrative expenses</td>
<td>36</td>
<td>20</td>
<td>23</td>
<td>5</td>
<td>77</td>
<td>214</td>
</tr>
<tr>
<td>Service expenses (including loan repayments)</td>
<td>48</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for property replacement and for equipment replacement and maintenance</td>
<td>78</td>
<td>25</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Profit/(Loss)</strong></td>
<td><strong>27</strong></td>
<td><strong>(4)</strong></td>
<td><strong>(3)</strong></td>
<td><strong>(2)</strong></td>
<td><strong>(17)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Abnormal Items**

**Add:** Royalties, paid in 1977, but related to the 1976 trading period

**Less:** Amounts transferred to visitors income equalisation fund

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

27  (4)  (3)  (2)  (26)

To be read in conjunction with the accompanying notes.
<table>
<thead>
<tr>
<th>Centre for Continuing Education*</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</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>188</td>
<td>470</td>
<td>465</td>
<td>206</td>
<td>170</td>
<td>12</td>
<td>25</td>
<td>9</td>
<td>21</td>
<td>1,970</td>
</tr>
<tr>
<td>188</td>
<td>2</td>
<td>4</td>
<td>5</td>
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<td>9</td>
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<td>280</td>
</tr>
<tr>
<td></td>
<td>99</td>
<td>41</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>658</td>
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<td></td>
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<td>117</td>
</tr>
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<td></td>
<td>38</td>
<td>42</td>
<td>45</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>1</td>
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<td>149</td>
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<td></td>
<td>4</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>188</td>
<td>609</td>
<td>552</td>
<td>266</td>
<td>175</td>
<td>13</td>
<td>35</td>
<td>10</td>
<td>25</td>
<td>3,328</td>
</tr>
<tr>
<td>200</td>
<td>460</td>
<td>414</td>
<td>116</td>
<td>69</td>
<td>10</td>
<td>9</td>
<td>2</td>
<td>6</td>
<td>1,981</td>
</tr>
<tr>
<td></td>
<td>112</td>
<td>82</td>
<td>88</td>
<td>42</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>14</td>
<td>946</td>
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<tr>
<td></td>
<td>2</td>
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<td>4</td>
<td>3</td>
<td>125</td>
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<td></td>
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<td></td>
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<td>283</td>
</tr>
<tr>
<td>200</td>
<td>618</td>
<td>539</td>
<td>261</td>
<td>168</td>
<td>21</td>
<td>35</td>
<td>10</td>
<td>29</td>
<td>3,335</td>
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<tr>
<td>(12)</td>
<td>(9)</td>
<td>13</td>
<td>5</td>
<td>7</td>
<td>(8)</td>
<td>(4)</td>
<td>(7)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>11</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(12)</td>
<td>(9)</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>(8)</td>
<td>(4)</td>
<td>(30)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Centre for Continuing Education operating statement refers to conference, seminar and workshop activities.
### Consolidated Operating Statement for University Housing Operations (note 12) for the year ended 31 December 1977

<table>
<thead>
<tr>
<th></th>
<th>Canberra</th>
<th>Siding Spring</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rentals—Dwellings</td>
<td>708</td>
<td>15</td>
<td>723</td>
</tr>
<tr>
<td>—Furnishings</td>
<td>112</td>
<td></td>
<td>112</td>
</tr>
<tr>
<td>Rental subsidies</td>
<td>134</td>
<td>954</td>
<td>146</td>
</tr>
<tr>
<td><strong>Less: Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rents—Department of the Capital Territory</td>
<td>24</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Rates—General</td>
<td>50</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>—Water</td>
<td>30</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>—Sewerage</td>
<td>24</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Gardening</td>
<td>47</td>
<td></td>
<td>47</td>
</tr>
<tr>
<td>Electricity, oil and gas</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Cleaning</td>
<td>20</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Laundry and dry cleaning</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Storage and freight</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Provision for maintenance of dwellings</td>
<td>188</td>
<td>11</td>
<td>199</td>
</tr>
<tr>
<td>Provision for maintenance of furnishings</td>
<td>15</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Alterations to furnishings</td>
<td>5</td>
<td>410</td>
<td>422</td>
</tr>
<tr>
<td><strong>Administrative Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative salaries</td>
<td>131</td>
<td></td>
<td>131</td>
</tr>
<tr>
<td>Payroll tax, workmen’s compensation insurance</td>
<td>24</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>and superannuation provision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing, stationery and telephones</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Accounting service fee</td>
<td>12</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Provision for long service leave</td>
<td>7</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Valuation fee</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Other administrative expenses</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Office accommodation costs</td>
<td>14</td>
<td>197</td>
<td>198</td>
</tr>
<tr>
<td><strong>Provisions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for insurance of—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dwellings</td>
<td>18</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>furnishings</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Provision for replacement of—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>furnishings</td>
<td>81</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>motor vehicles and office equipment</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Provision for replacement of—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dwellings</td>
<td>265</td>
<td>8</td>
<td>273</td>
</tr>
<tr>
<td>leasehold land</td>
<td>47</td>
<td>416</td>
<td>1,023</td>
</tr>
<tr>
<td><strong>Net Operating Profit/(Loss)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Add: Abnormal Items</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rates paid in respect of the years 1974/75 and 1975/76</td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Provision for sick leave</td>
<td>26</td>
<td>(36)</td>
<td>26</td>
</tr>
<tr>
<td><strong>Less: Non-Operating Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income from investments</td>
<td>51</td>
<td></td>
<td>51</td>
</tr>
<tr>
<td>Profit on sale of motor vehicle</td>
<td>3</td>
<td>54</td>
<td>3</td>
</tr>
<tr>
<td><strong>Net Profit/(Loss) transferred to Accumulated Profits/(Losses)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(51)</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

To be read in conjunction with the accompanying notes.
Explanatory Notes Accompanying and Forming Part of the Financial Statements for the year ended 31 December 1977

Note 1—Principal Accounting Policies

Basis of Accounting
The University's accounts for (i) recurrent funds for academic purposes (teaching, research and administration), (ii) funds for capital works and services and (iii) restricted purpose funds are maintained on a cash basis. Internal transfers between fund classifications are, accordingly, similarly treated. These transfers include amounts retained under contracts for buildings and equipment. The University's accounts for its trading activities are maintained on an accrual basis, except that depreciation accounting principles are only applied in the Housing Operations. Cash provisions for equipment replacement and building maintenance are made in all other trading activities.

Basis of Presentation
The Statement of Receipts and Payments reports all major and significant groups of receipts and payments. Receipts and payments in respect of the investment of recurrent funds are excluded. For certain transactions in which the receipt and payment components essentially constitute the whole transaction, net amounts are reported.

The Statement of Net Assets is prepared on an historical cost basis with the exception of (i) investments in public securities (note 3) and (ii) leasehold land and dwellings other than land let to the University and used primarily for academic activities (note 4). The item "Other creditors" reported in the table of Principal Assets & Liabilities excludes (i) accruals for materials and supplies and (ii) any liability in respect of amounts retained under contracts for buildings and equipment and included in the item "Cash at call and on deposit (net)" in the table of Restricted Purpose Assets.

Note 2—Cash at Call and on Deposit
Cash at call and on deposit totalling $14,904,994 net is reported in the Statement of Net Assets. This amount consists of:

<table>
<thead>
<tr>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash at call</td>
<td>1,971,281</td>
</tr>
<tr>
<td>Cash on deposit</td>
<td></td>
</tr>
<tr>
<td>—bank bills</td>
<td>14,967,468</td>
</tr>
<tr>
<td>—other</td>
<td>186,680</td>
</tr>
<tr>
<td></td>
<td>15,154,168</td>
</tr>
<tr>
<td></td>
<td>17,125,449</td>
</tr>
<tr>
<td>Cash book deficit (including unpresented cheques)</td>
<td>(2,220,455)</td>
</tr>
<tr>
<td></td>
<td>14,904,994</td>
</tr>
</tbody>
</table>

Note 3—Investments
University investments consisting of debentures, mortgages, real estate, shares in listed companies and bank bills are reported at acquisition cost in the Statement of Net Assets. University investments consisting of public securities are reported at acquisition cost adjusted for capital gains. In the opinion of the University's officers, based where appropriate on independent professional advice, the overall market value (or value to redemption, where applicable) of each of the above categories of investment at 31 December 1977 exceeded its acquisition cost.

Note 4—Non-Current Assets
With the exception of (i) gifts and (ii) leasehold land and dwellings, the University's non-current assets are generally reported at acquisition cost in the Statement of Net Assets. Gifts are reported at University officers' valuation. Leasehold land and dwellings are reported at their replacement value of $13,413,521, being equivalent to their current replacement cost of $18,719,331 less accumulated depreciation (based on the expected life of the assets concerned) totalling $5,305,810. The value of leasehold land and dwellings excludes land let to the University in the Australian Capital Territory and Northern Territory, whether in perpetuity or otherwise, and used primarily for the University's academic activities.

Note 5—Equipment and Furniture Inventories: Teaching, Research and Administration and Trading Activities
During 1977, procedures for the recording of equipment and furniture inventories used for teaching, research and administration and trading activities, which had been in force since April 1969, were revised. As a result of the revision the book value of these inventories was reduced by $5,201,955.

Note 6—Loans from Superannuation Reserve
In 1971 and 1974, amounts were advanced from a superannuation reserve, as long-term investments at commercial interest rates, to permit the completion of student residences for which insufficient funding was available from external sources.

Note 7—Agency and Trust Funds

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Balance 1 January 1977</td>
<td>7,418,637</td>
</tr>
<tr>
<td>Receipts and income</td>
<td>2,253,660</td>
</tr>
<tr>
<td></td>
<td>9,672,297</td>
</tr>
</tbody>
</table>
Less disbursements  

Balance 31 December 1977

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>819,320</td>
</tr>
<tr>
<td></td>
<td>8,852,917</td>
</tr>
</tbody>
</table>

The agency and trust funds include the 1966 Supplementary Superannuation 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 $13,624,000. Since the end of 1977, an actuarial investigation into the state and sufficiency of the fund as at 30 June 1976 has disclosed that the above deficiency has been reduced to $10,729,000. The rates of contribution to the fund have been based on official advice.

Note 8—Contingent Liabilities
Guarantees have been given (i) under the University’s Staff Members’ House Purchase Scheme to secure bank loans totalling $876,011 to University employees, (ii) to secure an overdraft facility of $250,000 negotiated by the University Union for building purposes, (iii) to secure a loan of $400,000 to the University Sports Union for building purposes, (iv) to secure an overdraft facility for $1,000 made available to the University Research Students’ Association Family Day-Care program and (v) to secure a banker’s indemnity for £36,266 sterling given to obtain requisite foreign government approvals for a member of staff undertaking field work overseas.

Note 9—Balances and Receipts
In the Statement of Receipts and Payments (excluding Trading Activities), the balance of Recurrent Funds brought forward includes amounts received in 1976 for expenditure in 1977, while the balance carried forward includes amounts received in 1977 for expenditure in 1978. Similarly, the balances of the Restricted Purpose Recurrent Funds brought forward from 1976 and carried forward to 1978 include amounts retained under contracts for buildings and equipment; the amount carried forward to 1978 is $761,355.

Note 10—Uncommitted and Overspent Balances
In 1977, recurrent funds were overspent by $434,237 on account of cost increases occurring in 1977 for which supplementation was received after 31 December 1977.

Note 11—Siding Spring Lodge
In 1977, an amount of $69,320 was allocated for the funding of accumulated trading losses to 31 December 1976 at Siding Spring Lodge.

Note 12—Profits/Losses from Sales of Dwellings
Profits or losses from the sale of dwellings are excluded from the operating statements of the University’s Housing Operations.