

THE
AUSTRALIAN NATIONAL UNIVERSITY

1971

REPORT

AUSTRALIAN NATIONAL UNIVERSITY
ARCHIVES



The Australian National University

**REPORT OF THE COUNCIL FOR THE PERIOD
1 JANUARY 1971 TO 31 DECEMBER 1971**

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THE AUSTRALIAN NATIONAL UNIVERSITY

**REPORT OF THE COUNCIL FOR THE PERIOD
1 JANUARY 1971 TO 31 DECEMBER 1971**

To His Excellency Major-General Sir Rohan Delacombe, K.C.M.G., K.C.V.O., K.B.E., C.B., D.S.O., K.St.J., Administrator of the Government of the Commonwealth 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 1971 to 31 December 1971 furnished in compliance with Section 33 of the *Australian National University Act 1946-1971*.

H. C. COOMBS

Chancellor

The Council

The Council met six times during the year in March, May, July, September, November and December.

The Chancellor presided over meetings in March, May, July and December; the Pro-Chancellor presided over the meetings in September and November.

The terms of office of the following members expired on the dates shown :

Members elected by the Senate: Senator Murphy*; Senator Rae*—30 June 1971.

Members chosen or elected: Bishop K. J. Clements; Sir Norman Cowper*; Sir Warwick Fairfax*; Dr G. L. McDonald*; Sir Frank Richardson; Sir Frederick White*; Professor W. D. Borrie; Professor F. J. Fenner*; Professor H. Whitmore; Mr A. D. Crombie; Mr J. G. Fennessy—29 September 1971; Professor L. D. Pryor—30 September 1971.

Members ex officio: Professor G. Sawyer, the Deputy Chairman of the Board of the Institute—9 August 1971; Professor C. A. Gibb, the Deputy Chairman of the Board of the School of General Studies—31 December 1971; Mr M. Wright, President of the Australian National University Students' Association—30 November 1971.

Member appointed by the Council: Mr G. J. Dusseldorp—9 March 1971.

An amendment of the Australian National University Act which came into force on 2 March 1971 increased the size of the Council by three members. The additional members are the President of the Australian National University Students' Association, a second member elected by the non-professorial members of the academic staff in the Institute of Advanced Studies and a second member elected by the non-professorial staff in the School of General Studies.

MEMBERS OF THE COUNCIL AS AT 31 DECEMBER 1971

MEMBERS EX OFFICIO

Herbert Cole Coombs, M.A.(W.Aust.), Ph.D.(Lond.), Hon.D.Litt.(W.Aust.), Hon.LL.D.(Melb., Syd. and ANU), F.A.A.—*Chancellor*.

The Honourable Sir Richard (Moulton) Eggleston, LL.B.(Melb.)—*Pro-Chancellor*.

Emeritus Professor Sir John (Grenfell) Crawford, C.B.E., M.Ec.(Syd.), Hon.D.Sc.(N'cle.(N.S.W.)), Hon.D.Ec.(N.E.), Hon.LL.D.(Tas.), F.A.I.A.S.—*Vice-Chancellor*.
David Noel Ferguson Dunbar, M.Sc.(N.Z.), Ph.D.(Melb.)—*Deputy Vice-Chancellor*.

* Reappointed or re-elected.

Frederick Colin Courtice, M.A., D.Phil.(Oxon.), D.Sc.(Syd.), M.R.C.S., F.R.A.C.P., Hon.F.R.A.C.S., F.A.A.—*Deputy Chairman of the Board of the Institute of Advanced Studies.*

Cecil Austin Gibb, O.B.E., M.A., B.Ec.(Syd.), Ph.D.(Ill.), F.A.Ps.S.—*Deputy Chairman of the Board of the School of General Studies.*

Richard Christopher Refshauge—*President of the Australian National University Students' Association.*

MEMBERS ELECTED BY THE SENATE

Lionel Keith Murphy, Q.C., B.Sc., LL.B.(Syd.).

Present tenure expires 30 June 1974.

Peter Elliot Rae, B.A., LL.B.(Tas.).

Present tenure expires 30 June 1974.

MEMBERS ELECTED BY THE HOUSE OF REPRESENTATIVES

Kim Edward Beazley, B.A.(W.Aust.), M.A.(ANU).

Present tenure expires 18 August 1973.

Michael John Randal MacKellar, B.Sc.Agr.(Syd.), B.A.(Oxon.)

Present tenure expires 18 August 1973.

MEMBERS APPOINTED BY THE GOVERNOR-GENERAL

George Austin Colman.

Present tenure expires 29 September 1972.

Sir Norman (Lethbridge) Cowper, C.B.E., B.A., LL.B.(Syd.).

Present tenure expires 29 September 1974.

John Qualtrough Ewens, C.M.G., C.B.E., LL.B.(Adel.).

Present tenure expires 29 September 1972.

Sir Warwick (Oswald) Fairfax, M.A.(Oxon.).

Present tenure expires 29 September 1974.

Sir Brian (William) Hone, O.B.E., B.A.(Adel.), M.A.(Oxon.).

Present tenure expires 29 September 1972.

Thomas Fulton Coleman Lawrence, B.Sc., B.E.(Syd.), F.R.Ae.S.

Present tenure expires 29 September 1972.

Geoffrey Lance McDonald, B.A., M.B., B.S.(Syd.), F.R.A.C.P., M.R.C.P.

Present tenure expires 29 September 1974.

The Honourable Mr Justice Anthony Frank Mason, C.B.E., B.A., LL.B.(Syd.).

Present tenure expires 29 September 1972.

John Colinton Moore, B.Com.(Qld.), A.A.U.Q.

Present tenure expires 29 September 1974.

Sir (Horace) Frank Richardson.

Present tenure expires 29 September 1973.

Sir Frederick (William George) White, K.B.E., M.Sc.(N.Z.), Ph.D.(Cantab.),
Hon.D.Sc.(Monash, ANU and P. & N.G.), F.A.A., F.R.S.
Present tenure expires 29 September 1974.
Arthur John Russel Yencken, M.A.(Cantab.).
Present tenure expires 29 September 1972.

MEMBERS CHOSEN BY HEADS OF THE RESEARCH SCHOOLS IN THE INSTITUTE OF
ADVANCED STUDIES

Frank John Fenner, M.B.E., M.D.(Adel.), D.T.M.(Syd.), Hon.M.D.(Monash),
F.R.A.C.P., F.R.C.P., F.A.A., F.R.S.
Present tenure expires 29 September 1972.
Oskar Hermann Khristian Spate, M.A., Ph.D.(Cantab.), F.A.H.A.
Present tenure expires 29 September 1972.

MEMBERS CHOSEN FROM AMONG THE DEANS OF THE FACULTIES IN THE SCHOOL OF
GENERAL STUDIES

Richard St. Clair Johnson, M.A., Dip.Ed.(Syd.).
Present tenure expires 29 September 1973.
Ian Gordon Ross, M.Sc.(Syd.), Ph.D.(Lond.), F.R.A.C.I.
Present tenure expires 29 September 1972.

MEMBER ELECTED BY THE PROFESSORS IN THE INSTITUTE OF
ADVANCED STUDIES

David Chase Peaslee, A.B.(Prin.), Ph.D.(M.I.T.).
Present tenure expires 29 September 1972.

MEMBER ELECTED BY THE PROFESSORS IN THE SCHOOL OF
GENERAL STUDIES

Liu Ts'un-Yan, B.A.(Peking), B.A., Ph.D., D.Lit.(Lond.), Dip.Ed.(H.K.),
F.A.H.A.
Present tenure expires 29 September 1974.

MEMBERS ELECTED BY THE NON-PROFESSORIAL ACADEMIC STAFF
IN THE INSTITUTE OF ADVANCED STUDIES

Marie Olive Reay, M.A.(Syd.), Ph.D.(ANU).
Present tenure expires 29 September 1972.
Stuart Ross Taylor, M.A.(Oxon.), M.Sc.(N.Z.), Ph.D.(Indiana).
Present tenure expires 29 September 1972.

MEMBERS ELECTED BY THE NON-PROFESSORIAL ACADEMIC STAFF
IN THE SCHOOL OF GENERAL STUDIES

William Joseph Ginnane, M.A.(Melb.), B.Phil.(Oxon.).
Present tenure expires 29 September 1972.
Michael Miles Gore, B.Sc., Ph.D.(Leeds).
Present tenure expires 29 September 1972.

MEMBER ELECTED BY THE RESEARCH STUDENTS

Geoffrey Bradfield Fox, B.Rur.Sc., Ph.D.(N.E.).

Present tenure expires 29 September 1972.

MEMBER ELECTED BY THE UNDERGRADUATE STUDENTS

John Christopher Bishop.

Present tenure expires 29 September 1972.

MEMBERS ELECTED BY CONVOCATION

Ruth Emma Auguste Arndt, B.Sc.(Econ.) (Lond.).

Present tenure expires 29 September 1972.

The Honourable John Johnstone Dedman, B.A., Hon.LL.D.(ANU).

Present tenure expires 29 September 1972.

Germaine Anne Joplin, B.A., D.Sc.(Syd.), Ph.D.(Cantab.).

Present tenure expires 29 September 1972.

Roy Douglas Wright, M.B., M.S., D.Sc.(Melb.), D.Sc.(ANU), F.R.A.C.P.

Present tenure expires 29 September 1972.

MEMBERS APPOINTED BY THE COUNCIL

John Darling.

Present tenure expires 11 March 1973.

One vacancy.

SECRETARY TO THE COUNCIL

The Registrar.

THE VICE-CHANCELLOR'S REPORT

Emeritus Professor Sir John Crawford, C.B.E.

This is the third occasion on which I have reported, as Vice-Chancellor, on the University's activities in the past year. 'Activities' is perhaps a misleading description of the contents of what I regard as proper to a Vice-Chancellor's report: what the University has accomplished in teaching and research, what objectives it may have failed to attain, is the subject of the detailed statements submitted by faculties, schools, and University agencies in the body of the Annual Report.

I shall not attempt a summary of these statements, much less offer comment on them, beyond observing that they present a record of progress and achievement in proven fields of endeavour, combined with a healthy experimentation in undergraduate course structure, staff and postgraduate research, and university organisation.

Specifically, it is my intention here to offer some comment on matters of policy and development which have concerned the University in the past year. In so doing I should remind you that a university does not easily segregate its activities into calendar years. In my 1969 report I referred to our efforts—and those of Australian universities in general—to bring about satisfactory relationships with other educational institutions which are evolving in this country; in 1970, I emphasised the prolonged discussions which had taken place in this University on establishing academic and organisational objectives for the next few years. I should not want it to be assumed, from the absence of comment on these two broad sets of objectives, that we have now ceased to be concerned with the University's relationships with other bodies, or with our own internal development!

On the contrary, 1971 was not an idle year. After the necessary consolidation of views, which culminated in December 1970 in the submission of proposals to the Australian Universities Commission for the 1973-75 triennium, university bodies returned in 1971 to certain matters of broad policy which had been left unresolved in earlier discussions. You will read elsewhere in this Annual Report of consideration given to admission standards, teacher evaluation, and the proposal to establish a separate Research School of Earth Sciences.

Discussions on the proposal to establish a Research School of Earth Sciences have continued throughout the year. Council in November expressed itself strongly in favour of establishing a School. This decision naturally raised important questions affecting the structure and objectives of the Institute of Advanced Studies as a whole. These questions were much in the mind of Council when it made its decision but it called for further consideration of them within the Institute. Even by the end of 1971 a committee was well forward with its work, and its recommendations will be submitted to the Board of the Institute and Council in the first half of 1972.

The two main themes of my earlier reports, namely, the University's external relations and its internal academic development, combined to focus attention on the size of the University and, in particular, the formulation of a policy on ultimate development.

On a simple view, a university which aimed to satisfy its social responsibilities by offering instruction to as many students as presented themselves to it could clearly set no limits on size. Again, on the simple view, a university which attempted to take all learning as its province, and to offer facilities for research in all fields of study would multiply indefinitely. In practice, in either case, there comes a point when a university must define more precisely the limitations to be imposed on its teaching and research.

Any consideration of the optimum size for a university inevitably involves subjective assessments, but the concept of the university with which one is working is of prime significance. The Australian National University aims at achieving more than a one-way transmission of knowledge: the direct exchange of ideas and the clash of minds in small groups is essential to its concept of itself as a high quality national university, with responsibilities in the national and international spheres in addition to providing for the needs of the local community. I shall have more to say about this below.

This philosophical approach is of prime importance but it must also be related to detailed considerations of faculty size, faculty structure, the rate of growth and the physical capacity of the site. At one end of the scale it can be argued that there is a certain minimum size for effective operation and though there can be room for argument about the precise level of this minimum, there are reasons for setting it somewhere around the level of 5,000 equivalent full-time undergraduate students. What of the maximum? Economies of scale begin to operate as the minimum figure is exceeded, but these economies are not as significant as is often supposed. The costs of increase in size include some loss of personal attention to students and of the interplay of ideas between staff working in different disciplines.

After taking all of these factors into account we have come to the decision that the Australian National University would appropriately stabilise at a level of 7,200 students, including 1,300 postgraduates. This is a moderate size by some Australian standards, though a large one by English standards. In reaching its conclusion Council adhered to the aim of a limited number of undergraduate faculties (the five existing ones with the possible addition of Medicine), and built up its aggregate figure after determining the appropriate size for each individual faculty. The Faculty of Arts, for instance, with an enrolment of over 1,500 equivalent full-time students, cannot be allowed to expand significantly if it is to retain any sense of coherence.

This figure of 7,200 students is not sacred—I should not be prepared to argue that 8,000 students, for instance, was too large—but it does represent what seems to us, after detailed investigation, a sensible compromise between those factors making for growth and those encouraging restriction of numbers. Ten thousand students on the other hand, is clearly too many: it would stretch the resources, and the necessary cohesion, of the small number of faculties beyond reason, and would moreover require the University to undertake a major new building program.

I have mentioned above the claim of this University to a special national status. In making this claim, I am not asserting any pre-eminence over the large universities embracing an extensive range of disciplines and student numbers three or four times the level currently enrolled at the Australian National

University. I am thinking more of a difference in aims and of a conscious attempt on our part to combine what is often loosely termed 'pure' research with a recognition of national objectives. This dual function of the University is reflected in that section of the University Act which provides that the University should aim 'to encourage, and provide facilities for, postgraduate research and study, both generally and in relation to subjects of national importance to Australia'.

This purpose is most easily exemplified in the structure of the Institute of Advanced Studies, but I regard it also as a distinguishing feature of the School of General Studies. On the one hand it is our intention to restrict the School of General Studies to a small number of faculties in some of which, for example, in the Faculty of Asian Studies, we have established our position as the main centre in Australia for teaching and research. On the other hand, the composition of the undergraduate student body reflects our aim to attract students from all over Australia, and indeed from overseas, without compromising responsibility, which we readily accept, to provide appropriately for the needs of the local community.

Of total undergraduate enrolments in 1971, over 60% are derived from an area within twenty-five miles of the University. This figure in itself is significant but it conceals an even greater awareness of the particular needs of Canberra. Living on the threshold of Government we are conscious of the requirements of the Public Service and are co-operating to the best of our ability with its attempts to encourage part-time university study by its non-graduate staff. Professor Gibb has referred in his report to the fall in the proportion of part-time students in 1971 though I should emphasise that this proportion still stood at the substantial level of 44% of total enrolments, and no less than 83% of part-time students enrolled come from the area within twenty-five miles of the University.

Student matters are dealt with at length in faculty reports and I shall refer here only to one aspect of student activity. This is the part played by the student body in the affairs of the University as a whole. I have been heartened by the success of student participation in University government in its third full year of operation. It has been mutually beneficial to students and academic staff and I have been impressed by the contributions many of the students have made to the work of their committees. We look on the students as having committee membership as individuals and not as delegates of any particular student group. Committee membership brings with it not only opportunity to participate but also responsibility; this responsibility can be best discharged by thorough preparation in the committee's business and a readiness to contribute on all items regardless of whether they touch on student matters or not. Considering the relative lack of continuity among student representatives, and their lesser opportunities to gain experience of University affairs, their performance often compares favourably with other committee members.

In reflecting on the areas of deepest concern during the past year I am unable to escape the thorny problem of university financing. I have commented on this before, both publicly and within the University, but I make no apology for returning to it once more, and I do not promise to be silent during the remainder of my term as Vice-Chancellor. No responsible person would claim that society

must be ready to support, without complaint or question, every expansion which a university can contemplate, no matter how academically worthy this expansion may be. Difficult and often painful decisions have to be made, and it is the Australian Universities Commission which is faced with the unenviable responsibility of making them. All we do expect is that due regard be paid to conclusions reached by a university after exhausting discussion and investigation and that these conclusions be not simply subjected to bench-marks unrelated to the Australian National University.

We entered 1971 with two major problems unresolved. There was, in the first place, the uncertainty surrounding support for increases in non-academic salaries—I spoke at length of this in my report for 1970. At the same time we recognised the need to divert resources to meet the University's computer needs not provided for in the triennial grant.

On both of these problems I am happy to report significant progress. The incidence of non-academic salary increases was largely responsible for the restrictions on expansion referred to by the Deputy Chairmen of the Boards, but in the course of the year, in response to our representations, the Department of Education and Science informed the University that supplementary grants, to a total of \$2.05 million, had been approved to cover non-academic salary increases for the latter half of the 1970-72 triennium.

I welcome this recognition by the Government of a continuing difficulty for universities. While there has been, hitherto, no acceptance of any continuing obligation to underwrite the cost of non-academic salaries in universities, I am now hopeful that a satisfactory system, allowing for periodic relief, will be evolved by the Australian Universities Commission and accepted by Governments.

This much-needed support allowed some relaxation of the restrictions which had been imposed during the first half of the triennium, though it should be realised that the process of 'stop-go' is as unsatisfactory in university as it is in national economic policies. Restrictions in academic recruitment and the purchase of major equipment cannot be reversed over-night, and the Government's help, welcome though it was, came too late in the triennium for all the lost ground to be recovered.

Partly as a result of this relief, and partly by voluntary restraints accepted by the rest of the University, it has been possible to contemplate some relief to a serious under-capacity in computing facilities.

It sometimes appears to be forgotten—though not by university administrations—that the teaching and research activities demanded of a modern university require a complex of supporting services both by way of personnel and equipment. The magnitude of this support has increased significantly in the past half century as university workers have sought to utilise the products of technological advance which used to be regarded as a province of 'applied' as distinct from pure scholarship. It is now recognised that research in the physical sciences requires ever more complex and expensive equipment; the social sciences in their turn have established their need for teams of ancillary workers to assist in the collection and collation of source material. The humanities have not

been exempt: paper and pencil are still essential, but the worker in the so-called 'arts' field is now rightly seeking to avail himself of the techniques for team investigations developed by the social and natural scientists and of some, at least, of the aids offered by computer facilities.

It had become clear during the past two years that the University's computer facilities, based on the IBM 360/50 computer purchased in 1966, were inadequate to meet the needs of teaching and research departments and, furthermore, of the sophisticated administrative support required by the complex operation of a university. In close consultation with the Commonwealth Scientific and Research Organization, whose needs are in many respects parallel, a proposal was developed and in 1968 submitted for a joint computer facility which would enable a large-capacity computer system to be purchased for the use of both institutions. In August 1971 the Australian Universities Commission advised that no provision for computing had been made in the 1971-72 budget, and the University was invited to review the 1973-75 submission on computing on the assumption that no supplementary grants would be available for this purpose in the current triennium. Accordingly, the University was compelled to revert to an earlier proposal to develop an independent installation. After a full evaluation of available equipment in what had fortunately come to be an extremely competitive market, the University decided on the purchase of a large Univac 1108 system, which has just been installed as I write this report in March 1972.

Once more I conclude this report by thanking the Council, staff and students for the help and co-operation they have offered throughout the year. Without the close working relationships which have been built up and consolidated, my task as Vice-Chancellor would have proved less effective, and certainly less satisfying, and I am confident that the path of development which the University has taken rests on the general support of all sections of the University community.

PUBLICATION

CRAWFORD, J. G.

Agriculture in Development: The Australian Case and Some Contrasts with Developing Countries. National Bank of Egypt Fiftieth Anniversary Commemoration Lectures, Cairo, 48 + tables.

Developments of 1971 in Summary

THE INSTITUTE OF ADVANCED STUDIES

REPORT OF THE DEPUTY CHAIRMAN OF THE BOARD

Professor F. C. Courtice, F.A.A.

Being the mid-year of the triennium, 1971 was a year in which the emphasis was on consolidation rather than on initiation of new projects. Work on several new buildings or additions to buildings continued and when completed in 1972 this building program will enable the academic developments planned for the present triennium to proceed as envisaged. The largest of these projects is the building for the Research School of Biological Sciences which is due for completion in August 1972. When this is occupied late in 1972 the various departments of this School will come together in one building instead of being scattered throughout the campus. In the Research School of Pacific Studies the new hemi-hexagon and laboratory block were completed and occupied; the laboratories have greatly improved the working conditions of the Departments of Biogeography and Geomorphology, and of Prehistory. The specific pathogen-free animal breeding house, designed for breeding mice and rats free of specific pathogens, will be finished early in 1972, and should enhance the work especially of the Departments of Microbiology and Immunology in the John Curtin School of Medical Research. In the Research School of Physical Sciences extensions to the Mathematical Sciences block and the Cockcroft Building were made; building works in relation to the Anglo-Australian 150-inch telescope and the Science Research Council Schmidt 48-inch telescope at Siding Spring Observatory and to the injector cyclotron for the EN tandem machine in the Department of Nuclear Physics made good progress and are proceeding.

As at December the academic staff numbered 379 and there were 118 research officers and assistants; 311 students were proceeding to the degree of Doctor of Philosophy, and eighty-three doctoral degrees were awarded. These figures are overall very close to, but slightly less than, the figures at the end of 1970. They reflect to some degree the financial stringency early in 1971 which inhibited academic recruitment. Improvement late in 1971, however, enabled departments to make several appointments and the staffing position in 1972 should be close to the limit provided in the triennial submission. Among the new appointments was that of Professor Emeritus R. N. Robertson*, F.A.A., F.R.S., as Director of the Research School of Biological Sciences to succeed Professor D. G. Catcheside, F.A.A., F.R.S., when he retires at the end of 1972. Professor B. John was appointed to the Chair of Population Biology, Professor R. L. Martin, F.A.A., to the chair of Inorganic Chemistry, Professor S. J. Butlin to a second chair in Economic History, Professor F. H. G. Gruen to a second chair in Economics and Professor L. Broom to a chair in Sociology. Professors pre-

* Knight Bachelor conferred 1 January 1972.

viously appointed and who took up their duties in 1971 include Professor L. W. Nichol in the Department of Physical Biochemistry, Professor R. G. Ward in the Department of Human Geography, Professor S. Kaneff in the Department of Engineering Physics, Professor B. Ninham in the Department of Applied Mathematics, Professor W. A. Runciman in the Department of Solid State Physics and Professor E. J. Hannan, F.A.A., in the Department of Statistics. The John Curtin School of Medical Research welcomed the first British Florey Memorial Fellow, Dr G. G. Macpherson, who will work with Professor B. Morris, F.A.A., in the Department of Immunology. It is fitting that Dr Macpherson should come to us from the Sir William Dunn School of Pathology, University of Oxford, which the late Lord Florey had directed for so many years before his retirement.

Owing to ill-health Professor J. C. Jaeger, F.A.A., F.R.S., resigned as Head of the Department of Geophysics and Geochemistry, and Professor A. E. Ringwood*, F.A.A., was appointed Acting Head of the Department. With Professor Jaeger's early retirement from the Headship of this Department, the question of a separate Research School of Earth Sciences was further discussed. The Board of the Institute of Advanced Studies set up a committee to examine the implications that the establishment of a Research School of Earth Sciences would have for the whole structure of the Institute. This committee will report to the Board early in 1972.

Although the work of the Institute of Advanced Studies is not directed towards the solution of *ad hoc* problems of immediate practical and economic value, it is nevertheless gratifying to note that an important discovery was made by Dr A. J. Parker and his colleagues in the Research School of Chemistry. Arising from fundamental knowledge gained by research into chemistry in non-aqueous solvents, new and potentially important processes for the extraction and refining of metals, especially copper, have been developed. Exploitation of this discovery is being planned by the University jointly with an industrial partner.

The high quality of research in the six research schools of the Institute of Advanced Studies has attracted in recent years an increasing number of visiting scholars from countries overseas as well as from other parts of Australia. This trend was especially prominent in 1971 in all schools. Visiting fellows play an important role in maintaining the standard of excellence to which the Institute of Advanced Studies always aspires. With rapid transport and the more liberal granting of study leave by some overseas universities, the use of visiting fellowships will no doubt have an increasing impact on the work of the Institute of Advanced Studies in the future. Another prominent feature of academic life in the Institute of Advanced Studies is the increasing number of national and international conferences being held in Australia, and especially in Canberra, in which members of the Institute are directly involved. An outstanding success in this regard was the 28th International Congress of Orientalists held in Canberra in January in which members of the Research School of Pacific Studies, as well as members of the Faculty of Asian Studies, played a leading role.

The quality and breadth of research are reflected in the lists of publications, both papers and books; these are given in detail elsewhere in this Report.

* Elected F.R.S. 1972.

Mention will be made here only of those scholars who have been honoured for their outstanding work. Among such distinctions have been the Britannica award to Professor D. H. Pike, F.A.H.A., the Rosenstiel award of the University of Miami to Professor A. E. Ringwood, F.A.A., the ANZAAS Mueller Medal to Emeritus Professor W. E. H. Stanner, C.M.G., the Royal Geographical Society's Victoria Medal to Professor O. H. K. Spate, F.A.H.A., the Purkynje Medal of the Czechoslovak Medical Society to Professor A. J. Birch, F.A.A., F.R.S., the Edgeworth David Medal of the Royal Society of New South Wales to Dr D. A. Buckingham, the H. G. Smith Memorial Medal of the Royal Australian Chemical Institute to Dr A. J. Parker (jointly with Professor I. G. Ross) and the Pawsey Medal of the Australian Academy of Science to Professor B. Ninham. Other honours include the election to Fellowship of the Australian Academy of Science of Professor F. W. E. Gibson, Professor G. A. Horridge and Dr W. Compston. The most notable honour was the appointment by Her Majesty the Queen of Emeritus Professor Sir Mark Oliphant, K.B.E., F.R.S.N.Z., F.A.A., F.R.S., as Governor of South Australia.

THE SCHOOL OF GENERAL STUDIES

REPORT OF THE DEPUTY CHAIRMAN OF THE BOARD

Professor C. A. Gibb, O.B.E.

The School of General Studies was much preoccupied throughout 1971 with the need for budgetary replanning, for restructuring development plans and for devising economies. This preoccupation had its basis in two sources of financial pressure. First, rapidly increasing costs, especially of non-academic salaries, were a major cause for concern until the Government gave its decision to make a supplementary grant. Second, the Australian Universities Commission gave evidence of its increasing concern with teaching and research costs per student enrolled as an index of support-level in the School of General Studies as in the State universities. Unfortunately these two pressures were mutually reinforcing and the latter will ensure that the quality of work in the School will place a heavier burden on the staff if impaired. In the School of General Studies which has been striving to provide the best possible teaching and research by employing well qualified staff on a full-time basis the primary source of 'savings' must be to follow the State universities in the cheaper expedient of greatly increasing the proportion of inexperienced junior staff and of part-time teachers who are paid by the university for their teaching service only and who receive no research support from this source. These pressures and policies could inhibit the achievement of that quality and status which the Council of the Australian National University has always believed was appropriate to a national university no less in its undergraduate programs than its research schools.

The steady growth of the School of General Studies, which has characterised the past several years since a policy of 'planned growth with rising standards' was adopted, continued into 1971. The total number of all students (including students working for the degree of Doctor of Philosophy) enrolled in the School increased from 4,255 in 1970 to 4,454 in 1971. In this figure it is interesting to observe that enrolments for the degree of Doctor of Philosophy in the School

of General Studies has now reached one third of the total number pursuing courses for the degree of Doctor of Philosophy in the University. In terms of equivalent full-time students (a measure now widely taken to represent teaching load) the total increase in the School was 7.8% from 1970 to 1971. To some extent this rate of increase in the teaching tasks is the result of a considerable increase in the proportion of students studying full-time in 1971. Whereas 53% of bachelor degrees students had studied full-time in 1970 this proportion was increased to 58% in 1971. Only 29% of new bachelor students in 1971 enrolled to study part-time compared with 45% in 1970 and 55% in 1967.

A number of factors contribute to this changing proportion, but before discussing them it is necessary to be clear that part-time study and indirect or mature-age entry are not synonymous. No part of this change is due to conscious or deliberate discrimination either for school leavers or against the more mature student who may have concluded his formal schooling some years before seeking admission to the University. On the other hand it is undeniable that increasing admission standards do have a differential effect on the admission of those wishing to study part-time since an unduly large proportion of them has been only marginally qualified. It is a not unreasonable hypothesis that many part-time students have come from the ranks of those whose school achievements were inadequate to win them support for tertiary study, who have consequently accepted jobs, often in the Commonwealth Public Service, and who have then sought to use the Fees Reimbursement Scheme to pursue their education, while also attempting to adapt to a new job and often to the first experience of living away from home. The records of students who conform to this pattern, have been very poor, a circumstance that led the Faculty of Economics to resolve in 1971 that in so far as any such students did win admission to the University in future they would not be admitted to the study of economics. On the other hand, the mature-age entrants to part-time studies have in general performed well. But there are other factors which also contribute to the change in the proportion studying full-time. In 1971 more school-leavers from beyond the Australian Capital Territory and New South Wales chose to study at the Australian National University and the number choosing to study science which commonly demands full-time enrolment rose by almost 11%. There is some reason to believe that these quite dramatic changes were associated with the new 'early admissions policy' which operated for the first time in respect of 1971 admissions. Further comment on this policy is offered below. However, the Faculty of Economics also experienced a marked increase (18%) in enrolments in 1971 and it is much less clear that early admissions affected this figure.

As against these measures of increasing activity in the School the teaching staff increased only from a total of 311 in 1970 to 327 in 1971—a modest 5.1%.

It is too early yet to comment in depth on the early admissions policy which was described at length in the 1970 Report. A full evaluation will be undertaken early in 1972. However, some preliminary information is already available: 550 early offers were made; 203 recipients of these offers actually enrolled in the Australian National University in 1971. Subsequent checking has shown that some 85% of recipients of early offers qualified for Commonwealth Scholarship support, and only five failed to achieve the regular admissions standard in the

State examinations taken later. In three known cases these failures were due to severe illness rather than to any lack of ability. There is also preliminary evidence to suggest that the 203 students who enrolled after receiving early offers have had a very good record in the University first-year examinations though that record has not, of course, been free of failure. Unfortunately, despite a doubling of the number of offers made during 1971 for 1972 admission the numbers of recipients enrolling increased only 25%. It is not yet known whether again there is an effect on faculty choice though it is known that the trend to an increasing ratio of full-time to part-time enrolments has been maintained. With the increase in the number of offers the proportion of recipients qualified for Commonwealth Scholarships has fallen slightly to 82%.

A number of trends noted at some length in the 1970 Report have persisted through 1971. Pass rates continue at an acceptably high level in courses after first year. First-year results whether in arts or science continue to show levels of wastage and examination failure which are so high and so stable as to be a serious cause for concern and one really calling for a study of examination practices and the objectivity of standards. A few examples will suffice and these are chosen from subjects with large enrolments to be representative rather than dramatic. Total wastage (i.e. drop-out plus failure) in arts units was 23% in history first-year units, 32% in geography, 29% in philosophy, 20% in pure mathematics and in political science. In the Faculty of Science representative figures for total wastage are physics, 45%, chemistry 42%, psychology 36%, zoology 29% and botany 12%. Actual examination failure rates are naturally lower varying from 10% in political science to 23% in geography and from 10% in botany to 28% in zoology. The Dean of the Faculty of Economics has drawn attention to failure rates of 32% in Economics I and 29% in Accounting I but has also shown that after first year the failure rates are reduced to 5%-7%. Apart from the concern expressed above the deduction is inescapable that first year study in this University at least is still being used as a sorting device with a clear indication that in the view of teacher/examiners there are still many students entering the University who, whether for lack of ability or of motivation, should not continue here. One implication of this is that there is still room to improve the admissions criteria and procedures.

The 1970 Report recorded an increasing interest in programs of study that cut across faculty boundaries and suggested that 'the time is probably near at hand when the School of General Studies should reconsider the wisdom of five separate degrees of bachelor'. During 1971 a further such program combining studies in science and economics has been approved and the Faculty of Science is calling for a study in 1972 of the desirability of returning to fewer undergraduate degree titles and so to a greater flexibility in the students' choice of programs of study.

The Graduate Degrees Committee described in the 1970 Report has received formal approval. Departments of the School of General Studies now have responsibility for studies for the degree of Doctor of Philosophy through their faculties rather than through research schools of the Institute of Advanced Studies. This is a most significant step in the working out of some of those difficulties which have been inherent in the Australian National University formed as it was by the combination of two such diverse institutions.

The Committee appointed by the Board of the School of General Studies to consider and advise on the total academic organisation of the University as it affected the School presented an interim report in mid-1971 for discussion by the Board and more widely in the faculties. The overall reorganisation recommended failed to win approval but discussion revealed that some elements of the program did command support and an enlarged committee will attempt to offer a more acceptable set of proposals in 1972. Until these central issues can be resolved the question of extending student participation in the deliberative councils of the University to membership of the Board of the School remains unanswered.

A committee report recommending a comprehensive scheme for the evaluation of teaching skill and for the development of such skill has also failed to find favour among members of the staff to whom it was widely distributed. There is, however, general agreement in the University that greater consideration must be given in both appointment and promotions procedures to an applicant's skill in teaching. This seems to imply either that a more attractive way of presenting such a scheme to the staff will need to be found or the University Council will need to take an unpopular decision.

All Australian universities have, through the years 1970 and 1971, considered in great depth suggestions that there would be advantages to the community in the adoption of year-round patterns of teaching. Very detailed examination of a variety of proposals for the School of General Studies was made by a special committee established by the Vice-Chancellor with Professor E. S. Crawcour as its chairman. This committee reported that implied economies and other advantages were largely illusory since both staff and physical plant were already much more fully employed than was usually recognised. However, the committee did suggest that while a full-scale term or semester during the summer lecture recess could not profitably be mounted there may be a case for providing some course work to serve such purposes as bridging the gap between secondary school and university and enabling students to accelerate their progress in certain circumstances. A committee has been appointed to make practicable proposals which would achieve these and other worthwhile objectives.

Discussion with the University of Puget Sound, Tacoma, Washington, continued through 1971 with the object of providing a base in the Australian National University for students of the University of Puget Sound pursuing a Junior Semester abroad in the Pacific. Negotiations were greatly advanced when Miss M. G. C. Bouquet, an Assistant Registrar of this University, was able to visit the University of Puget Sound in October. A further major advance which should prepare the way for the arrival of students in September 1973 will occur when Dr R. G. Albertson of the University of Puget Sound visits Canberra in March 1972.

The School records, with great sorrow, the sudden death of its very distinguished Professor of Pure Mathematics, Hanna Neumann. At the end of 1971 Professor C. M. H. Clark, F.A.H.A., who had been Head of the Department of History since 1951, relinquished that headship and was appointed by the University to be Professor of Australian History. Mr W. Milgate, Reader in English, was appointed to a non-established professorship of English in recognition of his outstanding scholarship. Professor G. H. Russell's resignation from the Head-

ship of the Department of English in order to be Professor of English in the University of Melbourne was received with regret. He will be ably replaced by Professor J. P. Hardy at present Professor of English in the University of New England. The decision was taken to substitute for the vacant chair of statistics—chairs of both mathematical statistics and econometrics; Professor C. R. Heathcote was appointed to the former and Professor R. D. Terrell to the latter. Professor B. L. C. Johnson, Professor of Geography in Monash University, accepted appointment as Head of the Department of Geography late in 1970 and commenced duty in 1971. Two other changes among the senior staff of the School deserve mention here. Professor L. R. Zines succeeded Professor C. M. Williams as Dean of Students and Professor A. N. Hambly has accepted appointment to the Deputy Chairmanship of the Board of the School.

SITE AND BUILDINGS

A list of buildings completed or under construction during the year is included in the building program summary which appears later in this Report. A satisfactory beginning, and continuing good progress, on the capital works program for the 1970-72 triennium has enabled the majority of buildings to be completed, or be under construction, by the second year of the triennium.

The University's capital building submission for the 1973-75 triennium is at present under consideration by the Australian Universities Commission, following the Commission's triennial visit to the University in July.

There has been a continuing review of the site plan during the year; this has been, and will continue to be, related to fine detail and the incorporation of new developments. Involvement of University staff and students in planning the future of the campus has been invited and welcomed.

The landscaping campaign has continued with perhaps the most significant event being the closure of the western end of University Avenue and its conversion as the first stage in the development of the avenue as a landscaped pedestrian area. Other achievements include the landscaping of the area between Daley Road and Linnaeus Way, the completion of a new sports oval, and intensification of the planting program.

Regular discussions with Canberra authorities, and notably the National Capital Development Commission, continue to be held with the object of integrating the campus with city development and co-ordinating the provision of facilities.

NOTES ON OTHER DEVELOPMENTS

In March 1971 the University Act was amended to increase the representation of undergraduate students and of the members of academic staff other than professors. Undergraduates are now represented on Council by their President and by one member elected directly to serve on the Council. The proposal to add an additional member elected by undergraduates was not acceptable to the

*Amendment
of the
University
Act*

Government but the Minister undertook to review the matter at an appropriate time. The amendment also led to an increase in the size of the Standing Committee of the Council from nine members to twelve and to the Pro-Chancellor becoming Chairman of the Standing Committee. The Council appointed the President of the Australian National University Students' Association as one of the additional members.

Melville Hall

Melville Hall, named after Sir Leslie Melville, K.B.E., who was the University's Vice-Chancellor from 1953-60, was officially opened on 10 September 1971. This building will be used mainly for examinations and public functions.

Biochemistry Building

The new building for the Department of Biochemistry, Faculty of Science, was opened by Emeritus Professor R. N. Robertson, C.M.G., F.A.A., F.R.S., Director-elect of the University's Research School of Biological Sciences, on 12 November 1971. The Department not only offers undergraduate and post-graduate instruction for scholars planning to specialise in biochemistry, but also offers ancillary courses for other disciplines such as botany, forestry and zoology.

Legal Workshop

The University has established a Legal Workshop, the aim of which is to give law graduates practical training in the application of their legal knowledge. Law graduates will work for six months in a simulated office situation in much the same way as legal practitioners. Mr K. F. O'Leary has been appointed Director of the Legal Workshop.

28th International Congress of Orientalists

The 28th International Congress of Orientalists was held at the University from 6 to 12 January 1971. One thousand two hundred scholars from all parts of the world attended and papers on all subjects, which could be offered by any member of the Congress, were scheduled for discussion in one or other of the six programs, organised on a regional basis from West Asia to Japan. A Commonwealth grant of \$50,000 including substantial gifts covered the basic administrative expenses of the Congress with some money left over to pay for the commissioning of papers on special fields. Further assistance of \$50,000 from the Ford Foundation and the Asia Foundation went to a travel support fund used to bring special guests.

As part of the program of the 28th International Congress of Orientalists, a series of Library Seminars was held on the theme of International Co-operation in Orientalist Librarianship. Those meetings were the first major activity of the International Association of Orientalist Librarians, which was established at the Library Panel of the 27th International Congress of Orientalists held at Ann Arbor in 1967.

Aquarius Festival of University Arts

The Aquarius Festival of University Arts, organised by the Australian Union of Students, was held on the Australian National University campus from 15 to 22 May 1971. It attracted nearly 6,000 students from interstate and was a week packed with events: drama, dance, music, non-stop jazz, folk and pop concerts, debates and films. The organisers called it 'the most exciting week in Canberra's cultural history'. In addition to the organised events going on simultaneously in many parts of the campus, the Library Lawn became a venue for a continuous

program of impromptu entertainments. Accommodation of the visitors presented one of the most difficult organisational problems, and most of the students spent the chilly nights under canvas at the Canberra Showground.

A gift of books from the Historical Archives Commission of the Kuomintang in Taipei, Taiwan, was presented by the Chairman of the Commission, Dr Chi-lu Huang, and the Vice-Chairman, Mr Yuan-tsai Tu, to the University on Friday, 8 January. The books concerning the early years of the Chinese Republic, comprise twenty-eight volumes of commemorative works for the centennial celebration of the birth of Dr Sun Yat-sen, founder of the Chinese Republic, and twenty-one volumes of documents to mark the Republic's fiftieth anniversary. The Deputy Vice-Chancellor received the books on behalf of the University. *Gifts*

An extensive collection of furniture, paintings, silver, books, oriental pieces and other items has been available through the generosity of Mrs K. Lyttelton-Taylor of Tamworth. Some are outright gifts while others are on loan. Mrs Lyttelton-Taylor acquired the collection over some twenty-five years from auctioneers and dealers in all parts of Australia. Some of the oriental pieces, which include jade, inlay work, painted scrolls and screens, may be used as teaching aids in appropriate departments of the Faculty of Asian Studies.

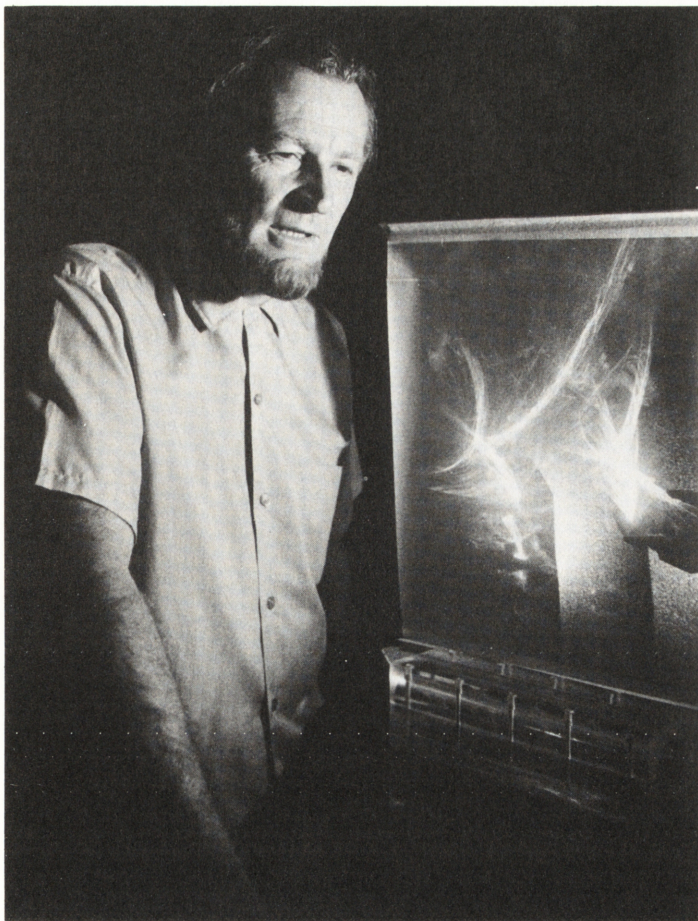
A plaster cast of an Indian yakshi or nature goddess has been presented to the Faculty of Asian Studies by the Patna Museum of Bihar. The cast is of the 'Didarganj Yakshi', a life-size figure of highly polished sandstone. It was found long ago at Didarganj near Patna, which was at its height in the third century B.C. Most scholars assign it to this period, but some have suggested that the image may belong to the second or first century B.C.

Stanislav Ostojak-Kotkowski arrived at the University in March to take up his Creative Arts Fellowship. He is working closely with members of University departments on developing kinetic experiments which will incorporate laser images. *Creative Arts Fellowships*

Arthur Boyd arrived in Canberra in September to take up a Creative Arts Fellowship and the following month held an exhibition of paintings, ceramics and tapestries in the Melville Hall. The paintings covered the whole of his life as a painter, beginning with landscapes done when he was only sixteen and extending to paintings from his 'Nebuchadnezzar' series of the late nineteen-sixties.

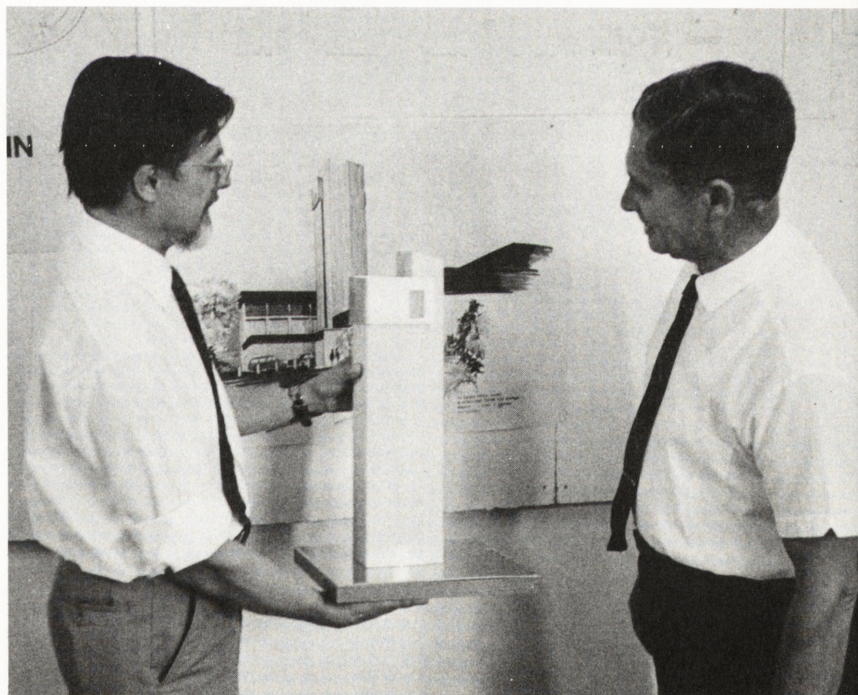
Mr Don Banks will take up his Creative Arts Fellowship, which is for one year, in January 1972. While at the University, apart from composing, he intends to undertake research in electronic music.

Australian sculptress, Norma Redpath, has been awarded a Creative Arts Fellowship. She works largely in Italy, but makes frequent return visits to Australia. Rather than spend some three months on one visit to the Australian National University under the terms of the Fellowship, Miss Redpath intends to make two shorter visits separated by a time at her studio in Milan, where she will prepare sketches and a model for a sculpture that could be placed on the University site.



Adelaide artist Stanislav Ostojakowski held a Creative Arts Fellowship during the year. He is pictured demonstrating a laser beam technique he is developing as a means of producing abstract visual images.

Photo by courtesy of G. Carpay



The University Architect-Designer, Mr D. F. Wrigley, and the Director of the Research School of Physical Sciences, Professor Sir Ernest Titterton, inspect a model of the tower being built to house the Research School's new tandem accelerator. Behind them is one of Mr Wrigley's perspective drawings of the building as it will look when complete.

Photo by courtesy of G. Carpay



Crowds such as this often gathered on the Library Lawn during the Aquarius Festival of University Arts held from 15 to 22 May. During the week a multitude of activities was conducted on campus in the biggest festival of its kind yet held.

Photo by courtesy of G. Carpay



Professor D. A. Brown, Professor of Geology (left), and Dr K. S. W. Campbell, Reader in Geology, examining a piece of fossil material, are planning a Vertebrate Palaeontology Research Unit to co-ordinate Australian efforts to collect and describe fossils. The research unit will be financed by a public appeal launched by the University during the year.

Photo by courtesy of G. Carpay



The Right Reverend K. J. Clements (*centre*), Bishop of Canberra and Goulburn, with Dr D. M. Griffin, Master of Burgmann College, and the Honourable David E. Fairbairn, D.F.C., M.P., then Minister for Education and Science, at the official opening of Burgmann College—the University's third affiliated residential college—on 31 July.

Photo by courtesy of G. Carpay

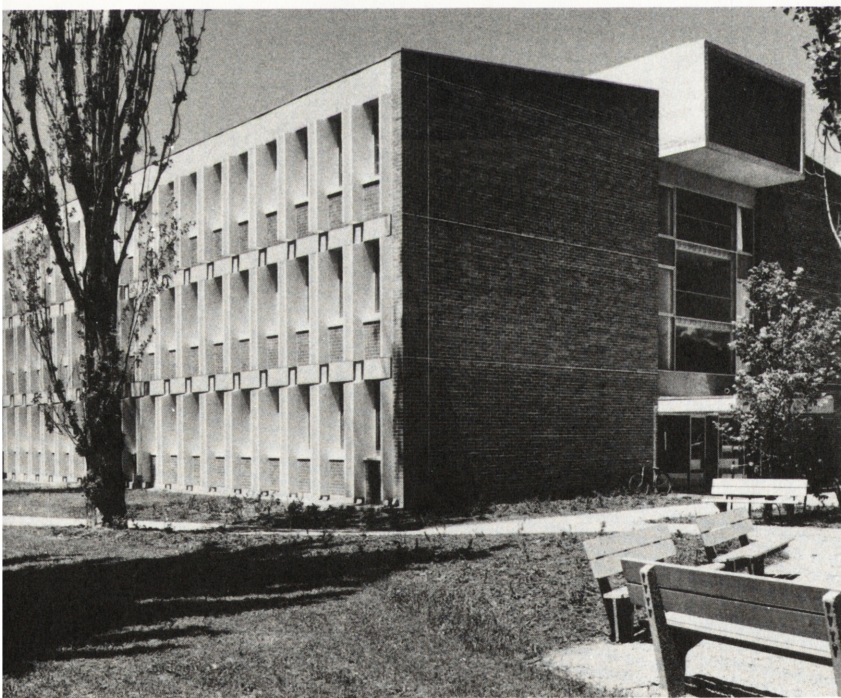


The western end of University Avenue, where cars and asphalt have been replaced with grass areas and a water wall that, together with associated planting that has still to develop, forms a visual 'base' for Bruce Hall.

Photo by courtesy of G. Carpay

Distinguished Australian artist Arthur Boyd with one of the paintings that was included in an exhibition of his works held in Melville Hall in October, shortly after Mr Boyd's arrival from London to take up a Creative Arts Fellowship, in the University.

Photo by courtesy of G. Carpay



This new building for the Department of Biochemistry in the School of General Studies was officially opened in November by Professor R. N. Robertson as President of the Australian Academy of Science. Professor Robertson is also Master of University House and Director-elect of the Research School of Biological Sciences. The building, which was built at a cost of more than \$1 million, has an appearance that is closely related to that of other buildings in the area.

Photo by courtesy of E. Richards

'Seven Days' 'Seven Days', a series of seven paintings by Leonard French, has been mounted in University House. Six of the paintings have been hung in the dining-hall foyer. The seventh—the largest work—has been placed on the wall above High Table. The paintings may remain at University House until permanent accommodation becomes available for them in the University.

'Bush Fire' 'Bush Fire', a triptych painting by Reinis Zusters, has been purchased by the University with a gift of money from J. B. Young Ltd. The painting is in the new Psychology Building.

'Cows Under The Palm' The Faculty of Asian Studies has acquired 'Cows under the Palm', a painting in the batik medium by Malaysian artist Lim Khoo Hock, who uses the *nom de plume* 'Toyo'. The painting is in the foyer of the Asian Studies Building.

Exhibitions The following exhibitions were held during the year in the R. G. Menzies Building of the University Library, except where otherwise shown:

6 to 30 January—Archaeological exhibition (in conjunction with the 28th International Congress of Orientalists); 22 February to 8 March—Exhibition of Japanese craft, lacquerware, ceramics and textiles (arranged by the Arts Council); 10 to 31 March—Posters on the commercial development of Holland (arranged by the Netherlands Information Centre); 13 to 25 May—Inter-university Photographic Exhibition (in conjunction with the Aquarius Festival of University Arts); 15 to 22 May—Inter-university Art Exhibition (in conjunction with the Aquarius Festival of University Arts) (J. B. Chifley Building of the University Library); 1 to 18 June—Ghanaian art, musical instruments, jewellery, carvings (arranged by the High Commission of Ghana); 21 June to 5 July—Books 'Environment-Quality of Life' (arranged by the Embassy of the United States of America); 5 to 12 July—Aboriginal bark paintings, artefacts (arranged by the Kanangra Society); 5 to 30 July—Exhibition of books, prints and other illustrative material on the Paris Commune 1871 (J. B. Chifley Building of the University Library); 26 July to 12 August—Indonesian arts and crafts (collected by Australian National University students on a field trip); 13 to 17 September—Sixth Annual Union Art Exhibition (Union Building); 28 September to 17 October—'Sepik Design'—arts and crafts of the Sepik region (collected by Dr D. C. Laycock); 21 to 26 October—Exhibition of paintings, ceramics, graphics and tapestries by Arthur Boyd, Australian National University Creative Arts Fellow (Melville Hall); 25 to 29 October—Exhibition of paintings entered in competition conducted by the Mentally, Physically and Socially Handicapped Association (arranged by Robin Hood Art Committee); 30 October to 13 November—Exhibition of paintings by Mr S. Vincett.

Public Lectures The following public lectures were given in the University during 1971: The University lectures, a series of four lectures in July on the theme: 'Revolution and Counter-revolution, the Paris Commune 1871-1971'; Mr R. B. Rose: 'The Paris Commune of 1871: The First Proletarian Revolution or the Last Episode of the French Revolution?'; Mr M. Rubel: 'Socialism and the Paris Commune'; Professor A. Gough: 'The Paris Commune: Reflections on the Death of an Archbishop'; Dr E. Kamenka: 'The Paris Commune and Revolution Today'.

A series of three lectures in September on the theme: 'USA—Crisis and Continuity'; Professor A. Weinstein: 'Repression in the USA? : Myths and Realities'; Professor P. Bourke: 'The Rhetoric of Crisis'; Dr H. Kinloch: 'The Greening of America'.

The John Curtin Memorial Lecture was given on 13 September by Mr K. E. Beazley, M.P., on 'John Curtin—An Atypical Australian Labor Leader'.

The Morrison Lecture was given on 3 November by Dr I. de Rachewiltz on 'Prester John and Europe's Discovery of East Asia'.

Other public lectures arranged were as follows: 14 April—Professor W. Mellers: 'The Fusion of the Genres'; 24 September—Mr M. Butor: 'The Book Today'; 27 September—Professor J. B. Duroselle: 'Modern Europe and France'; 20 October—Professor G. W. J. Drewes: 'The Changing Role of Islamic Women'; 26 October—Professor S. Hook: 'Academic Freedom and Academic Anarchy'.

In addition, a number of departmental lectures was given to which the public was invited.

The total full-time staff (excluding research scholars) increased from 2,714 at 30 April 1970 to 2,804 at 30 April 1971, an increase of ninety (or 3%). Of this increase twenty-three were teaching and research staff (including research only and central academic) and sixty-seven were other staff. Teaching and research staff increased by 3% from 876 in 1970 to 899 in 1971 and other staff increased by 4% from 1,838 to 1,905.

*Summary of
Staff Numbers*

ENROLMENTS

One hundred and thirty-one new research students enrolled for the degree of Doctor of Philosophy in the University during 1970-71, of whom eighty-six enrolled in the Institute of Advanced Studies and forty-five in the School of General Studies. They comprise sixty-seven Australians, twenty students from Britain, eleven students from Asian countries, ten students from Canada, eight students from New Zealand, five students from the United States of America and ten students from other countries. The total number of students enrolled in the Institute of Advanced Studies was 362 of whom three were not proceeding to a degree.

In the School of General Studies the total number of enrolled students increased by 199 (or 5%) from 4,255 in 1970 to 4,454 in 1971. The number of new students was 1,471 of whom forty-three were students for the degree of Doctor of Philosophy. Of the total students 2,478 were full-time and 1,976 were part-time; the proportion of full-time students increased from 49% in 1970 to 56% in 1971. The number of students enrolled for degrees of bachelor was 3,859 (3,682 in 1970), for degrees of master 187 (172 in 1970), for masters qualifying eighty-one (seventy-one in 1970) and for miscellaneous units not towards a degree 143 (156 in 1970). There were 182 (173 in 1970) students enrolled in the School of General Studies for the degree of Doctor of Philosophy and two students enrolled for courses of research not leading to a degree.

DEGREES AWARDED

The degree of *Bachelor of Arts* was conferred on: R. S. Adcock, Susan P. Admans, D. M. Anderson, W. C. Anderson, K. W. Aspinall, H. Badri, L. M. Bannister, Linda S. Bennett, Rosalind Bennett, D. J. Bergin, Helen R. Bernau, G. F. Bissaker, Francesca R. Booth, Catherine E. Bosser, E. S. Boyce, D. W. Brady, Wendy E. Braithwaite, Megan P. Brock, Margaret M. Brodie, Fiona M. Brotherton, Patricia N. Brown, P. K. Brown, T. A. Brownlow, Janet M. Brunskill, G. R. Bryant, J. M. Burns, J. W. Bury, Jacqueline A. Buswell, Kathryn Campbell, P. J. Campbell-Davys, Catherine M. Cardell-Oliver, Susan M. Carson, Susan M. Chadwick, Valerie E. Champion, W. C. H. Cheung, Y. J. Choi, Jane Ciracovitch, A. M. Collins, Janis L. Colman, Margaret R. S. Craik, J. A. Crystal, J. S. Curtis, Marion J. Davidson, J. T. Davies, Kathleen E. Davies, S. C. L. Davies, M. R. Davison, Roslyn Delaney, N. F. Dillman, Paula J. Donnelly, Marilyn S. Dooley, Lesley C. Dowse, Carol M. Dungey, C. G. Dureau, Gabrielle M. Edmonds, Jennifer M. Ellyard, N. A. Elphick, K. R. English, D. R. Erbacher, Elizabeth A. Erskine, Gillian E. Evans, Margaret S-G. Evans, Agnes H. Farrugia, N. B. Ferguson, W. R. Fischer, Mary E. Fisher, Lesley A. Fisk, Gillian D. Fleming, N. J. Fleming, Jacqueline A. Flint, June M. Flynn, C. J. Fogarty, Linda M. Gatfield, J. K. Gibson, G. A. J. Green, P. Gunton, Adrienne G. Gurnett-Smith, B. D. Hamilton, Patricia J. Handsaker, Jocelyn C. Harding, Lenore T. Hattersley, T. A. A. Havas, A. R. Hedley, Josephine A. Hennock, R. G. Henty, Carla C-A. T. Herbert, Janet E. Herbert, Christine F. Hicken, Mardi W. Hindmarsh, E. A. Hingee, Gillian M. Hoare, Harriet M. B. Horner, R. L. Hosking, Annette S. Howells, A. J. Hunt, P. M. Ilyk, Penelope M. Ingles, L. Jakimow, J. H. J. Jenkins, A. R. G. Johnson, A. W. Johnston, I. D. Johnston, Carmel F. Kain, Usanee Kanasuta, Joan M. Keane, Mary E. Kehoe, J. J. Kelleher, Noelene C. Kelly, Pamela V. Kenny, J. Kowalski, Jocelyn E. Kwaczynski, Y. F. Lam, Margaret A. Latham, M. W. J. Lee, K. G. Leonard, Susan P. Lever, D. N. Limbrick, Barbara K. Livermore, H. A. Livermore, Kathleen C. Lonergan, P. T. Lowe, Geraldine M. Lynch, Anita McCallum, Margaret L. MacCormick, Elizabeth A. McDonald, Maureen K. McDonald, K. J. McEwan, M. McKinnon, J. D. McMillan, D. W. Major, A. J. Martin, P. A. Mench, Valmai J. Mills, D. W. Mitchell, P. Montgomery, H. M. Moore, P. I. Moore, Ruth I. Morgan, Joan M. Morshead, B. P. G. Murphy, Rosemary C. Murphy, Lila M. Narain, Ailsa M. Neil, Pamela W. Oldmeadow, W. J. O'Mara, Wendy A. O'Neil, Rosemary J. Orr, S. R. G. Osborne, A. J. Overton, T. H. Palethorpe, K. E. Patino, Philippa I. Patterson, S. G. Payne, D. B. Pham, J. Polonyi, J. H. Rate, S. P. Reynolds, Alvina I. Reid, J. M. Robertson, Judith A. Robison, B. E. Roots, Susan K. Ross, Hilary J. Rowell, D. I. Rumble, R. A. Rummery, Gisela G. B. H. Sarossy, R. N. Schaedel, Loretta E. Schelb, B. A. Schick, I. D. Shann, Lindsay A. Shaw, A. G. Shelton, Lynne M. Short, A. C. Simpson, C. J. Sloan, A. J. Smith, Helen A. South, Beverley A. Stanford, J. J. Stephenson, G. S. Summerhayes, P. H. Sutton, L. R. Swindley, J. J. Tait, Elizabeth C. L. Taylor, Faye C. F. Thomas, S. G. Thompson, Anne C. Thorne, G. H. Tie, P. F. Tilley, G. W. Tinnion, Vizma I. Trepins, G. W. Tuite, Priscilla A. Tyler, C. Tyrrel, Lucy K. F. Tze, Robyn R. Ubrihien, Gillian N. Upton, A. B. Urquart, J. A. van der Moolen, E. A. J. van der Straaten, F. P. van Gestel, A. van Wierst, C. W. Vine, R. J. Walsh, S. A. Wenger, R. E. Werner,

P. W. F. Whalley, Lee E. Wilde, R. M. Willcocks, Virginia J. Wilton, R. T. Winch, R. E. Withnell, R. W. Woolfitt.

The degree of *Bachelor of Arts with Honours* was conferred on: Calila M. Black, M. H. Boothroyd, S. A. Christiansen, J. C. Dooley, Ann P. Duffy, F. L. Farrell, D. R. Fraser, W. M. Garnett, Cynthia A. Godfrey, Elizabeth G. Harper, G. Hart, Anne E. Holmes, G. J. Horsfield, J. D. Jameson, I. L. R. Kentwell, Sybille A. Kovacs, Louise C. Lake, R. B. Lee, Claire D. Lewis, Helen S. McCallum, I. D. McCalman, G. R. McKay, N. C. Morton, I. F. Olbrei, Linda E. Reid, J. S. Roberts, Linnett A. Sanchez, Suzanne H. Steadman.

The degree of *Master of Arts* was conferred on: Diane J. Austin (Philosophy, School of General Studies); Eve Buscombe (History, School of General Studies); Lynette A. Davis (Sociology, School of General Studies); R. M. Dickins (English, School of General Studies); B. F. Ford (Sociology, School of General Studies); B. M. Gray (Psychology, School of General Studies); Adele F. Hamilton (Psychology, School of General Studies); Susan D. Harvey (Sociology, School of General Studies); A. P. Hopkins (Sociology, School of General Studies); M. C. M. Hume (Statistics, School of General Studies); L. J. Kane (Psychology, School of General Studies); M. A. Khawaja (Demography, Research School of Social Sciences); Erika A. Langman (English and Germanic Languages, School of General Studies); H. J. Lourandos (Prehistory, Research School of Pacific Studies); B. I. McPherson (English, School of General Studies); D. R. Oram (Philosophy, School of General Studies); Barbara Ross (History, School of General Studies); P. A. Scherer (Sociology, School of General Studies); D. R. Shoemith (History, School of General Studies); Natalie Staples (Russian, School of General Studies); Mary T. N. Varghese (History, School of General Studies); D. F. Wetherell (History, School of General Studies).

The degree of *Bachelor of Arts (Asian Studies)* was conferred on: W. Amies, Rosemary M. Borthwick, M. J. Bourke, Valerie A. Brown, Wilma J. Chock Man, Judith E. Christie, Barbara L. Duke, Helen T. Grunseit, Jennifer L. Hendrie, Janet E. Knox, Judith A. Lee, P. C-T. M. Loh, Rhonda J. McKnight, Coleen M. Maloney, I. N. Peterson, A. P. Schonbaum, C. D. Smith, J. W. Stokes, Gail R. Tighe.

The degree of *Bachelor of Arts (Asian Studies) with Honours* was conferred on: Be Kien Nio, Adrienne H. Bradney, A. M. R. Gosling, Pamela C. Gutman, Jennifer Holmgren, D. R. Irvine, Margaret H. Johnson, Bronwen M. Jones, G. F. Lade, K-L. Siaw, Patricia G. Sippel.

The degree of *Master of Arts (Asian Studies)* was conferred on: Olga Hassanoff (Asian Civilizations, School of General Studies); E. P. P. Tang (Asian Civilizations, School of General Studies).

The degree of *Bachelor of Economics* was conferred on: G. F. J. Ashton, B. W. Bates, M. L. Beer, R. S. Beggs, W. J. Bracken, H. K. Clarke, J. P. Deane, S. J. Duckett, N. D. Dunn, P. G. Gifford, R. A. Grocott, Diana M. J. Heins, D. M. Howell, Marjorie P. Lance, D. A. Leckie, R. M. Levy, K. R. Lewis, G. K. C. Low, R. F. McPhail, P. C. Maher, B. J. Meredyth, R. S. Morris, I. R. Munro, R. F. P. Nairn, K. F. Paterson, D. C. Payne, P. P. Pond, A. S. Proctor,

A. J. Pulley, P. M. Richards, Ana M. Riethmuller, J. C. Sainsbury, A. C. Smart, D. W. Taylor, B. F. Thornton, D. J. Trewin, M. J. van der Hoek, M. H. Waterhouse, K. A. Webb, D. A. Whitty.

The degree of *Bachelor of Economics with Honours* was conferred on: K. D. Lin, Philida M. Sturgiss.

The degree of *Master of Economics* was conferred on: J. D. Belshaw (Economics, School of General Studies); D. W. James (Economics, School of General Studies); Margaret R. Kelly (Economics, School of General Studies); I. T. Loane (Economics, School of General Studies); T. D. O'Sullivan (Economics, School of General Studies); Janet G. Sutton (Economics, School of General Studies); G. R. Webb (Economics, School of General Studies); J. P. Weldon (Accounting and Public Finance, School of General Studies).

The degree of *Bachelor of Laws* was conferred on: W. J. Baker, A. Brooks, G. P. Brzostowski, J. M. Buxton, J. C. Campbell, H. L. R. Cook, R. J. Etridge, P. M. L. Ford, P. A. Gilmour, J. P. Hannaford, G. D. Holmes, G. S. Hosking, Maureen R. Kelleher, J. C. Kelly, B. R. Kwasnycia, F. J. A. Lynch, R. M. Mackay, D. J. Martin, P. M. Merity, M. J. Montalto, Phillippa M. Russell, N. M. Taylor, F. J. Vagg, P. A. Walker, S. J. Wawn, L. P. L. White, R. C. Whithear.

The degree of *Bachelor of Laws with Honours* was conferred on: H. C. Burmester, I. G. Cunliffe, Susan R. Eggins, A. G. Hartnell, W. I. Nairn, J. H. Pascoe, J. E. Rogers, D. W. Spain, G. A. Stretton.

The degree of *Bachelor of Science* was conferred on: Diana J. Antanaitis, Catherine M. Armstrong, Bettina M. Arndt, N. M. Blake, K. P. D. Chui, Annette L. Cook, Helen J. Crossing, G. D. Crow, S. R. Doyle, D. L. Edmunds, A. E. Geissler, Susan M. Glenn, K. P. Goodridge, Roberta A. Grady, R. M. Harris, M. E. Healy, J. R. L. Hoare, A. M. Hogan, K. P. Hoh, Suzanne J. Kearey, Valerie J. Kingston, Hazel C. M. Loggie, Susan M. Lowes, Patricia A. Mackay, A. E. Millar, P. D. Moore, C. W. Parker, F. A. Pellegrino, F. Perusich, Elizabeth J. Ross, T. Stolz, Elizabeth A. Sutherland, S. K. Toh, Elizabeth Vagg, G. M. Watkins, I. P. White, Jacqueline K. White, Jana E. White, B. J. Wilson, G. K. G. Wilson, P. F. Young.

The degree of *Bachelor of Science with Honours* was conferred on: C. V. W. Armstrong, N. R. P. Baczynski, B. G. Beeren, Helen P. Bray, J. M. Brown, W. R. Bucknell, M. G. Cowling, Peta L. Dawson, Carolyn A. Furlonger, A. M. Geier, Y. K. Goh, B. Harasymiw, R. I. Hartley, A. D. Hawke, D. F. Hazeltine, Gabrielle M. Heweston, T. J. Hillman, Maria Janczenko, G. R. Kelly, P. N. Madsen, J. A. Marshall, Susan J. Mathews, P. S. Moignard, R. P. Monckton, Sally Morrison, D. P. H. Murphy, B. W. Nisbet, R. W. Paltridge, J. W. Pitman, Margaret J. Pritchard, M. F. Reardon, Parveen U. Rizvi, M. J. Roby, P. J. Setchell, Cynthia H. Shen, D. M. Smyth, T. Spencer, F. R. W. Thorne, M. Veijayaratnam, A. W. Wadsley.

The degree of *Bachelor of Science (Forestry)* was conferred on: J. O. Awe, G. R. Blackwell, M. H. Bleby, P. J. Byrne, P. R. Carter, E. C. Cheong, A. E. Chessell, R. C. Clarkson, R. E. J. Coker, J. W. Courtman, A. B. Davies, R. M.

Davies, J. C. Doran, M. D. Evans, P. G. Foster, G. J. Gardner, R. A. Harris, G. J. Hodges, J. R. Hopcraft, R. J. Jackson, R. J. Lapworth, P. M. Lear, J. V. Leitch, A. R. Lush, G. M. McArthur, G. P. McDonald, S. M. Mackay, L. Mahmood, Z. Md Shaari, B. J. Nash, K. J. Neal, D. R. Page, K. J. Purdy, M. Pushparajah, A. D. Reid, J. H. Sedgley, G. R. Smith, R. W. Smith, R. E. Stevens, G. C. Stone, Y. K. Tan, M. C. Thomas, R. P. Underdown, P. C. Walker, C. H. Wells, A. L. Yates, C. T. Yong.

The degree of *Bachelor of Science (Forestry) with Honours* was conferred on: F. Arentz, R. D. Beck, P. M. Dear, D. M. Elliott, J. C. McCann, S. J. McPherson, J. F. Mills, J. W. Shirley, R. P. Smith, A. W. Walker, G. G. Wright.

The degree of *Master of Science* was conferred on: Beatrice J. Bancroft (Zoology, School of General Studies); B. F. Christiansen (Biochemistry, School of General Studies); J. N. Cosco (Forestry, School of General Studies); D. J. Crossley (Developmental Biology, Research School of Biological Sciences); J. D. Donnelly (Forestry, School of General Studies); K. W. Groves (Forestry, School of General Studies); G. E. Halford (Geology, School of General Studies); B. H. Kwa (Zoology, School of General Studies); C. H. D. Leong (Zoology, School of General Studies); D. M. O'Brien (Theoretical Physics, Research School of Physical Sciences); J. C. Slade (Physics, School of General Studies).

The degree of *Doctor of Philosophy* was conferred on: R. Ananthakrishnan (Human Biology, John Curtin School of Medical Research); J. M. Anthony (Pacific History, Research School of Pacific Studies); Robin L. Bade (Economics, School of General Studies); Rosemary E. Barnard (Human Geography, Research School of Pacific Studies); K. J. Batt (Philosophy, Research School of Social Sciences); D. Beattie (Accounting and Public Finance, School of General Studies); R. G. Bell (Experimental Pathology, John Curtin School of Medical Research); U. N. Bhati (Economics, Research School of Pacific Studies); I. D. Black (Pacific History, Research School of Pacific Studies); R. V. Blanden (Microbiology, John Curtin School of Medical Research); R. A. Both (Geology, School of General Studies); D. L. Bowers (Engineering Physics, Research School of Physical Sciences); J. M. Bowler (Biogeography and Geomorphology, Research School of Pacific Studies); C. J. Burrell (Microbiology, John Curtin School of Medical Research); K. W. Carter (Nuclear Physics, Research School of Physical Sciences); C. Y. Choi (Demography, Research School of Social Sciences); C. W. M. Chua (Economics, Research School of Pacific Studies); P. H. Chuong (Forestry, School of General Studies); S. W. J. Clement (Geophysics and Geochemistry, Research School of Physical Sciences); P. S. Cook (Political Science, Research School of Social Sciences); B. R. B. Crouch (Sociology, Research School of Social Sciences); P. R. Dasen (Psychology, School of General Studies); G. Delic (Theoretical Physics, Research School of Physical Sciences); R. D. Dikshit (Human Geography, Research School of Pacific Studies); A. Djaloeis (Nuclear Physics, Research School of Physical Sciences); A. W. Duggan (Physiology, John Curtin School of Medical Research); M. Dwyer (Research School of Chemistry); B. T. England (Medical Chemistry, John Curtin School of Medical Research); M. D. Fenn (Chemistry, School of General Studies); G. W. Gerrity (Physics, School of General Studies); J. R. J. Groves (Mathematics, Research School of Physical Sciences); A. E. Halladay (Sociology, Research School of Social Sciences); J. B. Hay (Experi-

mental Pathology, John Curtin School of Medical Research); B. J. Hensen (Geophysics and Geochemistry, Research School of Physical Sciences); N. D. Hicks (Demography, Research School of Social Sciences); P. J. Hoffmann (Genetics, Research School of Biological Sciences); K. E. Hopper (Physical Biochemistry, John Curtin School of Medical Research); A. H. Hughes (Political Science, Research School of Social Sciences); E. G. Hutchinson (Research School of Chemistry); M. Ikema (Economics, Research School of Pacific Studies); C. Isarangkun Na-Ayuthaya (Economics, Research School of Pacific Studies); P. Jakes (Geology, School of General Studies); P. A. Jenkins (Forestry, School of General Studies); J. K. Johnson (Human Geography, Research School of Pacific Studies); B. G. Jones (Geology, School of General Studies); M. A. Jones (Urban Research Unit, Research School of Social Sciences); I. P. S. Kang (Medical Chemistry, John Curtin School of Medical Research); G. L. E. Koch (Biochemistry, John Curtin School of Medical Research); A. K. Lahiri (Asian Civilizations, School of General Studies); R. Lang (Linguistics, Research School of Pacific Studies); P. K. P. Lauer (Pre-history, Research School of Pacific Studies); R. A. G. Lawson (Law, Research School of Social Sciences); H-S. Leng (Political Science, Research School of Social Sciences); Dianne N. Lewis (Pacific History, Research School of Pacific Studies); L. Li (Far Eastern History, Research School of Pacific Studies); A. G. Link (Geology, School of General Studies); I. A. Lockhart (Astronomy, Research School of Physical Sciences); B. K. MacDonald (Pacific History, Research School of Pacific Studies); F. H. McKinnell (Forestry, School of General Studies); H. G. McPherson (Environmental Biology, Research School of Biological Sciences); A. R. V. Makan (Mathematics, Research School of Physical Sciences); G. E. Melville (Forestry, School of General Studies); B. D. Millar (Forestry, School of General Studies); R. K. Milne (Statistics, Research School of Social Sciences); J. N. Molony (History, School of General Studies); K. S. Nijhar (Economics, Research School of Pacific Studies); I. Noy-Meir (Biogeography and Geomorphology, Research School of Pacific Studies); I. G. O'Brien (Biochemistry, John Curtin School of Medical Research); K. Ohta (Medical Chemistry, John Curtin School of Medical Research); J. M. O'Shea (Chemistry, School of General Studies); R. W. Page (Geophysics and Geochemistry, Research School of Physical Sciences); J. P. Paterson (Urban Research Unit, Research School of Social Sciences); P. F. Pentony (Pure Mathematics, School of General Studies); Daphne E. Phillips (Sociology, Research School of Social Sciences); R. L. Pope (Theoretical Physics, Research School of Physical Sciences); D. L. Powell (Nuclear Physics, Research School of Physical Sciences); Jocelyn M. Powell (Biogeography and Geomorphology, Research School of Pacific Studies); A. W. Rew (Anthropology and Sociology, Research School of Pacific Studies); F. G. Rixon (Law, Research School of Social Sciences); A. G. Robertson (Electron and Ion Diffusion Unit, Research School of Physical Sciences); D. M. Rosalky (Nuclear Physics, Research School of Physical Sciences); P. G. Sack (Law, Research School of Social Sciences); K. J. Sanderson (Physiology, John Curtin School of Medical Research); J. A. A. Santucci (Asian Civilizations, School of General Studies); M. Sawyer (Far Eastern History, Research School of Pacific Studies); S. D. Scott (Mathematics, Research School of Physical Sciences); G. P. Shaw (History, School of General Studies); H. L. Simmons (Germanic Languages, School of General Studies);

M. Sivamurthy (Demography, Research School of Social Sciences); G. B. Smith (Theoretical Physics, Research School of Physical Sciences); W. H. Smith (International Relations, Research School of Pacific Studies); Susan C. Somerville (Psychology, School of General Studies); Hazel E. Steiger (Psychology, School of General Studies); D. J. Stone (Pacific History, Research School of Pacific Studies); T. Sugimoto (Medical Chemistry, John Curtin School of Medical Research); S. Supomo (Indonesian Languages and Literatures, School of General Studies); D. G. Tacon (Mathematics, Research School of Physical Sciences); A. J. Taylor (Linguistics, Research School of Pacific Studies); R. J. Thistlethwaite (Forestry, School of General Studies); R. C. Thompson (Pacific History, Research School of Pacific Studies); S. Tsuda (South Asian and Buddhist Studies, School of General Studies); S. N. Tucker (Nuclear Physics, Research School of Physical Sciences); D. J. van de Kaa (Demography, Research School of Social Sciences); R. D. Watson (Astronomy, Research School of Physical Sciences); D. H. Williamson (Research School of Chemistry); C. J. L. Wilson (Geophysics and Geochemistry, Research School of Physical Sciences); J. M. Worden (Geophysics and Geochemistry, Research School of Physical Sciences); C. Wright (Geophysics and Geochemistry, Research School of Physical Sciences); G. Yanow (Physics, School of General Studies); A. C. Young (Medical Chemistry, John Curtin School of Medical Research); A. Yuyama (South Asian and Buddhist Studies, School of General Studies).

PRIZEWINNERS

The Alliance Française de Canberra Prizes FRENCH I: Christine Edna Walker
FRENCH II: Not awarded FRENCH III: Penelope Turner FRENCH IV:
Susan Alexandra Baldwin

The Ansett Air and Space Law Prize Ian Geoffrey Booth and John David
Gunther

Australian-American Association Prize for American Studies AMERICAN HISTORY:
Elizabeth Helen Hegerty

The Australian Capital Territory Bar Association Prize Philip Anthony
McNamara

The Australian Institute of Physics Prize Gayle Edith Adams

The Australian Psychological Society Prize Not awarded

Australian Society of Accountants' Prizes ACCOUNTING I: Brian Eric Leonard
ACCOUNTING II: Sirilaksana Chutikul FINANCIAL ACCOUNTING THEORY:
John Peter Tydeman COMPANY FINANCE: John Peter Tydeman

The B. C. Meagher Prize for Commonwealth Constitutional Law Grahame
James Kennedy

Canberra Association of University Women Prize Mary Anne Ahuja and
Jennifer Mary Herridge

The C.S.R. Chemicals Prize Herbert Yuan

- The Commonwealth Forestry Bureau Book Prize* Rodney William Carter
- The Economic Society Prizes* ECONOMICS I: Raymond Stuart Andrews
ECONOMICS II: Ian Keith Lindenmayer ECONOMICS III: Jennifer Marjorie Corbett ECONOMICS IV: Neil Francis Hyden
- Freehill, Hollingdale and Page Prize for Commercial Studies* Ronald Gordon Mills
- The Geological Society of Australia Prize* George Rowland Heys
- The George Knowles Memorial Prize* Peter John Lahy
- The Goethe Society Prizes* GERMAN LANGUAGE AND LITERATURE I: Michael Garrett Levinge Dunn GERMAN LANGUAGE AND LITERATURE II: Mary Grace Livermore GERMAN LANGUAGE AND LITERATURE III: Renate Ursula Weissgaerber GERMAN LANGUAGE AND LITERATURE IV: Jill Common
- The Hanna Neumann Prizes for Pure Mathematics* PURE MATHEMATICS IIIH: Kenneth Leslie Smith and Daniel Weissman PURE MATHEMATICS IV: Robert Ian McKay
- The Institute Prize for Economic History* Not awarded
- The Lady Isaacs' Prize* HISTORY IA: Loma Rae Snooks
- The Law Society of the Australian Capital Territory Prize for Contracts* Roger Graeme Featherston
- The Leslie Holdsworth Allen Memorial Prize* ENGLISH IV: George Witynski
- The Marie Halford Memorial Prize* ENGLISH: Brenda Joyce Wirth
- Permanent Trustee Company (Canberra) Limited Prizes* PROPERTY II: Glenn Ives Simpson TRUSTS: Andrew John Halkyard
- Priscilla Fairfield Bok Prize* SCIENCE: Kathryn Jennifer Horadam
- The Professional Officers' Association Prizes* GEOLOGY AOI: Susan Ann Gibbings MATHEMATICS: Peter John Kennewell, Huw Price and Graeme John Williams
- Rachel Dorph Memorial Prize* Elizabeth Gai Gillespie
- The Ramsay Prize* BIOLOGICAL SCIENCES: Jeremy James Burdon, Janetta Gladys Gulvenor and Mark Wayne Schwinghamer
- The Royal Australian Chemical Institute Prize* Not awarded
- The Royal Institute of Public Administration Prize* Not awarded
- Schlich Memorial Trust Prize* Michael Andrew Veal
- The Shell Company Prizes* ECONOMICS: Mathew William Butlin SCIENCE: Peter John Blamey
- The Statistical Society of Australia (Canberra Branch) Prize* STATISTICS IIIH: Kathryn Jennifer Horadam, David George Nash and Kenneth Leslie Smith
- The Supreme Court Judges' Prize* Kevin Michael Crotty

The Tillyard Prize John Christopher Bishop

The Timbind Utilization Prize Ronald Neil Byron

The Trustees Executors (Canberra) Limited Prize Robert Kenneth O'Connor

The United Commercial Travellers' Association Prize Hugh Trentham Graham

The University Medals John Christopher Bishop (Philosophy); Ian Michael Britain (History); John Alfred Charles Conybeare (Political Science/Economics); Kevin Michael Crotty (Law); Kerry Eugene Jones (Asian Studies); Robert Ian McKay (Pure Mathematics); Michael Mathew McKernan (History); Graeme Eric Sneddon (Theoretical Physics)

The W. B. Clarke Prize in Geology John Ian Cameron

STAFF

THE INSTITUTE OF ADVANCED STUDIES

Dr D. G. Beswick, Fellow in Education Research Unit, formerly Senior Fellow in Psychology, School of General Studies.

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

Professor L. Broom, Professor of Sociology, formerly Professor of Sociology, University of Texas at Austin.

Professor S. J. C. L. Butlin, Professor of Economic History, formerly Professor of Economics, University of Sydney.

Dr W. C. Clarke, Senior Research Fellow in Human Geography, formerly Research Fellow.

Dr A. J. Cunningham, Senior Research Fellow in Microbiology, formerly Postdoctoral Travelling Fellow.

Dr S. A. FitzGerald, Fellow in Far Eastern History, formerly Research Fellow.

Dr A. J. Gibbs, Senior Fellow in Developmental Biology, formerly at Rothamsted Experimental Station, England.

Mrs Masako Izumi, Senior Research Fellow in the Department of Mathematics.

Dr P. D. Jeffrey, Fellow in Physical Biochemistry, formerly Research Scientist, Commonwealth Scientific and Industrial Research Organization, Parkville, Victoria.

Dr S. Kaneff, Professor of Engineering Physics, formerly Professorial Fellow.

Dr K. J. Lafferty, Senior Fellow in Immunology, formerly Senior Fellow in Experimental Pathology.

Dr P. J. McCullagh, Senior Research Fellow in Immunology, formerly Research Fellow.

Dr R. E. Miles, Fellow in Statistics, formerly Research Fellow.

Dr B. W. Ninham, Professor in Applied Mathematics, formerly Associate Professor in Applied Mathematics, University of New South Wales.

Dr P. F. Nixon, Senior Research Fellow in Biochemistry, formerly Research Fellow.

Dr P. J. Rimmer, Senior Fellow in Human Geography, formerly Fellow.

*Senior Staff
Appointments
and
Promotions*

Dr A. W. Rodgers, Professorial Fellow in Astronomy, formerly Senior Fellow.
 Dr O. M. Roe, Senior Research Fellow in History, formerly Reader in History, University of Tasmania.
 Dr W. A. Runciman, Professor in Solid State Physics, formerly Head of Solid State Division, Atomic Energy Research Establishment, Harwell, United Kingdom.
 Dr L. T. Ruzicka, Senior Research Fellow in Demography, formerly Curriculum Director, Institute of Population Studies, Bombay, India.
 Dr D. A. Scarr, Senior Fellow in Pacific History, formerly Fellow.
 Dr C. S. Smith, Fellow in Education Research Unit, formerly Research Fellow.
 Dr A. W. Snyder, Senior Research Fellow in Applied Mathematics, formerly Research Fellow in Engineering and Applied Science, Yale University.
 Dr P. R. Stewart, Fellow in Developmental Biology, formerly Senior Research Fellow.
 Dr N. M. Wace, Senior Fellow in Biogeography and Geomorphology, formerly Senior Lecturer in Geography, University of Adelaide.
 Dr B. Walcott, Fellow in Neurobiology, formerly Research Fellow.
 Professor R. G. Ward, Professor and Head of Department of Human Geography, formerly Professor of Geography, University of Papua and New Guinea.
 Mr G. Warner, Senior Research Fellow in International Relations, formerly Reader in Politics, University of Reading.

THE SCHOOL OF GENERAL STUDIES

Mr S. A. Barnett, Professor of Zoology, formerly Senior Lecturer in Zoology, University of Glasgow.
 Mr G. R. Bartlett, Senior Lecturer in History, formerly Lecturer.
 Dr R. P. Byron, Reader in Econometrics, formerly Fellow in Economics, Research School of Social Sciences.
 Dr M. L. Cook, Senior Lecturer in Psychology, formerly Lecturer.
 Dr R. G. Cushing, Senior Lecturer in Sociology, formerly Assistant Professor of Sociology, University of Texas.
 Mr J. L. R. Davis, Reader in Law, formerly Senior Lecturer.
 Professor R. G. A. de Bray, Professor of Russian, formerly Professor of Russian, School of Slavonic and East European Studies, London.
 Dr L. J. Downer, Reader in Medieval Studies, formerly Senior Lecturer.
 Dr H. M. Edwards, Visiting Senior Lecturer in Pure Mathematics, formerly Associate Professor of Pure Mathematics, Columbia University.
 Dr J. A. Elix, Senior Lecturer in Chemistry, formerly Lecturer.
 Dr I. S. Ferguson, Senior Lecturer in Forestry, formerly Senior Lecturer in Forestry, University of Melbourne.
 Mr J. A. Grieve, Senior Lecturer in French, formerly Lecturer.
 Mr K. W. Groves, Senior Lecturer in Forestry, formerly Lecturer.
 Mr G. J. Halligan, Senior Lecturer in French, formerly Lecturer.
 Mr A. D. Hambly, Reader in Law, formerly Senior Lecturer.
 Dr C. R. Heathcote, Professor of Mathematical Statistics, formerly Reader.

Dr J. F. Hookey, Senior Lecturer in Law, formerly Senior Lecturer in Law, University of Papua and New Guinea.

Dr H. G. Hornung, Senior Lecturer in Physics, formerly Lecturer.

Dr R. P. Irwin, Senior Research Fellow in Sociology, formerly Senior Lecturer in Physical Education, Hamilton Teachers' College.

Dr R. A. Jarvis, Senior Lecturer in Computer Science, formerly Visiting Assistant Professor in Electrical Engineering, Purdue University.

Professor B. L. C. Johnson, Professor of Geography, formerly Professor of Geography, Monash University.

Dr J. M. McDonald, Senior Lecturer in Geology, formerly Associate Professor of Geology, University of Saskatchewan.

Mr W. Milgate, Personal Professor of English, formerly Reader.

Mr J. H. T. Morgan, Senior Lecturer in Statistics, formerly Lecturer.

Dr D. J. Mulvaney, Professor of Prehistory, formerly Senior Fellow in Prehistory, Institute of Advanced Studies.

Mr K. P. O'Leary, Director of the Legal Workshop, formerly Barrister.

Dr W. S. Ramson, Reader in English, formerly Senior Lecturer.

Dr K. H. M. Rensch, Senior Lecturer in Linguistics, formerly Lecturer.

Dr P. Ryckmans, Senior Lecturer in Chinese, formerly Lecturer.

Dr B. K. Selinger, Senior Lecturer in Chemistry, formerly Lecturer.

Dr K. R. Shepherd, Senior Lecturer in Forestry, formerly Lecturer.

Dr L. Sternstein, Senior Lecturer in Geography, formerly Municipal Advisor, Bangkok.

Mr D. M. Stodart, Senior Lecturer in Forestry, formerly Lecturer.

Dr R. D. Terrell, Professor of Econometrics, formerly Fellow in Economics, Research School of Social Sciences.

Dr R. N. Warrener, Reader in Chemistry, formerly Senior Lecturer.

Dr A. H. Weatherley, Reader in Zoology, former Senior Lecturer.

Dr A. Yuyama, Senior Lecturer in South Asian and Buddhist Studies, formerly Lecturer.

THE INSTITUTE OF ADVANCED STUDIES

Senior Staff Resignations

Dr J. L. Bailey, Professorial Fellow in Developmental Biology.

Dr K. G. Basavarajappa, Fellow in Demography.

Mr P. R. May, Senior Research Fellow in History.

Dr S. S. Swierczkowski, Senior Research Fellow in Mathematics.

Dr R. G. Webster, Senior Fellow in Microbiology, to return to St. Jude Children's Research Hospital, Memphis, United States of America.

THE SCHOOL OF GENERAL STUDIES

Dr D. G. Beswick, Senior Lecturer in Psychology, on appointment as Fellow, Education Research Unit, Institute of Advanced Studies.

Mr R. Ma, Senior Lecturer in Accounting and Public Finance, on appointment to Chair of Accounting, University of New South Wales.

Professor G. H. Russell, Professor of English, on appointment to Chair of English, University of Melbourne.

Mr D. W. Smith, Reader in Law, on appointment as Dean of the School of Business and Liberal Studies, Riverina College of Advanced Education.

Dr A. R. J. White, Reader in Geology, on appointment to Chair of Geology, La Trobe University.

*Senior Staff
Retirement*

THE INSTITUTE OF ADVANCED STUDIES

Mr M. C. Taylor (Electron Microscopist), Fellow, Department of Experimental Pathology.

THE SCHOOL OF GENERAL STUDIES

Associate Professor O. B. van der Sprenkel, Associate Professor of Asian Civilizations.

Obituary

Mr H. P. Brown, Professorial Fellow in Economic Statistics, Research School of Social Sciences, died 30 January 1971.

Dr A. Hunter, Professorial Fellow in Economics, Research School of Social Sciences, died 21 May 1971.

Professor Hanna Neumann, Head of the Department of Pure Mathematics in the School of General Studies, died 14 November 1971.

Dr Sutjipto Wirjosuparto, Senior Lecturer in Asian Civilizations in the School of General Studies, died 29 June 1971.

*Visiting
Research
Workers*

Dr Jennifer S. Altman; Dr V. A. Arkhipov, Moscow State University; Dr K. E. Atkinson, Indiana University; Professor K. A. Awaya, Yamaguchi University; Professor M. Margaret Ball, Duke University; Mr J. Banno, Chiba University; Professor H. B. Barlow, University of California (Berkeley); Professor W. Bartley, University of Sheffield; Dr O. E. Björkman, Carnegie Institution of Washington; Mr T. R. Bredmeyer, Papua New Guinea; Dr P. L. Burns, University of Adelaide; Mr S. S. Cameron, University of Otago; Professor E. E. Campaigne, Indiana University; Mrs Stella G. M. Carr; Dr E. A. Chapman, Commonwealth Scientific and Industrial Research Organization, Sydney; Professor J. Ch'en, York University; Dr C. Christensen; Mr P. Clifton-Bligh, Canberra Hospital; Professor F. L. Crane, Purdue University; Miss D. Crozier, Victoria University of Wellington; Dr F. D. Cruickshank, University of Tasmania; Dr L. Dale, Australian Atomic Energy Commission, Lucas Heights; Professor B. J. Dalton, James Cook University of North Queensland; Dr A. Di Maria, University of Rome; Dr N. Droszdov, Moscow State University; Dr A. G. Duba, University of Chicago; Dr M. W. Dubin, Johns Hopkins University; Professor C. Duncan, University of Waikato; Dr J. R. Dunstone, Canberra College of Advanced Education; Professor J. Durbin, London School of Economics and Political Science; Professor I. Dyen, Yale University; Dr J. B. A. England, University of Birmingham; Mr R. F. Ericksen; Dr K. Franklin, Summer Institute of Linguistics, New Guinea; Professor B. Fritsch, Swiss

Federal Institute of Technology; Dr V. T. Frolov, Moscow State University; Dr R. S. Gilbert, Commonwealth Treasury; Professor B. Glassburner, University of California (Davis); Dr F. H. Gleason, Colorado College; Dr Olga Gostin, Flinders University; Professor D. I. Gough, University of Alberta; Dr T. H. Green, Macquarie University; Dr P. J. Grubb, University of Cambridge; Professor C. Grunfeld, London School of Economics and Political Science; Professor K. J. Hancock, Flinders University; Mr I. Hanna, University of Adelaide; Emeritus Professor Sir Keith Hancock, K.B.E.; Professor J. Hart, Lakehead University; Dr J. Haviland, Harvard University; Dr D. D. Heath; Dr W. Hofheinz, F. W. Hoffmann-La Roche & Co. (Chemical Research Institute) Switzerland; Mr M. Howard, F.B.A., University of Oxford; Dr T. C-T. Hsiao, University of California (Davis); Professor E. P. Hutchinson, University of Pennsylvania; Emeritus Professor Sir Leonard Huxley, K.B.E.; Professor K. S. Inglis, University of Papua and New Guinea; Dr S. Izumi; Professor F. E. Jones, McMaster University; Dr P. W. E. Kingston, Queen's University at Kingston; Professor L. Koenigsberg, State University of New York; Professor A. N. Kost, Moscow State University; Professor K. Katsuda, Kyoto University; Dr L. L. Langness, University of Washington; Professor Joyce Lebra, University of Colorado; Mr W. H. Litchfield, Commonwealth Scientific and Industrial Research Organization; Dr J. C. Loper, University of Cincinnati; Dr A. R. Luff; Dr D. Lynden-Bell, Royal Greenwich Observatory; Professor K. D. Magill, Jr, State University of New York at Buffalo; Professor K. Mahler, Ohio State University; Mr W. G. Malcolm, Victoria University of Wellington; Professor R. W. Marsh, Victoria University of Wellington; Professor D. Ya Martynov, Moscow State University; Dr B. Mason, Smithsonian Institution; Dr M. J. Mays, University of Cambridge; Sir Leslie Melville, K.B.E.; Dr R. F. Mereu, University of Western Ontario; Professor R. F. Meyer, University of Auckland; Mr A. R. Milnes; Mr D. D. Mitchell; Professor J. J. Mol, McMaster University; Dr J. Moses, University of Queensland; Dr Mubyarto, Gadjah Mada University; Dr F. A. Murphy, National Communicable Disease Center, Atlanta; Mr G. P. Nazareth, Solicitor-General, Solomon Islands; Dr Silva D. Newton; Dr R. C. Y. Ng, School of Oriental and African Studies, London; Professor Y. Okudaira, University of Tokyo; Emeritus Professor Sir Mark Oliphant, K.B.E.; Dr K. Omoto, University of Tokyo; Professor S. Otsuka, Osaka University; Dr J. M. R. Owens, Massey University; Assistant Professor L. Parai, University of Western Ontario; Dr M. L. Parker; Dr C. Pask; Professor H. W. Peter, State University of New York at Buffalo; Mr A. Petridis, University of Western Australia; Professor A. R. Prest, London School of Economics and Political Science; Dr G. M. Polya, Cornell University; Dr A. u. Rehman, University of the Punjab, Lahore; Professor M. S. Rajan, Jawaharlal Nehru University; Sir Richard Randall; Professor G. Rasche, University of Zurich; Dr J. A. Rees, University of Liverpool; Dr T. Reese, Institute of Commonwealth Studies; Professor E. Reich, Rockefeller University; Professor A. H. Richmond, York University; Dr P. Richmond; Dr S. Riesen-berg, Smithsonian Institution; Dr W. T. Robinson, University of Canterbury; Professor E. Roe, University of Papua and New Guinea; Dr B. G. Rolfe, University of Toronto; Professor D. C. Rowan, University of Southampton; Dr M. Rubel, Centre National de la Recherche Scientifique; Dr Pamela J. Russell, Walter and Eliza Hall Institute of Medical Research; Associate Professor B. N.

Sahney, University of Calgary; Dr J. H. Sass, United States Geological Survey; Associate Professor H. W. Scheffler, Yale University; Dr S. M. Sherman, University of Pennsylvania; Dr J. J. Sims, University of California; Dr S. Singh, Ministry of Foreign Affairs, India; Dr S. Singh, University of New England; Dr P. F. Sinnett, Kanematsu Institute, Sydney; Dr F. Smithies, University of Cambridge; Associate Professor T. S. Sorenson, University of Calgary; Emeritus Professor W. E. H. Stanner, C.M.G.; Professor R. H. Stokes, University of New England; Professor K. P. Strickland, University of Western Ontario; Dr A. Sugimura, University of Tokyo; Mr M. C. Taylor; Professor G. S. L. Tucker; Dr R. J. Twiss, Princeton University; Dr F. W. von Fleckenstein; Dr S. H. Walmsley, University College, London; Sir Alan Watt, C.B.E.; Dr G. A. Wegner, University of Washington; Dr R. S. Wilcox, Michigan University.

VISITORS

During the year the University was honoured by the visit of—

The Administrator of the Commonwealth and Governor of Victoria His Excellency Sir Rohan Delacombe, K.C.M.G., K.C.V.O., K.B.E., C.B., D.S.O., K.St.J., and Lady Delacombe.

His Excellency Sir Arthur Porritt, B.T., G.C.M.G., G.C.V.O., C.B.E., Governor-General of New Zealand.

Among overseas visitors to the University during the year were: Chancellor D. G. Aldrich, Jr, University of California (Irvine); Professor the Honourable W. B. Banage, Minister of Animal Industry, Game and Fisheries, Uganda; Professor H. Brainard, University of Michigan; Mr M. Butor, French author; Professor J. B. Duroselle, University of Paris; Mr N. Calder, British science writer; Canadian National Defence College visitors; Dr E. Collins, Millsaps College, Mississippi; Lord Diplock, Member of the House of Lords (also Lord of Appeal in Ordinary); Mr P. Daly, BBC; Dr M. B. Dickerson, University of Michigan; Professor Sir Richard Doll, F.R.S., University of Oxford; Dr J. F. Foster, C.M.G., former Secretary-General, Association of Commonwealth Universities, London; Professor A. Hafid, Hasanuddin University; His Excellency Mr M. Jakobson, Finnish representative to the UN; Dr J. Katz, Hebrew University of Jerusalem; Mr H. Leussink, Minister of Education, Federal Republic of Germany; Miss M. Maung, University of Rangoon; Professor W. Mellers, University of York; H. I. H. Prince Mikasa of Japan; Dr H. Moore, Bowling Green State University, Ohio; Dr D. S. Nicol, Permanent Representative of Sierra Leone to the UN; His Excellency the Honourable Gehendra Bahadur Rajbhandary, Foreign Minister of Nepal; Mr Bharat Rajbhandary, Foreign Secretary of Nepal; Mr G. Raphael, Director-General, Israeli Ministry of Foreign Affairs; Professor R. L. Huang, Nanyang University; Professor E. T. Salmon, McMaster University; Sir Hugh Springer, K.C.M.G., C.B.E., Secretary-General, Association of Commonwealth Universities, London; Lord Shackleton, Leader of the Opposition, House of Lords; Professor N. Smart, University of Birmingham; the Honourable B. E. Talboys, New Zealand Minister of Education; Major Sri Tharan, Director of Army Education, Malaysia; Mr B. G. J. van Rensburg, University of South Africa; Judge Wisdom, US Court of Appeal; Professor G. Winkler, University of Vienna; Delegates to the fifth Commonwealth Education Conference.

PRINCIPAL BENEFACTIONS

Special purpose Grants and Bequests to the University during 1971 were as follows:

<i>Donor</i>	<i>Amount</i>	<i>Purpose</i>
	\$	
Abbott Laboratories Pty Ltd	300	For A.C.T. Postgraduate Committee in Medicine
American Council of Learned Societies	2,204	For library—School of General Studies
Ampol Petroleum Limited	2,400	For scholarship—Department of Geology
Anonymous	4,594	For research—Department of Economic History, Institute of Advanced Studies
	3,000	For research—Department of Economics, Research School of Pacific Studies
	6,000	For research—Department of Economics, School of General Studies
A.P.M. Forests Pty Ltd	1,022	For research—Department of Botany
Asian Development Bank	1,267	For research—Department of Economics, School of General Studies
Asian Foundation of San Francisco	300	For International Congress of Orientalists
Associated Pulp and Paper Mills Ltd	1,000	For research—Department of Forestry
Australian Academy of Science	1,600	For research—Department of Economics, School of General Studies
	500	For David Nichol Smith Seminar
Australian Dairy Produce Board	1,500	For research—Department of Physical Biochemistry
Australian Institute of Aboriginal Studies	5,788	For research—Department of Linguistics, Institute of Advanced Studies
Australian Institute of International Affairs	1,500	For research—Department of Demography
Australian Institute of Nuclear Science and Engineering	8,503	For fellowship—Department of Nuclear Physics
Australian Institute of Urban Studies	22,600	For research—Urban Research Unit
Australian Meat Board	19,968	For research—Department of Zoology
The Australian Museum	200	For research—Department of Zoology
Australian Research Grants Committee	400	For research—Department of Economic History, Institute of Advanced Studies
	6,588	For research—Department of English
	4,075	For research—Department of History, School of General Studies
	4,470	For research—Department of Germanic Languages
	4,545	For research—Department of Linguistics, School of General Studies
	7,912	For research—Faculty of Law
	2,082	For research—Department of Chinese
	10,203	For research—Department of Asian Civilizations
	27,325	For research—Department of Botany
	31,348	For research—Department of Chemistry
	7,151	For research—Department of Geology
	29,687	For research—Department of Physics
	9,131	For research—Department of Theoretical Physics, School of General Studies
	3,799	For research—Department of Zoology
	13,025	For research—Department of Forestry
	35,132	For research—Department of Biochemistry, School of General Studies
Australian Wool Board	1,229	For research—Department of Statistics, School of General Studies
	10,048	For research—Department of Chemistry
	3,640	For scholarship—Department of Zoology
	9,807	For fellowship—Department of Sociology, School of General Studies

<i>Donor</i>	<i>Amount</i>	<i>Purpose</i>
	\$	
Bank of New South Wales	1,000	Gift for Fossil Appeal Research—Vertebrate Palaeontology Unit
	1,000	For the Ditchley Foundation Conference
Bougainville Copper Pty Limited	24,896	For research—Research School of Pacific Studies
The Broken Hill Proprietary Company Limited	1,000	For the Ditchley Foundation Conference
Bryant & May Pty Ltd	500	For research—Department of Botany
Burroughs Welcome Co. (Aust.) Ltd	8,500	For fellowship—Department of Physiology
Ciba Co. Pty Ltd	250	For research—Department of Clinical Sciences
Commonwealth Advisory Committee on Advanced Education	6,500	For research—Education Research Unit
Council of Aboriginal Affairs	2,000	For research—Department of Anthropology and Sociology
CSIRO	2,050	For research—Department of Economics, School of General Studies
	1,000	For research—Department of Zoology
	3,500	For research—Department of Prehistory
	500	For research—Department of Forestry
	612	For scholarship—John Curtin School of Medical Research
	495	For scholarship—Research School of Physical Sciences
	175	For scholarship—Research School of Chemistry
	1,137	For scholarship—School of General Studies
Department of Foreign Affairs	2,579	For research—Department of Forestry
	1,298	For work on the Berlin Crisis
	4,570	For research—Department of Forestry
Department of Forestry, Queensland	1,000	For research—Department of Forestry
Department of Health	6,967	For research—Department of Sociology, School of General Studies
Department of Education and Science	4,642	For International Congress of Orientalists
Department of Immigration	30,300	For research—Department of Demography
Department of the Interior	200	For research—Department of Forestry
	4,500	For scholarship—School of General Studies
Department of Supply	4,485	For research—Department of Statistics, Institute of Advanced Studies
Drapers Company	2,033	For scholarship—Department of Economics, School of General Studies
Esso Standard Oil (Australia) Ltd	500	For research—Department of Geology
Elder Smith Goldsbrough Mort Ltd	500	For publication of <i>The Australian Economic Review</i>
Federal Match Forests Pty Ltd	500	For research—Department of Botany
Forestry Commission of New South Wales	2,000	For research—Department of Forestry
Food and Agricultural Organisation	1,000	For research—Department of Botany
Ford Foundation	26,099	For research—Department of Demography
	9,569	For research—Research Schools of Social Sciences and Pacific Studies
General Motors-Holden's Pty Ltd	3,450	For fellowship—Department of Mathematics, Institute of Advanced Studies
The Ian Potter Foundation	500	For David Nichol Smith Seminar
	1,000	For research—Research School of Physical Sciences
I.B.M. Australia Limited	500	For National Summer School for Talented Students of Mathematics
Imperial Chemical Industries of Australia and New Zealand Ltd	300	For seminars—Centre for Continuing Education
International Bank for Reconstruction and Development	4,642	For research—Department of Economics, Research School of Pacific Studies
International Council of Philosophy	3,667	For International Congress of Orientalists
The International Union for the Scientific Study of Population	575	For research—Department of Demography
Leverhulme Trust	10,566	For visiting fellowships
Lilley Industries Pty Ltd	250	For travel assistance—Department of Microbiology
Lowell Observatory	14,152	For research—Department of Astronomy
Luv Pet Foods Pty Ltd	540	For Seminars and Schools—Centre for Continuing Education

<i>Donor</i>	<i>Amount</i>	<i>Purpose</i>
	\$	
The Mathematical Association of New South Wales	200	For National Summer School for Talented Students of Mathematics
May & Baker (Aust.) Pty Ltd	200	For A.C.T. Postgraduate Committee in Medicine
Merck, Sharp & Dohme (Australia) Pty Ltd	500	For travel assistance—Department of Microbiology
National Capital Development Commission	250	For research—Department of Forestry
National Heart Foundation of Australia	5,400	For research—Department of Clinical Science
	583	For publication of updated edition of <i>Anti-Coronary Cookbook</i>
	6834	For fellowship—Department of Clinical Science
National Multiple Sclerosis Society	441	For research—Department of Microbiology
National Union of Australian University Students	400	For research—Education Research Unit
News Ltd	1,000	For the Ditchley Foundation Conference
Northern Territory Administration	13,442	For research—Department of Psychology
Nuffield Foundation in conjunction with University of Queensland	4,000	For research—Department of Anthropology and Sociology
Office of Aboriginal Affairs	15,000	For research—Dr H. R. Bustard
Paramount Nurseries	500	For research—Department of Botany
Population Council Inc.	2,524	For research—Department of Demography
Prime Minister's Department	3,000	For research—Department of Sociology, Institute of Advanced Studies
Queen Elizabeth II Fellowship Committee	20,386	For fellowships—Department of Astronomy
	5,729	For fellowships—Department of Environmental Biology
Roche Products Pty Ltd	250	For travel assistance—Department of Microbiology
	300	For A.C.T. Postgraduate Committee in Medicine
Rockefeller Foundation	5,686	For research—Department of Pacific History
Reserve Bank of Australia—Rural Credits Development Fund	11,850	For research—New Guinea Research Unit
	500	Gift for Fossil Appeal Research—Vertebrate Palaeontology Unit
	4,250	For research—Department of Zoology
Reserve Bank of Australia—Rural Credits Development Fund	13,168	For fellowship—Research School of Pacific Studies
W. D. Scott & Co. Pty Ltd	1,000	For the Ditchley Foundation Conference
G. D. Searle	200	For A.C.T. Postgraduate Committee in Medicine
Smith, Kline and French Laboratories (Aust.) Ltd	200	For A.C.T. Postgraduate Committee in Medicine
Snowy Mountains Hydro-Electric Authority	1,500	For research—Department of Geophysics and Geochemistry
E. R. Sqibb & Sons Pty Ltd	500	For travel assistance—Department of Microbiology
Torrens Electronics	1,000	For research—Department of Geology
U.S. National Institutes of Health	882	For research—Department of Physiology
	882	For research—Department of Genetics
University of Melbourne	1,357	For research—Urban Research Unit
Wenner-Gren Foundation of Anthropological Research Inc.	3,579	For research—Department of Anthropology and Sociology
Western Australia Department of Forests	1,396	For research—Department of Forestry
Western Mining Corporation Limited	500	For research—Department of Geology
World Health Organization	885	For research—Department of Microbiology
	8,889	For autoanalyser—Department of Clinical Science
J. B. Young Ltd	2,300	For purchase of triptych painting 'Bush Fire'

Acknowledgement must also be made here of the many gifts in kind received by the University.

Accompanying Reports and Statements

THE INSTITUTE OF ADVANCED STUDIES

THE JOHN CURTIN SCHOOL OF MEDICAL RESEARCH

REPORT OF THE DIRECTOR

Professor F. J. Fenner, M.B.E., F.A.A., F.R.S.

Being the mid-year of the current triennium, 1971 has been a year of consolidation of the developments initiated in 1970 rather than a year of innovation. Financial stringency early in the year greatly inhibited academic recruitment, but improvement in the fiscal situation late in 1971 has allowed departmental heads to fill many of the vacant positions and we hope to end the triennium with a staff close to that proposed in the 1970-72 submission to the Australian Universities Commission.

The major new building proposed for the triennium, an animal breeding house extension designed for breeding specific pathogen-free mice and rats, was begun in July and is expected to be complete early next year.

Two departments are in process of major expansion. Professor L. W. Nichol, who took up the Headship of the Department of Physical Biochemistry in January this year, has made appointments to several vacant posts in that Department. The Department of Immunology was established late in 1970, with the appointment of Professor B. Morris, F.A.A. Early this year three members of the Department of Experimental Pathology and several of their students transferred to the Department of Immunology, and further appointments have built the Department up rapidly. Space for further expansion is limited until the Department of Genetics, Research School of Biological Sciences, moves into its new building in the latter part of 1972. Because of the active participation of the School in the Florey Memorial Appeal in 1969, we were especially glad to welcome the first British Florey Fellow, Dr G. G. Macpherson, to the Department of Immunology, where he will work for two years.

During the year Mr M. C. Taylor retired as Head of the Electron Microscope Unit and the unit has been absorbed into the Department of Experimental Pathology. The facilities have been extensively reconstructed and the day-to-day use of the electron microscopes is supervised by Dr Gutta I. Schoeffl. No appointment has yet been made to the headship of the Department of Human Biology.

Staff numbers at the end of 1971 were slightly higher than they were a year ago, with seventy-nine academic staff members (forty-three permanent, twenty-five short tenure; eleven postdoctoral fellows) forty-six research students and 248

support staff. Fifteen research students were awarded the degree of Doctor of Philosophy during the year and thirteen new research students were enrolled.

Scientific activity continued at a high level; detailed accounts of the work in the various departments will be found in the pages that follow. Exclusive of abstracts and brief notes, 155 articles were published in scientific journals, eight chapters were contributed to a wide variety of books, and three books.

Senior members of the School were involved in a variety of international scientific activities. The school was strongly represented at the major international congresses in heterocyclic chemistry, immunology, physiology and virology, and members of appropriate departments attended a variety of smaller international congresses as well as the conferences held by national scientific bodies. Professor P. O. Bishop served as a member of the Council of the International Union of Physiological Sciences, Dr D. D. Perrin as Australian delegate to the Council of the International Union of Pure and Applied Chemistry, and I served as President of the International Committee on Nomenclature of Viruses, and as a member of the Scientific Committee on Problems of the Environment.

Among honours conferred on members of the School during 1971 were the election of Professor F. W. E. Gibson to Fellowship of the Australian Academy of Science and my election as a Vice-President of the Australian Conservation Foundation.

Work in the *Department of Biochemistry* has continued to be oriented towards the determination of the function of cellular constituents and enzymes. The general nature of this work can be illustrated by reference to investigations on vitamin K and the enzyme, galactosyl transferase.

Research Activities

Vitamin K, which plays an important role in blood clotting in animals, occurs also in a number of bacteria, but the way in which the vitamin acts has never been explained in biochemical terms. During the past year it has been possible using bacterial cells to define, in precise terms, the function of vitamin K at least in one type of cell. A mutant bacterium unable to form vitamin K was compared with a normal strain of the same bacterium and it was found that vitamin K was important for growth in the absence of oxygen. It was then found that the only essential role of vitamin K in the bacterium was for the formation of one of the components of deoxyribosenucleic acid (DNA) when the cell was growing in the absence of oxygen.

It has recently been shown that the enzyme galactosyl transferase, which was previously thought to be concerned only with the formation of certain protein-sugar complexes (glycoproteins) is also the enzyme which, in the presence of another protein (α -lactalbumin) synthesises lactose in the lactating animal. α -Lactalbumin in turn, is formed as the result of hormone action. A study, carried out in collaboration with a group of workers in the USA, has made it possible to describe in some detail the method whereby α -lactalbumin directs galactosyl transferase to form lactose rather than glycoproteins.

Other examples of problems investigated during the year were the transfer of iron into cells, the basic mechanisms of energy production in cells and the biosynthesis of some vitamins.

The *Department of Clinical Science* is located in the Canberra Hospital. It accepts responsibility for the investigation and treatment of patients and pursues a program of clinical and laboratory research orientated towards problems associated with coronary heart disease.

Work done during the year has included investigations into the form in which fats are transported in blood and the dietary and hormonal factors which influence the concentration and flux of blood fats; studies on the interrelationships between carbohydrates and fats; an evaluation of the treatment of obese patients and examination of the responsiveness of obese tissue to normal controlling mechanisms; studies on borderline high-blood pressure and its control by a drug which blocks nervous stress effects; and investigations relating to blood coagulation and thrombus formation. The effect of diet during pregnancy on the growth and health of offspring has been under study in rats.

The *Department of Experimental Pathology* has continued its work on the basic mechanisms concerned in several disease processes.

Investigations of the origin of atherosclerosis, the disease of arteries underlying coronary heart disease, have been directed to the effects of aging on the structure of the arterial wall and to cholesterol transport and metabolism. Studies on the transport and metabolism of chylomicrons, the form in which fat and cholesterol are absorbed into the body, are also related to this disease.

Another field of research concerns the effects of different types of injury on the organelles of cells. These changes studied by light and electron microscopy are fundamental in an understanding of inflammation. Other studies in this field concern the release of enzymes in ischaemia and are aimed at a better understanding of the fundamental mechanisms underlying 'shock', a clinical condition which often follows severe operations or severe injuries in man.

Work on the lymphatic system and also on the microcirculation is related to a better understanding of the phenomenon of rejection of transplanted tissue and organs, and of the transport and metabolism of hormones, especially thyroxine.

The *Department of Human Biology* was set up in January 1970 by amalgamating the Urban Biology Group (previously attached to the Department of Microbiology) and the Human Genetics Group (previously attached to the Department of Clinical Science). Professor Fenner, as Director of the John Curtin School of Medical Research, is Acting Head of the Department until a permanent head is appointed. Research work continued along the two main lines previously pursued by these groups.

The Urban Biology Group is concerned with the biological consequences of civilisation and is concentrating particularly on the impact of the processes of civilisation on the biology of the human organism. The main objectives of the Group are to gather information from different disciplines that can be used for a proper description of the biology of *Homo sapiens* in modern society; and to contribute to the literature articles relating to the biology of man in his changing environment and on the interactions between biological and cultural processes as they relate to this topic.

The Human Genetics Group has continued studies of the genetic diversity of human populations, particularly in India, South-East Asia and Australia.

Modern biochemical techniques make it possible to recognise inherited differences in a large number of protein and enzyme systems present in samples of blood and other tissues. Some of these differences are due to specific mutant genes which have a restricted distribution in certain populations. Such mutant genes are valuable markers for studying human migrations in preliterate societies. In addition, it is possible to use the data on the variation at all the gene loci studies to estimate the evolutionary divergence between populations, and the Group has been involved in studies of this kind with respect to the relationship between tribes of Aborigines in Australia as well as for the highly structural caste groups in India. Finally the data is being analysed to provide information on the amount of genetic diversity which is maintained in normal human populations, and in an attempt to determine what factors might be important in determining the extent of this variability.

The research work in the *Department of Immunology* is concerned with describing and analysing the means whereby organisms recognise foreign materials and react against them. This capability of recognising material as 'foreign' or 'non-self' is a fundamental property which enables individuals to preserve their own special uniqueness amongst other individuals of the same or different species.

Although infectious agents such as bacteria and viruses are the most common foreign materials which enter the body and produce immune reactions, there are a host of other non-infectious substances such as house-dust, pollens and chemicals which cause the body's immune defence system to react, the end results being distressing and debilitating allergies and hypersensitivities. The immune system of the body is concerned also in reactions against tumours and in so-called 'autoimmune' diseases, disorders in which the body's defence system is subverted so that it reacts against components of its own tissues. In recent years, transplantation surgery has introduced a new clinical problem to immunology, for if the replacement of a diseased organ by a transplant is to be successful, the immune defences of the recipient must be controlled to prevent the transplanted tissue from being recognised as 'foreign' and being rejected.

The crucial cell concerned in all these reactions is the lymphocyte and the research of the Department is largely devoted to investigations into the nature of this particular cell. Experiments are being done on kidney transplants, using a model system from which vast numbers of specifically sensitised lymphocytes can be obtained as a pure population. The chemical make up and the metabolism of these cells are being studied so as to find out how they recognise the grafted kidney as foreign and to discover ways of controlling their destructive potentialities.

Other work related to the problem of transplantation immunity deals with the reactions that occur between populations of lymphocytes obtained from different animals of the same species. These cells, when mixed with one other *in vitro* or *in vivo*, multiply violently giving rise to a great deal of tissue destruction. Reactions of this sort seem to be mediated in a quite specific way and are probably of central importance in processes of graft rejection and tumour biology.

The management of tissue and organ grafts at the present time depends on the virtual elimination of the reactive capability of the body's defence system against

all types of foreign substances. The drugs currently used to suppress graft rejection are, in the main, general destructive agents for most cells. The best prospect for controlling the immune response that occurs against transplanted tissues lies in producing a state of 'tolerance' in the host towards the grafted organ. This can be achieved experimentally by various manipulations in the host and experiments are being done to devise ways of establishing long-term tolerance to grafts of skin, bone marrow and kidney.

Immune responses are also being investigated in primitive species of animals to look for clues as to how the highly precise and specific recognition mechanisms which are present in higher animals have evolved.

A continuing major interest of the *Department of Medical Chemistry* is the study of substances allied to the purines, pyrimidines, and pteridines, naturally-occurring compounds which play leading roles in controlling the living cell, governing its growth and reproduction. This work is making good headway in unravelling the chemistry of the new analogues, thus paving the way for the discovery of different biological agonists and antagonists.

In the year under review, a very interesting chemical reaction has been found in which pteridine, the parent-substance of the pteridine series, adds a molecule of alcohol very rapidly to one side of the molecule, and then slowly transfers it to the other side where it is very firmly bound. In addition, two new synthetic methods for making hitherto difficultly-accessible pteridines were discovered. Relevant to the azapurine series (a class of substance which occurs in micro-organisms and has many biologically-potent members), the long-sought triazole aldehydes were at last obtained, and are being studied as potential intermediates for synthesising new azapurines. Addition reactions between azapurines and nucleophiles (a class of substance widely distributed in tissues), foreshadowed in last year's Report, have now actually been detected, and have been studied in depth.

An extension of the Dimroth Rearrangement has been found and much other new territory explored in the pyrimidine field. One interesting development was pioneering the introduction of double sulphur linkages suitable for producing drugs of limited duration in the bloodstream.

Study of the formation of complexes between copper (and zinc) and substances (e.g. penicillamine) used clinically to vary the concentration of these metals in blood and tissues, has afforded useful quantitative data. This work has been extended to the simpler peptides. A quantitative basis is being sought for the use of complexing agents for regulating the levels of lime in the bloodstream and for the decalcification of blood-vessels in pathological states. All of this work has made heavy demands on computer time, but a very useful library of the relevant computer program has been built up.

Further progress has been made towards synthesising tetrodotoxin, a shellfish poison with a very interesting and specific action on the nervous system. Each stage in the gradual realisation of the total structure is being followed biologically.

Valuable help in these, and other, aspects of the Department's work has been provided by the physicochemical techniques available in the Department, many

of them depending on elaborate and costly instruments, periodically in need of replacement. One particularly useful technique explored during the year is the use of europium (an uncommon chemical element) to separate the overlapping signals in the magnetic resonance spectrum, thus facilitating the inspection of much more complex biological material than was previously possible.

Work in the *Department of Microbiology* is concerned with the study of viruses and with the way in which the body can recognise and react against both these and much simpler substances. Most of the work carried out is on a long-term basis but every now and then findings are made which have a more immediate interest.

This year saw the final characterisation of a number of viruses which have been isolated from mosquitoes caught in New Guinea since 1962. Most of the laboratory work involved in the study was carried out in this University but the final steps in identification were done at Yale University by a member of the Departmental staff during study leave. Eight different viruses were recovered and several of these seem to be new agents not previously described. A comprehensive study is now being made of the pathological effects which result when laboratory animals are injected with some of these strains and with a related virus which was isolated previously from the Nelson Bay area of New South Wales.

The body's defences against both viral infections or the injection of simpler substances such as proteins is a complicated process and at least three different types of responses can be discerned. The first is the production by and liberation from cells of a substance, interferon, which interferes with the multiplication of viruses. It is not yet clear how great a role this plays in many viral infections, but in certain laboratory situations, it can be very important. The other two are part of the immunological defence of the body. In the simplest case, a class of cells called lymphocytes are stimulated so that they produce special proteins called antibodies which specifically react with and cause the destruction of the foreign substances, be it a virus particle or a protein. In the other situation, a sub-population of lymphocytes are stimulated and these do not secrete antibodies but a quite different class of substance, sometimes called lymphokines. These lymphokines do not react directly with the foreign substances but with another class of cells which are thereby activated so they ingest and destroy the foreign substances. These two types of immunological reactions are often called an 'antibody response' and a 'cellular response'.

It is becoming increasingly clear from work in the Department that these responses differ very much in their importance during viral infections and that the relative importance of each depends upon the virus concerned. With some viruses, such as mousepox, the cellular response seems to be all important and with others, such as Sendai virus, a type of influenza virus, the cellular response seems to be far less important.

We know a lot about the cells which secrete antibody but less is known about the sub-class of lymphocytes which take part in the cellular response. Because of their importance, they are being studied in a variety of ways, one of which is to examine their ability to discriminate between different substances. This has given results which suggest important differences between this class of lymphocytes and those that secrete antibody.

The work of the *Department of Physical Biochemistry* is concerned with the study of physical and chemical aspects of substances (mainly large molecules), systems and processes of biological and medical interest. Frequently, this involves the development of new theories and experimental procedures in collaboration with scientists in several parts of Australia and overseas.

With the arrival of Professor L. W. Nichol in January as Head of the Department, work was commenced on a detailed study of interacting systems with systems with emphasis on the binding of small molecules (such as sugars and dyes) to proteins. The approach employs concepts of physical chemistry in an attempt to elucidate certain control effects in the operation of the living cell. Another worker, Dr P. D. Jeffrey, in a related field, is studying the behaviour of insulin in solution and the effect of glucose on it.

A group, headed by Dr H. A. McKenzie, is studying the chemical evolution of milk and blood proteins and the relationship of their structure to their biological function. The findings are pertinent to studies, also performed by this group, on the mechanism of protein denaturation. These studies not only enable fundamental information to be gained on protein structure, but they also have considerable practical significance. Thus, close liaison is maintained with paediatricians concerned with allergenicity reactions in children, and with food scientists and technologists.

Interest in the role of the enzyme, sulphatase A, in the metabolism of nervous tissue is growing and one group, headed by Dr A. B. Roy, is providing fundamental information in this area by studying the conversion of the enzyme to modified forms on interaction with substrates.

Theoretical studies on the mammalian retina and kidney have continued and have led, for example, to an explanation of the unexpectedly high concentration of non-polar compounds in the urine compared to that in the blood. In addition, more information has been obtained on the properties of materials which comprise connective tissue, such as cartilage.

In general, the members of the Department continue to assist and to encourage others to employ physicochemical and mathematical concepts and methods for the formulation and solution of biological problems.

The work of the *Department of Physiology* is mainly concentrated along three separate lines—the nature of the chemical substances used to transmit information between nerve cells; the way muscle nerves influence and determine the properties of the muscles to which they are connected; and the nervous mechanisms in the eye and the brain that enable us to see and recognise the objects in the world about us.

Studies of chemical transmitter substances operating at synapses within the mammalian brain and spinal cord have continued using microtechniques, chemical and biochemical procedures developed in past years. Using bicuculline as a specific antagonist further evidence has been obtained of the vital role of gamma-aminobutyric acid as an inhibitory transmitter in the central nervous system, a role relevant to the neurological problems of epilepsy and Parkinson's disease. A number of antagonists of the excitation of neurones by glutamic and aspartic acids have been found which may prove useful in assessing the function

of these amino acids as excitatory transmitters. Investigations have continued of the factors involved in the synthesis, storage and inactivation of transmitters, and the manner in which these substances excite or inhibit nerve cells.

Investigations have continued on dynamic properties of mammalian muscles. The relation between intrinsic speed of shortening and duration of the active state was determined for extraocular muscles. One of the principal findings is that these muscle fibres shorten much more rapidly than the fastest limb muscle fibres. These differences between heterologous muscles afford opportunities for investigating factors which limit the speed of shortening of the contractile material, and raise new questions concerning trophic neural control of differentiation of muscles.

The main aim of the studies of neural mechanisms underlying vision is to understand how the brain uses the patterns of nerve impulses from the eyes so as to build up an effective internal representation of the external world. In principle, information from the two eyes jointly specifies the third dimension of visual space. Experiments revealed neurones in the visual cortex which properly combine the joint information; continuing studies are now providing detailed evidence in support of the new and explicit theory for stereoscopic vision which has been developed. A significant advance has been made in unravelling the detailed connections that link the nerve cells in the retina with those further up the visual pathway. The technique involves simultaneous recordings from a single nerve cell in the retina and a cell to which it connects at the higher level. Neural modification of visual messages may thus be studied very directly. Work continues on behavioural studies designed to assess the normal visual abilities and characteristics of the animals used in the electrophysiological work. A solution to the problem of visual pattern recognition is of the greatest importance not only in relation to vision but also for our general understanding of brain function.

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† Not a member of this University.

¶ Member of the Research School of Chemistry.

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* Based on work done while a member of the Department.

** Based on work done prior to joining this University.

† Not a member of this University.

‡ Member of the Department of Chemistry.

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* Based on work done while a member of the Department.

† Visiting Research Worker.

‡ Not a member of this University.

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THESES

Thesis titles of work successfully submitted by research students in the John Curtin School of Medical Research on whom degrees were conferred in 1971:

- | | |
|--|-----------------------------|
| ANANTHAKRISHNAN, R. | <i>Doctor of Philosophy</i> |
| 'Population genetic studies in south India.' <i>Department of Human Biology.</i> | |
| BELL, R. G. | |
| 'The local response to antigenic stimulation in the duck.' <i>Department of Experimental Pathology.</i> | |
| BLANDEN, R. V. | |
| 'Mechanisms of recovery from mousepox.' <i>Department of Microbiology.</i> | |
| BURRELL, C. J. | |
| 'Studies on the proteins of Semliki Forest virus and poliovirus.' <i>Department of Microbiology.</i> | |
| DUGGAN, A. W. | |
| 'Amino acids as central transmitters.' <i>Department of Physiology.</i> | |
| ENGLAND, B. T. | |
| 'Dimroth Rearrangement of some pyrimidine systems.' <i>Department of Medical Chemistry.</i> | |
| HAY, J. B. | |
| 'The role of fixed and migratory cells in immunological reactions.' <i>Department of Experimental Pathology.</i> | |
| HOPPER, K. E. | |
| 'Comparative study of α -lactalbumins and of their relationship to lysozymes.' <i>Department of Physical Biochemistry.</i> | |
| KANG, I. P. S. | |
| 'Spectral studies of compounds containing the carboxylate ion, nitro and related groupings.' <i>Department of Medical Chemistry.</i> | |

** Based on work done prior to joining this University.

† Not a member of this University.

* Based on work done while a member of the Department.

KOCH, G. L. E.

'The structure and functions of chorismate mutaseprephenate dehydrogenase.'
Department of Biochemistry.

O'BRIEN, I. G.

'The structure and function of enterochelin: A catechol involved in iron transport in *Escherichia coli* K-12.' *Department of Biochemistry.*

OHTA, K.

'The synthesis of 4-unsubstituted pteridines from pyrazines.' *Department of Medical Chemistry.*

SANDERSON, K. J.

'Visual mechanisms at the level of the diencephalon.' *Department of Physiology.*

SUGIMOTO, T.

'A study of 1,2,4,6,8-penta-azanaphthalenes and some related compounds.'
Department of Medical Chemistry.

YOUNG, A. C.

'Synthesis and reactivity of nitrogen heterocyclic quaternary ammonium salts.'
Department of Medical Chemistry.

THE RESEARCH SCHOOL OF PHYSICAL SCIENCES

REPORT OF THE DIRECTOR

Professor Sir Ernest Titterton, C.M.G., F.A.A.

The year has been a rather mixed one for the School. Building operations—extensions to the Cockcroft complex, the Mathematical Sciences building and commencement of the new accelerator tower in Nuclear Physics—have caused interruptions to work.

The long drawn-out discussions on the future of the Department of Geophysics and Geochemistry, produced strong emotions and an unfortunate division between that Department and the remainder of the School, with consequent effects on morale. The matter still had not been settled by the end of the year.

On the other hand the establishment of two new departments, the Department of Applied Mathematics and the Department of Solid State Physics, has been enormously successful and, additionally the output of research from the School has climbed steadily. A total of 319 publications was made, 269 of these being papers in international and local scientific journals, forty-one books, chapters of books or encyclopaedia entries, while nine were research reports. This is an all-time high for publications from the School. In addition, twenty-eight theses for the degree of Doctor of Philosophy went forward for examination during the year which, also, is a record.

A number of high honours were accorded to members of the School. The most notable was the appointment in November by Her Majesty The Queen of Emeritus Professor Sir Mark Oliphant, K.B.E., F.R.S.N.Z., F.A.A., F.R.S., as Governor of South Australia. Sir Mark resigned his Honorary Fellowship in December in order to take up his new and very important duties. On 14 October the Director and Lady Titterton gave a party to celebrate Sir Mark's seventieth birthday—a party attended by some 100 colleagues and friends of Sir Mark and Lady Oliphant. A portrait of Sir Mark by Noel Counihan was purchased by subscriptions within the University community and now hangs in the foyer of the Oliphant Building.

Dr W. Compston, Department of Geophysics was elected a Fellow of the Australian Academy of Science, Professor B. W. Ninham, Department of Applied Mathematics, was awarded the Pawsey Medal of the Australian Academy of Science and was elected a Fellow of the American Institute of Chemists, and Professor A. E. Ringwood, F.A.A., received the Rosenstiel award of the University of Miami.

The Director represented the School at the Rutherford Centenary Celebrations in Christchurch, New Zealand, during July. He gave an invited paper at the conference held in honour of the occasion.

The School offered sympathy to Professor B. H. Neumann, F.A.A., F.R.S., on the sudden death, in Ottawa, of his wife Professor Hanna Neumann, F.A.A., Head of the Department of Pure Mathematics in the School of General Studies.

She had held a Professorial Fellowship in the School and had been a great friend, working very closely with many members of the Department of Mathematics.

Three technical staff members, Mr P. Rudge, Mr W. Butterfield and Mr J. Ladyzhynsky died during the year. Each had given service of great importance to the University and will be sorely missed.

Messrs W. Berry, R. Mulcaster and F. C. James, technical staff members with long years of service in the School, also retired during the year.

On the academic front, Professor J. C. Jaeger, F.A.A., F.R.S., for health reasons, resigned as Head of the Department of Geophysics and Geochemistry from 1 September. He will continue in the Chair of Geophysics until his retirement at the end of 1972. Professor A. E. Ringwood was appointed Acting Head of the Department pending decisions on its future.

The Chair of Engineering Physics was filled by the appointment of Dr S. Kaneff, who had held a professorial fellowship in the Department for five years. Professor Kaneff, who had been Acting Head of the Department for the previous nine months following on the retirement of Emeritus Professor G. H. Newstead, set about implementing the policy outlined in last year's Report. This, in essence, was to centre research activities around the unique capabilities of the homopolar generator system, and fill staff vacancies with young physicists with the experimental capacities and theoretical understanding to pursue a vigorous research program. The result has been outstandingly successful, the better interdisciplinary balance within the Department has paid off and a large increase in experimental activity and publication of research papers has resulted.

The award of a Queen Elizabeth II Fellowship to Dr M. N. Barber, Cornell University, brings to four the number of Queen Elizabeth II Fellows in the Department of Applied Mathematics—an all-time record for any department in Australia and a remarkable testimonial to the standing of the Department in the eyes of vigorous young research workers.

Emeritus Professor Sir Leonard Huxley, K.B.E., F.A.A., was appointed to an honorary fellowship for two years and this will enable him to complete the book he is writing with Dr R. W. Crompton.

The Time Service (positional Astronomy group) was transferred to the Department of National Development in July. Facilities for this work will remain available at Mount Stromlo Observatory.

As usual the School received a number of distinguished visitors during the year. Amongst them were the Administrator of the Commonwealth and Governor of Victoria, His Excellency Major-General Sir Rohan Delacombe, K.C.M.G., K.C.V.O., K.B.E., C.B., D.S.O., K.St.J., and Lady Delacombe; Professor K. S. Pitzer, Stanford University; Dr G. M. Volkoff, F.R.S.Can., University of British Columbia; Professor P. M. Morse, Massachusetts Institute of Technology; Professor N. Kurti, F.R.S., University of Oxford; Dr P. Field, Argonne National Laboratory; Dr M. Shapiro, Naval Research Laboratory, Washington, D.C.; Dr G. R. Harrison, Massachusetts Institute of Technology; and Emeritus Professor G. H. Newstead.

As in 1970, owing to shortage of funds both here and overseas, visiting research workers were not as numerous as in earlier years. However, some twenty-five visitors spent part of the year in the School and made considerable contributions to the various research programs.

During the year the full Faculty met on three occasions and the Faculty Board thirteen times. With the addition of two new heads of departments to the latter body it became necessary to add another elected member to bring the numbers in this group to four. Dr W. Compston, F.A.A., and Dr Crompton were elected by Faculty and joined the Board in August.

Both the Faculty and the Faculty Board considered a wide range of problems during the year including the new Faculty Statute, Faculty and Faculty Board working rules, difficulties with the current computer situation, School colloquia, site development and so on.

Major preoccupations of Faculty Board were with academic and non-academic reclassifications; the fiscal situation, particularly in relation to the inflation in costs and the increasing use of expendable research materials; the transition into the new triennium of 1973-75; the relationship between the Anglo-Australia 150-inch telescope project and the Department of Astronomy and, above all, the problem of the future of the Department of Geophysics and Geochemistry.

This last had been discussed in detail during 1970 prior to the Australian Universities Commission submissions and all bodies of the University, the Faculty Board of the School, Heads of Schools, the Board of the Institute and the Professorial Board had recommended that a separation from the School, or a substantial enlargement of the earth sciences group within the School, at this stage, should not be attempted. Council, in its submission to the Australian Universities Commission for 1973-75 had therefore, not asked for funds for either development. It had, however, requested that the matter be re-examined during 1971. As it turned out, the early resignation of Professor Jaeger as Head of the Department precipitated this re-examination, both within the School and the University.

Faculty Board met on the problem on four occasions, including two meetings with the Vice-Chancellor. Although the Department of Geophysics and Geochemistry representatives on the Board pressed very strongly for agreement to separation, Faculty Board again recommended that, at this time, the Department remain within the Research School of Physical Sciences. The Board also prepared papers setting out the pros and cons of a separation for consideration by the Board of the Institute and by the Council.

In November, Council recorded that it considered that the establishment of a separate Research School of Earth Sciences was desirable and asked the Vice-Chancellor to examine the implications such a decision would have for the whole structure of the Institute, with a view to a report being submitted to Council by about mid-1972.

By the end of the year the Board of the Institute had set up a committee '.... to examine without restraint the implications a decision to establish an autonomous organisation of Earth Sciences would have for the whole structure of the Institute and to prepare an interim report for the March meeting of the Board

on matters it believes should be examined in this context and, if necessary, to suggest more precise terms of reference for its continuing work'.

It is now a matter of considerable concern to the School that these issues be settled with a minimum of delay and with a full understanding of the total implications for all parties involved.

By the end of the year the extensions to the Mathematical Sciences block were almost complete and part of the area had been handed over for occupation. Work on the extensions at both ends of the Cockcroft Building was well advanced and occupation of the new areas should be possible before Easter. These two developments will greatly ease pressure for accommodation within the Department of Solid State Physics and the two Units.

At the Siding Spring Observatory the building works relating to the Anglo-Australian 150-inch telescope and the Science Research Council 48-inch Schmidt telescope are continuing. The Siding Spring Lodge, extensions to which were completed last year, is now being operated as a financially self-supporting unit on a compatible basis to that applying to halls of residence.

Building work in the Department of Nuclear Physics, to house the injector cyclotron for the EN tandem, is near completion. The machine arrives in early February 1972. The first stage, to the 40-ft level, of the tower to accommodate the new vertical tandem accelerator was completed in August and the 72-ft long, 18-ft diameter pressure vessel, mounted on a tripod support designed and built within the Department, was erected by Christmas. Welding of the vessel, and its pressure testing, should be completed by the end of February and stage two of the tower, to be erected around the vessel, will commence in March and should be completed by August. It is hoped to have the new accelerator completely assembled by the end of 1972.

In the following sections brief outlines are given of the more important developments in the various Departments and units of the School.

Research Activities

Activities commenced in the *Department of Applied Mathematics* in April, when one postdoctoral fellow, one postgraduate student and the Head of the Department took up their positions. In June two staff members joined. The Department was particularly fortunate in obtaining three Queen Elizabeth II Post-doctoral Fellows who arrived at various times through the year and a fourth award was made to the Department in December.

Principal research interests have centred on two main themes. Theoretical work on the electromagnetic properties of visual receptors is complementary to and has a close overlap with experimental work carried out in the Department of Neurobiology of the Research School of Biological Sciences. In this area three important advances have been made—the different sizes of retinal receptors in the fly have been shown to be responsible for its colour vision; this new concept may necessitate a revision of traditional photopigment colour vision theories in general. The peculiar electromagnetic mode rejection properties of the visual receptors of bees have been shown to enhance the polarisation sensitivity of the bee eye for navigational purposes; the bees' ability to navigate accurately over

long distances has long been an enigma to physiologists. Further theoretical work has shown how discrepancies between recent electrophysiological measurements and ray tracing procedures for the worker bee eye can be resolved. Again this has been something of a puzzle for some time. Other interesting projects in collaboration with the Department of Neurobiology are under way.

The other main area, and in fact the major research line of the Department, relate to problems in the general area of colloid, surface and polymer chemistry, electrolytes and macromolecular forces. Some of this work complements research being carried out in the Research School of Chemistry as well as in two units of this School. Its main thrust is directed towards developing a quantitative understanding of the specificity of biological macromolecule forces and cell-cell interactions via the aid of a new physical theory of interatomic and molecular forces. At first sight this may seem to be a somewhat extraordinary activity for a Department of Applied Mathematics. However, the physical theory is by now very firmly established. The study of the influence of geometry or structure on the magnitude and specificity of forces which act in biological systems then becomes a problem requiring the heavy use of classical techniques of applied mathematics. A good deal of progress has been made in this new field, and the work continues at a quite satisfactory rate. In the general area of colloids and electrolytes, a theory of silica-water interfaces has been developed. The properties of these and similar systems have not previously been explained. Further a long standing problem in soil science—the explanation of apparently anomalous swelling in clay soils—appears to have been resolved. The phenomenon itself has been exploited to some economic advantage in the Colorado River irrigation scheme and elsewhere without it being properly understood.

Various miscellaneous projects, most of which have been developed from the two main research lines have been pursued. These include work on the theory of water, a theory of phase transitions, low temperature physics, a method for optimising filtration problems (separation of oil from water) which may prove practical, collaborative work with the Electron and Ion Diffusion Unit, satellite data processing and, curiously, an embryo theory of nuclear forces. The last is somewhat radical in conception and still highly speculative.

The year within the *Department of Astronomy* was marked by major instrumental advances at both the Mount Stromlo and Siding Spring Observatories. These include the development and use of a photoelectric stellar speedometer and installation on the 74-inch reflector of a Fabry-Perot interferometer, a low light level TV finding system (SEC Vidicon and image tube), a coudé autoguider and a computer for the control of encoders and drive rate.

Research has been especially fruitful in extragalactic astronomy where several interesting Quasars have been isolated; radio spiral arms found in M 51; and a possible new, massive member of the local group of galaxies identified. In the field of stellar evolution additional supporting evidence has been found for the collapsing galaxy picture of the early evolution of our own galaxy; abundance analyses of some twenty elements in nineteen stars of known age indicate a slow chemical and kinematical evolution of the Galaxy after the initial and rapid collapse; from 1 Å/mm spectra obtained with the echelle spectrograph a detailed study of nucleogenesis processes in stars with a variety of ages has given

insights to the element building since the collapse of the Galaxy. The interpretation of a wide variety of observational data has been greatly aided by the production of stellar models, involving sophisticated input physics and evolved with the use of the 360/50 computer.

Other research included an extensive spectrographic and photometric survey of the nearest stars, the development of photometric criteria for stellar luminosity, numerous investigations of the stellar population in the Magellanic Clouds, and both theoretical and observational studies of the nature of intrinsic variable stars.

Extensive use of the Observatory's equipment was made during the year by astronomers from the Universities of Melbourne and Sydney working, both on their own projects, and in combined projects with astronomers at this University. As in previous years an extensive cosmological program was carried out in collaboration with the CSIRO (Parkes) astronomers using both the optical instruments here and the radio telescopes at Parkes.

The interests of the *Diffusion Research Unit* lie in the general field of liquid-state physics, a branch of physics which has only recently acquired an identity of its own. In its theoretical aspects, progress in the physics of liquids depends mainly on computers because of its mathematical complexity. This is one of the reasons why significant advances in the field have occurred only in the last decade. Research in this area is also multidisciplinary in nature and includes aspects of physical chemistry, theoretical and experimental physics, applied mathematics and numerical analysis. For this reason the Unit collaborates advantageously with many other departments in the School.

Within the limited physical and financial resources available, it has been necessary to concentrate in a particular section of the field and so, in the first instance the process of self-diffusion was chosen for study. This property is the simplest of all transport processes and is in fact, a measure of the random molecular movements in liquids—the so-called Brownian motion. For some years self diffusion in liquids has been measured with radioactive tracers and these experiments have involved materials ranging from molten salts to the liquid rare gases. This year, the Unit's theoretical group has used computers to calculate self-diffusion coefficients of liquid argon. In this technique of molecular dynamics, the computer takes a few hundred molecules in a box, sets them off with initial velocities and then follows all their individual motions and collisions until several thousand configurations have been generated. The configurations are eventually averaged to give many properties of interest including the self-diffusion coefficient. The stage has now been reached where one can compare the experimentally-observed argon coefficients with these computer-generated ones. Arrangements have been made to establish a spin-echo nuclear magnetic resonance apparatus in the Unit early next year and this equipment will provide a new technique to measure self-diffusion in liquids. This means that the Unit now has three independent methods of determining these important coefficients and probably is the only laboratory so equipped.

Although liquid self-diffusion is the research field in which the Unit's major effort has been expanded in recent years other important areas are now being developed. For example, the theoretical group on the computer simulation

program have used their data to calculate thermodynamic properties of liquid and gaseous argon and the elastic constants of solid argon. A student working with the group is studying the nature of absorbed water on silica surfaces which include not only self-diffusion coefficients but many other interesting properties as well.

In the *Electron and Ion Diffusion Unit* research in gaseous electronics and its interpretation in terms of fundamental collision processes between electrons, ions and neutral molecules continued. This project depends for its future success in some areas on an increasing sophistication in the application of transport theory. Until quite recently a straightforward application of an accepted theory accounted for the results of most experiments with sufficient accuracy. The contributions by this School to the present knowledge of low energy elastic and inelastic scattering processes through the application of this theory to the results of highly refined experiments is acknowledged in a series of review articles in the October issue of *Reviews of Modern Physics* for this year. However, this work required the most accurate measurements of transport coefficients that have so far been made and it was perhaps inevitable that some inadequacy in the theory used to analyse the experiments should begin to appear. This has been particularly true of the ion mobility measurements, where the precision of the measurements has revealed a dependence of the ion mobility on gas pressure approximately an order of magnitude larger than the experimental error, an effect which has been masked by the relatively large random and systematic errors of other investigations.

The emphasis of a major part of the work of the Unit therefore has been somewhat different from previous years although the basic aim of using transport coefficient measurements as a tool in the study of electron and ion impact phenomena remains unchanged. First, checks have been made of the validity of transport theory as applied to electron diffusion in situations where the experimental results do not suggest any shortcomings of the existing theory but where it has been suggested, nevertheless, that the theory may be inadequate. The experimental check consisted of measuring a transport coefficient, whose magnitude could be calculated from the results of previous work, under conditions in which it is no longer necessary to invoke a basic approximation in order to interpret the results. The theoretical check, undertaken by the Department of Theoretical Physics, consisted of estimating directly the magnitude of the error resulting from the use of the approximation, a calculation that had not previously been attempted because of its complexity. Both tests confirmed the adequacy of the usual approximation in these circumstances. Further experiments have been designed to test the adequacy of a new theory of anisotropic diffusion.

The second major area of investigation, to examine the apparent breakdown of the usually accepted transport theory as applied to ion mobility measurements, has revealed several new phenomena and a pattern is emerging which suggests that a straightforward application of the theory may be invalid because of the formation of short lived ion-molecule complexes during orbiting collisions. These complexes have not previously been observed either directly because of their short life-time, or indirectly because of their relatively small effect on the transit time of an ion since the ion normally spends only a small fraction of the transit

time as part of the complex. Nevertheless if this theory is correct it has important implications both to scattering theory and to the interpretation of mobility measurements.

The year also has seen commencement of a systematic investigation of the formation of alkali ion—neutral clusters. Some previously unobserved reactions have already been identified and these and others will be studied at both room and low temperatures.

The research program in the *Department of Engineering Physics* is expanding rapidly. The following highlights are worthy of mention.

The homopolar generator system itself has been developed to a stage that a reduction in operating staff, while still maintaining adequate control and supervision, has been possible. Experiments powered by the generator have involved high field magnet research, solid state physics, high-power lasers, macroparticle acceleration and the study of problems involved in the control of very large currents. Useful experimental time has increased sharply over the past year, and the stage has now been reached in which rapid changeover of the homopolar generator from one experiment to another, with operation in a time-shared mode between pulses of energy or between groups of pulses, can effect a substantial increase in productivity. Because of the high currents and complex parameter changes involved, achievement of this objective, currently being studied, is expected to be difficult.

Successful completion and commissioning of the Department's 300 kilogauss magnet, the most intense field of its kind ever produced, has achieved new understanding on the conception and design of high field magnets, which has led to considerable interest from overseas, particularly the UK, USA and West Germany, who have sought advice on their own developing high field systems.

Following development begun in 1970, the high power laser group expects to complete, early next year, the first amplifier powered by the homopolar generator and containing twenty neodymium glass discs to handle a beam aperture of two inches. Output is expected to exceed 100 joules per pulse. Concurrently with this work, unexpected results, which may throw interesting light on dielectric breakdown phenomena due to self-focussing of laser radiation in liquids, have been obtained recently.

The 'exponential' laser amplifier concept, pioneered by a member of the laser group for amplifying intense laser pulses, has recently been considered in its simplest form, by groups in France and the USSR. The latter group predicts that this type of amplifier may deliver more output power than has been obtained by other methods. The Department is ahead in utilising this approach in fundamental research. As an indication of its repute the laser group's assistance was sought in conducting a lunar tracking experiment in conjunction with the Apollo XV Moon Mission at the time of the eclipse of the moon on 6 August. At very short notice, a laser system was designed and assembled and appropriate communication and control links established. Unfortunately, the experiment could not be completed due to failure of the colour television system on the lunar vehicle.

Development of an electromagnetic macroparticle accelerator, designed to bring a mass of one gram or so up to a velocity near 100 kilometres per second has progressed to the final testing stage.

A study of high current arcs made with versatile apparatus containing a rotating drum anode and stationary cathode has resulted in the detection of transitions between two arc modes: previously it had been assumed that only one of these modes could exist on a moving anode. Detailed examination of these newly found transitions indicates that they represent important stages in the evolution of high current arcs in air at atmospheric pressure.

Investigation of plasma behaviour in a toroidal plasma machine has produced better understanding of runaway electron phenomena: as a result of this and other successes, a study is being made to evaluate use of the homopolar generator to provide an increased longitudinal magnetic field for the machine in order to extend its experimental range.

Other achievements have included development of a heat-sink-cooled version of a rotary heater and linear channel gas accelerator with applications in a hypersonic wind tunnel powered by the homopolar generator.

Finally, the Information Science Group has made advances in three directions—(a) enhancement of on-line facilities, particularly interactive capability; (b) the establishment of seismic data processing capabilities which are unique: development of the handling of long-period seismic data; the realisation of novel long-term portable seismic recorders; and the production of a successful two-component long-period horizontal seismometer; and (c) advances in the processing of images and in the automatic learning of concepts.

In the Department of *Geophysics and Geochemistry* research has continued on a wide range of problems related to the structure and evolution of the earth and moon.

Perhaps the most exciting activities have centred around investigations of rocks returned from the moon. Studies of maria samples from the Apollo XI and XII missions are now complete. They have led to a broad understanding of chronology, chemistry and mode of formation of the lunar maria—which are now known to represent vast floods of basaltic rocks erupted from deep within the lunar interior mostly between three and four thousand million years ago. The chemical compositions of these lunar basalts differ in important respects from those of all terrestrial basalts and have provided valuable clues to the origin of the moon. This year, the Department received its first samples of lunar highland rocks from the Apollo XIV and XV missions, and detailed studies of the chronology, chemistry and origins of these rocks are in progress. Already, they have shown that the moon was extensively melted and differentiated during its formation about 4.5 thousand million years ago and that the chemical composition and origins of the highland regions differ in important respects from those of the maria. New results and interpretations continue to pour in and it is hoped that during the next two or three years, several of the most fundamental and ancient problems relating to the origin and structure of the moon, and its relationship to the earth will be resolved.

Geophysical studies of the structure of the Australian continent using several interdisciplinary methods have begun to converge, leading to a demonstration of the existence of a major continental suture in the vicinity of the Flinders Ranges. The existence of this contrast in continental suture was suggested last year by the geomagnetic array investigations which indicated relatively higher mantle temperatures to the east of this line and relatively low mantle temperatures beneath the ancient Precambrian shield to the west. The structural discontinuity has been confirmed by further detailed analyses of the geomagnetic data, by direct heat flow measurements and from the study of seismic travel time delays for waves from the recent Amchitka nuclear explosion, Aleutian Islands, which were recorded by the Department's array of portable seismographs. This major structure is clearly related in a fundamental way to the evolution of the Australian continent.

The Department continues to lead the world in the application of experimental high pressure - high temperature investigations to elucidate the nature of the earth's deep interior and the origins of magmas. Several new high-pressure phase transformations were discovered during the year. Emphasis in this field is now moving towards the fabrication of large samples of high pressure minerals previously discovered here, with the aim of investigating in detail their physical properties by means of ultrasonic and other techniques.

A major effort continues to be made in geochronology and isotope geochemistry using rubidium-strontium, potassium-argon, uranium-lead and carbon-14 techniques. These have been facilitated by the construction of an improved mass-spectrometer designed with the Department and capable of unmatched sensitivity and precision. The dating techniques have been extensively applied to the systematic geochronology not only of the Australian continent, but also of Antarctica, New Guinea, the Solomon Islands and other Pacific Islands. These researches have been combined as far as possible with other studies of trace-element geochemistry, isotope geochemistry and palaeomagnetism in an integrated interdisciplinary approach which is clarifying our understanding of the structural and geochemical evolution of the southern hemisphere.

Other investigations in seismology, with the operation of the Warramunga and Canberra arrays are in progress.

Work on rock deformation, structural geology and heat flow continues actively.

The *Department of Mathematics* continued its research activities in pure mathematics, principally in algebra and analysis; again substantial use was made of computing equipment of the University for a study of a narrow range of algebraic problems and a comparison of different computer methods to attack them. The through-flow of research students continued and former scholars of the Department again obtained academic appointments in many parts of the world. The ancillary activities of members of the Department, such as refereeing, reviewing, examining, advising and editing continued undiminished. There was less overseas travel by members—the year happened to be quiet for overseas conferences of interest to the Department—but the Department again played a large part in bringing distinguished mathematicians as visitors to Australia and visitors from other parts of Australia to Canberra.

Planning began for the second International Conference on the Theory of Groups to be held at this University from 13 to 24 August 1973; the first such conference was held here in August 1965 and was highly successful. The second conference is being jointly sponsored by the Australian Academy of Science and the International Mathematical Union as well as the University.

The major building operation in the *Department of Nuclear Physics* related to the 14 UD tandem accelerator project and this is now well under way. The first stage of the tower, up to the 40-ft level, has been completed and the pressure vessel assembled. The positional adjustment mechanism for the pressure vessel, which was designed and built in the Department, appears to be very successful. It is expected that the accelerator will be complete by the end of 1972 and testing will commence early in 1973.

The cyclotron originally scheduled to arrive in August 1972 is now expected to arrive early in February 1972. It performed very well in tests at Berkeley, producing 20 μ a beams of 26 MeV protons; both of these figures exceed those guaranteed. Installation as an injector into the present EN tandem accelerator is expected to take about four months and experimental work should begin with the new complex late in 1972.

Progress with the polarised ion source has been rather disappointing to date. A variety of troubles have been experienced and although most have been sorted out, no useful experimental work has yet been done with it. An accelerated beam of about 6 na has been obtained on a target and a development program to increase this is under way.

There has been a considerable turnover of staff this year. Five research fellows left and have now been replaced.

The research activities of the Department continued successfully. Further work on the lower $T = 2$ state in ^{12}C has been done but so far no extra information on the main road of its decay has been obtained. Other experiments on isobaric analogue states in deformed nuclei have led to interesting results.

Work in the field of heavy-ion induced reactions has continued to flourish and expand. Particularly interesting results have been obtained on states of high spin and excitation energy in ^{28}Si from a study of the $^{12}\text{C} + ^{16}\text{O}$ reactions. One state, at 30.3 MeV excitation with a spin of 10^+ , has been firmly established and there is tentative evidence for the presence of other states of high excitation. The nature of the states is not at present understood. An optical model analysis has been made of the total reaction cross-section for the $^{12}\text{C} + ^{16}\text{O}$ reaction at energies below the Coulomb barrier. Quasi-molecular type resonances are seen in this reaction and the calculations reproduce them remarkably well.

Experiments on ^4He capture reactions in the giant-resonance region, using the 10-inch NaI(Tl) crystal, continue to produce interesting results. Data on the $^{36}\text{Ar}(\alpha, \nu)^{40}\text{Ca}$ reaction indicate that it proceeds mainly through $J = 1^-$ states which are also populated in the $^{39}\text{K}(p, \nu)^{40}\text{Ca}$ reaction. The results suggest that the mixing between $T = 0$ and $T = 1$ states changes drastically over the region of the giant-dipole resonance. Another experiment has the aim of studying the isospin splitting in the nucleus ^{80}Ni , and preliminary results are encouraging.

A variety of techniques and reactions have been employed to study energy levels of nuclei in the 1_p , $2s$ - $1d$ and $f_{7/2}$ shells. Reaction mechanism studies have continued though at a slightly lower level of activity than last year.

The facilities for beam-foil spectroscopy have been improved markedly. A digital data storage system is now in use enabling the reliable measurements of much weaker lines than hitherto. The observed line width in this method is usually determined by the Doppler broadening. Some notable improvements have been made so that these widths have been reduced by large factors.

Professor W. A. Runciman arrived in February to take charge of the new *Department of Solid State Physics* and the staff numbers built up rapidly during the year to a total of three research fellows, three research assistants and two technical staff. The first graduate student has arrived and a second is due to start early in 1972. Similarly, on the equipment side, there has been a steady build-up and major items include a Cary 17 spectrophotometer for spectroscopic studies in the ultraviolet and visible regions and a Perkin-Elmer 180 spectrophotometer for the infra-red region. Experimental arrangements have been devised to allow studies to be made of crystals at liquid helium temperatures. The 1-inch horizontal bore superconducting solenoid has been commissioned and will be used for investigations of magnetic circular dichroism of crystals as well as for Zeeman experiments. The 2-inch vertical bore superconducting solenoid has been refitted with a second replacement coil, and has been tested satisfactorily to seventy-nine kilogauss.

The program of research on magnetic oxides, started in the Department of Engineering Physics, has been continued and has made use of the 300 kilogauss pulsed magnet operated by the Department of Engineering Physics. An attempt will be made to bring this work to a satisfactory conclusion early in 1972. A new major program of optical investigations has been started and has yielded several interesting results, including a more detailed infra-red spectrum of pure magnesium oxide, a more detailed absorption spectrum of magnesium oxide doped with iron and the observation of infra-red lines believed to be due to hydrogen present as an impurity in calcium oxide. However, the outstanding discovery has been that of the new phenomenon of magnetically enhanced fluorescence. It is believed that this is the first time the effect has been observed, in this instance in crystals of bismuth-doped calcium oxide. This optical program will be pursued vigorously next year in association with related work on Mössbauer Spectroscopy and x-ray studies.

During 1972 the *Department of Theoretical Physics* continued to work on problems of nuclear physics, statistical mechanics, field theory and high energy physics. Part of the work is related directly to the experimental interests of the School, and there was close collaboration with the Department of Nuclear Physics on problems of nuclear structure and reactions, and with the Electron and Ion Diffusion Unit on the calculation of mobilities. A most satisfactory appointment of a solid state theorist was made and we look forward to expanding work in this field in 1972.

The most exciting event of the year was Dr R. J. Baxter's exact solution of the 'eight-vertex lattice model', a generalisation of the difficult two-dimensional Ising model in statistical mechanics. This work shows that the exponents which

determine the behaviour of a substance at its critical point may take on a continuous range of values, instead of only some discrete values as had previously been assumed. This result has aroused considerable excitement overseas, particularly in the USA where Dr Baxter has invitations to lecture on his work.

During the year regular evening meetings for discussions with the experimental nuclear physicists were organised, in addition to the usual seminars and study groups.

At the April Conferring of Degrees ceremony, three students in the Department took the degree of Doctor of Philosophy in person, a most unusual circumstance. Since then student numbers have been allowed to fall, because of the present uncertainty about the prospects for graduates with the degree of Doctor of Philosophy, although so far all our graduates have obtained suitable appointments.

This brief review of the work of the School during 1971 shows the year to have been a record one for the research work of the various groups. The programs established in the new Departments of Applied Mathematics and Solid State Physics can be expected to develop rapidly in 1972. We look forward with interest, and some anxiety, to the decision of the Australian Universities Commission on the proposed funding for this School over the next triennium 1973-75.

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THESES

Thesis titles of work successfully submitted by research students in the Research School of Physical Sciences on whom degrees were conferred in 1971:

Doctor of Philosophy

BOWERS, D. L.

'Studies on the heating and containment of plasma in a magnetic trap.' *Department of Engineering Physics*.

CARTER, K. W.

'Gamma ray studies in ${}^{27}\text{Al}$ and ${}^{29}\text{Al}$.' *Department of Nuclear Physics*.

CLEMENT, S. W. J.

'The application of beam transport theory to mass spectrometer.' *Department of Geophysics and Geochemistry*.

DELIC, G.

'The deuteron D-state and (d,p) reactions.' *Department of Theoretical Physics*.

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'Tensor polarization and differential cross section in the elastic scattering of deuterons by some light nuclei.' *Department of Nuclear Physics*.

GROVES, J. R. J.

'Varieties of soluble groups.' *Department of Mathematics*.

HENSEN, B. J.

'Experimental study of the stability of cordierite and garnet in pelitic compositions at high pressures and temperatures.' *Department of Geophysics and Geochemistry*.

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- LOCKHART, I. A.
 'High resolution observations of 80MHz of galactic and extragalactic radio sources.' *Department of Astronomy.*
- MAKAN, A. R. V.
 'On some aspects of finite soluble groups.' *Department of Mathematics.*
- PAGE, R. W.
 'The geochronology of igneous rocks in the New Guinea region.' *Department of Geophysics and Geochemistry.*
- POPE, R. L.
 'The recombination of diatomic molecules and its effects in expanding gas flows.' *Department of Theoretical Physics.*
- POWELL, D. L.
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- ROBERTSON, A. G.
 'The measurement and interpretation of electron drift velocities in helium, neon, argon and hydrogen.' *Electron and Ion Diffusion Unit.*
- ROSALKY, D. M.
 'Spectroscopy of ^{55}Cr from direct reaction and gamma ray studies.' *Department of Nuclear Physics.*
- SCOTT, S. D.
 'Near-rings and near-ring modules.' *Department of Mathematics.*
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 'Estimation of the properties of quarks.' *Department of Theoretical Physics.*
- TACON, D. G.
 'Compactness-type problems in topological vector spaces. A treatment mainly from the viewpoint of non-standard analysis.' *Department of Mathematics.*
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 'A study of some levels in the nuclei, ^8Be , ^9Be , ^{15}O and ^{28}Al .' *Department of Nuclear Physics.*
- WATSON, R. D.
 'A study of the Beta cephei stars.' *Department of Astronomy.*
- WILSON, C. J. L.
 'The microfabric of a deformed quartzite sequence, Mount Isa, Queensland.' *Department of Geophysics and Geochemistry.*
- WORDEN, J. M.
 'Weathering of Australian granitic rocks: A study of variations in trace elements and isotopic ratios.' *Department of Geophysics and Geochemistry.*
- WRIGHT, C.
 'P wave investigations of the earth's structure using the Warramunga seismic array.' *Department of Geophysics and Geochemistry.*
- O'BRIEN, D. M.
 'Kaon-nucleon forward dispersion relations.' *Department of Theoretical Physics.*

*Master of
 Science*

THE RESEARCH SCHOOL OF SOCIAL SCIENCES

REPORT OF THE DIRECTOR

Professor W. D. Borrie, O.B.E.

As 1971 was the mid-year of a triennium, the predominant feature was the continuation of triennial projects rather than the initiation of new work. However, some new research projects were begun, four examples being the history of the Australian Workers' Union aided by the microfilmed records now available in the School Archives, studies of the teaching profession in Australia, the analysis of trends in the size and structure of the Australian workforce, and a study of the ethics of conservation and of the relationships between man and nature.

Social surveys and quantitative analyses continued to play a significant role in the School's research program: as the Department of Political Science was completing the analyses of data relating to voting behaviour from its two Australian sample surveys, another major sample survey was being mounted by the Department of Demography to study the formation, growth and structure of the Australian family. The Department of Economic History was also involved in the analysis of massive data from universities and elsewhere concerning the academic records and earning profiles of graduates. Similar methods were being applied in educational and sociological studies. In addition, extensive special tabulations of 1966 census data were carried out by the Commonwealth Bureau of Census and Statistics for research into the patterns of urban growth and internal migration. The School expresses its appreciation of the extensive assistance of the Bureau in these and many other aspects of its research work.

Research of this kind is time-consuming and costly. The School therefore welcomed the news towards the close of the year that a greatly extended computer system was to be installed early in 1972: but for this some of the major quantitative projects faced the prospect of serious curtailment. The School also appreciated the considerable support from outside funds which flowed into these costly projects: without this support some of them could not have been launched.

Such funds came from a number of sources. Demographic research was greatly assisted by grants from the Ford Foundation and the Population Council of America. A number of projects initiated or still current in 1971 were also assisted by direct grants from within Australia to pursue applied research in areas considered to be of national importance. Examples are the National Population Enquiry; statistical research in association with the Aeronautical Research Laboratory of the Commonwealth Department of Supply; the three-year project of the Urban Research Unit in association with the Australian Institute of Urban Studies designed to study the economic, social and administrative aspects of the processes of urban development in Melbourne; and assistance from the Nuffield Foundation and from the Commonwealth for a number of projects in the Education Research Unit.

The National Population Enquiry under the control of the Director of the School and being carried out at the request of the Commonwealth Government, as referred to in the Report for 1970, began operations during the year. By June

a postdoctoral fellow, and two research assistants had begun work. A research fellow will take up duties early in 1972. The project which, *inter alia*, will study the major factors determining the growth and distribution of Australia's population and their implications for the future, is to be completed within three years.

While Australia remained a major focus of much of the School's work, research ranged widely both in ideas and in geographical area. Philosophy continued its search into moral, political and social questions from Plato to the present; the History of Ideas Unit continued its concern with the development of ideas about man and society primarily in the last three centuries; the Department of Political Science supplemented its Australian studies with major work relating to European integration and totalitarianism and change in communist countries in Europe; and the Department of Demography gave increasing attention to the issues of population growth and control in South-East Asia.

Research publications continued at the high levels noted in the Reports for 1969 and 1970. Eighteen books, thirty-four chapters to books and 132 articles and lectures were published in 1971.

With regard to staff, there were eleven terminations of temporary appointments and resignations during the year, but these were more than offset by nineteen new appointments made during the year, some of which will not be taken up until 1972. The new appointments included Professor S. J. C. L. Butlin to a second chair in the Department of Economic History, and Professor F. H. G. Gruen to the second chair in the Department of Economics. Professor Butlin took up his chair in October; Professor Gruen will join the School towards the close of 1972. Professor L. Broom, whose appointment was reported in 1970, joined the School in October. In December the Chair and Headship of the Department of Sociology was advertised with a view to filling this post in 1972. In October Council approved the establishment of a second chair in History which will be advertised early in 1972.

During the year the School, and particularly the Department of Economics, suffered great and unexpected losses in the sudden deaths of Mr H. P. Brown and Dr A. Hunter, both professorial fellows. With the death of Mrs Helen Thorpe the School also lost a clerical officer who had given years of devoted service to the building of the School's Archives Section.

Visitors continued to play a significant role in the research work and seminars of the School. Of the nineteen visitors sponsored by the School, six were from Australia, thus continuing the tendency noted in 1970 for staff from other Australian universities to come to the School to pursue research; four were from Canada; three were from USA; three came from Papua New Guinea; and three came from other areas.

Staff of the School were again active in disseminating knowledge in their special fields through invitations to lecture from universities in Australia and New Zealand, and through conferences and seminars both in Australia and abroad. Staff also participated in undergraduate and graduate courses in the School of General Studies. Particularly significant in this regard was the role of the economists of the School in the degree of master by course work in the Faculty of Economics. The *Australian Dictionary of Biography* project, which moved to

the completion of volume IV, thus completing half of the second chronological section for 1851-1890, also continued as a major enterprise amongst historians drawn from universities throughout Australia.

Student numbers were sustained at approximately the levels of 1969 and 1970. In general the competition for scholarships remained keen and continued to reflect the increasing output of high quality graduates both from Australian and overseas universities.

The student statistics for the year were—

Students enrolled January 1971	65
Students appointed during 1971	
From Australia	9
Overseas	5
	14
	—
	79
Terminated during the year	
Degrees conferred	16
Admitted by Council	1
Resigned	2
	—
	19
Enrolled at December 1971	60

Job competition for graduates completing their degrees also remained keen, although all graduates appear to have gained posts appropriate to their qualifications. While the position in 1971 did not seem to call for any reduction in future inputs of scholars, it did suggest that they should not be greatly increased.

Support staff of research assistants, the programming and archives sections and secretarial staff continued their very important roles in the research work of the School. Both staff and students particularly appreciated and benefited from a course, 'Introduction to the Use of Computers', organised by the Programming Section.

The completion of the hemihexagon of the H. C. Coombs Building gave much-needed relief to the space requirements of the departments and units of the School and also enabled the valuable archives collection to be brought together in properly equipped quarters.

Finally, the School again expresses its appreciation of the Honourable Dr J. J. Dedman's generosity in funding the John Curtin Memorial Lecture. The 1971 lecture, the second in the series, was delivered in September by Mr K. E. Beazley, M.P., on the subject of 'John Curtin, an Atypical Labor Leader'. The lecture has been published by the Australian National University Press.

Research Activities

The details of the research output of the School are available in the publication lists provided later in this Report. The following is a brief summary of the main activities of each department and unit.

Much of the work of the *Department of Demography* went into the Australian Family Formation Project; five members of staff and students, with a number of temporary assistants, completed a survey of 250 families in one rural town and

almost completed a survey of 2,500 families in Melbourne. By December the processing of the material was well advanced and ancillary studies were under way into female employment and the legal restrictions and encouragements relating to fertility. Other studies on family formation and planning were commenced in Indonesia, the Philippines and West Africa.

In migration, in which subject the Department has had a long-standing interest, the work continued on refugees, Scandinavians, immigrant concentrations in metropolitan areas, restrictive immigration policies, and on certain demographic consequences of large-scale immigration. During the year the staff produced another issue of *Australian Immigration—a Bibliography and Digest*.

Other staff and student research was concerned with Australian mortality, marriage patterns in Australasia, and internal migration and urbanisation in Australia, India and South-East Asia.

The work of the *Department of Economic History* concentrated in 1971 on economic measurement and projection, industry and institutional studies, policy in economic growth, trade cycle analysis and monetary history. This work is illustrated by Mr B. D. Haig's analysis of women in the workforce and his projections of economic trends; by Dr N. G. Cain's work on economic policy and thought in the 1920's and 1930's; by Dr A. Barnard's activity in the history of Goldsbrough Mort and Co. and in the dairying industry. Professor N. G. Butlin has participated in a study of graduate professions and has joined with Dr Barnard and Dr Cain in a study of the Australian trade cycle between the two world wars.

The basic interests of the *Department of Economics* remained with economic conditions and prospects, capital growth, econometric and more generally quantitative studies of economic problems, all largely but not exclusively related to the Australian economy. A major collection of Australian banking and monetary statistics was completed and published by the Reserve Bank of Australia; the comprehensive and analytical presentation of Australian vital statistics, tragically interrupted by the death of Mr H. P. Brown, was taken in hand by Dr A. R. Hall. A new series, 'A.N.U. Working Papers in Economics and Econometrics', was initiated by a group drawn from relevant departments in the University, and staff and students contributed to four such papers in 1971.

A major activity was the participation of staff in teaching for the degree of Master of Economics by course work under the co-ordinating and organising role of Dr R. G. Gregory. The Department has been active in encouraging future academics and public servants to enrol for this degree, which is aimed to provide both a valuable qualification in its own right and a better preparation for students who may wish to proceed towards the degree of Doctor of Philosophy.

The untimely deaths in the first half of the year of Mr Brown and Dr Hunter, both professorial fellows, as well as the appointment of Dr R. D. Terrell to a chair and Dr R. P. Byron to a readership, both in the School of General Studies, greatly depleted the Department. However, two senior appointments were also made: Professor F. H. G. Gruen to the second chair and Dr S. J. Turnovsky to a senior fellowship. Both are expected to take up their appointments in the latter part of 1972. Other vacancies were actively under canvas as the year ended.

In the *Education Research Unit* stage one of the longitudinal study of professional socialisation was completed with the analysis of data to the end of the students' first year. A majority of the sample (students preparing for engineering, law, medicine and teaching in six Australian universities) has now left university and the final wave of data collection, from those now in professional practice, will be obtained in 1972. A special study of the 1,000 students who withdrew from training was started this year. The project is a joint enterprise of Mr D. S. Anderson, and Professor J. S. Western of the University of Queensland.

The study has links with Dr C. S. Smith's economic research on the costs and benefits of higher education. It is intended to marry data from the two projects in order, first to estimate the cost of academic failure, and secondly to determine the role anticipated earnings play in career choice.

The cost-benefit study of courses in higher education was slowed because of the government decision to eliminate the income question from the 1971 census. The data for earnings profiles had to be obtained at some expense from other sources. In the meantime the study of costs proceeded on schedule and should be completed in 1972. An interim report on the cost of adding an additional year to engineering diploma courses in advanced colleges will be ready in February 1972.

A bibliography of the politics of education was completed and will be a major point of reference for studies of education in the Unit and elsewhere.

One focus of the Unit's future research will be studies of the teaching profession and in 1971 a start was made on two topics: first, a report on the implications of the bonding system on the recruitment and attitudes of teachers; and secondly, a study begun by Professor E. Roe, a visiting fellow from the University of Papua and New Guinea, of the way in which the idea of independent learning and the role of resource materials is conveyed to teachers-in-training. This work will be extended in 1972.

The School's growing collection of business and trade union archives continued to support the research programs of this and other universities. Throughout 1971, sixty-two people made a total of 645 visits to consult archival records. Revised lists of holdings, which included the now substantial microfilm deposits, were issued to appropriate faculties in all Australian universities.

The archives added thirty-three new deposits to its holdings in 1971, and in June the company records and private collections were rehoused in the new hemi-hexagon of the H. C. Coombs Building, where there is much improved accommodation for searchers.

Mr R. C. Sharman tendered his resignation at the end of 1971 and from January 1972 will take up his new duties as Deputy State Librarian in the State Library of South Australia. During his two years at the Australian National University, the organisation and listing of materials was more soundly based on modern archival principles which will increase their value to students by the production of more efficient finding aids.

With the still increasing roles of quantitative studies and the computer in the School's research the Programming Section continued to provide an indispensable support for the School's research.

There was a marked increase in the number of people interested in using the computer. To encourage the spread of computer skills, a course called 'Introduction to the Use of Computers' was held during the year. It resulted in an increase in use of standard programs and packages, and in better communication between the users and the Programming Section. Demand upon the Section for program writing remained steady but use of the Section for consultation about problems increased.

There was a large increase in use of the computer out of hours, the main reasons being the urgency of jobs, the number of large tape jobs, and the number of large jobs which would be more efficiently run out of hours.

As foreshadowed last year, the *Department of History* decided to discontinue the study of modern Indian history after the two members of staff concerned in this field had left to take positions elsewhere. Appointments in modern British political history and in 'imperial' history were made to strengthen two of the three main branches of the Department's work. It is expected that among other new work some comparative studies of Australian and Canadian history will be thereby encouraged.

Work of the staff continued to be concerned with Australian federal, political and 'labour' history, with administrative relations between Britain and Australia in the nineteenth century and with British social and political history. A new project was a history of the Australian Workers' Union, aided by the microfilmed records deposited in the School's Archives. Visiting fellows worked on the origin and significance of the 'ANZAC' tradition, and on the explorations of Ernest Giles. The research associate, whose responsibilities are divided between the Department and the Australian Academy of Science, identified and secured copies of materials relating to the history of science during a period in Europe as a Humboldt Fellow.

Co-operation and consultation continued as distinctive features of the *Australian Dictionary of Biography*.

All copy for the 560 entries in volume IV (D-J), contributed by 300 voluntary authors, was in the hands of the publishers by June and galley proofs were read by December; publication is expected before June 1972. This will complete half of the second chronological section for 1851-1890. Editing of the 570 entries for volume V (K-P) is well under way.

The Editorial Board met in June to draw up criteria for entries in the six volumes for section 3, 1891-1939. Representatives from all the Australian universities and observers from State working parties attended the National Committee meeting in Canberra in October to discuss the problems of the section and its editors.

The Biographical Register has steadily expanded. Indexing of biographical material in the *Australasian* for 1863-1910 was completed and similar selective indexing of newspapers, periodicals, government gazettes, parliamentary papers and Colonial Office records is in progress. The growing number of subject indexes and reference material helps to meet increasing inquiries from both inside and outside the University.

Two further volumes in the parliamentary series have been completed. These comprise short biographical entries on members of both Houses for Queensland (1860-1929) and Victoria (1856-1900). Publication is expected in 1972.

Professor D. H. Pike, F.A.H.A., received the 1971 Britannica Australasia Award, Humanities Section.

The *History of Ideas Unit* continued its concern with the development of ideas about man and society, primarily in the eighteenth, nineteenth and twentieth centuries. Staff research concentrated on Marx, Marxism and its impact on philosophy, jurisprudence, modern theories of society and religion, on theories of revolution and revolutionary ideologies and on the ethical and political stance of radical Christian thinkers and movements. Research students in the Unit worked on the concept of taste, 1750-1820; on the notion of recurrence in western historical thought; on the relation between Marxist aesthetics and socialist realism in the Soviet Union; and on the concept of oriental despotism and its relation to the Marxist discussion of Russia's pre-revolutionary backwardness.

Five books were completed or brought near completion during the year: two related studies of the life and thought of Karl Marx; a book on Marxism and the Theory of Law prepared in collaboration with a member of the Faculty of Law in the School of General Studies; a book on Descartes; and a collection of lectures commemorating the centenary of the Paris Commune. Work on the history of the concept of the Church and on various aspects of revolutionary theology has been published in a number of journals devoted to religious studies.

Two visiting fellows, Dr M. Rubel of the Centre National de la Recherche Scientifique in Paris and Professor K. Katsuda of Kyoto University, each spent three months in the Unit. Dr Rubel worked and lectured on various aspects of Marxism and the Paris Commune and Professor Katsuda made use of the Russian pamphlet collection in the National Library in connection with a forthcoming study of the social and political attitudes of the Russian intelligentsia.

The *Department of Law* continued its considerable emphasis on public law problems, particularly in constitutional and international law. In the international field work progressed on a digest of Australian contributions to international law doctrines and practice, and in the constitutional field there were important studies on Australian federal relations, and on the development of constitutional government in Papua-New Guinea. The private law side was represented by some original analysis of legal personality concepts, especially in relation to group activities, and by work on New Guinea land law which also had implications for public law and legal theory. A newly-appointed senior fellow, Dr G. E. Parker, opened up studies in criminology.

To a larger degree than usual, the work of the *Department of Philosophy* emphasised social, moral and political philosophy; but work also continued in logic, the history of philosophy, and methodology.

In logic, the appointment of a new Senior Fellow permitted new work at a more formalised level, both in the logic of significance and in deontic logic. A large scale book was brought near to completion on the first of these topics. Work

also continued in the philosophical implications of model and standard logics, with special reference to the role of negation. The Department hopes to strengthen work in this area in 1972.

Work in the history of philosophy continues to be concentrated mainly on the seventeenth century. A book-length study on the ethics of conversation, or, more generally, of relationships between man and nature, is seeking out the roots of contemporary controversies in the traditions of western thought, although its main concern is with problems in moral and social philosophy.

In areas more immediately related to social theory, a major methodological study was completed on conceptual problems in sociology. Other work included investigations of the idea of toleration. Problems about belief and the extent to which men are free to believe have taken a central place in the year's discussions. Work also continues on the applicability of physical theory, or physics-type theories, to the analysis of human action.

On the side of ethics, a monograph was substantially completed on the idea of character-formation in moral education, work continued on a book on freedom and autonomy, and a thesis was completed on the idea of objectivity in moral philosophy.

The Department arranged a series of seminars on the idea of rationality in the social sciences and it is hoped to convert these, together with additional papers, into a book.

The *Department of Political Science* lost three academic staff members—Dr D. A. Aitkin to the foundation Chair of Politics at Macquarie University, and two other non-tenured members to posts overseas. All vacancies had been readvertised by the end of the year.

Processing of data from the Australian Survey Project (outlined in the 1970 Report) continued through most of the year, the main report of which will be a book on stability and change in Australian politics. The project is being extended by more intensive interviewing of 'politically interested' people to elicit attitudes to current political institutions. Data from the 'second wave' of the main survey are assisting research on the politics of trade union members, and Australian Survey Project materials brought an American scholar briefly to the Department to further an international study of criteria for voters' political choices. Survey data were also assembled for research on the roles of Australian parliamentarians. Work continued in political history, partly by documentary research on Australian political ideas on the rise of political parties in New South Wales and Tasmania, and partly by the quantitative elucidation of group voting in the Federation Conventions of the eighteen-nineties.

Research in Soviet politics concentrated on new material available on the congresses of the Union and constituent Republic Communist Parties. In addition, a review of work on totalitarianism and change in communist countries was completed, together with further chapters of a book on the Soviet Government under Lenin.

Studies of European integration emerged in articles criticising the application of functional theory and input-output analysis to this subject, and on 'French Policy and Europe of the Ten'. Work continued on a book on the politics of the

European Economic Community, and on Australia and the nuclear balance. The concept of 'radical uncertainty', arising from some of the Department's theoretical work on world politics, is being applied to a new project on the conditions for structural change in the parliamentary party system.

Studies of political change in Papua New Guinea included completed papers on administrative development and prospects for the emergent independent state, and quantitative methods are being applied to an analysis of group voting in the first House of Assembly.

Staff research of the *Department of Sociology* covered three general areas: social differentiation and stratification, organisations and systems analysis, and an educational study of the interrelationships of 'The Home, the School, and Educational Achievement'. In connection with this last project, the author, Mr J. P. Keeves, was on leave of absence in Stockholm in the latter part of the year to collaborate on research conducted by the International Association for the Evaluation of Educational Achievement. Later in the year Mr Keeves was appointed Vice-Director of the Australian Council for Educational Research. A significant thesis highly commended by examiners, dealt with 'The Large Family in Sydney, 1968-69: a Study of Living Conditions and Social Policy'.

In numerical terms the Department was below strength in 1971, and some difficulties were still experienced in filling vacant posts, but steps taken towards the end of the year suggested the likelihood of new appointees to work with Professor L. Broom and Dr F. L. Jones in a major study of social stratification and the Australian value system, to begin in mid-1972.

In the *Department of Statistics* work continued on mathematical statistics and probability theory. The main new development was due to Professor E. J. Hannan, F.A.A., and his group who worked on stationary time series especially on spectral analysis, estimation of regression with time series, auto-correlation, and non linear problems. Work also continued on point processes and their application, geometric probability, theory of inference, and on estimation and assortative mating in genetic populations. Professor Hannan gave a course of lectures on time series in econometrics and five members of the Department read papers at overseas conferences. Consulting was done for other departments.

The *Urban Research Unit* worked on studies of the economic, social and administrative aspects of the processes of urban development in Sydney and Melbourne. During the year four monographs were published containing some of the results of the Sydney surveys and the first of the Melbourne monographs was completed for publication. A book on *The Cost of Collisions* was published in November.

The Unit's second thesis, on the role of the state housing authorities, was accepted for the award of the degree of Doctor of Philosophy and is to be published. Scholars were working on theses dealing with local services in Sydney, the politics of local government and planning ideas for cities in Australia. The papers presented at the Urbanisation Seminar for 1971 on 'The Politics of Urban Growth' are to be published as a book.

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¶¶¶ Member of the Department of Economic History, Institute of Advanced Studies.

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*Education
 Research Unit*

History

† Visiting Research Worker.

‡ Not a member of this University.

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THESES

Thesis titles of work successfully submitted by research students in the Research School of Social Sciences on whom degrees were conferred in 1971:

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- HUGHES, A. H.
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THE RESEARCH SCHOOL OF PACIFIC STUDIES

REPORT OF THE DIRECTOR

Professor O. H. K. Spate, F.A.H.A.

Apart from the continuation of the School's existing activities the year was perhaps unusually active on the conference and seminar front, and there were a number of new developments and changes of emphases in departmental work, which are briefly referred to below. With the arrival in Canberra of Professor R. G. Ward to take up the Chair of Human Geography, all departments had substantive heads at the end of the year. The gain of Professor Ward, however, carries with it the loss of his wife, Dr Marion W. Ward, who as Field Director had very ably headed the New Guinea Research Unit. Tribute is due to the really devoted work of Dr G. J. R. Linge in an unusually protracted term as Acting Head of the Department of Human Geography. Dr D. J. Mulvaney was lost to the School but, as Professor of Prehistory in the School of General Studies, not to the University. Recruitment was well maintained, and at 31 December 84% of established academic posts and nearly all other posts were filled; this excludes visiting academics.

The new hemihexagon and the laboratory block were completed and occupied during the year. The Department of Biogeography and Geomorphology and the Department of Prehistory have settled into the impressive new laboratories, and the problems of location-finding in the three hexagons proved rather less confusing than had been expected.

The Department of Anthropology and Sociology played a major role in the preparation of the volume *The Politics of Dependence: Papua New Guinea 1968*, dealing with the 1968 general election in Papua New Guinea and edited by Professor A. L. Epstein, Dr Marie O. Reay, and Professor R. S. Parker of the Research School of Social Sciences. The Department of Biogeography and Geomorphology has greatly extended our knowledge of the vegetation history of Australia and New Guinea, and both in geomorphology and biogeography is paying increased attention to the dynamics of change; this Department and to some extent the Department of Prehistory (with which its links are close) represent an element of natural science in a dominant social science school, and play a valuable role in keeping environmental conditions before us. In the Department of Economics the year was notable for an extension of its work to India; the Department is also contributing to the organisation of the new course, designed especially for Asian students, for a degree of Master in Agricultural Economics. Previous Annual Reports have stressed the desire of the Department of Far Eastern History to achieve a better balance between classical and modern, Chinese and Japanese, and it is gratifying to note that considerable progress has been made. The Department of Human Geography is paying increasing attention to South-East Asia, especially Thailand. The Department of International Relations is perhaps the department most active in 'affairs', and besides its important work for scholarly publications has contributed significantly, with the Strategic and Defence Studies Centre, to encourage informed public discussion of foreign

affairs. Much new light has been thrown on the ancient peopling of New Guinea and adjacent Melanesia by the systematic campaigns of the Department of Linguistics. The Department of Pacific History is strengthening its work in South-East Asia as well as in the Pacific proper, and the Department of Prehistory has been very active in tracing, amongst other things, the lines of settlement and trade in western Melanesia. Finally, the New Guinea Research Unit continued its researches into current economic, political, and social problems of the island: its work has a strong empirical and indeed applied bias, and it is not too much to say that, along with the University of Papua and New Guinea, it has contributed a good deal to the very notable increase in sophisticated discourse of such topics by expatriates and Niuginians alike. The Contemporary China Centre, which groups interested people from all parts of this University, was set up in 1970 and is now getting into its stride. All these departmental activities have been very fruitful but, as we shall see, the year has been even more notable for the very wide involvement of the School in external activities. Full details will be found in the individual reports of the Departments.

It is a matter of regret that the proposals for greater student participation, outlined in the Annual Reports for 1969 and 1970, have not yet been put into effect, owing to the law's delays. Implementation is, however, expected early in 1972, and in the Director's opinion this should contribute to more efficient working, especially on the Faculty Board; the lack of a direct and fairly formal channel of communication has been seriously felt. As for student training, there were seventy-two students enrolled for the degree of Doctor of Philosophy at the beginning of the year and seventy-five at the end of it; twenty-three degrees of Doctor of Philosophy were awarded or recommended during the year.

The number of major publications showed some decline as against 1970, but this is more apparent than real since several important works, both by individuals and collectives, are in an advanced stage and should appear in 1972. Among the commercially published works may be noted *Place and People: An Ecology of a New Guinean Community* (W. C. Clarke), *The Theory of Protection* (W. M. Corden), *The Changing Map of Asia* (W. G. East, O. H. K. Spate and C. A. Fisher (eds)), *The Politics of Dependence: Papua New Guinea 1968* (A. L. Epstein, R. S. Parker, Marie O. Reay (eds)), *Super Powers and World Order* (C. Holbraad (ed)), *Karst* (J. N. Jennings), *Aboriginal Man and Environment in Australia* (D. J. Mulvaney and J. Golson (eds)), *Papal Envoys to the Great Khans* (I. de Rachewiltz), *The Rope of Moka* (A. J. Strathern).

Conference activity began with the very notable 28th International Congress of Orientalists held in Canberra in January. The Department of Far Eastern History naturally played a prominent role, with Professor Wang Gungwu organising the China and Korea section; but School participation was wider: the Director was a Vice-President, Director of Seminars, and Convenor of the Seminar on 'The Traditional City and Modern Technology', while Dr R. T. Shand in the Department of Economics organised that on 'The Impact of New Techniques in Agriculture'. In association with the 28th International Congress of Orientalists, the Department of Prehistory organised the eighth Far Eastern Prehistory Congress. The School as a school had no formal connection with the Pacific Science Congress, also held in Canberra, but Dr Norma R. Macarthur in the Department of Prehistory played a very large part in running the section on

human activities, while Dr J. D. Freeman and Dr Marie O. Reay, Department of Anthropology and Sociology, Dr A. J. S. Reid, Department of Pacific History, and Professor D. Walker, Department of Biogeography and Geomorphology, also took part. The New Guinea Research Unit as usual played a large part in the organisation of the fifth Waigani Seminar, on 'Change and Development in Rural Melanesia'.

It would be impossible to list all the internal and quasi-internal seminar activities of the School, but some of the more important may be mentioned. The Department of Biogeography and Geomorphology, with the Department of Prehistory and the CSIRO, ran an interdisciplinary symposium on 'Torres Strait: Bridge or Barrier'; the proceedings when published will form an important reassessment of a key area in biogeographical and cultural distributions. The Department of Far Eastern History took advantage of the presence of a distinguished modern Chinese scholar, Dr J. Ch'en, to run a seminar on 'Nationalism and Cultural Change in Republican China'; the Department of Human Geography, in co-operation with the Department of Geography, School of General Studies, held a contemporary Thailand seminar which attracted a surprisingly large number of participants. In the Department of International Relations, the main seminar was on the ideas of leading world statesmen from the Cold War to date, and in the Strategic and Defence Studies Centre 'The Changing Pattern of Strategic Interests in the South Pacific' directed attention to an area much neglected in strategic thinking.

Members of the School were perhaps in more than usual demand as outside lecturers, whether to other parts of this University (including the Centre for Continuing Education), other universities at home and abroad, or various societies and agencies. Amongst these may be cited the Morrison Oration 'Prester John and Europe's Discovery of East Asia' by Dr I. de Rachewiltz; Dr J. D. Freeman's address on 'Biology, "Race" and Human Values' to the UN Symposium against Racial Discrimination and Racism; Professor J. Golson's Rivett Memorial Lecture 'The Remarkable History of Indo-Pacific Man'; Professor Spate's Memorial Lecture on aspects of Griffith Taylor's life and work. Emeritus Professor W. E. H. Stanner delivered the address at the Conferring of Degrees Ceremony on 1 April. A good deal of interest was also aroused by two lectures on the Bangla Desh crisis given by Professor Spate and Dr Millar under the auspices of the Australian Institute of International Affairs.

Demand is also increasing for the advisory services of members of the School. Once more, a full list of such services, and of services to national and international academic agencies, would be impossibly long, but a few instances may be given. Emeritus Professor Stanner in the Department of Anthropology and Sociology, is a member of the Commonwealth Council for Aboriginal Affairs, and Dr Freeman is a member of the West German Research Unit in Human Ethology, a branch of the Max-Planck-Institut für Verhaltensphysiologie. Professor H. W. Arndt visited Bangkok twice as Australian representative on Governing Council of the UN Asian Institute, and other members of the Department of Economics have been advisors in Fiji, New Guinea, Iran and Ceylon. In the Department of International Relations, Dr Millar is Director of the Australian Institute of International Affairs, and Mr D. C. S. Sissons has been appointed specialist advisor on Japan to the new Senate Committee on Foreign Affairs and Defence.

Professor S. A. Wurm is a member of the Council and the Executive Council of the Australian Institute of Aboriginal Affairs, and has been appointed to the Executive Committee of the international project for the Description of the Languages of the World. Professor J. W. Davidson has attended discussions between a USA Government delegation and the Joint Committee on Future Political Status set up by the Congress of Melanesia, as a consultant for the latter body.

Mention may be made of two academic honours conferred on School members—the ANZAAS Mueller Medal to Emeritus Professor W. E. H. Stanner, and the Royal Geographical Society's Victoria Medal to Professor O. H. K. Spate.

The roll of visitors is ever-lengthening, and at the risk of being invidious it is necessary to be selective. Distinguished visitors from without the academic world include His Imperial Highness Prince Takahito Mikasa and the Japanese Ambassador, His Excellency Mr Shizuo Saito, the High Commissioner for Fiji, His Excellency Mr R. N. Nair, M.V.O., and the High Commissioner for Singapore, His Excellency Mr A. P. Rajah. Medium or long-term academic visitors include Professor H. W. Scheffler, Yale University (Department of Anthropology and Sociology); Dr P. J. Grubb, University of Cambridge (Department of Biogeography and Geomorphology); Dr Mubyarto, Gadjah Mada University, Dr V. A. Arkhipov, Moscow State University, Professor B. Glassburner, University of California (Davis), Professor B. Fritsch, Swiss Federal Institute of Technology, Dr M. L. Parker, Port Moresby (Department of Economics); Dr J. Ch'en, York University, Canada, Professor Joyce Lebra, University of Colorado, Mr J. Banno, Chiba University (Department of Far Eastern History); Professor C. Duncan, University of Waikato, Dr R. C. Y. Ng, School of Oriental and African Studies, London (Department of Human Geography); Professor R. G. Neale, University of Queensland, Mr M. Howard, University of Oxford, Professor M. S. Rajan, Jawaharlal Nehru University, Professor Y. Okudaira, University of Tokyo (Department of International Relations); Professor I. Dyen, Yale University, Dr K. Franklin, Summer Institute of Linguistics (Department of Linguistics); Dr P. L. Burns, University of Adelaide, Miss D. Crozier, Victoria University of Wellington, Dr P. France and Dr J. A. Moses, University of Queensland, Dr J. M. R. Owens, Massey University, Professor S. Riesenbergs, Smithsonian Institution (Department of Pacific History); while the Department of Prehistory had the advantage of a visit from Dr J. Pfeiffer, Rutgers University.

The School is grateful for continued financial support from the Ford Foundation, Bougainville Copper Proprietary and the Reserve Bank of Australia-Rural Credits Fund, and also to the Wenner-Gren Foundation. As some of the preceding paragraphs suggest, contacts continue to increase with such bodies as the CSIRO, the Bureau of Census and Statistics, the Bureau of Agricultural Economics, the Australian Institute of International Affairs, the Australian Institute of Aboriginal Studies, and Commonwealth Government departments, including Foreign Affairs, especially in connection with its cadet training program. Co-operation with the School of General Studies and the Centre for Continuing Education is increasing.

It is a pleasure to repeat my thanks to the Graduate Assistant, Mr G. L. Hutchens, the Business Manager, Mr P. J. Grimshaw, and their staff. Research assistants, typists, secretaries (especially departmental secretaries), cartographers,

cleaners, technicians, and indeed all the ancillaries without whom the academics would be helpless—all have contributed to make the School a remarkably smooth-running and cheerful place to work in.

This is the last Annual Report which I shall write as Director, and I trust I may be pardoned a few personal reflections. On the whole, I have enjoyed the job much more than I had expected. In one sense, it was no easy challenge to succeed so distinguished an administrator as Emeritus Professor Sir John Crawford; on the other hand, the morale and efficiency he had built up made my task so much the easier. While I cannot lay claim to his charisma, I feel that my administration has at least not been discreditable, and that the School has been and is in very good heart. In writing this present report, for instance, I have myself been greatly heartened by the very many evidences—far too many for citation or even summary here—of the impact which the School has, nationally and in many fields internationally, and I have been proud to think that I have been at the head of such an admirable company. Naturally, as in any large organisation, we have had strains and stresses, frictions and inefficiencies; but all things considered they have been remarkably few. There has been a fine spirit of concord—even under the strain of budget revisions and scholarship allocations!—and no man can have had a better team of colleagues. It is in no conventional sense that I say that, if I have had any success as Director, it has been due to this general spirit of comradeship in a joint effort, and to all—academics, students and supporting staff—I tender my most sincere thanks and my warmest good wishes for the future.

The *Department of Anthropology and Sociology* has continued to pursue its program of research on the societies and cultures of Aboriginal Australia, the Pacific region and South-East Asia. Although few new field studies were initiated during the year, it has been on the whole an unusually productive period in terms of publications and theses completed and submitted. A study, edited by Professor A. L. Epstein and Dr Marie O. Reay, together with Professor R. S. L. Parker of the Department of Political Science, Research School of Social Sciences of contemporary politics in Papua New Guinea, based on the 1968 elections for the House of Assembly, was published by the Australian National University Press. Dr A. J. Strathern has brought out two volumes reporting on his earlier researches in the Mount Hagen area of New Guinea, and has also published a work written jointly with his wife, *Self-decoration in Mount Hagen*. Theses submitted cover such topics as group structure, marriage and killing in a remote part of the New Guinea Highlands, the Hahalis Welfare Society on Buka Island, and studies of economic development at village level in Fiji and North India.

*Research
Activities*

The long-anticipated move by the *Department of Biogeography and Geomorphology* to the new laboratory wing of the H. C. Coombs Building which took place in June brought substantial relief from overcrowding of people and equipment and will increasingly enable the Department to carry out its work efficiently. The associated move of the Department of Prehistory brought into physical proximity the group in the Research School with which academic contact has long been strongest.

With the appointment of Dr N. M. Wace to a senior fellowship and Dr J. M. Bowler to a fellowship, the permanent academic staff rose to full strength.

In the field of Quaternary research, studies of the landforms and former climates of Australia took a significant shift by the beginnings of the extension of work on lake and lunette stratigraphy in Western Australia and the completion of the reconnaissance of the New South Wales coast for the investigation of land and sea level changes. These and other aspects of the Department's work will be greatly facilitated by the new deep boring rig, approval for the purchase of which was given at the end of the year. On the Atherton Tableland in North Queensland an already highly significant record of the vegetation history of the last 10,000 years has been extended well beyond three times that length by the pollen analysis of a remarkable deposit at Lynch's Crater. The established lines of geomorphological and vegetational history work continue in New Guinea.

Studies of geomorphic processes active at the present day have been strengthened by some small departures in coastal situations which it is expected will develop further in future years. The description of extant vegetation and the development of descriptive methods is being replaced, as a major concern of the department, by studies of the dynamics of plant groups in New Guinea and Australia. In particular, a major project has been launched to document and explain the degree of stability of native plant communities in the face of alien immigrants and the manner in which such aliens may become incorporated into balanced ecosystems.

In December the Department organised a three-day symposium on the geography and history of Torres Strait and its significance for plant, animal and human migration. About ninety people participated by invitation and the results, to be published next year, completely change the position of Torres Strait in world biogeographical reconstructions.

The main areas of research in the *Department of Economics* have continued to be Indonesia, Papua New Guinea and the relations between trade and development, but China and the Pacific islands have attracted increasing attention, and in 1971 also India. Among the more important publications were Part I of the report by Dr B. A. Lockwood and Dr R. T. Shand on their joint study with the Indian Planning Commission of the high-yielding varieties program and Dr W. M. Corden's major work on the theory of protection which occupied him for much of his time in the Department. The proceedings of a successful seminar on the impact of new techniques in agriculture which was held as part of the 28th International Congress of Orientalists will be published next year. The Department also organised two one-day seminars on aspects of the economy of Papua New Guinea and especially the impact of the Bougainville copper project; two of the papers have been published as a Departmental paper. Finally, mention should be made of the preparations for the one-year course for the degree of Master in Agricultural Development Economics to be given for the first time in 1972.

The *Department of Far Eastern History* has now achieved a more balanced interest in modern as compared with early Chinese history. Modern Japanese history has also been strengthened by the visit of two visiting fellows during the year. The range of research subjects is still very wide, and the Department's strength still lies principally in political history and some aspects of social and cultural history. As a test of our interest in modern China, the Department succeeded in organising a six-week seminar series on modern Chinese political

history with mainly Australian National University resources. This was given a special focus by the presence of Professor J. Ch'en, visiting fellow in the Department in August and September. Eleven scholarly papers were produced around the theme of 'Nationalism and Cultural Change in Republican China'. The Department received a great deal of help and co-operation from various parts of the School of General Studies as well as the Institute of Advanced Studies and was impressed by the wide interest in the subject. It was felt that the success of this seminar has justified the Department's recent efforts to pay more attention to modern history. The Department remains convinced that the continuities in Chinese history are particularly significant and hopes to emphasise such continuities a great deal more in the next few years.

The Department produced two issues of *Papers on Far Eastern History* and also its fourth volume in the Monograph Series. In addition to the special seminar on Chinese nationalism, it organised work-in-progress seminars throughout the year. Again throughout the year, both in research and teaching, the Department has enjoyed the fullest co-operation with the Faculty of Asian Studies and several other departments in the School of General Studies and the Institute.

The *Department of Human Geography* continued theoretical and empirical research in Australia, the Pacific and South-East Asia. Studies centred around the principal theme of the spatial reorganisation of human activities in both developed and developing areas. In Australia staff and research scholars continued investigations into the location of manufacturing, mineral processing and retailing activities; in South-East Asia a study of transport in Thailand was completed and work on rural development in Malaya continued; migration, transport costs and the efficiency of agricultural systems, were among the topics under investigation in New Guinea, Fiji and Tonga.

During the year the Department joined with the Department of Geography, School of General Studies, in organising a seminar on 'Contemporary Thailand' in which eighteen papers were presented on economic development, agricultural prospects and the problems arising from ethnic diversity. The seminar attracted participants from other universities, the CSIRO and several government departments. The proceedings will be published.

Professor R. G. Ward took up the Chair of Human Geography on 1 December 1971, Dr G. J. R. Linge, Professorial Fellow, having been Acting Head until that date. Mr R. Ho, a senior fellow, was deeply involved in the Thailand seminar and Dr P. J. Rimmer, a senior fellow, completed a report on 'Transport in Thailand' before proceeding to England on study leave. Dr W. C. Clarke was appointed senior research fellow and continued his work in New Guinea and Dr Diana Howlett took up an appointment as research fellow. Professor C. Duncan, University of Waikato, spent six months in the Department as a visiting fellow and the Department also benefited from a shorter visit by Dr R. C. Y. Ng, School of Oriental and African Studies, London. Ten doctoral students were in residence for part or all of the year. Three theses for the degree of Doctor of Philosophy were successfully submitted for examination and another was completed and is being examined. The cartographic office of the Department continued to provide a service not only to the Department but also to members of the Research Schools of Pacific Studies and Social Sciences, and the Australian National University Press.

The work of the *Department of International Relations* in general world politics, Asian international politics, and Australian foreign and defence policy, was continued in 1971. Some twenty students were engaged on work on theses for the degree of Doctor of Philosophy on a wide range of topics. One former student received the degree of Doctor of Philosophy.

The staff was strengthened by the arrival of Mr W. A. C. Adie, formerly of St. Antony's College, Oxford, and Mr G. Warner, formerly Reader in Politics at the University of Reading. Professor H. N. Bull and Mr J. L. S. Girling returned from study leave.

The Department tries to fulfil three purposes. These are the cultivation of sound research, the encouragement of informed discussion of international relations, and the provision of graduates who may apply for staff positions at Australian universities.

In 1971 the first of these was pursued through work which will, in the main, reach fruition in 1972. Professor J. D. B. Miller's major work on changes in the Commonwealth of Nations in the nineteen-fifties and nineteen-sixties should then be completed, as should Professor Bull's study of the conditions of world order. Two books prepared by Dr T. B. Millar will be published, together with two by Mr J. T. G. Jukes, and one by Sir Alan Watt, C.B.E. Other work will appear as articles and monographs.

The second purpose has been pursued through numerous lectures and papers by members of the staff to public conferences, seminars, courses at staff colleges, meetings of the Australian Institute of International Affairs, and submissions to parliamentary committees. Mr D. C. S. Sissons was appointed specialist adviser on Japan to the newly created Senate Standing Committee on Foreign Affairs and Defence. The Department's close connections with the Strategic and Defence Studies Centre and the Australian Institute of International Affairs have continued.

The third purpose was strengthened by the appointment of two more of the Department's graduates to teaching posts in the field of international politics. Although exact enumeration is difficult, it appears that between 30% and 40% of such posts in Australia are filled by former members of the Department.

Visitors to the Department for some length of time in 1971 included Mr M. Howard, All Souls College, Oxford; Professor M. Margaret Ball, Duke University; Professor M. S. Rajan, the University's Asian Fellow; and Professor Y. Okudaira, University of Tokyo. Others who gave occasional seminars included Professor J. B. Duroselle, University of Paris; Professor C. H. Grattan, University of Texas; and Dr B. Gordon, Research Analysis Corporation, Washington.

During the year the Department gave close attention to its procedures in regard to students. In particular, an attempt was made to reduce delay in settling thesis topics, to ensure that supervision was direct and consistent, and to emphasise the major points of importance in the construction of a satisfactory thesis. Arrangements were also made for less formal work in progress seminars, and for a higher degree of staff/student consultation.

In the *Department of Linguistics* one student submitted a thesis for the degree of Doctor of Philosophy. This student and a second student who had submitted late in 1970, were awarded the degree of Doctor of Philosophy in 1971.

The year proved to be particularly successful with regard to the achievement of spectacular results in the two long-term projects carried out by the Department with regard to the language situation, language classification and the question of linguistic prehistory in the New Guinea area, and the South-Western Pacific. In the former area, work carried out by Dr C. L. Voorhoeve, Dr T. E. Dutton and Professor S. A. Wurm demonstrated that a large group of interrelated languages which contains 380 languages and covers approximately three quarters of the New Guinea mainland does not consist of a number of loosely connected groups, but in fact constitutes a single large group whose language members are comparatively closely related to each other. Work by Dr D. C. Laycock showed that about 130 languages which do not belong to this large group and are located predominately in the Sepik District of Papua New Guinea together form a second large group of interrelated languages. This area was until Dr Laycock's latest work in it, believed to be occupied by a large number of unrelated or only very distantly related separate language groups. These two major findings have had a very significant influence upon our understanding of linguistic prehistory of the New Guinea area and of the migrations into and inside the New Guinea area during the last 10,000 years or so. It now seems possible to give a fairly detailed picture of the possible trends and directions of these migrations.

In the second project, concerned with the languages of the South-Western Pacific. Dr D. T. Tryon's work has produced results of very great importance in demonstrating that all the languages of the New Hebrides which had been believed to be in many ways, quite different from each other, and used to be little known, were in fact members of a single large language family and quite similar to each other. The impact of this discovery upon our notions of migrations of man into the South-Western Pacific during the last 5,000 years or so is very great, and will have a radical effect on our understanding of these problems in the future. Unfortunately, our work in this field will come to an abrupt end early in 1972 because of the resignation of Dr Tryon, a research fellow in the Department, who has been offered a senior lectureship in the James Cook University of North Queensland.

The Department's work in Australian linguistics and linguistics of South-East Asia has been continuing with further good results.

The publication activity of the Department has continued strongly and nine important monographs, occasional papers and books have been published.

In the *New Guinea Research Unit* research continued in the fields of rural resettlement, urbanisation, economic growth (socio-economic change and leadership, nucleus estates, transport), motivation or rural cash croppers, local courts as a means of dispute settlement, political change and co-operatives.

The fifth Waigani Seminar on the theme 'Change and Development in Rural Melanesia' was held in May and was organised jointly by the New Guinea Research Unit, the University of Papua and New Guinea, the Administrative College and the Council on New Guinea Affairs. The collected papers from this conference are expected to be published in 1972.

Financial assistance was received during the year from the Reserve Bank of Australia, and the Australian-American Educational Foundation.

Five issues of the *New Guinea Research Bulletin* were published during the year and several more are in the final stages of preparation. Four issues of *Luksave* were published.

The *Department of Pacific History* maintained the broad program of research in the history and politics of the Pacific Islands and South-East Asia upon which its members have been engaged for some years. One research fellow, Dr P. R. Corris, joined the Department, and six visiting fellows spent varying periods with it, during the year. The number of research students dropped to about half that for 1970: five former students received the degree of Doctor of Philosophy, two more completed their theses and were under examination at the end of the year, and—because of the current financial stringency—only limited new recruitment has been possible.

Members of the Department lectured at a number of other universities in Australia, New Zealand and Fiji and in the School of General Studies. Dr A. J. S. Reid read a paper at the 28th International Congress of Orientalists and Mr R. A. Langdon one at the UNESCO Seminar on source materials relating to the Pacific area. Professor J. W. Davidson continued to act as a consultant to the Congress of Micronesia.

The third volume in the Pacific History Series, *The Trading Voyages of Andrew Cheyne, 1841-1844*, edited by Dr Dorothy L. Shineberg, appeared during the year, as did volume VI of *The Journal of Pacific History*. The Pacific Manuscripts Bureau, which is supported jointly by the University and a group of Research libraries, continued to collect and microfilm records relating to the history of the area. During the year over a hundred reels of material filmed in New England repositories by Dr J. S. Cumpston were distributed.

For the *Department of Prehistory* the year has been marked by the appearance of a review volume on Australian prehistoric and allied studies, *Aboriginal Man and Environment in Australia* (D. J. Mulvaney and J. Golson (eds)), based on a series of seminars organised by the Department at the end of 1968; by the initiation of the departmental monograph series *Terra Australis* recording the research results of staff and scholars of the Department and beginning with Mr R. J. Lampert's record of his archaeological investigations on the New South Wales south coast, *Burrill Lake and Currarong: Coastal Sites in Southern New South Wales*. The Department was host to an important international conference in January—the eighth Congress of the Far-Eastern Prehistory Association held as a section of the 28th International Congress of Orientalists and attended by archaeological scholars from India, most South-East Asian countries, Japan and Korea, as well as from Europe, North America and New Zealand. The Department also organised a post-congress tour, financed with a grant from the Australian Institute of Aboriginal Studies, of archaeological sites and institutions in south-eastern Australia, in the course of which the reconstitution and further development of the Far-Eastern Prehistory Association as the organisation of archaeologists of the Indo-Pacific region were discussed.

Research continued on Departmental projects in New Guinea and the South-West Pacific, where the history and interconnections of pottery using communities on the Papuan coast and adjacent islands were under particular investigation. It appears likely that the settlement in coastal New Guinea of some of these

communities is an episode in the colonisation of the Pacific Islands at large by incoming, sea-going groups speaking Austronesian languages. Trace element analysis of obsidian tools associated with pottery on sites in this area shows that obsidian from New Britain found its way to islands off the east coast of New Ireland, a distance of 350 miles, and to the Santa Cruz group 1,200 miles to the south-east (material from Santa Cruz was provided by Dr R. C. Green, Auckland Institute and Museum).

In the Australian field the major emphasis was on the history of the Aborigines of south-eastern Australia and Tasmania. Previous work in this field, in Tasmania, western New South Wales and the Southern Tablelands, was extended in two directions. Mr R. J. Lampert undertook a coastal reconnaissance of western Victoria and south-eastern South Australia, paying particular attention to Kangaroo Island, which, although uninhabited at European discovery, had maintained human populations in prehistory. Mr A. G. Thorne joined the Department from the University of Sydney and continued work on important skeletal evidence from the Riverina testifying to the presence of two apparently distinct physical types in late Pleistocene Australia, one 'modern', the other with cranial characteristics reminiscent of the early Javanese fossils.

The *Strategic and Defence Studies Centre* has concentrated on four major forms of activity in 1971—a series of fourteen seminars on the theme 'The Changing Pattern of Strategic Interests in the South Pacific'; a series of six seminars on the theme 'The Development of Strategic Thinking Since 1950'; the production of *Canberra Papers on Strategy and Defence*, numbers X, XI and XII; continued maintenance and expansion of the collection of reference materials.

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¶ Member of the Department of Economics, Research School of Pacific Studies.

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‡ Not a member of this University.

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 'Radiocarbon dating of arid-zone calcareous Paleosols.' *Bull. geol. Soc. Am.*, LXXXII, xi, 3069-85.

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McGAURR, D.

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*Strategic
and Defence
Studies
Centre*

THESES

Thesis titles of work successfully submitted by research students in the Research School of Pacific Studies on whom degrees were conferred in 1971:

ANTHONY, J. M.

'Urban politics in Malaysia: A study of Kuala Lumpur.' *Department of Pacific History.*

*Doctor of
Philosophy*

BARNARD, ROSEMARY E.

'Organisation of production in a Kedah rice-farming village.' *Department of Human Geography.*

BHATI, U. N.

'Economic determinants of income on irrigated paddy farms in Tanjong Kerang, West Malaysia.' *Department of Economics.*

BLACK, I. D.

'Native administration by the British North Borneo Chartered Company, 1878-1915.' *Department of Pacific History.*

BOWLER, J. M.

'Late Quaternary environments: A study of lakes and associated sediments in south eastern Australia.' *Department of Biogeography and Geomorphology.*

CHUA, C. W. M.

'An inter-industry study of the Singapore economy 1967.' *Department of Economics.*

DIKSHIT, R. D.

'The political geography of Federalism: An enquiry into origins and stability.' *Department of Human Geography.*

IKEMA, M.

'Import dependence in the Australian economy.' *Department of Economics.*

ISARANGKUN NA-AYUTHAYA, C.

'Manufacturing industries in Thailand.' *Department of Economics.*

JOHNSON, J. K.

'Accessibility, transportation and land development: Complementarity and location rent adjustment in the Northern Territory beef cattle industry.' *Department of Human Geography.*

LANG, R.

'Enga questions: Structural and semantic studies.' *Department of Linguistics.*

LAUER, P. K. P.

'Pottery traditions in the D'Entrecasteaux Islands of Papua.' *Department of Pre-history.*

LEWIS, DIANNE N.

'The Dutch East India Company and the Straits of Malacca, 1700-1784; trade and politics in the eighteenth century.' *Department of Pacific History.*

LI, L.

'The Japanese Army in North China: Problems of political and economic control July 1937 to December 1941.' *Department of Far Eastern History.*

MACDONALD, B. K.

'Policy and practice in an Atoll territory: British rule in the Gilbert and Ellice Islands, 1892-1970.' *Department of Pacific History*.

NIJHAR, K. S.

'Wage structure in the rubber estates in West Malaysia.' *Department of Economics*.

NOY-MEIR, I.

'Component analysis of semi-arid vegetation in Southeastern Australia.' *Department of Biogeography and Geomorphology*.

POWELL, JOCELYN M.

'The impact of man on the vegetation of the Mt. Hagen region, New Guinea.' *Department of Biogeography and Geomorphology*.

REW, A. W.

'Passenger-ship or cargo vessel? The adaptation of indigenous industrial workers to the social life at Port Moresby, a town in Papua-New Guinea.' *Department of Anthropology and Sociology*.

SAWER, M.

'Studies in middle Chinese grammar: The language of the early Yeuluh.' *Department of Far Eastern History*.

SMITH, W. H.

'Intervention in civil strife and international order.' *Department of International Relations*.

STONE, D. J.

'Self-rule in the Cook Islands: The government and politics of a new micro-state.' *Department of Pacific History*.

TAYLOR, A. J.

'Syntax and phonology of Motu (Papua): A transformational approach.' *Department of Linguistics*.

THOMPSON, R. C.

'Australian imperialism and the New Hebrides, 1882-1922.' *Department of Pacific History*.

LOURANDOS, H. J.

'Coast and hinterland—archaeological sites of Eastern Tasmania.' *Department of Prehistory*.

Master of
Arts

THE RESEARCH SCHOOL OF CHEMISTRY

REPORT OF THE DEAN

Professor D. P. Craig, F.A.A., F.R.S.

Growth of the School continued during its fourth year, in research output and in diversity of activity, as well as in numbers. At the end of September there were forty-five staff and thirty-one students.

The policy of encouraging borderline studies by collaborative effort between research workers with different special skills is now showing a clear result in completed and published research work of this kind. This was a principal aim of a non-departmental school structure, the merits of which thus continue to be evident.

During the year Professor R. L. Martin, F.A.A., was appointed to the Chair of Inorganic Chemistry, so completing the professoriate foreseen when the School was established. Professor Martin will take up his appointment in 1972; he is now Professor of Inorganic Chemistry in the University of Melbourne.

Three members of the School were honoured by the award of medals of learned societies. Professor A. J. Birch, F.A.A., F.R.S., was awarded the Purkyne Medal of the Czechoslovak Medical Society, Dr D. A. Buckingham was awarded the Edgeworth David Medal of the Royal Society of New South Wales, and Dr A. J. Parker, jointly with Professor I. G. Ross, was awarded the H. G. Smith Memorial Medal of the Royal Australian Chemical Institute.

*Staff
Activities*

Professor A. J. Birch was a Plenary Lecturer at a Symposium of Terpene Chemistry at the American Chemical Society in Los Angeles, and was invited to lecture to the Chemical Institute of the Polish Academy of Science, to the Institute for Natural Products of the USSR Academy of Science, and to the Indian Institute of Science. Professor D. P. Craig spent four weeks as visiting professor at University College, London. He gave the Seaver Memorial Lecture in the University of Southern California, and was an invited speaker at the Chemical Society of London meeting on photochemistry held in Hamilton, New Zealand. Mr R. Rickards gave a series of lectures at the James Cook University of North Queensland. Dr A. J. Parker gave the H. G. Smith Memorial Lecture in Perth. Dr J. Ferguson was an invited speaker at the Princeton Conference on Exchange Interactions. Dr D. A. Buckingham gave a series of lectures at the California Institute of Technology, and was the National Science Foundation Visiting Professor at the Texas A & M University, College Station, Texas. Dr M. A. Bennett contributed to the twenty-third International Congress of Pure and Applied Chemistry in Boston, USA, and the Gordon Research Conference on Early Transition Metal Chemistry.

There were further moves to improve employment prospects for the degree of Doctor of Philosophy graduates in chemistry, particularly by developing contacts with industry. The Science and Industry Encounter, organised by the Centre for

Continuing Education, took place in the School in June. Members of the School participated in the meeting and in the reciprocal visits to chemically-oriented industries made as a preparation to the Encounter itself.

A notable development in the School was the discovery by Dr A. J. Parker and his colleagues, arising from fundamental knowledge gained by research into chemistry in non-aqueous solvents, of novel and potentially important processes for the extraction and refining of metals, notably copper. Provisional patents have been taken out, and exploitation is planned by the University jointly with an industrial partner.

Lectures and Seminars

The School has again benefited from visits by overseas chemists. Dr W. Hofheinz, Hoffmann-La Roche and Co.; Professor S. Otsuka, Osaka University; Dr J. J. Sims, University of California (Riverside); Dr T. S. Sorenson, University of Calgary and Dr S. H. Walmsley, University College, London, were in the School for varying periods and participated in the work of the School. The courses given by some of the visitors formed a part of a more systematically organised scheme of postgraduate lectures, which together with a range of less formal research seminars and literature groups, form an important part of postgraduate education in the School.

Visitors who gave seminars included Dr E. W. Abel, University of Bristol; Professor J. K. Beattie, University of Illinois (Urbana-Champaign); Professor H. Bloom, University of Tasmania; Professor J. M. Bobbitt, University of Connecticut; Professor R. D. Brown, Monash University; Professor A. R. H. Cole, University of Western Australia; Professor J. Foster, Chester Beatty Research Institute, UK; Professor J. L. Garnett, University of New South Wales; Dr R. D. Gillard, University of Kent at Canterbury; Professor D. Gottlieb, University of Illinois (Urbana-Champaign); Dr J. Grutzner, Purdue University; Dr J. R. Hall, University of Queensland; Professor D. Haneman, University of New South Wales; Professor S. C. Haydon, University of New England; Dr M. Hearne, University of British Columbia; Mr G. Henshilwood, Deputy Commissioner of Patents; Professor M. Huggins, Stanford Research Institute; Professor H. B. Jonassen, Tulane University of Louisiana; Dr D. Koch, CSIRO; Professor A. N. Kost, Moscow State University; Professor F. P. Larkins, Monash University; Dr L. Lindoy, James Cook University of North Queensland; Dr L. N. Mander, University of Adelaide; Dr B. J. Orr, University of New South Wales; Professor G. Porter, University of Kent at Canterbury; Professor C. W. Rees, University of Liverpool; Dr A. J. Ryan, University of Sydney; Professor E. E. Smissman, University of Kansas; Dr M. R. Snow, University of Adelaide; Professor R. H. Stokes, University of New England; Professor T. W. Swaddle, University of Calgary; Mr L. Thompson, Patent Attorney and Mr A. J. R. Yencken, Monash University.

PUBLICATIONS

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** Based on work done prior to joining this University.

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*** Based on work done while a Visiting Research Worker.

* Based on work done while a member of the Department.

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‡ Not a member of this University.

*** Based on work done while a Visiting Research Worker.

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THESES

Thesis titles of work successfully submitted by research students in the Research School of Chemistry on whom degrees were conferred in 1971:

DWYER, M.

*Doctor of
Philosophy*

'Stereochemistry and mechanism in multidentate cobalt (III) complexes.'

HUTCHINSON, E. G.

'New synthetic reactions.'

WILLIAMSON, D. H.

'Reactions of the organic ligand in tricarbonyldieneiron complexes.'

THE RESEARCH SCHOOL OF BIOLOGICAL SCIENCES

REPORT OF THE DIRECTOR

Professor D. G. Catcheside, F.A.A., F.R.S.

In its fifth year, the School consolidated its research activities, but was unable to develop very much. Its main continuing preoccupations and difficulties arise from being in temporary accommodation scattered over the campus and being a continuing embarrassment to other research schools who are its hosts. Unfortunately, the new building will not be finished until late in August 1972 at the earliest. Then we shall have to move the parts of the School one at a time, the workshop first of all, so that its staff will be able to assist in the installation of apparatus. Happily the standard of workmanship in the construction of the building is extremely good.

Professor Emeritus Sir Rutherford Robertson, C.M.G., F.A.A., F.R.S., presently Master of University House, was appointed by Council to succeed on 1 January 1973 as Director. He will bring with him the great experience in scientific administration, now being used to good effect in his position as President of the Australian Academy of Science. He was the first Chairman of the Australian Research Grants Committee and the wide experience and shrewdness there exhibited will be a gain to the conduct of the School. His contributions to science and education were recognised when Her Majesty The Queen conferred on him the honour of Knight Bachelor in the New Year's Honours for 1972. He plans to continue his own research on the biochemistry of the membranes of mitochondria.

Professor B. John, F.I.Biol., was appointed as Professor and first Head of the new Department of Population Biology established by Council in December 1970. He comes from the Chair of Zoology at Southampton University and will probably take up his appointment in August 1972. He is an authority on chromosomal variation in natural populations, with whose evolution he is deeply concerned. He expects to use also developmental, ecological and ethological as well as genetical methods in his studies and to couple them with theoretical and experimental work. It seems likely that there will be useful interactions with the Departments of Environmental Biology and Genetics.

Professor G. A. Horridge, F.R.S., was elected to Fellowship of the Australian Academy of Science. Dr D. J. Anderson was appointed to the Chair of Botany at the University of New South Wales and will leave the School in March 1972.

An important grant from the Rockefeller Foundation has been received to support research in the Department of Genetics on methods for improving the content of amino acids in the protein of cereals. This work is being conducted jointly with the Section of Genetics in the Division of Plant Industry, CSIRO. The part of the work which will be undertaken in the School is concerned with methods of selecting new strains, in the first place using bacteria as model organisms. The purpose of changing amino acid composition, specifically increasing amino acids such as lysine, is to improve the quality of protein in grains.

At the end of the year the academic staff numbered thirty-eight, comprising five professors, one professorial fellow, seven senior fellows, five fellows, fourteen research fellows and six postdoctoral fellows. Fifteen visitors, as visiting fellows (five) or honorary fellows (ten), have worked in the School for one to many months during the year; many others have come for short visits.

The School was fortunate to gain two able young men, Dr G. M. Polya and Dr B. G. Rolfe, as Queen Elizabeth II Fellows, one in each of the Departments of Environmental Biology and Genetics. There were thirty-one research students and three gained the degree of Doctor of Philosophy. It has been decided to concentrate relatively more on postdoctoral work than on research students, though the number of these has grown a little.

Three lines of research previously established in the *Department of Developmental Biology* have been continued. Each studies a developmental situation in which genetic information is utilised by cells. One concerns the development of cellular organelles, particularly the mitochondrion. These organelles are found in cells of all organisms other than bacteria and blue-green algae, but developmental studies are particularly favourable in yeast and other fungi, which can continue to live and grow without fully developed mitochondria, whereas higher organisms cannot.

*Research
Activities*

The second is concerned with the mechanism of hormone action. The systems are those of plants, relating particularly to the induced synthesis of enzymes by hormones in plant cell growth. Work on the relationship between the developmental effects of light on plants and their hormone systems continues. The third system is the unicellular animal *Paramecium*; an electron microscopic study of its cell and nuclear division has been completed.

Scanning electron microscopy has been used very successfully in the work on eucalyptus species. These may be identified and a number of difficult problems solved by a combination of techniques for which the term 'phytoglyphics' (plant finger printing) has been proposed.

The *Department of Environmental Biology* is concerned with the relationships between environmental factors and various biological systems. The work has the objective of understanding the key mechanisms which underlie such important phenomena as stability in ecological systems, adaptation to particular environments, competition between species for energy, water and nutrients and productivity in relation to genotype and environment.

The research program at present comprises several closely linked areas of activity. The first covers whole organism and population studies, related particularly to the environmental constraints within which individual species operate, the second comprises biochemical and biophysical studies of key physiological processes, and the third is associated with the evaluation and understanding of physical phenomena which have special relevance to energy, water and gas exchanges in ecosystems.

Increasingly the work is concentrating on studies of ecosystems as self-regulating entities. This field is of considerable importance because a full understanding of the dynamics of an ecosystem, and the factors which lead to its stability and

instability, is fundamental to the long-term conservation and management of it. This applies not only to natural ecosystems but also to the many ecosystems modified by human activity.

The main theme of the *Department of Genetics*, to combine genetic and biochemical approaches to the study of adaptation and evolution, is now well-established. At present, our main knowledge of evolutionary processes comes from the statistical analysis of genetic variation in natural populations and the facts of palaeontology and comparative anatomy. The former rests on crossing, recombination and segregation and thus applies primarily to species formation. For the evolution of higher taxonomic groups, there are additional processes. These include, in simple single celled organisms, the origin of new genes and enzymes, the development of control systems and the evolution of particular forms of gene organisation. In higher organisms, which have about a thousand times as much genetic information, techniques are being developed to study the nature, origin and expression of the extra information.

In addition, experiments are continuing on the control of genetic recombination. This can, at present, only be studied in living cells, but it is an essential process in maintaining variability in populations and in the origin of species. A new activity is the culture of certain genetically defined tissues of flowering plants. This work will provide new methods for studying biochemical genetics in higher plants and has important implications in the breeding of new crops. Another new project, financially supported by the Rockefeller Foundation, concerns the modification of amino acid content in the proteins of food plants. This, it is hoped, would alleviate the protein deficiency diseases, at present widespread in Asia and Africa, by making the plant proteins more like those of animals.

In the *Molecular Biology Unit*, work on the molecular mechanism of protein synthesis and its role in cell differentiation and carcinogenesis has continued.

Protein synthesis comprises a series of complex reactions with the aid of a number of cell components, the first step being the specific selection of an individual message by a ribosome. Progress has been made in understanding the mechanism by which the protein synthesis is regulated and cell functions are stabilised in differentiated cells. Evidence has been found that some proteins are responsible for specific recognition of the messages and that association and dissociation between these proteins and ribosomes is involved in the mechanism controlling protein synthesis.

In the *Department of Neurobiology* several themes are continuing, all concerned with the correlated structure and function of the nervous system. The first is the analysis of various types of insect visual systems. Although there is an apparently endless diversity of eyes among insects, the stage has been reached where the most important types are known in outline and a comprehensive review is in preparation. All the work involves an integration of results obtained by a variety of techniques, basically interference microscopy, electrophysiology of marked cells, electron microscopy and reconstruction from serial sections. It is a continuing problem to find and bring into the laboratory for analysis a sufficient number of large insects of the particular groups still needed to complete the survey.

A major effort has been devoted to mechanisms in eyes of nocturnal insects which make use of special adaptations to increase sensitivity. Closely associated with the extensive work concerned with the retina is the analysis of the neural processing of information in the ganglia immediately behind the compound eye.

The second main theme is the analysis of the integrative mechanisms which control eye movement by the visual and statocyst inputs in the crab. The third theme, perhaps the one likely to become dominant, is the analysis of mechanisms by which nerve fibres make the correct connections with their target cells.

In the *Taxonomy Unit* considerable progress in the development of computational methods of general value have been made with particular application to grasses, wattles and host parasite relations. Monographs of Dilleniaceae, especially the genus *Hibbertia*, and some families related to the saxifragaceae are at a fairly advanced stage.

PUBLICATIONS

BAILEY, J. L., DOWNTON, W. J. S.†¶ & MASIAR, EVA*

'The proteins of photosystems I and II in mesophyll and bundle sheath chloroplasts of *Sorghum bicolor*.' In *Photosynthesis and Photorespiration* (eds M. D. Hatch, C. B. Osmond & R. O. Slatyer), 382-6, Wiley-Interscience.

*Developmental
Biology*

BOTTOMLEY, W.‡, SPENCER, D.‡, WHEELER, ANNABEL M. & WHITFIELD, P. R.‡

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'Loggerhead turtle movements.' *Br. J. Herpetol.*, **4**, 9, 228-30.

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'Light in plant stands with horizontal foliage.' *J. appl. Ecol.*, **8**, 579-80.

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DOWNTON, W. J. S.† & PYLIOTIS, N. A.‡

'Loss of photosystem II during ontogeny of sorghum bundle sheath chloroplasts.' *Can. J. Bot.*, **49**, 179-80.

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LÜTTGE, U. E.***, PALLAGHY, C. K.* & VON WILLERT, KATHARINA‡

'Microautoradiographic investigations of sulfate uptake by glands and epidermal cells of Water Lily (*Nymphaea*) leaves with special reference to the effect of Poly-L-Lysine.' *J. Membrane Biol.*, **4**, 395-407.

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MORROW, PATRICE A. & SLATYER, R. O.

'Leaf temperature effects on measurements of diffusive resistance to water vapor transfer.' *Pl. Physiol., Lancaster*, **47**, 559-61.

'Leaf resistance measurements with diffusive porometers: Precautions in calibration and use.' *Agric. Met.*, **8**, 223-33.

* Based on work done while a member of the Department.

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‡ Not a member of this University.

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THESES

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Doctor of Philosophy

HOFFMAN, P. J.

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† Not a member of this University.

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THE SCHOOL OF GENERAL STUDIES

THE FACULTY OF ARTS

REPORT OF THE DEAN

Professor R. St. C. Johnson

The year 1971 was the first in which enrolments to the Faculty of Arts were restricted, so that not all applicants who were qualified for admission to the University and who wished to enter arts were permitted to do so. This was necessary to delay the growth of the Faculty and permit desirable new developments before the University and the Faculty reach their maximum size. The machinery and policies devised to control enrolment in parts worked smoothly, although naturally there were some painful decisions. One of the consequences of the restriction may be seen in departmental reports such as those of Pure Mathematics and Sociology, which show a sudden rise in the calibre and success rates of the intake.

Considering the publicity in the press, and even ministerial statements, concerning the employment difficulties facing arts graduates, one may wonder why there is such pressure to enrol in this Faculty. The Faculty Education Committee set up a sub-committee to look into the question of employment for arts graduates of this University; it produced a very useful report, which makes it clear that, at least in times of normal economic growth, the problem does not extend across all the areas of study offered in arts, but only a section of these. Furthermore, the report shows what are the strengths as well as the weaknesses, from an employer's point of view, in an arts degree. Proposals are being developed and will be put to the Faculty in 1972 to accentuate the strengths and minimise the weaknesses.

Another activity of the Faculty Education Committee has been to initiate the preparation of a booklet on the Faculty and the subjects it offers, for the information primarily of pupils about to leave school and for their parents. Each department has been asked to state what it is trying to achieve in its teaching, and by what methods, and what values it sees in this work. It is sometimes surprising how much the attitudes and expectations of students differ from those of the staff teaching them, and this booklet cannot help but bring the two closer together.

Although these last two items were initiated by the Faculty Education Committee, they have been carried forward with the approval and support of the Faculty proper. The other items on which the Faculty has expended a great deal of discussion during the year have been the site plan, and the structure of the University. The development of the site in the arts area, and the proposals for future development, caused some concern in the Faculty in the later part of 1971, and some strong views were expressed to the Buildings and Grounds

Committee and to the University Council. The Faculty's problems were closely examined, and remedied as far as possible. The debate on the structure of the University continues, with several knotty problems waiting to be settled in 1972.

In 1969 the Faculty changed the office of Dean to make it a three-year appointment, and almost a full-time office. The first three-year term expires in August 1972, and late in 1971 the Faculty considered whether or not to alter the terms. It decided to continue the same terms, and has elected Dr E. C. Fry of the Department of History to be Dean for three years from 10 August 1972. Dr Fry will act as deputy for the present Dean during the remainder of his term of office. This is the first occasion within this University on which a Reader has been elected Dean.

As the departmental reports illustrate, the work of the Departments continues steadily, with first-year examination pass rates usually around 84%, and total first-year success rates (that is, passes in relation to initial enrolments) usually well over 70%. Success rates in the higher years are of course better than this. Despite particular pockets of difficulty, such as those mentioned in the reports from the Departments of Germanic Languages and Linguistics, the teaching of the Faculty appears to continue soundly. The research record is obvious from the list of publications.

The year saw some notable staff changes. A memorable period in the history of the Faculty ended when Professor C. M. H. Clark resigned his position as Head of the Department of History, though happily he continues as Professor of Australian History; it is hoped that relief from his administrative responsibilities will give more time for his research and writing. Another distinguished member of the Faculty, Professor G. H. Russell, resigned to accept a chair in the University of Melbourne. The most tragic loss was the sudden and unexpected death of Professor Hanna Neumann, F.A.A., who had guided the Department of Pure Mathematics for seven years. However, the Faculty has been fortunate in recruitment; it has appointed Professor C. L. Johnson to the Chair of Geography, and Professor J. P. Hardy to the Chair of English, both of them coming from chairs in other Australian universities, and from very strong fields. Professor Johnson's appointment enhances his Department's very considerable strength in South-East Asian geography; that of Professor Hardy, in conjunction with existing members of staff, makes this Department of English a major centre of eighteenth-century studies within Australia.

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'United Front Government and the politics of agrarian struggle in West Bengal, 1967-and 1969-70.' *Australian Outlook*, **XXV**, ii, 213-27.

'Bangla Desh, India and the refugee problem.' *Hub*, **II**, iv, 2-9.

STOCKWIN, J. A. A.

'A comparison of political factionalism in Japan and India.' *Australian Journal of Politics and History*, **XVI**, iii, 361-74, 1970.

'Japan and Asia.' *Current Affairs Bulletin*, **XLVII**, vii, 99-110.

'Japanese Foreign Policy and Australia.' *Aust. Neighbours*, 4th ser., lxxiv, 3-7.

'The Japanese Opposition: Political irrelevances or wave of the future?' *Australian Outlook*, **XXV**, ii, 181-97.

HASSANOFF, OLGA

'The keeper of antiquities.' *Melbourne Slav. Stud.*, **V** and **VI**, 194-202.

Russian

TRAVERS, MARGARET B.

'The first twenty-five years.' *Melbourne Slav. Stud.*, **V** and **VI**, 223-31.

CUSHING, R. G. & BEAN, F. D.†

'Criminal homicide, punishment, and deterrence: Methodological and substantive reconsiderations.' *Social Science Quarterly*, **LII**, ii, 277-89.

Sociology

FOX, G. B.

The Agricultural Development of Phuoc Tuy Province, South Vietnam, Commonwealth Department of Foreign Affairs, March, 48.

GLASNER, P. E.

'Secularisation: Its limitations and usefulness in sociology.' *Expository Times*, **LXXXIII**, i, 18-23.

IRWIN, R. P.

'Curriculum development in health education: The school health education study.' *New Zealand Journal of Health, Physical Education and Recreation*, **IV**, i, 21-8.

'The effect of the teacher and three different classroom approaches on seventh grade students' knowledge, attitudes, and beliefs about smoking.' In *Youth Smoking Behaviour Characteristics and Their Educational Implications* (eds W. H. Creswell, W. J. Hoffman & D. B. Stone), 38-47, Univ. of Illinois Press.

IRWIN, R. P., NEWMAN, I.†, ANG, J.† & SMITH, JOY M.†

'Adolescent cigarette smoking in two societies.' *Int. J. Hlth Educ.*, **XIV**, iii, 114-20.

ZUBRZYCKI, J. (ed.)

The Teaching of Sociology in Australia and New Zealand. Cheshire, F. W., xiv + 170.

ZUBRZYCKI, J.

'The teaching of sociology in Australian universities, past and present.' In *The Teaching of Sociology in Australia and New Zealand* (ed. J. Zubrzycki), 1-32, Cheshire, F. W.

ZUBRZYCKI, J. & TIMMS, D. G.†

'A rationale for sociology teaching in Australasia.' *Aust. & N.Z. Jl Sociology*, **VII**, i, 3-20.

† Not a member of this University.

THESES

Thesis titles of work successfully submitted by research students in the Faculty of Arts on whom degrees were conferred in 1971:

Doctor of Philosophy

MOLONY, J. N.

'John Hubert Plunkett in New South Wales, 1832-1869.' *Department of History.*

PENTONY, P. F.

'Laws in torsion free nilpotent varieties with particular reference to the laws of free nilpotent groups.' *Department of Pure Mathematics.*

SHAW, G. P.

'William Grant Broughton and his early years in New South Wales.' *Department of History.*

SIMMONS, H. L.

'Problems of grammatical gender in German; with particular reference to English loanwords.' *Department of Germanic Languages.*

Master of Arts

AUSTIN, DIANE J.

'Values, valuing and evaluation.' *Department of Philosophy.*

BUSCOMBE, EVE

'Artists and their sitters: A colonial portrait. A guide to the portrait painters of New South Wales and Van Dieman's Land 1820-1850.' *Department of History.*

DAVIS, LYNETTE A.

'Professional socialisation and withdrawal from courses of professional education.' *Department of Sociology.*

DICKINS, R. M.

'Two old English Apocrypha: The *Gospel of Psuedo-Matthew* and the *Visio Pauli*, edited from the manuscripts.' *Department of English.*

FORD, B. F.*

'The aged who have needs in Canberra: An organizational analysis of the problems of the aged in Canberra.' *Department of Sociology.*

GRAY, B. M.

'Toward a theory of group development in group psychotherapy.' *Department of Psychology.*

HAMILTON, ADELE F.

'An investigation of a problem solving situation as a paradigm of the double bind.' *Department of Psychology.*

HARVEY, SUSAN D.

'Some aspects of national language maintenance among children of Dutch and Polish origin in Canberra.' *Department of Sociology.*

HOPKINS, A. P.

'The politics of upward mobility.' *Department of Sociology.*

HUME, M. C. M.

'Measuring serial correlation of residuals in econometric relations.' *Department of Statistics.*

KANE, L. J.

'Wolfe's systematic desensitisation: A behavioural psychotherapy?' *Department of Psychology.*

LANGMAN, ERIKA A.

'A comparison of themes and methods in James Joyce's *A Portrait of the Artist as a Young Man* and Robert Musil's *Die Verwirrungen des Zoglings Torless*.' *Departments of English and Germanic Languages.*

* Submitted as a requirement in addition to course work.

McPHERSON, B. I.

'Images of the Negro in contemporary American fiction.' *Department of English.*

ORAM, D. R.

'Performances and activities.' *Department of Philosophy.*

ROSS, BARBARA

'The accounts of the Talbot household at Blakemere in the county of Shropshire 1394-1425.' *Department of History.*

SCHERER, P. A.

'The managers of discontent: The social bases of the Australian arbitration system.' *Department of Sociology.*

SHOESMITH, D. R.

'Boom year: A study of popular leisure in Melbourne in 1919.' *Department of History.*

STAPLES, NATALIE

'A widening world—a discussion of the social attitudes and social problems of young people in Soviet literature 1957-1963.' *Department of Russian.*

VARGHESE, MARY T. N.

'Kerala 1945-1957—a study of some of the factors leading to the communist victory of 1957.' *Department of History.*

WETHERELL, D. F.

'A history of the Anglican Mission in Papua, 1891-1941.' *Department of History.*

THE FACULTY OF ASIAN STUDIES

REPORT OF THE DEAN

Professor Liu Ts'un-yan, F.A.H.A.

The Faculty sustained the growth of 1970, and in fact moved further forward. Within the framework of this development the increases were proportionally distributed rather evenly among the departments.

During the year combined courses in Asian Studies and Economics and in Asian Studies and Law were formally introduced and these courses will be formally offered for the first time in 1972. A three-year course in Hindi was introduced, for the time being under the aegis of the Department of South Asian and Buddhist Studies. New units, Buddhist Civilization and Islamic Civilization (the latter in conjunction with the Department of Indonesian Languages and Literatures) were offered by the Department of Asian Civilizations. Combined with Introduction to Asian Civilization A these units form sub-majors and majors in Asian religions.

Continuing its general policy of creating a broader interest in things Asian among school leavers, the Faculty again organised a program of lectures for secondary schools within reach of Canberra. In January the Faculty was host to groups of Anglican youth who attended lectures given by staff members, and in July groups from Canberra schools visited the Faculty. During Orientation Week Faculty showed four films about regions of Asia covered in the teaching of Faculty. These were very well attended.

Student participation in Faculty affairs, both at Faculty and departmental level, continued. At Faculty level, the Faculty Education Committee continued to meet regularly and discussed such topics as the feasibility of including study overseas within the framework of the course for the degree of Bachelor of Arts (Asian Studies), the concept of a National School of Languages, the structure of the academic year and rearrangement of the lecture timetable. At departmental level, all departments continued the principle that students should participate in the formulation of the education policies and structure of courses in departments.

The 28th International Congress of Orientalists was held at this University from 6 to 12 January 1971, presided over by Professor A.L. Basham, F.A.H.A., with Dr R. R. C. de Crespigny as Secretary-General. Professor E. S. Crawcour was Program Director for the Japanese Program, Professor J. W. de Jong, F.A.H.A., for South Asia and Professor A. H. Johns, F.A.H.A., for South-East Asia. Papers were presented by seventeen members of staff. The Congress was attended by 1,067 members and eighty-one observers, who were either private visitors or accredited from Commonwealth Government departments. Of the members, ninety-eight were official representatives; 435 came from Australia and the remainder from some forty countries overseas. To this extent the congress though smaller than the 27th meeting at Ann Arbor, is still one of the largest to be held, and received a greater proportion of overseas scholars than any in the past.

In the course of the year members of the Faculty participated in lectures, seminars and Continuing Education courses at this University and at other universities, institutions and associations elsewhere in Australia and overseas. Professor Johns was appointed external examiner to the Department of Malay Studies at the University of Singapore and Professor Liu continued to serve as an external examiner in Chinese Studies at the Universities of Malaya and of Singapore. Close co-operation was maintained with the Canberra College of Advanced Education with an interchange of lecturers and tutors to the mutual advantage of both institutions. The Principal of the College, Dr S. S. Richardson, assisted with the new unit of Islamic Civilization.

The Intensive Course in Chinese, a joint venture between the Department of Chinese and the Canberra College of Advanced Education, which had made a good start the year before, was presented again in January 1971. The Intensive Japanese Language Course was also provided again in January in conjunction with the Centre for Continuing Education. It was directed by Dr A. Alfonso, with the assistance of visiting Professor K. Okutsu and members of the Department of Japanese. In October Professor Basham attended the 2,500th Anniversary Celebrations of the founding of the Persian Empire, as guest of the Iranian Government. To commemorate the anniversary and to stimulate interest in the culture of Iran, Professor Basham, F.A.H.A., and Dr S. A. A. Rizvi, F.A.H.A., conducted a series of three public lectures in September.

Continuing its policy of active assistance to disaster areas of Asia when the need arises, members of Faculty, and in particular Dr Rizvi, were instrumental in organising the Australian National University Committee for Relief to East Pakistani Refugees. A total of \$15,388.63 was sent to the Indian Red Cross. Members of the Faculty also contributed separately to the relief of scholars who suffered during the Indo-Pakistan conflict.

The English-Malay Dictionary Project completed a further satisfactory year, but progress was hampered by a turnover in staffing, and the refusal of the Malaysian Ministry of Education to second two suitable replacements to work on the project at this University.

Professor Basham is engaged in editing a new edition of *The Legacy of India* for the Clarendon Press, Oxford. He also contributed a lengthy article on the 'History of Hinduism' for the new edition of the *Encyclopaedia Britannica*. 'Annotated Bibliography of Works of Chinese History, Thought and Institutions in Western Languages' (Associate Professor O. B. van der Sprenkel), has progressed well, and a xerox copy including all entries completed so far is now held in the Asian Studies Division of the University Library. Also completed are 'Abu'l Fazl and His Times' (Dr Rizvi) and 'A History of Japan' (Dr R. P. H. Mason and Dr J. G. Caiger). Dr Alfonso worked on an analysis of the grammatical structures which survive practically only in the written Japanese language. Research continued in the following projects: study of the finds from the Thai-British Archaeological Expedition (Dr H. H. E. Loofs), 'Anthology of Chinese Verse' (Dr J. D. Frodsham, F.A.H.A.), research of money and prices in the late Tokugawa period (Professor E. S. Crawcour), 'Landmarks of Modern Japanese Literature' (Mr H. Mukai), and a study of the Arabana-Wanganuru Language-group and salvage work in north-eastern South Australia

and western New South Wales (Mrs Luise A. Hercus). In addition Dr Loofs contributed a series of articles on the literatures of Vietnam, Cambodia, Thailand and Laos for *Cassell's Encyclopaedia of Literature* and while in Japan, Mr Mukai studied the effects of Yukio Mishima's suicide and collected materials on his continuing exploration of the Japanese national character.

The Australian Research Grants Committee renewed its support of Associate Professor van der Sprenkel's bibliographical project and Dr Frodsham's research on the anthology of Chinese Verse. It also made funds available to assist Mrs Hercus in her research into aboriginal languages.

Among matters of personal interest Dr Loofs was elected a member of the Comité pour la Sidérurgie Ancienne, which has its headquarters at the Institute of Archaeology, Charles University, Prague. Professor Crawcour visited the Institute for Economic Research, Hitotsubashi University, as the 1971 outgoing Leverhulme Visiting Fellow. The outgoing Leverhulme Visiting Fellowship for 1972-73 was awarded to Dr J. T. F. Jordens who will spend three months in India in order to pursue his research on the life and work of Swami Dayarand Saraswati. The Académie Française des Inscriptions et Belles-Lettres awarded Dr P. Ryckmans the Stanislas Julien Prize for 1971 for his book on Su Renshan. Professor Johns was elected a Fellow of the Australian Academy of the Humanities.

Visitors to the Faculty during the year included Dr R. S. McGregor the University of Cambridge, who came to start off the Hindi course. Professor K. Okutsu of the International Christian University of Tokyo, under the sponsorship of the Japanese Government, assisted with the Japanese Intensive Course and remained till May with the Department of Japanese as a visiting professor. Professor G. W. J. Drewes, lately Professor of Arabic and Islamic Studies at the State University of Leiden, held a visiting appointment in the Faculty for the Third Term during which he was attached to the Department of Indonesian Languages and Literatures. In the course of his stay in Canberra he gave a series of seminars to fourth-year honours students and several lectures to third-year students in the Department of Asian Civilizations, as well as contributing to the unit Islamic Civilization. In addition he spent many hours in discussions with students and members of staff on the definition of research projects and difficulties encountered in research programs under way. He also was of assistance to the English-Malay Dictionary project. The Faculty was grateful for the assistance of Dr C. Mackerras, Department of Far Eastern History, for his voluntary services as visiting lecturer without remuneration in Third Term during Dr Ryckmans' illness.

Members of the Faculty were deeply saddened by the sudden death of Dr Sutjipto Wirjosuparto, who collapsed while lecturing on the morning of 29 June. At the end of 1971 Associate Professor van der Sprenkel became the first member of Faculty to reach retiring age while still in the service of the University. Over the years he has rendered unstinted service to the Faculty and done much to promote interest in the study of the Far East. The University granted Dr Frodsham special leave to enable him to accept an invitation to teach for approximately two years, as Professor of Literature at the University of Dar es Salaam, and he left in December. Mrs Winifred S. Chang's appointment, due to terminate officially in early July, was extended until the end of

the annual examinations. Dr Ann L. Kumar and Miss J. Ching were appointed to lectureships in the Department of Asian Civilizations and promotions included that of Dr Ryckmans to Senior Lecturer in the Department of Chinese.

Undergraduate unit enrolments totalled 782 (Asian Civilizations 436; Indonesian Languages and Literatures 154; Japanese eighty-seven; Chinese seventy-five; South Asian and Buddhist Studies thirty) as compared with 635 in 1970. The overall enrolment in the course for the degree of Bachelor of Arts (Asian Studies) was 233. Forty-two students held Asian Studies Scholarships and of these scholars Mrs Mary A. Ahuja and Miss J. M. Herridge gained first class honours in Chinese and Bahasa Indonesia and Malay, respectively, and shared the Canberra Association of University Women Prize. Mr K. E. Jones gained first class honours in Bahasa Indonesia and Malay and was awarded a University Medal.

Seventeen full-time and two staff candidates were enrolled for the degree of Doctor of Philosophy. Thirteen students were enrolled for the degree of Master of Arts (Asian Studies) and six students for masters qualifying courses.

At the Conferring of Degrees ceremony held in April the degrees of Bachelor of Arts (Asian Studies) and Master of Arts (Asian Studies) were conferred for the first time following the change of the name of the Faculty and its degrees which formally came into operation in January. Ten students received the Degree of Bachelor of Arts (Asian Studies) with Honours, nineteen the pass degree, one the degree of Master of Arts (Asian Studies) and two the degree of Doctor of Philosophy.

Staff candidates who had the degree of Doctor of Philosophy conferred in April were Dr A. Yuyama, Department of South Asian and Buddhist Studies, and Dr Supomo Surjohudojo, Department of Indonesian Languages and Literatures.

PUBLICATIONS

BASHAM, A. L.

'The Ajanta Murals.' *Art Aust.*, **VIII**, ii, 242-51, 1970.

'Hindi and Urdu literature.' *Hemisphere*, January, 24-7.

'The Indian religious tradition.' In *Proceedings of the Second National Summer School on Religion*, Canberra, 15-16, Australian National University Centre for Continuing Education.

BEHM, A. J.

'The theodicy of the Upanishads.' *J. orient. Soc. Aust.*, **VII**, i and ii, 5-14, 1970.

'The eschatology of the Jātakas.' *Numen International Review for the History of Religions*, **XVIII**, Fascicule 1, 30-44.

DOBBINS, K. W.

'Eras of Gāndhara.' *J. orient. Soc. Aust.*, **VII**, i and ii, 23-36, 1970.

'The question of the imitation Hermaios Coinage.' *East and West*, **XX**, 307-27, 1970.

The Stūpa and Vihāra of Kanishka I. The Asiatic Society Monograph Series, **XVIII**, 99.

'Sanabares and the Gondophares Dynasty.' *Numismatic Chronicle*, **VI**, xi, 135-42.

*Asian
Civilization*

DUFTY, D.‡ & CAIGER, J.

'Teaching about Asian religions in Australia.' In *Proceedings of the Second National Summer School on Religion*, Canberra, 11-13, Australian National University Centre for Continuing Education.

GARDINER, K. H. J.

'The Hou-Han-Shu as a source for the early expansion of Koguryo.' *Monumenta Serica*, XXVIII, 148-87, 1969.

RIZVI, S. A. A.

'Sufis and Nātha Yogis in Mediaeval Northern India (XII to XVI Centuries).' *J. orient. Soc. Aust.*, VII, i and ii, 119-33, 1970.

'The breakdown of traditional society.' In *The Cambridge History of Islam* (eds P. M. Holt & Anne K. S. Lambton), II, 67-96, Cambridge Univ. Press, 1970.

Alak Bāni or Rushd Nāma of Shaikh Ahd-ul Quddus Gangoli. Bharat Prakashan Mander, 312.

'Victoria's Persian paintings.' *Hemisphere*, Special Illustrated Issue, January, 28-35.

'The Mughal elite in the sixteenth and seventeenth century.' *Abr-Nahrain*, XI, 69-104.

Chinese

CHING, JULIA C-Y.

'Wang Yang-ming: A study in mad ardour.' *Pap. Far E. Hist.*, III, March, 85-130.

DE CRESPIGNY, R. R. C.

China: The Land and Its People. Nelson, 235.

FRODSHAM, J. D.

'Excitement with peace.' *Hemisphere*, XV, ii, 13-17.

'The rise of the Far Eastern novel: Part One, The Japanese novel.' *Hemisphere*, XV, vi, 12-20.

LIU TS'UN-YAN

'Social and moral limitations of Chinese fiction before the Republic.' *AUMLA*, XXXIV, 197-211, 1970.

'Young Yung, "emendation and annotation of the Shih-shuo hsin-yu".' *Journal of the Institute of Chinese Studies*, III, i, 223-9, Chinese Univ. of Hong Kong, 1970.

'Wang Yang-ming and Taoism.' *Journal of the Institute of Chinese Studies*, III, ii, 489-508, 1970.

'On the nature of Ku Huan's annotations on the Book of Lao-tzu (*Tao-tsang* edition).' *United College Journal*, VIII, 15-28.

RYCKMANS, P.

'Chen Tcheou (Shen Zhou).' In *Encyclopaedia Universalis*, IV, 212-13, Paris.

'Calligraphie et peinture.' In *Encyclopaedia Universalis*, IV, 351-6, Paris.

'Estampes et Gravures.' In *Encyclopaedia Universalis*, IV, 356, Paris.

'Estampage.' In *Encyclopaedia Universalis*, IV, 356, Paris.

'Han Kan (Han Gan).' In *Encyclopaedia Universalis*, VIII, 236-7, Paris.

'Han Yu.' In *Encyclopaedia Universalis*, VIII, 241-2, Paris.

'Hia Kouei (Xia Gui).' In *Encyclopaedia Universalis*, VIII, 386-7, Paris.

'Houang Kong-wang (Huang Gongwang).' In *Encyclopaedia Universalis*, VIII, 585-6, Paris.

'Houang Pin-hong et Fou Pao-che (Huang Hinhong and Fu Baoshi).' In *Encyclopaedia Universalis*, VIII, 586-7, Paris.

'Houei-tsong (Huizong).' In *Encyclopaedia Universalis*, VIII, 588-9, Paris.

'King Hao et Kouan T'ong (Jing Hao and Guan Tong).' In *Encyclopaedia Universalis*, IX, 674-5, Paris.

'Kong Hien and K'ouen-ts'an (Gong Xian and Kuncan).' In *Encyclopaedia Universalis*, IX, 694-5, Paris.

'Kou K'ai-tche (Gu Kaizhi).' In *Encyclopaedia Universalis*, IX, 703-4, Paris.

‡ Not a member of this University.

- 'Kouo Hi (Guo Xi).' In *Encyclopaedia Universalis*, **IX**, 705-6, Paris.
 'Leang K'ai et Mou-k'i (Liang Kai and Muqi).' In *Encyclopaedia Universalis*, **IX**, 857-9, Paris.
 'Li Long-mien (Li Longmian).' In *Encyclopaedia Universalis*, **IX**, 946, Paris.
 'Li Sseu-hiun (Li Sixun).' In *Encyclopaedia Universalis*, **IX**, 948-9, Paris.
 'Li T'ang et Ma Yuan (Li Tang and Ma Yuan).' In *Encyclopaedia Universalis*, **IX**, 949-51, Paris.
 'Li Tch'eng et Fan K'ouan (Li Cheng and Fan Kuan).' In *Encyclopaedia Universalis*, **IX**, 951-3, Paris.
 'Mi Fou (Mi Fu).' In *Encyclopaedia Universalis*, **X**, 1028-9, Paris.
 'Ni Tsan (Ni Zan).' In *Encyclopaedia Universalis*, **XI**, 790-1, Paris.
 'A new interpretation of the term *lieh-chuan* as used in the *Shi-chi*.' *Pap. Far E. Hist.*, **V**, 135-47.

VAN DER SPENKEL, O. P. N. B.

- 'The Chinese religious tradition.' In *Proceedings of the Second National Summer School on Religion*, Canberra, 7-8, Australian National University Centre for Continuing Education.

JOHNS, A. H.

- 'The educational value of Asian studies in Australian schools.' In *Teaching About Asia in Australian Schools*, 1-6, Australian National University Centre for Continuing Education.
 'Islamic Theology.' In *Proceedings of the Second National Summer School on Religion*, Canberra, 9-10, Australian National University Centre for Continuing Education.

Indonesian
Languages
and
Literatures

SOEBARDI

- 'Santri religious elements as reflected in the book of Tjenti.' *Bijdragen Tot de Taal-, Land-en Volkenkunde*, **CXXVII**, iii, 331-49.
 Review article on *Literature of Java*, **II** and **III** (by T. G. T. Pigeaud). *J. SE. Asian Stud.*, **II**, ii, 234.

SOEWITO-SANTOSO

- 'Makara.' *Relung Pustaka*, 20-4, 1970.
 Translation of 'Canto 1-6 of the Sutasoma Kakawin.' *Relung Pustaka*, July, 44-9; August, 46-50.
Dari Barat sampai KeTimur (A Modern Indonesian Reader). **LXXX**, Novak, 1969.

ALFONSO, A.

- Japanese Language Patterns Nihongoban I-IV*, Sophia Univ. Language Laboratory Center of Applied Linguistics, 1167, 1970.
 'On the "adversative" passive.' *The Journal-Newsletter of the Association of Teachers of Japanese*, **VII**, i, 1-7, Institute of Far Eastern Languages, Yale Univ.

Japanese

ALFONSO, A. & NIIMI, K.*

- Japanese: A Basic Course*. Sophia Univ. Language Laboratory Center of Applied Linguistics, 525, 1970.

DE JONG, J. W.

- Review of *Manicūdāvadāna Being a Translation and Edition and Lokānanda, a Transliteration and Synopsis (Sacred Books of the Buddhists)* (by Ratna Handurukande), **XXIV**. *Indo-Iranian Journal*, **XIII**, 140-3, 1967.
 'Un fragment de l'histoire de Rāma en tibétain.' In *Études tibétaines dédiées à la mémoire de Marcelle Lalou*, 127-41.

South Asian
and Buddhist
Studies

* Based on work done while a member of the Department.

Review of *Dvādaśāram Nayacakram* (by Ācārya Śrī Mallavādi Ksamāśramana) with the commentary *Nyāyāgamānūsarini* by Śrī Simhasūri Gani Vādi Ksamāśramana, Part I, Chapters 1-4. (Śrī Ātmānand Jain Granthamālā, Ser., XCIII) (ed. with critical notes by Muni Jambūvijayajī). *Indo-Iranian Journal*, XIII, 144-50.

Review of *Les études jaina, Etat présent et tâches futures* and *Die Āryā-Strophen des Pali-Kanons Metrisch hergestellt und textgeschichtlich untersucht*. (Akademie der Wissenschaften und der Literatur, Abh. d. Geistes- u. sozialw. Kl., IV (by L. Alsdorf). *Indo-Iranian Journal*, XIII, 207-12.

Review of *Subud Erike, Ein Rosenkranz aus Perlen*. Die Biographie des 1. Pekinger IČan skya Khutukhtu Nag bdan blo bzang ṣ'os ldan, verfasst von Nag bdan ṣ'os ldan alias Šes rab dar rgyas. Herausgegeben, übersetzt und kommentiert von K.S. (*Asiatische Forschungen*, XX) (by K. Sagaster) Weisbaden. *Indo-Iranian Journal*, XIII, 215-20.

Review of *The Nine Ways of Bon. Excerpts from gZi-brjid edited and translated* (London Oriental Ser. XVIII) (by D. L. Snellgrove). *Indo-Iranian Journal*, XIII, 220-2.

Review of *Tibetan Texts Concerning Khotan* (London Oriental Ser. XIX) (by R. E. Emmerick). *Indo-Iranian Journal*, XIII, 222-5.

Review of *The Khotanese Sūrangamasamādhisūtra* (London Oriental Ser. XXIII) (by R. E. Emmerick). *Asia maj.*, N.S., XVI, 207-10.

Review of 'Chung-kuo fo-chiao shih-chuan yu mu-lu yuan-ch'u lü-hsüeh shamen chih t'an-t'ao.' (A study of Chinese Buddhist biographies and bibliographies derived from the Vinaya sect), *Hsin Ya hsüeh-pao* (*New Asia Journal*), VI, i, 415-86; VII, i, 305-61; VII, ii, 79-155 (by Tso Sze-bong). *T'oung Pao*, LVI, 314-21.

HERCUS, LUISE A. & WHITE, ISOBEL M.†

Review of *Die Āryā-Strophen des Pali-Kanons metrisch hergestellt und textgeschichtlich untersucht*. (Akademie der Wissenschaften und der Literatur; Abh. D. Geistes- u. sozialw. Kl., 1967, IV), 89, 1968. *J. Am. orient. Soc.*, XC, iv, 586-7, 1970.

'The last Madimadi Man.' *Victorian Nat.*, LXXXVIII, i, 11-18.

RAJAPATIRANA, T. & REYNOLDS, C. H. B.†

An Anthology of Sinhalese Literature up to 1815. (Trans. of *Amavatura* by Gurulugómi), 32-91, Allen, G., 1970.

An Anthology of Sinhalese Literature up to 1815. (Trans. of *Butsarana* by Vidyāchakravartī), 107-68, Allen, G., 1970.

THESES

Thesis titles of work successfully submitted by research students in the Faculty of Asian Studies on whom degrees were conferred in 1971:

Doctor of
Philosophy

LAHIRI, A. K.

'Vedic VRTRA: A study and a suggested interpretation.' *Department of Asian Civilizations*.

SANTUCCI, J. A. A.

'Vedic *raj** and *raj**: Their meaning and relationship.' *Department of Asian Civilizations*.

SUPOMO, S.

'Arjunawijaya: A kakawin of mpu tantular.' *Department of Indonesian Languages and Literatures*.

† Not a member of this University.

TSUDA, S.

'The Samvarodaya-tantra. Selected chapters.' *Department of South Asian and Buddhist Studies.*

YUYAMA, A.

'A study of the Prajna-paramita-ratna-guna-samcaya-gatha.' *Department of South Asian and Buddhist Studies.*

HASSANOFF, OLGA

'Min-Pao, the official organ of the Chinese Revolutionary Party, 1905-1908, 1910.' *Department of Asian Civilizations.*

Master of Arts (Asian Studies)

TANG, E. P. P.

'British policy toward the Chinese in the Straits settlements: Protection and control 1877-1900 (with special reference to Singapore).' *Department of Asian Civilizations.*

THE FACULTY OF ECONOMICS

REPORT OF THE DEAN

Professor B. D. Cameron

Degree Structure

The year was one of consolidation in a number of areas such as the course work program for the degree of Master of Economics, which is now well established. The main new developments were the successful introduction of Computer Science and, later in the year, the establishment of two chairs in the Department of Statistics. One of these is in Theoretical Statistics and the second is in Econometrics. A number of supporting appointments have been made in econometrics. There has been a major reorganisation of statistics courses and this will be an area of rapid change over the coming two years.

Enrolments

Student enrolments in the Department of Economics of around 1,000 students indicate the size of the work done by the departments. As failure rates continue to decline and postgraduate work expands, student enrolments will rise further. However, it is proposed to hold first-year economics enrolments to 600 students.

Student Performance

While a large number of students still fail in first year, this proportion is declining. Moreover, once the student is through first year, failure rates are generally low as the following figures show:

	<i>Failures as % of Numbers Sitting</i>	
Economics I	32%	
Economics II		5%
Economic History I	21%	
Economic History II		7%
Accounting I	29%	
Accounting II		6%
Statistics I	18%	
Statistics II		22%*

Research

The following excerpts from departmental reports indicate the character of research undertaken: members of the Department of Economic History have worked on the British economy in the eighteen-forties (Dr H. M. Boot); agriculture and economic change in Australia, 1890 to 1914; economic stagnation in India, 1890 to 1940, with special reference to agriculture and population growth (Mr S. H. Cornish); Australian fertility trends in the late nineteenth century (Dr C. Forster); the determinants and consequences of Australian agricultural commodity policy, 1929 to 1968, with special reference to wool, wheat and dairy produce (Mr J. E. S. Gagg); urban growth in eastern Australia, 1861 to 1891 (Dr R. V. Jackson); the application of economic theory and econometrics to historical problems (Mr A. Martina); the influence of the old Poor Law on English intercounty fertility differentials, 1821 (Professor G. S. L. Tucker).

* Statistics II is the first statistics unit taken by students in this stream. So in a sense the comparable figure is for Statistics III—a failure rate of 11%.

The main research work carried out by members of the Department of Accounting and Public Finance in 1971 was concerned with public expenditure theory (Mr H. G. Brennan); resource allocation in the public sector (Professor R. L. Mathews); cost-benefit analysis applied to roads (Mr W. R. C. Jay, Mr J. E. Hodges); planning, programming, budgeting systems (Mr W. R. C. Jay, Professor R. L. Mathews); defence economics (Mr M. M. van Gelder); economics of education (Mr H. G. Brennan, Professor R. L. Mathews); taxation theory and policy (Professor R. L. Mathews, Mr W. J. Stock, Mr A. Lewchalermwong, Mr A. St. J. Minchin); intergovernmental fiscal relations (Mr W. R. C. Jay, Professor R. L. Mathews, Mr E. Ingevics); national accounting systems (Mr W. R. C. Jay, Mr R. A. Ma, Mr J. Y. Henderson); income measurement theory; company finance (Mr P. E. M. Standish, Mr R. A. Ma).

Research by members of the Department of Statistics was mainly in the fields of pure and applied probability (particularly limit theorems, branching processes, and characteristic functions), multivariate analysis, econometric time series, picture processing and pattern recognition, adaptive control, and interactive systems.

Professor J. D. Pitchford, Department of Economics, published a paper on the average productivity wage adjustment rule. Work is nearing completion on his book on theoretical aspects of population growth and control. He lectured and gave seminars at the University of Tasmania and Monash University, and gave papers at the ANZAAS meeting in May and the Economists' Conference in August.

Dr C. A. Tisdell completed his textbook on microeconomics for publication in 1972, and initiated his studies under a grant to work on government policy on industrial research. Dr Drysdale continued his major work on Pacific area trade, in connection with which he made an overseas trip late in the year. Dr C. T. Edwards, returned from sabbatical leave in Bangkok, continued his work on South-East Asian countries. Dr D. W. Stammer, who was also Subdean of the Faculty, continued his main interests in monetary policy and inflation theory.

While departmental reports indicate varied experience with the formalities of student participation, it is my experience that staff in the Faculty are regarded as approachable and co-operative by the students. With the growth of student numbers it is important that we ensure the individual does not get lost in the crowd. In this respect it does help to have full-time tutors.

*Student
Participation*

As with other sectors of the University, the Faculty of Economics has experienced a space shortage; but in this, as in all other matters, the University Administration has been extremely helpful.

Accommodation

PUBLICATIONS

BRENNAN, H. G.

'Fee abolition: An appraisal.' *Aust. Univ.*, IX, ii, 81-149.

JAY, W. R. C.

'Immigration: The case for continuation.' In *Applied Economics: Readings for Australian Students* (eds K. J. Hancock, B. Hughes & R. H. Wallace), 59-60, McGraw.

*Accounting
and Public
Finance*

MATHEWS, R. L.

The Accounting Framework. Cheshire, F. W., xviii + 585.

'Towards a system of current value accounting.' *Singapore Accountant*, VI, 9-17.

'Commonwealth-State fiscal adjustment and equalization.' *Economics*, VI, i, 8-21.

MATHEWS, R. L., DOWNING, R. I.‡, ARNDT, H. W.¶ & BOXER, A. H.‡

'Proposals for reform of the Australian Tax System.' In *Applied Economics: Readings for Australian Students* (eds K. J. Hancock, B. Hughes & R. H. Wallace), 81-5, McGraw.

MATHEWS, R. L., RICHARDSON, J. E.¶¶ & NEVILLE, J. W.‡

'Report of committee on the effects of Commonwealth-State relations on university finances.' *Vestes*, XIV, iii, 308-12.

STANDISH, P. E. M.

Australian Financial Reporting. Accounting Research Study No. 2, Accountancy Research Foundation, Melbourne, xiii + 305.

'Immigration: The case for reduction.' In *Applied Economics: Readings for Australian Students* (eds K. J. Hancock, B. Hughes & R. H. Wallace), 61-4, McGraw.

Economics

BAMBRICK, SUSAN C.

'An economic analysis of the proposed Cooloolool Sands mining project: A comment.' *Economic Analysis and Policy*, March, 30-48.

CAMERON, B. D.

'Measuring the effects of the tariff.' *Economic Record*, XLVII, cxvii, 119-23.

CHISHOLM, A. H.

'A comparison of income averaging procedures for income tax purposes.' *Aust. J. agric. Econ.*, XV, i, 36-50.

GARNAUT, R. G.

'Policy for timber processing.' *Bull. Indones. econ. Stud.*, VII, iii, 144-6.

NEVILLE, J.‡ & STAMMER, D. W. (eds)

Inflation and Unemployment. Penguin, 248.

PITCHFORD, J. D.

'The usefulness of the average productivity wage adjustment rule.' *Economic Record*, XLVII, cxviii, 255-61.

SMITH, B.

'Immigration policy: A survey of the issues.' *Australian Quarterly*, XLIII, ii, 8-15.

STAMMER, D. W.

'A further comment on potential money as a monetary indication.' *Economic Record*, XLVII, cxix, 433-6.

TISDELL, C. A.

'Efficiency and decreasing cost industries.' *Aust. econ. Pap.*, IX, xv, 256-72, 1970.

'Economic policy, forecasting and flexibility.' *Weltwirtschaftliches Archiv*, CVI, 34-54.

'Commonwealth Industrial Research and Development Grants—an economic evaluation.' *Economic Analysis and Policy*, II, ii, 27-50.

'Rules versus discretion—A note on economic policy.' In *Inflation and Unemployment* (eds J. Neville & D. W. Stammer), 88-96, Penguin.

TIDSELL, C. A. & DUNCAN, R.‡

'Research and technical progress: The returns to producers.' *Economic Record*, XLVII, cxvii, 124-9.

‡ Not a member of this University.

¶ Member of the Department of Economics, Research School of Pacific Studies.

¶¶ Member of the Faculty of Law.

ANDERSSSEN, R. S.¶ & SENETA, E.

'Simple statistical estimation procedure for Monte Carlo Inversion in geophysics.' *Pure appl. Geophys.*, **91**, 5-13.

'On smoothing techniques for the removal of periodic noise of known period.' *Mathematical Geology*, **3**, 157-70.

BOJANIC, R.‡ & SENETA, E.

'Slowly varying functions and asymptotic relations.' *J. math. Analysis Applic.*, **34**, 302-15.

HANNAN, E. J.*, TERRELL, R. D.* & TUCKWELL, N. E.*

'The seasonal adjustment of economic time series.' *Int. econ. Rev.*, **2**, 24-52, 1970.

HEATHCOTE, C. R.

Probability: Elements of the Mathematical Theory. Allen, G., 267.

HEYDE, C. C.

'On the growth of the maximum queue length in a stable queue.' *Ops. Res.*, **19**, 447-52.

'Some central limit analogues for super-critical Galton-Watson processes.' *J. appl. Probab.*, **8**, 52-9.

'Some almost sure convergence theorems for branching processes.' *Z. Wahrscheinlichkeitstheorie Verwandte Gebiete*, **20**, 189-92.

HEYDE, C. C. & BROWN, B. M.‡

'On the departure from normality of a certain class of martingales.' *Ann. math. Statist.*, **41**, 2161-5, 1970.

'An invariance principle and some convergence rate results for branching processes.' *Z. Wahrscheinlichkeitstheorie Verwandte Gebiete*, **20**, 271-8.

HEYDE, C. C. & HEYDE, ELIZABETH¶¶

'Stochastic fluctuations in a one substrate one product enzyme system: are they ever relevant?' *J. theor. Biol.*, **30**, 395-404.

HEYDE, C. C. & LESLIE, J. R.

'Improved classical limit analogues for Galton-Watson processes with or without immigration.' *Bull. Aust. math. Soc.*, **5**, 145-55.

HEYDE, C. C. & SENETA, E.

'Analogues of classical limit theorems for the supercritical Galton-Watson process with immigration.' *Math. Biosci.*, **11**, 249-59.

JOHN, S.

'Some optimal multivariate tests.' *Biometrika*, **1**, 58, 123-7.

'A test of equality of block-diagonal covariance matrices and its role of unification.' *Jl R. statist. Soc.*, **33**, 301-6.

SENETA, E.

'On invariant measures for simple branching processes.' *J. appl. Probab.*, **8**, 43-51. (Also in *Bull. Aust. math. Soc.*, **2**, 359-62, 1970.)

'Sequential criteria for regular variation.' *Q. Jl Math.*, **22**, 565-70.

SCOTT, D. J.

'An invariance principle for reversed martingales.' *Z. Wahrscheinlichkeitstheorie Verwandte Gebiete*, **20**, 9-28.

TERRELL, R. D.* & TUCKWELL, N. E.*

'Efficiency of least squares in estimating a stable seasonal pattern.' *J. Am. statist. Ass.*, **66**, 334, 254-72.

¶ Member of the Computer Centre.

‡ Not a member of this University.

* Based on work done while a member of the Department.

¶¶ Member of the Department of Biochemistry, Institute of Advanced Studies.

THESES

Thesis titles of work successfully submitted by research students in the Faculty of Economics on whom degrees were conferred in 1971:

Doctor of Philosophy

BADE, ROBIN L.

'International capital movements in the context of optimal growth.' *Department of Economics.*

BEATTIE, D.

'Resource allocation studies within the framework of public finance theory.' *Department of Accounting and Public Finance.*

Master of Economics

WEBB, G. R.

'The economics of public urban bus services. A study of the economics of government and municipal operated bus services in the Australian capital cities.' *Department of Economics.*

WELDON, J. P.

'Managerial real investment incentives under corporate income taxation.' *Department of Accounting and Public Finance.*

THE FACULTY OF LAW

REPORT OF THE DEAN

Professor H. Whitmore

The Faculty of Law aims to train students to qualify for admission to the practice of law and to give others, who do not wish to practise, training in law which will equip them for work in both governmental and non-governmental organisations at both the executive and administrative levels whether in legal or non-legal capacities. It is interesting to note that a questionnaire sent to all law graduates of the University during the year revealed that approximately 60% of graduates are not engaged in private legal practice.

*General
Comments*

The Faculty is planning a range of courses appropriate to the national character of the Law School and hopes to introduce additional subjects for the degree of Bachelor of Laws in the areas of business law and public law.

As soon as staffing permits the Faculty will introduce a Master of Laws degree by course work. The number of Australian degree of Bachelor of Laws graduates undertaking postgraduate studies outside the University of Sydney is minimal and it is considered that the University has a special responsibility to foster developments in this field.

The Faculty in 1970 reached its maximum enrolment of about 500 undergraduate students. One of the Faculty's chief aims is to reduce its staff : student ratio appreciably from the 1971 level of 1 : 16.5. Law cannot be taught effectively by the discussion method adopted by the Faculty in most subjects to groups of more than forty to fifty students. In the more difficult second-year subjects there is also a strong student demand for tutorials. With the growth in class sizes in third and fourth years more staff are needed to ensure standards of teaching do not fall.

During the year the Council approved the introduction in 1972 of a combined Bachelor of Arts(Asian Studies) and Bachelor of Laws course of five years duration.

Courses

One of the major developments of the year was the introduction of a Bachelor of Laws course for graduates in other disciplines with good academic records. The course, which comprises sixteen subjects, ten compulsory and six optional, may be completed over three years of full-time or five years of part-time study. The degree has been recognised by the admission authorities in the State of Victoria and the State of New South Wales, provided Legal Drafting, Succession, Evidence and Procedure and Pleading are included amongst the subjects taken.

The other major development was the decision to offer a Legal Workshop course. Following the establishment of the Committee of Management and the appointment of the Director in the first half of the year, much work has been devoted to course planning and administrative arrangements for the workshop's operation.

The first course which begins on 10 January 1972, will run for six months.

The course is prescribed under the Australian Capital Territory Legal Practitioners Ordinance 1970, which makes provision for direct admission to legal practice in the Australian Capital Territory, as an alternative to articles of legal workshop graduates. The Victorian admission authorities have given an undertaking that Australian Capital Territory practitioners will be admitted to practice in Victoria under the reciprocal provisions of legislation relating to admission to practice in Victoria. The New South Wales Barristers and Solicitors Admission Board has approved the Legal Workshop course as an alternative to articles for the purpose of admission to practice as a solicitor in New South Wales. Those admitted will be subject to such limitations relating to the issue of a full practising certificate as may be in force in New South Wales at that time irrespective of whether qualification for admission has been made by means of articles or workshop training.

Graduates in law of any Australian university are eligible to apply for admission to the workshop course. Enrolments for each course will be restricted to thirty students.

The course will provide common training for all practitioners whether they ultimately propose to practise as barristers or solicitors or both. It will consist mainly of practical training, instruction and exercises in professional problems and procedures but will also include instruction in office management and procedures, accounting and professional conduct. The Director will be assisted by Consultants and Associate Consultants, who are members of the legal profession in the Australian Capital Territory, New South Wales or Victoria.

The Committee of Management of the Legal Workshop has the responsibility for advising the Faculty on the standards and content of the courses of study. It comprises the Honourable Mr Justice R. W. Fox, Judge of the Supreme Court of the Australian Capital Territory; Mr T. J. Briggs and Mr J. E. Ellis representing the Law Society of the Australian Capital Territory; Mr S. F. Parsons, representing the Attorney-General's Department (Mr Parsons replaced Mr C. L. Hermes as the Department's representative in November 1971); Mr K. F. O'Leary, Director of the Legal Workshop; Professor H. Whitmore, representing the Faculty of Law.

A new optional subject, Environmental Resources Law, is to be offered in 1972 bringing the total number of optional subjects available to nineteen.

In 1971 a law major was offered for the first time for students enrolled in the Bachelor of Economics degree course. Forty-five economics students enrolled at the beginning of the year for Legal Method, the first subject in the law major. Fifteen students cancelled their enrolment during the year.

Enrolments and Examination Results

For the first time a quota was operated in 1971 to limit enrolments for law courses. The aim was to fill 130 new places and to restrict total enrolments to 500 students. Four hundred and sixty applications for places were received and 136 new law students were enrolled within the quota at the beginning of the academic year. The entry level was only a little below the minimum aggregate for the award of a Commonwealth open entrance scholarship. In 1972 140 places will be available for new law students.

Enrolment figures as at 30 April 1971 were—

	<i>Full-time</i>	<i>Part-time</i>	<i>New</i>	<i>Re-enrolments</i>	<i>Total</i>
LL.B.	107	127	36	198	234
B.A./LL.B.	168	27	54	141	195
B.Ec./LL.B.	59	3	30	32	62
Total	334	157	120	371	491
<i>Higher Degree</i>	<i>Full-time</i>	<i>Part-time</i>			
LL.M.	2	9 (1 qualifying)			
Ph.D.	1				

From 1970 to 1971 the proportion of students enrolled for the combined degrees of Bachelor of Arts and Bachelor of Laws or Bachelor of Economics and Bachelor of Laws courses rose by 10% from 42% to 52%. The combined degrees of Bachelor of Economics and Bachelor of Laws enrolments increased by 63% on 1970 enrolments giving an increase of 18% over two years.

The proportion of part-time students to full-time students is continuing to decline and reduced from 34% of total enrolments in 1970 to 32% in 1971.

A noteworthy feature of the 1971 annual examination results was the decline in failure rates especially in first-year subjects. This is attributed to the higher quality of the first-year class following the introduction of a quota. In Legal Method the failure rate decreased in 1971 to 16% from 25% in 1970 but if students taking Legal Method in a Bachelor of Economics degree course are excluded from the calculation, the percentage of students failing the subject was only 10%. Similarly between 1970 and 1971 the failure rate in Legal and Constitutional History decreased from 23% to 8% and in Contracts from 31% to 12%. In Criminal Law and Procedure the failure rate remained constant at 13%.

Only in two subjects in the course for the degree of Bachelor of Laws in 1971 was the failure rate higher than 20%. These are the second-year subjects of Commercial Law and Property I. A strong demand has been expressed through the Faculty Education Committee for tutorials in these subjects. The Faculty has agreed that as soon as the staff: student ratio permits tutorials should be offered; but it is doubtful whether the Faculty's staff resources will permit this in 1972.

The composition of the 1971 Faculty Education Committee was—the Dean (ex officio), Professor P. S. Atiyah, Mr G. Clark (President, Australian National University Law Society), Mr R. S. Geddes, Mr D. W. Major (general representative), Mr K. F. Morrissey (second-year representative), Mr D. L. Pape, Mr D. C. Pearce, Mr J. P. Pola (nominated by Australian National University Law Society Committee), Mr R. C. Refshauge (the Students' Representative Council nominee on Faculty was invited to attend meetings as an observer), Mr R. E. Withnell (general representative).

Student Participation

At elections for student representatives held in April 1971 only one nomination was received for three vacant positions. Special arrangements were made to co-opt students for the two vacancies. The Faculty Education Committee elected Messrs Clark and Withnell to serve with Mr Refshauge as members of Faculty.

The Faculty Education Committee met three times in 1971. It has given useful advice to Faculty on matters relating to courses and instruction and has itself initiated several items of business. Amongst the more important matters before the Committee during the year were mid-year examinations and written work counting towards final results, the Degree of Bachelor of Laws with Honours examination, semester teaching, the workload in the degree of Bachelor of Laws course and the need for tutorials especially in Commercial Law and Property I.

Staff

The full-time academic staff comprised four professors, three readers, nine senior lecturers, three lecturers, one temporary lecturer and one senior tutor. There were two part-time lecturers and ten part-time tutors.

Mr J. L. R. Davis and Mr A. D. Hambly were appointed to vacant readerships from 12 November 1971.

Mr C. J. H. Thomson was appointed to the position of lecturer late in 1971 and will take up duty early in 1972.

Three members of staff, Mr J. L. R. Davis, Mr G. J. Davies and Mr F. Rinaldi, were absent on study leave during 1971.

Legal Workshop

Mr K. F. O'Leary took up his appointment as Director of the Legal Workshop in June 1971. Mr O'Leary also lectured in 1971 in the subject of Practice and Procedure.

Visitors

Visitors, many of whom delivered guest lectures, included Lord Diplock, Law Lord of England; Judge J. M. Wisdom, Judge of the United States Federal Circuit Court; the Honourable O. E. Lang, Canadian Minister for Manpower and Immigration and Minister Responsible for the Canadian Wheat Board; Mrs Justice Wiratmo Soekito, Justice of the Supreme Court of Ceylon; the Honourable D. L. Chipp, M.P., Minister for Customs and Excise; the Honourable R. J. D. Hunt, M.P., Minister for the Interior; the Right Honourable Sir Garfield Barwick, G.C.M.G., Chief Justice of the High Court of Australia; Mr J. D. Jess, M.P.; Professor J. Stone, University of Sydney; Mr W. S. Johnson, Barrister-at-Law, Australian Capital Territory; Professor A. M. Linden, University of Toronto; Mr G. J. Terry, Department of Foreign Affairs; the Right Honourable Sir Harry T. Gibbs, K.B.E., Judge of the High Court of Australia; Mr S. A. Bosci, Taxation Division, Commonwealth Treasury; Master I. H. Jacob, Judge of the High Court of England; Dr D. C. M. Yardley, University of Oxford; Dr H. W. Poulton, Executive Director, Ansett Transport Industries Ltd; Sir Guy R. Powles, K.B.E., C.M.G., New Zealand Ombudsman; Professor G. Winkler, Dean of the Law School of the University of Vienna; Mr J. Tydings, former Senator, USA; Mr R. R. Dickey, Attorney, Washington; Professor J. Munro, University of South Dakota; Mr B. J. O'Donovan, Attorney-General's Department.

Research

Professor Atiyah was responsible for preparation for a week-end seminar held at the Law School in February 1971 on the 'Uniform Laws on International Sale'. The seminar was sponsored under the joint auspices of the Faculty of Law and the Attorney-General's Department. Professor Atiyah delivered to the

1971 Australian Universities Law Schools Association Conference held in Adelaide in August, a paper on 'The Teaching of Tort Law in Australia'. He has also delivered papers to the New South Wales Bar Association on 'International Commercial Arbitration' and 'Property Damage and Personal Injuries—Different Duties of Care?' Professor Atiyah is continuing his research on 'Contracts of Guarantee' for the *International Encyclopaedia of Comparative Law*.

Whilst on Study leave, Mr Davies has given a course of lectures in Legal History at the University of Alberta and has also lectured on 'Royalty Interests in the Oil and Gas Industry'. As an observer he attended the tenth Annual Research Seminar of the Canadian Petroleum Law Foundation. Two articles prepared by Mr Davies during his study leave are to be published in the next edition of the *Alberta Law Review*.

Mr Davis has been working on a book on comparative law at the Max-Planck-Institut für Verhaltensphysiologie in Hamburg and at Gonville and Caius College, Cambridge. In September he attended the conferences of the Society of Public Teachers of Law and the United Kingdom Committee for Comparative Law held in Edinburgh.

Mrs R. Burnett delivered a paper on 'Chinese Participation in the United Nations' to the Australian Law Schools Conference held in Adelaide in August.

Mr D. E. Harding delivered a paper 'Modification of the Hearsay Rule' to the sixteenth Legal Convention held in Melbourne in July 1971.

Mr W. Holder is working with Mr G. A. Brennan, Attorney-General's Department, on a book 'The International Legal System', which is to be published by Butterworth early in 1972. He delivered a paper on 'Teaching International Law in 1984' to the Australian Law Schools Conference held in Adelaide in August.

Dr D. O'Connor is preparing a book 'Criminal Appeals from Superior Courts in Australia' which is expected to be published shortly.

Mr Pearce presented a paper on 'The Senate Standing Committees' to the Law Schools Conference in Adelaide.

Mr Rinaldi has, whilst on study leave at the University of Bologna, continued his research in the field of jurisprudence. In September he attended the Philosophy of Law Congress held in Brussels.

Professor J. E. Richardson is working on a book on Australian air law. He is Chairman of the Air and Space Law Committee, Australian Branch, International Law Association, which in the middle of the year submitted a report relating to registration and nationality of spacecraft in response to an international questionnaire.

Professor Richardson has lectured and participated in seminars on the operation of the Commonwealth Constitution at the Australian Administrative Staff College and has, with Mrs Burnett, lectured Department of Foreign Affairs officers on law. In October 1971 he delivered the Lipsham Memorial Trust address for the Pharmaceutical Society of South Australia in Adelaide. The

topic was 'Recent Events Concerning the Federal Control of Trade Practices'. He also delivered to the inter-governmental relations seminar, held in November under the joint auspices of the Academy of Social Sciences in Australia and the University, a paper entitled 'Patterns of Australian Federalism'.

Dr J. C. Turner has had an article on hire-purchase legislation accepted for publication by the *University of Sydney Law Review* and is completing a second article in the same field.

Professor Whitmore with Professor Enid Campbell of Monash University is preparing a new edition of the book *Freedom in Australia* which is to be published next year.

Professor L. R. Zines has lectured to revenue officers at the Taxation Department and to administrative trainees of the Commonwealth Public Service.

Other Activities

In August 1971 Professor Atiyah was appointed as a part-time member of the Australian Capital Territory Law Reform Commission.

Mr Harding is carrying out extensive work as Legal Adviser to the Senate Committee on Securities and Exchange and is assisting with the preparation of the Committee's report. Mr Harding has also assisted and advised the Attorney-General's Department on the Evidence Ordinance for the Australian Capital Territory which is to be reintroduced next year before the Commonwealth Parliament as a Bill for an Act.

Professor Richardson and Professor Zines are continuing to serve as members of the Judiciary Act Review Committee. Professor Richardson was Chairman of the special committee of the Federation of Australian University Staff Associations to investigate the effects of Commonwealth and State financial relations on the allocation of funds to universities. He has continued as Chairman of the Committee on Australian Legal Education of the Australasian Universities Law Schools Association. At the annual conference of the Association held in Adelaide in August, he chaired the plenary session which was devoted to a study of the Committee's progress. It is hoped that the Committee's report will be completed for publication during 1972.

The report of the Commonwealth Administrative Review Committee, of which Professor Whitmore was a member, was tabled in Parliament in August 1971. The Report of the Defence Legal Services Committee of Review of which Professor Whitmore was Chairman was handed to the Minister of Defence on 23 November.

Professor Whitmore was recently appointed by the Attorney-General to serve on a committee to examine and report on administrative discretions. The Committee has been appointed following the tabling of a report of the Commonwealth Administrative Review Committee.

Professor Zines has advised the Senate Select Committee on Securities and Exchange on the constitutional aspects of controlling securities. In September 1971 he was elected Dean of Students of the University.

The George Knowles Prize for the student doing the best work during the year was awarded to Mr P. J. Lahy, a third-year Economics/Law student who is one of the first to qualify to graduate Bachelor of Economics.

*Prizes and
Scholarships*

Mr K. M. Crotty, who qualified to graduate with the Degree of Bachelor of Laws with First Class Honours, received the Supreme Court Judges' Prize for the student obtaining the highest honours result in Law and was awarded a University Medal.

The Permanent Trustee Company's Will Drafting Prize was awarded to Mr P. A. McNamara. Mr I. J. Booth and Mr J. D. Gunther shared the Ansett Air and Space Law Prize. Mr P. A. McNamara, who qualified to graduate with first class honours, won the Australian Capital Territory Bar Association Prize for Contracts, Mr G. I. Simpson the Permanent Trustee Company (Canberra) Limited Prize for Property II and Mr A. J. Halkyard the other prize awarded by this Company for Trusts. The B. C. Meagher Prize for Commonwealth Constitutional Law was awarded to Mr G. J. Kennedy and the Trustee Executors (Canberra) Limited Prize for taxation to Mr R. K. O'Connor.

A new prize, the Freehill, Hollingdale and Page Prize for Commercial Studies, was established during the year for award to the student obtaining the best result in four out of the total of six subjects offered in the field of Commercial Law. This prize was awarded to Mr R. G. Mills, who qualified to graduate with the Degree of Bachelor of Laws with First Class Honours.

The Faculty is extremely grateful to the prize donors for their interest in legal education and law students.

The 1971 Editorial Board of the *Federal Law Review* comprised Mr P. A. McNamara, Editor; Mr J. D. McMillan, Assistant Editor; Mr R. T. J. Stein, Book Review Editor; Fiona M. Brotherton, Business Manager; Mr K. M. Crotty, Mr J. D. Gunther, Mr A. J. Halkyard, Mr G. C. Harders, Mr M. J. Higgins, Mr R. G. Mills, Mr A. van Wierst and Mr L. A. Warnick.

*Federal
Law Review*

Mr D. E. Harding acted as Faculty Adviser. The publication of the eighth issue was marked by a dinner at Ursula College at which the guest speakers were the Honourable Mr Justice A. F. Mason and the Right Honourable Sir Harry T. Gibbs.

The moot program continued to function effectively under Mr Pape's guidance. Its purpose is to teach students the practical skills involved in advocacy and the preparation of a comprehensive brief. Participation is compulsory for all students after first year.

Moots

The Law School was represented at the Australia and New Zealand Intervarsity Law Schools Moot Competition held at Auckland in May 1971 by a team comprising Mr P. P. Costello, Mr P. A. McNamara and Mr R. E. Withnell.

The 1971 executive of the Society comprised Mr G. R. Clark, President; Mr P. J. Power, Vice-President; Mr P. P. Costello, Secretary; Mr I. M. Cameron, Treasurer.

*Australian
National
University
Law Society*

The guest speaker at the Society's annual dinner was Professor Z. Cowen, Vice-Chancellor, University of Queensland. Several other guest speakers addressed the Society during the year including the Honourable D. L. Chipp

M.P., Minister for Customs and Excise, and members of the Australian Capital Territory Police Force who demonstrated the use of breathalyser equipment. During the year the Society took steps to establish a legal referral service. Fifty students have volunteered their services and negotiations are still proceeding.

*The Law
School
Building*

The decision of the Australian Universities Commission on the University's submission for the extension of the building during the 1973-75 triennium is still awaited.

In the Law Library both pressure on seating and shortage of space for bookshelves is acute. It was necessary during the year to sacrifice most of the moot preparation room for shelves. Further sets are housed temporarily in the crowded staff workroom.

Classroom use expressed in hours per week is amongst the highest in the School of General Studies. Again it was necessary to hold classes in the H. C. Coombs Lecture Theatre which is very unsuited for law teaching as it has no benches and because discussion between the teacher and class is very difficult to conduct as a result of the theatre's design.

PUBLICATIONS

ATITYAH, P. S.

The Sale of Goods. 4th Ed., Pitman, 343.

An Introduction to the Law of Contract. 2nd Ed., Oxford, 282.

'Compensation for the injured.' *Modern Law Review*, XXXIV, iv, 432-6.

Consideration in Contracts: A Fundamental Restatement. Australian National University Press, 61.

'Misrepresentation, warranty and estoppel.' *Alberta Law Review*, IX, ii, 347-85.

'Loss of earnings or earning capacity.' *Australian Law Journal*, XLV, v, 228-33.

'Compensating the accident victim.' *Australian Quarterly*, XLIII, ii, 16-24.

BENJAFIELD, D. J.† & WHITMORE, H.

Principles of Australian Administrative Law. 4th Ed., Law Bk Co., 367.

BURNETT, R.

'Chinese participation in the United Nations, some legal implications.' *LAWASIA*, II, 51-79.

DAVIES, G. J.

'Equity, notice and fraud in the Torrens System.' *Alberta Law Review*, X, i, 106-25.

DAVIES, J. L. R.

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THE FACULTY OF SCIENCE

REPORT OF THE DEAN

Professor I. G. Ross

A ruminant is an animal equipped to present difficultly digestible material to several different digestive processes. In this sense, the Faculty of Science is in a ruminative phase. It is digesting the difficultly digestible.

One portion of its intake is of its own making. The semester system, introduced in 1969, is still revealing its opportunities and complexities. The system is stimulating, but is admittedly imperfect. The logic of the scheme requires that all the principal subjects in the Faculty should work to a common semester plan. Our first year is not so organised, nor are the mathematics departments (located in other faculties), nor can we yet mount repetitions, in each semester, of key courses—essential, if the complexities of timetabling are to be overcome.

But also, the Faculty has been required to work within new kinds of constraints, and our eventual expectations, in respect of the size, nature and number of departments, must plainly be rethought. These consequences flow from a new method of calculating staff entitlements vis à vis student enrolments; from Council's determination of the ultimate size of the University; and from general considerations of costs. These considerations are serious. Compared with most other Australian universities, in which much teaching in science is provided in the form of service courses for other faculties—medicine, dentistry, pharmacy, agricultural and veterinary science, engineering—the science departments in this University are small, and lack the economies of scale which are now built into the assumptions, in the Australian university system, concerning what a science faculty should be. Without wishing at this stage to be alarmist, or to particularise, we predict that the present forecasts will prove indigestible and that some kind of restructuring of the faculty will prove necessary. Evaluation of alternative plans will be prominent in faculty affairs over the next few years.

Meanwhile, there have been some observable events. The Department of Biochemistry is now housed in a new, permanent building, and Chemistry, with an extensive new wing, valuably linked to the Research School of Chemistry, has been gathered together in one building.

Courses have been mildly modified; the most notable development is the introduction of masters' programs (by course work) in Forest Management and in Psychological Counselling.

Enrolments

New student enrolments increased sharply (22%). The early admissions policy is thought to be responsible, since an unexpectedly and disproportionately high number of these early admissions were to the Faculty of Science. There is no way of knowing whether this trend will persist. Probably it will not, especially if other universities follow this University's lead.

Staff changes in the Faculty were: Professor J. D. Smyth has been succeeded by Professor S. A. Barnett as Head of the Department of Zoology; Dr D. M. Griffin, Master of Burgmann College, has a half-time appointment in the Department of Forestry; new lecturers are Dr I. S. Ferguson and Dr P. R. Stevens, Department of Forestry; Dr J. A. McDonald, Department of Geology; Dr May-Jane Chen and Dr R. K. Darroch, Department of Psychology. Dr A. J. R. White, Department of Geology, left for a chair at La Trobe University and Dr D. G. Beswick, Department of Psychology, for the Institute of Advanced Studies. These last two positions have been disestablished—the first manifestations in respect of senior appointments of the revised staffing policy and, for the departments concerned, a matter of consequence.

Staff

As the Faculty has grown and matured so has its productivity in research. The following figures provide measures of research activity over the past eight years.

Research

	1964	1965	1966	1967	1968	1969	1970	1971
Publications	63	79	116	130	126	176	188	222
Degrees of Doctor of Philosophy awarded	2	8	8	11	14	15	18	16
Degrees of Master of Science awarded (by thesis)	1	4	13	11	18	11	13	12

It is of interest that the number of higher degree graduates is not manifestly increasing. Because of the long time lapse between choice of a postgraduate career, and eventual graduation, the consequences of publicity about the so-called surplus of degrees of Doctor of Philosophy in science have probably not yet become apparent; the present figures probably merely reflect the increasing competition from non-science departments for scholarships for the degree of Doctor of Philosophy.

The actual nature of research in the Faculty is necessarily diverse: there are ten departments, and within each department there is a spread of interests dictated by the need to provide wide coverage in teaching. Concentration of research in particular areas is the exception rather than the rule, and an attempt to summarise research activities comprehensively would be unrewarding. Instead, illustrative examples are quoted, one from each department, with the intention that different examples will be given in subsequent report.

Biochemistry—Molecular studies of mosquito-borne viruses. The life-cycle of many insect-transmitted viruses depends on their multiplication in both an insect (normally the mosquito) and a vertebrate host. Virus growth may kill vertebrate cells but not the tissues of the mosquito vector. Such a virus is the Ross River virus, which causes polyarthritis. The mode of multiplication of this, and similar viruses, in vertebrate cells and in mosquito cells, is being investigated. The aim is to determine, at a molecular level, why insect cells are able to tolerate the growth of the virus. (Dr L. Dalgarno and associates; the project is being sup-

ported by the Australian Research Grants Committee and is being conducted in collaboration with the John Curtin School of Medical Research and with the Division of Entomology, CSIRO.)

Botany—Crop hybridisation, hay fever. Pollen grains carry on their outer surfaces a considerable load of proteins. Allergic responses to these proteins are responsible for hay fever in man, yet their natural function is entirely different. It is these proteins which control recognition of pollens by the female organs of the plant. Recognising this, it has proved possible so to interfere with the natural role of these proteins that crop species, previously regarded as incompatible, can be hybridised. (Dr R. B. Knox, with Australian Research Grants Committee support.)

Chemistry—Nitrogen fixation. Nitrogen, from air, is currently converted to ammonia (for fertilisers, and every other use) by a high temperature, high pressure reaction. The roots of leguminous plants can achieve the same process with ordinary air, at ordinary temperatures, through an enzyme catalyst known to contain molybdenum, which is probably linked to sulphur. Newly-devised molybdenum-sulphur compounds have shown ability to link to molecular nitrogen. The area is one of intense current interest, but such compounds are nevertheless still uncommon, and known compounds which might plausibly mimic natural enzymes are particularly few. (Dr J. A. Broomhead, with Australian Research Grants Committee support.)

Forestry—Root fungus scourge. The soil borne fungus *Phytophthora cinnamomi* was found in 1922 in cinnamon plants in Sumatra, and has since been associated with dieback disease in horticultural and forest crops throughout the world. In Australia, it strikes ornamental plants in home gardens, seedling conifers, fruit trees, pineapples and native plants—and has destroyed some 300 square miles of jarrah forest. The fungus is most likely indigenous to eastern Australia, and its control is a major problem. Forest road construction and the use of mechanised vehicles appear to be spreading the fungus disease. A major research program is investigating the aetiology of the disease, and the possibility of controlling it. Sub-projects range from tests of fungicides, through studies of resistance mechanisms in eucalypts and pines, to the effects of site disturbance and the possibility of manipulating the soil environment in the interests of disease control. (Dr W. H. Heather and Dr D. Pratt. This project is supported by forest authorities of the states and territories, and by the principal paper manufacturers; co-operative studies are being undertaken in the Research School of Chemistry.)

Geology—Palaeontology of vertebrate animals. The Department of Geology is currently seeking support on an international scale for the study and preservation of Australian fossil vertebrates. Limestones near Canberra (Taemas Bridge—Wee Jasper area) are a notably rich source, and have yielded new evidence on the development of the cranium in primitive lungfish; strontium isotope dating techniques (these fossils are nearly 400 million years old) show that these are marine remains. It is hoped to extend the studies to vertebrates of higher grade which are abundantly present in Australia. (Dr K. S. W. Campbell, with support from the Peabody Museum of Natural History, Yale University.)

Physics—Solid state nuclear reactor materials. The so-called 'pebble-bed' nuclear reactor places the fissionable plutonium in ceramic pellets. The heat generated in reaction is swept away in a gas stream. Diffusion of radioactive materials from the solid pellets to the gas stream carries dangerous contamination to other parts of the reactor. The practical implications have been studied by work on model systems in which selected impurities have been incorporated in solid magnesium oxide. Mobility of possible fission products, at specified temperatures, has been found to depend, in a theoretically predictable way, on the radii of the diffusing atoms; thus beryllium (radius thirty-five billionths of a centimetre), at 1000°C, diffuses one thousand times faster than barium (radius 135 billionths). (Dr A. J. Mortlock, supported by the Australian Atomic Energy Commission.)

Psychology—Child mortality among Aborigines. A three-year project has been completed. The aim was to discover the social factors contributing to the high death rates among infants in an aboriginal settlement (Walbiri tribe) in Central Australia. Reaching, in terms of culture and language, a people who had been in contact with Europeans for as few as five years, proved difficult. On all measures, present beliefs and practices in respect of food-values, treatment of disease, etc., show a blend of the traditional and introduced cultures, and the study provokes an evaluation of settlement living as a transitional stage in the assimilation of aborigines. (Dr Margaret R. Middleton and Dr S. Francis, supported by the Commonwealth Department of the Interior.)

Theoretical Physics—The theory of optical instruments. Recent developments in commercial optical instruments, including the everyday camera, are not simply the result of better methods applied to known theory. The theory of the defects of the image formed by an optical instrument is a subject of continuing study in the department. In particular, the possible use of inhomogeneous glasses has been investigated at length. This has incidentally led to collaboration with the Research School of Biological Sciences on the problem of insect vision. As regards the general theory of optical instruments, methods were developed for actually calculating image defects for instruments which have (a) an axis of symmetry, (b) only a plane of symmetry, or (c) no symmetry at all. (Professor H. A. Buchdahl and Dr P. J. Sands, with Australian Research Grants Committee support.)

Zoology—Intestinal parasites. One project is directed towards the development of a vaccine to control hydatid worms. A single substance obtained from laboratory-grown parasitic tissue has been isolated; when injected into the host animal it stimulates the development of immunity to the disease. The metabolic pathways of tapeworms and of their host animals are being compared, in the hope that additional chemical methods of attack on the parasite may be developed. The environment in which the parasites live within a free-ranging animal needs to be continually monitored. Miniature radio transmitters have therefore been developed which broadcast physiological information from the alimentary tract of unrestrained dogs. (Dr C. Bryant, Dr R. E. Barwick and Dr D. D. Heath, with support from the Australian Meat Research Committee and the Rural Credits Fund of the Reserve Bank of Australia.)

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THESES

Thesis titles of work successfully submitted by research students in the Faculty of Science on whom degrees were conferred in 1971:

- BOTH, R. A. *Doctor of Philosophy*
 'Minor element geochemistry of sulphide minerals in the Broken Hill Lode, N.S.W.' *Department of Geology.*
- CHUONG, P. H.
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 'The influence of energy transfer mechanisms on the spectral properties of the neodymium: Glass laser.' *Department of Physics.*
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- JONES, B. G.
 'Stratigraphy and sedimentology of the upper Devonian Pertnjara and Finke groups, Amadeus Basin, Northern Territory.' *Department of Geology.*
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- McKINNELL, F. H.
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- MILLAR, B. D.
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- O'SHEA, J. M.
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- CHRISTIANSEN, B. F.
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'Studies on the sparganum of *Spirometra Erinacei*.' *Department of Zoology*.

LEONG, C. H. D.

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SLADE, J. C.

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THE UNIVERSITY LIBRARY

REPORT OF THE UNIVERSITY LIBRARIAN

Mr J. J. Graneek

As indicated in the following table total expenditure on the Library increased by 21% in 1971 over the comparable figure for 1970:

*General and
Finance*

	1970	1971
	\$	\$
Salaries and salary related items	695,334	828,278
Acquisitions (books and periodicals)	362,049	468,355
Binding and sundries	78,142	76,181
Total	1,135,525	1,372,814

Despite an embargo for most of the year on recruitment of new staff, the salaries component maintained the inflationary trend of recent years. In addition to the 6% cost of living increase which was applied to all salaries, approval was given to improved salary scales for professional staff, which brought this University's scales into line with those paid in other Australian university libraries. Increased expenditure on acquisitions was made possible by additional allocations for general purposes in implementation of the program of expansion in the Library's submission for the 1970-72 triennium supplemented by a number of special grants amounting to \$43,000. Of this total \$30,000 were earmarked for the purchase of reprints in the humanities, \$10,000 for back sets of life sciences periodicals and \$3,000 for materials required in support of the Contemporary China program of the Research School of Pacific Studies.

Following the retirement in December of Miss C. Campbell-Smith, Associate Librarian, School of General Studies, approval was given to a restructuring of the administration organisation of the Library. The pattern of two Associate Librarians has been retained but an attempt has been made to achieve a more functional division of responsibilities. Miss J. M. Waller, Associate Librarian (Collection Building and Reader Services), is now responsible in respect of all materials, except those in Asian vernacular languages, for all aspects of these services in the R. G. Menzies Building, the J. B. Chifley Building and branch libraries. She will be assisted by four subject specialists (in science, humanities, social sciences and law) in the grade of senior librarian, who will be responsible, in close co-operation with the academic staff, for development of the collections, and who will participate in bibliographic projects and reader education programs.

*Administrative
Organisation*

Mr K. N. J. Bernie has been promoted to the newly created post of Associate Librarian (Administration and Technical Services).

Miss E. Bishop, with the title of Divisional Librarian Asian Studies, remains responsible for all aspects of collection building, reader services and technical services in respect of material in Asian vernacular languages.

Sections and
Branches

Advanced
Studies

R. G. Menzies Building

The established pattern of a high standard of service in support of research activity in the social sciences has been well maintained. The fear which was expressed in some quarters that admission of undergraduate readers to the R. G. Menzies Building might impair the quality of the service proved to be unfounded. On the basis of a report submitted by the Librarian, the Library Committee was able to assure the Boards of the Institute of Advanced Studies and the School of General Studies that, whereas under the present arrangement no undergraduate who has a need for access to research collections is debarred therefrom, there is no evidence that use by undergraduates is creating problems for postgraduate readers.

The amenities of the R. G. Menzies Building have been markedly improved by the installation of complete air-conditioning and by structural alterations to the lower ground floor. Additional accommodation became available on completion of the undercroft storage area but the resultant benefits were short-lived. Towards the end of the year it became urgently necessary to provide accommodation for the new computer installation and it was agreed that as a temporary measure the Library should make the undercroft storage area available for this purpose. It is hoped that compensating provision will be made to enable the Library to house its expanding collections and developing services in the interim, pending erection of the R. G. Menzies Building extension which it is now hoped will be accorded high priority for the 1976-78 triennium.

General
Studies

J. B. Chifley Building

Undergraduates continue to make extensive use of the collections and services in the J. B. Chifley Building. The Readers Adviser Unit, which now consists of two full-time qualified assistants (with some support from the subject specialists already appointed or to be appointed) has had a particularly successful year. There are signs, both among teaching staff and undergraduates, of increasing awareness and appreciation of the services rendered. The readers' guide to the General Studies collection, which was a joint enterprise of Library and Design Unit staff, proved to be effective both in terms of content and presentation and won high praise from librarians and others interested in Australia as well as overseas.

Asian
Studies

The distribution of the 6,962 items added to the collection was as follows:

Chinese	2,157
Japanese	1,484
Korean	356
South Asian	1,450
South-East Asian	1,295
Western Languages	107
Other	113
Total	6,962

As a result of the grant by the Ford Foundation of a sum of \$13,000 to be spent over three years, it was possible to make a start on the systematic acquisition of a wide range of materials in book form and in microfilm relating to modern and contemporary China. It is expected that this program will become fully operative early in 1972 with the arrival in Canberra from Hong Kong of the newly appointed senior librarian whose salary will also be a charge on Ford Foundation funds.

In the South-East Asian field the Library has undertaken for a trial period of six months responsibility for the cataloguing of publications supplied to libraries participating in the Indonesian Acquisition project.

Reclassification of the collections is now virtually complete to the apparent satisfaction of the users, both teaching staff and students. A printed list of current serials was produced and the Law Library staff took a major part in the preparation of a Union List of Legal Periodicals for Australian libraries to be published on behalf of the Australian Law Libraries Group by the Law Book Company in 1972. *Law*

Mr P. Biskup, Law Librarian since July 1969, submitted his resignation on appointment as Senior Lecturer in the Department of Librarianship in the Canberra College of Advanced Education.

The additional accommodation resulting from the extensions carried out in 1970 has been fully utilised. The newly installed carrels and the abstracts consulting area proved to be particularly welcome additions. Reclassification of the monograph collection was completed. *Medical Sciences*

The planned extension was almost completed by the end of the year and the new space will be occupied early in 1972. The existence of two classification schemes created difficulties for some newly arrived members of the research staff and it was agreed that a high priority should be accorded in 1972 to reclassification of the collection as a whole. *Physical Sciences*

The two collections, one in Geophysics and the other in Geology, developed along pre-determined lines but there remains a need for further rationalisation of collecting policies and it is hoped to achieve this in the course of 1972. The newly established Geophysics collection is providing a highly appreciated service to its specialised clientele. *Earth Sciences*

The collection is developing at a satisfactory rate in the lower ground floor area of the R. G. Menzies Building and is threatening to outgrow the space allocated. A Users Committee has been appointed and has produced a brief for the life sciences library which it is hoped will be approved as a high priority for the 1973-75 triennium. *Life Sciences*

Acquisitions

The following tables show the intake of books acquired by purchase, gift and exchange:

	<i>Purchases</i>	<i>Gifts and Exchanges</i>	<i>Total</i>
Advanced Studies . . .	8,985	3,623	12,608
General Studies . . .	15,776	2,900	18,676
Asian Studies . . .	6,440	522	6,962
Branches—			
Law . . .	3,609	277	3,886
Medical Sciences . . .	1,399	60	1,459
Physical Sciences . . .	1,557	253	1,810
Chemistry . . .	583	15	598
Life Sciences . . .	1,040	150	1,190
Astronomy . . .	776	107	883
Earth Sciences . . .	885	794	1,679
New Guinea Research Unit .	164	639	803
Total . . .	41,514	9,340	50,554

During the year a total of 452 accessions was cancelled and various transfers between the main libraries and branches took place, so that the distribution of volumes at 31 December was as follows:

	<i>1970</i>	<i>1971</i>
Advanced Studies . . .	189,486	200,700
General Studies . . .	158,936	177,397
Asian Studies . . .	82,066	88,919
Branches—		
Law . . .	28,365	33,453
Medical Sciences . . .	31,130	32,582
Physical Sciences . . .	20,724	22,342
Chemistry . . .	5,455	6,057
Life Sciences . . .	3,350	4,556
Astronomy . . .	7,547	8,429
Earth Sciences . . .	7,011	8,933
New Guinea Research Unit .	4,247	5,051
Total . . .	538,317	588,419

Notable Benefactions

The number of items received by gift and exchange was the highest ever recorded in any one year. Outstanding among the donations were a collection of several hundred volumes presented by French and German publishers on the occasion of the 28th International Congress of Orientalists held in Canberra in January 1971; some 2,000 volumes, mainly in the fields of Polish history, literature and theology, presented by the Reverend Father L. Jaroszka of Geelong for incorporation in the Polish collection; approximately 2,000 titles presented by Mrs Lyttleton Taylor of Tamworth, comprising monographs and sets of periodicals, mainly in the field of the fine arts with particular emphasis on Asian and oriental art; approximately 2,000 items presented by Professor C. C. Berg, formerly at the State University of Leyden, being the bulk of his private library, mainly in the field of Indonesian linguistics and culture; upwards of 1,000 items, mainly in law and English literature, presented by Dr G. E. Parker of the Department of Law, Research School of Social Sciences.

Professor F. J. Fenner, M.B.E., F.A.A., F.R.S., presented to the University a sum of \$2,000 for the purchase of books and periodicals relating to natural resources to be housed in the life sciences library.

The pattern of Library use is reflected in the following statistics:

Service To
Readers

	1969	1970	1971
<i>Transactions recorded at Loans Desks</i>			
Advanced Studies	71,849	77,152	77,992
General Studies—			
Reserved books	150,677	160,859	184,643
Others	92,056	104,274	115,016
Total	314,582	342,285	377,651
<i>Inter-library loans—Borrowed</i>			
Advanced Studies	4,006	3,196	2,598
General Studies	2,278	2,166	2,247
Total	6,284	5,362	4,845
<i>Inter-library loans—Lent</i>			
Advanced Studies	5,728	6,091	6,144
General Studies	1,687	2,065	2,414
Total	7,415	8,156	8,558

The Reader Services Division of the Advanced Studies section of the Library completed two bibliographic projects—a classified list of *Theses Accepted for Higher Degrees* in the Australian National University (together with a supplement) and a brochure entitled *How to Locate Theses in Progress or Completed at Australian Universities*. These were distributed within the University and made available at a nominal charge to other libraries. The first draft was also produced of a publication provisionally entitled *Bibliographic Aids to Research in History and Politics, Especially on Australian Topics*. New procedures for providing improved reference service to individual scholars were devised and are being systematically tested and applied.

The principal activities of the cataloguing department are recorded in the following table:

Technical
Services

<i>Titles catalogued and classified</i>				
	<i>Western languages</i>		<i>Asian languages</i>	<i>Total</i>
	<i>Monographs</i>	<i>Periodicals</i>		
1969	22,076	1,058	3,622	26,756
1970	21,171	969	3,210	25,350
1971	23,781	991	3,237	28,009

The number of titles catalogued was the highest yet recorded in any one year but there was some falling off in the number of titles reclassified, namely, 10,700 against 16,363 in the previous year. This was partly due to the nature of the materials handled and partly the result of staff changes. Approval has been given for an additional grant to enable the reclassification project to be expanded. It is hoped that in 1972 it will be possible to recruit suitably qualified

supplementary staff and thereby recover the momentum of previous years and bring the operation to a conclusion well within the period of ten years from its inception in 1966, which was the original estimate for its duration.

The physical growth of the catalogue may be gauged from the fact that 430,000 cards were produced and interfiled. This rate of growth in itself creates problems of housing and access which are of considerable concern and which have engendered a number of investigations designed to simplify the task of the reader seeking information and guidance from the catalogue records.

Automation

Thanks to the co-operation of the Canberra College of Advanced Education and its willingness to provide access to its computer facilities, considerable progress was made with the two projects which have been in abeyance because it had not been possible to obtain computer time on the University's machine. A variety of print-outs relating to reserve books and current serials acquisitions is now ready for use. Two other projects are being actively developed—a semi-automated control of staff and postgraduate loans and a comprehensive acquisitions record.

Exhibitions

The McDonald Room and adjacent area in the R. G. Menzies Building housed as in previous years a variety of exhibitions. Among these were—an archaeological exhibition held in conjunction with the 28th International Congress of Orientalists; a display of contemporary Japanese design; an inter-university photographic exhibition held in conjunction with the Aquarius Festival of University Arts; an exhibition of Ghanaian arts and crafts; bark paintings and aboriginal artifacts, organised by the Kanangra Society; arts and crafts of the Sepik region; and an exhibition of paintings by a member of the University's gardening staff.

In addition, a number of exhibitions was arranged in the J. B. Chifley Building, of which the most notable was one designed to mark the centenary of the Paris Commune of 1871, organised in conjunction with a series of lectures provided by the History of Ideas Unit in the Research School of Social Sciences.

Professional Staff Activities

The Librarian was appointed Chairman of the UNESCO Committee for Museums and Libraries and of the Australian Capital Territory Book Resources Committee.

Miss Waller, as chairman, and Miss Bishop, as secretary of the local planning committee, were responsible for the library seminars held as part of the 28th International Congress of Orientalists. As joint editors, they have been preparing the papers presented at the seminars under the title 'International Co-operation in Oriental Librarianship'.

Miss Bishop served as editor of the *Newsletter of the International Association of Orientalist Librarians*, of which the first issue appeared in July. She also presented a paper entitled 'South-East Asian Resources and Services: Progress and Planning' at the sixteenth Biennial Conference of the Library Association of Australia, held in Sydney in August.

Mrs Marjory I. Day was chairman of the planning committee of a seminar on publications of international organisations held under the auspices of the Australian Capital Territory Branch of the Library Association of Australia.

CENTRE FOR CONTINUING EDUCATION

REPORT OF THE DIRECTOR

Dr C. Duke

The Centre for Continuing Education has a diversity of functions. It is a providing body intended particularly to mobilise the educational resources of the University for various extra-mural groups, a channel or bridge between the University and various of the communities which constitute Australian society, a neutral forum for the consideration of selected controversial issues, and an academic department studying continuing education as an emerging field for university investigation. Progress has been made in 1971 in each of these areas.

The Centre has both a national and a local (Australian Capital Territory) responsibility. Nationally the number and level of courses has increased. With accumulating experience the Centre has begun to tackle kinds of conferences and seminars calling for particular sensitivity and skill, of a sort which might not be attempted with success by any other agency. A science and industry 'Encounter' in June brought together representatives of university chemistry departments and of industries employing graduate and postgraduate students in research laboratories and other situations. A sub-committee of that 'Encounter' drawn from both sides and the Centre undertook to produce a report to take further the dialogue between universities and industry. A major conference in a new 'Australia's World' series examined relations with Indonesia as a trading partner in August. Well over 100 senior executives from commerce and exporting industries attended the conference, in preparation for which a staff member of the Centre visited Djakarta at the time of an Australian Trade Fair there; the conference appears to be having influence on emergent trade practice with Indonesia. A closed seminar on 'Defence Policy and Procurement' took place in April, arranged jointly with the University of Sydney Extension Board; this attracted senior participants from appropriate public service departments and the Armed Forces, as well as from industries producing armaments and other equipment of interest to the Forces and the Department of Supply.

Another exercise arranged without press publicity was on the retention and loss of teachers from the State school systems. This brought to Canberra by invitation for three days senior department personnel, the heads of teacher unions, and the arbitration heads from all States, together with selected Commonwealth participants and resource people from this and other universities, the Canberra College of Advanced Education and from industry. The seminar examined reasons for resignation, the state of statistical and other knowledge, and channels for co-operative improvement in the situation, particularly through enhancement of job satisfaction in practising teachers. A week-end seminar in September examined the implications of reform or repeal of the law relating to abortion. Other ventures included month-long language courses in Japanese and Chinese (the latter jointly with the Canberra College of Advanced Education), National

Religion and Journalism Summer Schools, a ten-day residential seminar on the 'Development of Human Resources' for managers and administrators, a refresher school for pharmacists and a seminar on English teaching, and a conference on children's diet entitled the 'School Tuck Shop' (these three recruiting mostly locally); a symposium on the 'Neurogenic Bladder' which brought together specialists from different branches of medicine for the first time, and a conference arranged in conjunction with the 28th International Congress of Orientalists examined teaching about Asia in Australian schools.

A six-week course of training was provided on the culture, identity and future of the Aborigines for a selected group from all regions and from both traditional and urbanised Aborigines. A conference and a training course on 'Small Group Learning' in May, arranged with the University of Sydney Extension Board, explored this increasingly significant approach to teaching and learning. A national conference on reality and reform in schools was so designed as to launch working parties in different cities and regions to explore problems thrown up at the conference. In December the last national exercise of the year was a residential seminar on the fishing industry arranged for and with the Commonwealth Department of Primary Industry. The Centre also administered for the Social Science Research Council (now Academy of the Social Sciences of Australia) what is intended to be the first of a series of annual month-long courses on mathematics for social scientists. In all the Centre arranged twenty-four schools, seminars and conferences attended by 1,358 people.

Locally the main provision was again the class program for residents in the Australian Capital Territory. This was further modified compared with previous years and continued to widen its diversity of university disciplines, and the areas for multi-disciplinary exploration of current concern, drawing on a large number of departments of the University. A thirteen-week in-service course on health and welfare in Canberra was run again. It is intended that this course should devolve to another agency after 1972. The Centre was increasingly involved, mainly locally but also at a national level, as an adviser or consultant in aspects of continuing education, both for formal educational activities and for the development of educative dimensions in other kinds of work. The Centre receives many more requests for assistance as a providing body, from both within the University and without, than it is able with existing resources to meet; it is therefore desirable that it should develop this advisory role to complement its providing function.

Discussion has been continued with groups within the University and outside with a view to developing more extended residential refresher courses for selected groups, such as high school teachers, principals or inspectors, public service personnel, migrants to Australia with professional qualifications who are at present unable to practise, trade union leaders, and others. These talks have exposed some general reluctance at present to recognise the need for more substantial refresher education, and also the difficulties in the way of mobilising internal teaching resources on a substantial scale for external populations. The effect at present is for the Centre to move increasingly towards special seminars designed to examine areas of Australian society which benefit from the application of academic perspective, rather than to develop more extended refresher

courses. During the year the Centre has sought to become more of a bridge between the University and the community. Co-operation has increased with a large number of external agencies, both educational institutions, such as the Canberra College of Advanced Education and other universities, and also public service departments, industry, community groups, professions, and other agencies and institutions around the country. In some instances this contact has been of direct and acknowledged benefit to sectors within the University. In all the Centre made use of teaching staff in one or another capacity from all research schools and faculties of the University, from twenty-three different departments or units in the Institute of Advanced Studies and twenty-one in the School of General Studies; this mobilisation of resources for teaching purposes suggests the question whether the Centre or some other agency should develop more systematically some way of mobilising University resources of a research kind.

As an academic department committed to the study of continuing education the Centre has made progress in several directions. Research has continued on the class program clientele, leading towards the development of a model for understanding the function of such classes; Mr B. H. Crew has continued his work on the history of Australian education, and in the second half of the year was on study leave to examine this and other matters. Other work has been on problems of evaluating forms of provision, on the relations between a philosophy of continuing education and the needs of a changing technological society, and on forms of small group teaching and learning. The Centre has begun to publish appropriate papers such as those arising from the Small Group Conference. Weekly seminars in aspects of continuing education have drawn participants from different States and from different sectors of the community; an edited collection of a number of these papers is to be published. A senior lecturer from the University of Adelaide has worked throughout the year at the Centre, applying systems and organisation theory to adult education. The Director continues to be editor of the *Journal of the International Congress of University Adult Education* and a Vice-President of the Australian Institute of Human Relations. He is a member of the Postgraduate Committee in Medicine of this University and of a committee set up to develop an association for training personnel in the Australian Capital Territory. He presented a keynote paper at the national conference of adult educators in Perth. He was succeeded as an executive member of the Australian Association of Adult Education by Dr A. T. Davies, who was awarded a doctorate of the University of Melbourne for research in the field of chemistry. Members of the Centre have spoken formally and informally to a variety of institutions and groups on aspects of continuing education.

Allocation of scarce resources across a wide diversity of needs continues to be the main problem for the Centre. Efforts have been made to sustain a balance between the servicing and the academic functions of the University, while developing the leadership which continuing education in Australia so clearly needs. The present condition and recognition of continuing education in Australia's main tertiary educational institutions gives no cause for complacency and the Centre remains conscious of its significant position in the evolution of continuing education in Australia and of its somewhat exposed situation.

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AUSTRALIAN NATIONAL UNIVERSITY PRESS

REPORT OF THE DIRECTOR

Mr W. A. Wood

The Press is the publishing department of the University administering the University imprint and publishing fund. General responsibility for and control of the Press are vested in the Vice-Chancellor. An Editorial Committee, consisting mainly of members of the academic staff, supervises editorial policy, authorises publications, and advises the Director.

During 1971 twenty-seven new books and one journal were published; 42,463 copies of books were printed and 38,405 bound. Continuing trends noted before, a number of new publications dealt with the past and present in East and South-East Asia, the Pacific and Australia. Press acclaim greeted publication of the two concluding volumes of Professor C. D. Rowley's *Aboriginal Policy and Practice*. Five public lectures given at the University were published, and fifteen publications issued by other departments were taken on for commercial distribution, both activities being services traditionally rendered. Ninety-two manuscripts were submitted in 1971, of which twenty-three were accepted for publication.

The Director visited the USA and Canada to see publishers and the Press's new distribution agency on that continent. The Editor travelled to Papua New Guinea to reinforce the publishing interest of the Press in subjects Melanesian.

Early in the year the Press was honoured to receive the highest design award of the Australian Book Publishers Association for the 1970 title, *Tomorrow's Canberra*.

Heavy emphasis continued to be placed on distribution abroad. A number of editions were sold to overseas publishers, and new sales agencies were appointed in India and Italy. Programs for regular mail announcements and advertising were developed further in the past year, being directed principally to the book trade in Australasia but also to more than a thousand overseas libraries and booksellers.

Mr J. Iremonger was appointed Production Manager to fill an important vacancy, but no new positions were established. The Director was re-elected President of the Association of Australian University Presses.

PUBLICATIONS

ATIYAH, P. S.

Consideration in Contracts: A Fundamental Restatement

BROWN, B. (ed.)

Asia and the Pacific in the 1970s: The Roles of the United States, Australia and New Zealand

CLARKE, W. C.

Place and People: An Ecology of a New Guinean Community

- COOKSEY, R.
Lang and Socialism: A Study in the Great Depression
- COOMBS, H. C.
Other People's Money: Economic Essays (clothbound and paperbound editions)
- EPSTEIN, A. L., PARKER, R. S. & REAY, MARIE O. (eds)
The Politics of Dependence: Papua New Guinea 1968
- FRODSHAM, J. D.
New Perspectives in Chinese Literature
- HOLBRAAD, C. (ed.)
Super Powers and World Order
- HUCK, A.
The Assimilation of the Chinese in Australia
- JENNINGS, J. N.
Karst.
- JENNINGS, J. N. & MABBUTT, J. A. (eds)
Landform Studies from Australia and New Guinea (paperback reprint)
- KELLY, J. H.
Beef in Northern Australia
- LEONG SOW-THENG
Sino-Soviet Relations: The First Phase 1917-1920
- LIEW, K. S.
Struggle for Democracy: Sung Chiao-jen and the 1911 Chinese Revolution
- MCGAURR, D.
Conscription and Australian Military Capability
- MULVANEY, D. J. & GOLSON, J. (eds)
Aboriginal Man and Environment in Australia
- NAKANO, MIYOKO
A Phonological Study in the 'Phags-pa Script and the Meng-ku Tzu-yun'
- O'NEILL, R. J.
The Army in Papua-New Guinea: Current Role and Implications for Independence
Peking-Hanoi Relations in 1970
- ROSS, L.
John Curtin for Labor and for Australia
- ROWLEY, C. D.
Outcasts in White Australia (Aboriginal Policy and Practice—Volume II)
The Remote Aborigines (Aboriginal Policy and Practice—Volume III)
- SHINEBERG, DOROTHY L. (ed.)
The Trading Voyages of Andrew Cheyne, 1841-1844
- TWIDALE, C. R.
Structural Landforms
- WITTFOGEL, K. A.
Agriculture: A Key to the Understanding of Chinese Society, Past and Present
- DEPARTMENT OF SOCIOLOGY, INSTITUTE OF ADVANCED STUDIES
The Australian and New Zealand Journal of Sociology (2 issues)

COMPUTER CENTRE

REPORT OF THE HEAD OF THE CENTRE

Dr M. R. Osborne

The problem of computer overload continued during the year, but decisive action has now been taken to remedy this situation and substantial relief should be available in 1972.

The first decision taken was to purchase a PDP-11 computer for \$110,000. This machine was ordered in May for delivery in October and is already providing some relief. However, problems with the supplied software have prevented maximum benefit being obtained.

The major step was made when it became clear that funds would not be provided for the Joint Centre with the CSIRO, and that the CSIRO were planning independent computer procurement. The University then decided to ask for bids for a major new computer installation, and also investigated the possibilities of buying computer time and renting computer hardware. The installation of a large Univac 1108 system was approved by a unanimous decision of the Computer Advisory Committee. This system will be installed in March and should be available to the University shortly thereafter. It is expected that it will give a performance improvement of some seven times the current equipment.

The Centre's research activities are now concentrated in the fields of numerical analysis and on-line computer applications. In numerical analysis, contributions during the year include new methods for optimisation, the solution of problems in mathematical geophysics, and integral equation. A console system for the computer is currently being implemented. Work is being carried out on computer hardware and computer addressing schemes.

Introductory programming courses were provided whenever there was sufficient demand; longer courses were given throughout the year to outline the available facilities and to give the relevant theoretical background in the fields of scientific computation, information processing, digital circuit design, and real time computer use. Colloquia are organised jointly with the CSIRO, and a one-day seminar on 'Optimisation' was organised in December and attracted over three hundred participants. The University of Queensland Press undertook the publication of the proceedings of our previous one-day seminar on 'Data Acquisition and Real Time Systems'.

Members of the Centre's staff have made important contributions to several seminars and conferences held during the year.

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'On an algorithm for discrete non-linear L_1 approximation.' *Comput. J.*, **14**, 184-8.

¶ Member of the Department of Statistics, School of General Studies.

* Based on work done while a member of the Department.

UNIVERSITY HOUSE

REPORT OF THE MASTER

Professor Emeritus R. N. Robertson, C.M.G., F.A.A., F.R.S.

At the end of 1971 the composition of the Governing Body was as follows:

*Governing
Body*

Master: Professor Emeritus R. N. Robertson.

Fellows: *Retiring 15 August 1972*: Mr J. F. Atchison, Dr R. E. Barwick, Dr A. R. Crawford (Deputy Master), Professor C. R. Heathcote, Mr S. M. Khan.

Retiring 15 August 1973: Dr P. A. Arriens (Steward), Mr W. J. Caelli, Mr P. E. M. Standish (Bursar).

The Master was in residence throughout the academic year except for an absence of two weeks in January-February visiting London to represent the Australian Academy of Science at discussions with representatives of the Royal Society of London, the Royal Society of New Zealand and the Canadian National Research Council. He was also absent in hospital for some weeks as a result of accidents. During the year he continued research on the biochemistry of mitochondrial membranes in collaboration with Dr D. Weiss, F.A.A., of the CSIRO and Dr F. L. Bygrave of the Department of Biochemistry, School of General Studies.

Professor Robertson was re-elected President of the Australian Academy of Science. During the year he delivered the J. G. Wood Memorial Lecture to the Australian Society of Plant Physiologists, the Occasional Address to the Third Biennial Convocation of the Australian College of Dental Surgeons and the Bertrand Russell Memorial Lecture to the Science Association of Flinders University.

The Chancellor, Dr H. C. Coombs, F.A.A., has been frequently in residence in the Chancellor's flat during the year.

The Chancellor

The total membership increased to about 775, including fifty-six visitor members and seventy-three invited members. Over 135 regular new members were enrolled. There has been further decrease in the number of research students in residence during the year; this decrease was due to the increase in alternative accommodation available in Canberra, particularly with the opening of Graduate House, self-contained flats for unmarried research students. There was, in consequence, a considerable fall in occupancy rate during the year because the number of casual visitors did not offset the reduced number. This decrease in occupancy posed some very difficult financial problems for University House, which is seeking more casual residents attending conferences in Canberra, visiting government departments, etc. In particular, an arrangement has been made with the Centre for Continuing Education to hold their short conferences in University House and to provide accommodation for the visitors to Canberra attending these conferences.

*Members and
Residents*

<i>Tariff</i>	The tariffs for permanent residents were increased from 1 January 1971, except for research students. A further increase in tariffs had to be made in July 1971 following the very marked increase in domestic staff wages, due to the Union award.
<i>Visitors</i>	<p>The Creative Arts Fellow for 1971, Mr Stanislaw Ostoja-Kotkowski, was resident in the House for most of 1971.</p> <p>During the year the House was glad to have as residents many distinguished visitors to the University including a high proportion of those listed earlier in this Report as Visiting Research Workers or Visitors.</p> <p>Many members of the staffs of Australian universities and national institutes have also stayed in the House.</p>
<i>Buildings and Grounds</i>	The rearrangement of chairs and tables in the Common-room has been appreciated by most people because it is socially easier than the previous groupings. The most noticeable change in the public rooms has been the installation of Leonard French's paintings, 'The Seven Days of Creation'. The six rectangular panels have been hung in the Hall foyer, and the large medallion on the end wall of the Hall above High Table. These paintings, which belong to the University, have created much interest, and added greatly to the appearance of the Hall.
<i>Library and Record Collection</i>	The library has been in constant use during the year; over 3,450 borrowings were recorded and there were many acquisitions either by gift or by purchase. The Music-room has been as popular as usual and many new records have been acquired.
<i>Functions and Activities</i>	<p>The Commencement Dinner was held on 2 March and was attended by about 120 members. Guest Nights were held on 30 June and 13 October. The University Consort presented musical programs at the Commencement Dinner and one of the Guest Nights. At the other Guest Night, we had a program from the Deakin High School Pre-baroque Consort which was very much appreciated. Guest Tables have been arranged four evenings a week during term and two evenings a week out of term; the average number taking part has been about fourteen. These provide opportunities for members of the House to dine with casual residents and invited guests.</p> <p>The light lunch served in the bar and in the Fellows' Garden has increased in popularity, particularly with non-resident members.</p>
<i>Residents' Committee</i>	With the low number of research students in the House, it was agreed that the Residents' Committee should be suspended pro tem. Various members of the House have undertaken, as individuals, the duties normally performed by the Residents' Committee.

The Committee appointed by Council to look into the role and functions of University House consisted of the Master (Chairman), Professor G. Sawyer, Professor C. A. Gibb, O.B.E., Mr D. M. B. Butt, Mr A. D. Crombie and Mr R. A. Hohnen, O.B.E. The full report of the Committee went before the December Meeting of Council. As a result of that report, it has been decided to widen eligibility for membership of University House to include any graduate employed by the University or any graduate of the University.

*Council
Committee*

PUBLICATIONS

ROBERTSON, R. N.

'How good is science?' *Annals of the Australian College of Dental Surgeons*, 3, 14-18.

Science: Its Scope and Limits. Second Bertrand Russell Memorial Lecture, Flinders Univ. Science Association, 13.

STUDENT RESIDENCES

BRUCE HALL—*Warden*: Mr W. P. Packard

BURTON HALL—*Warden*: Mr G. G. Rossiter

GARRAN HALL—*Warden*: Dr J. R. T. Short (on leave until July 1971)

Acting Warden: Dr B. E. Kent (until June 1971)

GRADUATE HOUSE—*Chairman of the Governing Body*: Mr J. Boland

There was a marked increase in the overall applications for residential accommodation from 1970. As in previous years male applicants were predominant, making up about 60% of applicants. This is reflected in the following table which shows the numbers of males and females, undergraduates and postgraduates, in the halls during 1971:

<i>Halls</i>	<i>Undergraduates</i>			<i>Postgraduates</i>			<i>Total</i>
	<i>Men</i>	<i>Women</i>	<i>Total</i>	<i>Men</i>	<i>Women</i>	<i>Total</i>	
Bruce	129	71	200	16	1	17	217
Burton	125	105	230	12	1	13	243
Garran	131	88	219	10	1	11	230

In addition to the two existing affiliated colleges, John XXIII and Ursula, a third, Burgmann College, established by six Protestant churches, opened in First Term. To a large extent the increased numbers seeking accommodation were absorbed into Burgmann's initial 150 places. Although Burgmann's buildings and facilities were not completed by the beginning of First Term, co-operation from the other halls and colleges enabled the College to open with the minimum of inconvenience to the foundation residents.

Because of the relative lack of females Ursula College was again forced to draw a proportion of residents from outside the University. A small surplus of male applicants was housed in various types of private accommodation by the University Accommodation Officer.

Undergraduate scholars, both University and Commonwealth, were well represented in the halls. Achievement in the annual examinations was again high with only four residents failing all subjects. Just on 80% of hall undergraduates passed all their subjects.

The Halls of Residence Committee met twice during the year and as a result of its discussions modifications to the operation of the halls of residence were recommended. These related mainly to the composition of hall governing bodies. The Committee itself was enlarged to include the chairman of the Hall Junior Common-rooms and the chairman of Graduate House Governing Body.

The opening of Graduate House for postgraduate students in April marked another important development in the history of the University's residential accommodation. Graduate House has 100 motel-type units for single students

and eight double units for married couples. There are no central cooking or eating areas, each unit having a small table stove as well as washing and bathroom facilities. Although designated as a hall of residence it is administered by a governing body of seven members, five being residents, and has a full-time secretary to undertake detailed clerical work on behalf of the Governing Body. There is one large common-room with adjoining kitchen facilities. Demand by postgraduate students for places in Graduate House has been heavy and a waiting list has already been established. Graduate House has, to date, proved successful as a residence offering an alternative kind of accommodation to that provided by University House and the undergraduate halls of residence.

Hall finances were again the subject of a number of discussions. After consideration of rising costs and the ability of the halls to absorb these it was decided that hall fees would have to rise in 1972 from \$630 to \$685. Discussions later in the year began reviewing the impact on the halls and colleges of a change to the structure of the teaching year. It was recognised that conferences continued to be a significant portion of a hall's income and the fact that these were often booked up to four years in advance made it more difficult to contemplate early changes to the academic year structure.

STUDENT ASSOCIATIONS AND WELFARE

REPORT OF THE DEAN OF STUDENTS

Professor L. R. Zines

My term as Dean of Students commenced on 1 October 1971, on the retirement from that office of Professor C. M. Williams. Professor Williams' contribution to the development of contacts between students, staff and University Administration was outstanding. He was also of invaluable assistance in helping me to familiarise myself with the duties of the position.

Much of my time has been concerned with undergraduate scholarships and with students who hold them. Considerable changes were made in 1971 to the scholarships schemes. One committee was established to deal with both National Undergraduate scholarships and Asian Studies scholarships in place of the previous two committees. Asian Studies scholarships are now given only to scholars with at least one year's experience at a university; at the same time, National Undergraduate scholarships are available to students who wish to pursue a degree of Bachelor of Arts(Asian Studies). This amalgamation will, it is believed, be a more effective means of achieving the objects of both schemes. These scholarships have continued to bring to the University students of high calibre from all parts of the country.

The University now has a wide range of student welfare services and help in one form or another is available to students from a variety of sources. In last year's Report, my predecessor drew attention to the fact these services were not fully understood by many students. A booklet prepared by Professor Williams and officers of Student Administration should do much to improve this position. It may be that some single point of contact should be made known to students who are not sure of the most appropriate persons from whom to seek assistance. In the meantime the Dean of Students to some extent serves this function.

As a result of initiative taken by the Students' Representative Council, and upon the recommendation of the Student Welfare Committee, the University has agreed that a costs analysis of a proposed dental scheme be carried out. Professor N. D. Martin, University of Sydney, has agreed to undertake a diagnostic survey of the dental condition of a sample group of students. This should occur in mid-April 1972.

Student representation on departmental committees, faculty education committees and faculties, has been an established part of University government for the past two years. By and large, it has proved a successful arrangement, although its effectiveness has varied somewhat from faculty to faculty and within faculties from time to time. In many cases, it has been of considerable educational value in itself to the student members. Some faculties and departments have noted an increasing tendency for students to be much better prepared for meetings and have observed an improved standard of debate and discussion. The sheer diversity of interests of students and groups of students

in the University, however, means that these formal structures are not a substitute for more informal contacts. Like my predecessors, I consider it desirable that more casual meetings and discussions among administrators, academics and students should continue and indeed increase.

UNIVERSITY HEALTH SERVICE

The year was notable for a marked (53%) increase in the number of consultations, out of proportion to the increase in student population (10%). Thus, the major increases in consultation rates were accounted for by full-time students. Approximately 52% of all full-time undergraduate students enrolled at the University attended the University Health Service, while 48% of full-time postgraduate students did so. On the other hand only 12% of eligible part-time students consulted the Health Service, the majority presumably visiting their local general practitioners when in need of medical help.

Consultation Rates

As in previous years, students from the Faculties of Arts and Asian Studies tend to be over-represented and students from the Faculty of Science and the Department of Forestry under-represented in visits to the Health Service, students from the Faculty of Law occupying an intermediate position. There has been a progressive relative increase in the proportion of visits from students in the Faculty of Economics and a progressive relative decrease in the proportion of visits from students in the Faculty of Science and Department of Forestry since 1969.

The most time-consuming and significant increase in consultations at the Health Service both by undergraduate and postgraduate students has been in the field of mental health.

Mental Health

One of the reasons for a disproportionate increase in seeking advice for emotional problems may be a wider acceptance of the Health Service in this area. On the other hand the change may represent a true increase in stress reaction to academic work loads, competitive pressures, uncertain motivation in choice of course, and disillusionment in the type of educational experience which the University has to offer. Emotional disorders are often more apparent amongst intellectually gifted and diligent students, who are subjected to the additional fear of losing their scholarships if their academic performance does not measure up to the required standards.

One of the indices of stress was seen in the ten students presenting through the Health Service with overdosage of tranquillising or sedative drugs (prescribed elsewhere), three of whom required hospital admission and subsequent psychiatric care.

During the first two weeks of November, sixteen students presented to the Health Service with acute examination stress, and either completed their examination papers in the Health Centre or were granted deferred examinations. Thus, males showing signs of emotional maladaptation were on an average ten months younger and females seven months younger than their counterparts presenting with predominantly physical complaints.

Emotional Stress and Age of Enrolment

At a meeting of the Directors of the Australian University Health Services and Student Counsellors of Victorian Universities at La Trobe University on 21 and 22 May 1971, concern was expressed about the disillusionment and sometimes depression experienced by many students on the aims and context of university curricula. The above findings are consistent with the view that some of the difficulties may be related to emotional immaturity and pressures for too hasty decisions about university education. The following recommendations of the La Trobe conference were favourably received by the Australian Vice-Chancellors' Committee, the Australian Universities Commission and the Department of Education and Science — (a) that more flexibility should be built into the award of Commonwealth and other tertiary scholarships to encourage prospective students to travel, work, or otherwise gain experience of non-academic aspects of education for living. This flexibility might include scholarship deferment up to three years after leaving school or of a one-year break during an undergraduate degree course to allow time for personality development and for clarification of choice of subjects for study; (b) that a substantially greater proportion of mature-age scholarships be offered to persons in their twenties and thirties who are motivated to obtain academic qualifications as an aid to their chosen careers.

A positive encouragement by the University to accept students after a break of one or two years from full-time academic work would probably reduce the wastage in terms of student withdrawals, academic failure and sense of personal inadequacy, which are partly reflected in attendance at the Health Service.

Overseas Visits

A total of 574 students and staff members attended the Health Service for prophylactic inoculations and medical advice on overseas travel, including a party of students from the Department of Zoology who undertook a field trip to the medically isolated island of Taam in Indonesia.

The increase in overseas travel is reflected in the rise in the number of inoculations given, which has more than doubled since 1969.

Exercise

During the year over one hundred tests of cardio-respiratory function were performed on students and staff members, entailing measurement of pulse rate response to exercise on a standard step or bicycle ergometer. Less than 50% of subjects showed a satisfactory level of endurance fitness, although those who subsequently undertook an exercise program have reported an improved feeling of wellbeing, and some have noted a more satisfactory sleep pattern and mental working capacity.

In the sedentary academic environment there is still a good deal of reluctance to accept the fact that physical and mental health are interrelated. A common excuse for failure to take exercise is lack of time, even though an effective level of cardio-vascular fitness can be maintained with as little as one hour endurance-type exercise per week—constituting less than 1% of waking hours. The proposed construction of squash courts on campus during 1972 should offer a good alternative opportunity to team sports for maintaining cardio-vascular health.

Mr J. E. Gough, who has headed the Counselling Service since 1965, resigned at the end of 1971 to take up a position as Head of the School of General Studies at the Gordon Institute of Technology. During his period at this University, the University Counselling Service has grown and expanded its activities to cover not only personal counselling but also careers and appointments advice, help in the areas of efficient English and efficient reading and a growing part-time and vacation student employment service.

In 1971 there were three Counsellors in the Service—Mr J. E. Gough, Mrs Margaret Evans and Mr D. Judge; Mr S. Rawling, the Careers and Appointments Officer, was assisted by Mrs Shirley Kral in charge of vacation and part-time student employment. In the area of communication and study skills Mr B. Palfrey has been lecturer in efficient English with Mrs Lyndon Rose running courses in efficient reading.

The Service is still located in the south wing of the Copland Building but will move into permanent quarters on completion of the new University Union Building. Numbers using the service continue to increase, with the total number of 674 clients seen in 1971 resulting in 2,628 counselling hours. The largest categories of clients were undergraduates and pre-entry students with relatively small numbers of postgraduate students and staff members.

With the advent of a Director of Psychiatric Services in the Australian Capital Territory, there was established a course of training for those working in positions which brought them into contact with people in need. The Counselling Service has assisted with this course by providing a series of lectures on counselling together with leadership for a sensitivity group in the course held this year.

*Community
Health and
Welfare
Training
Course*

An experimental program was offered in First Term to introduce interested students to the basic philosophy and approaches of counselling psychology. Ten sessions were held and about a dozen students participated in the course. One of the values of the course appeared to be its illustration of the particular contribution of professional counselling. The repetition of such a course for both staff and students alike was recommended by the group.

*Student
Group in
Counselling*

The Counselling Service gave a seminar series, covering major theorists in counselling psychology and common psychological disorders, for students studying for the degree of Master of Arts in counselling psychology.

There was continued expansion and dissemination of information about career opportunities through the distribution of the *Graduate Careers Directory* and a further publication *Into Employment*. The careers library with information about scholarships, postgraduate study and general career information was kept up-to-date and expanded and made readily available for consultation.

Response to campus interviews—when final-year students had an opportunity to make a personal contact and get first hand information from an employer—has been disappointingly low in 1971. The explanation for this is not clear.

A survey of the destinations of graduates was carried out again in 1971. Plans are under way for a national conference 'Graduates for What?'—to be held in Canberra in August 1972 when all aspects of the employment of graduates in Australia in the nineteen-seventies will be examined.

Figures from the student employment office reflected the tightening job situation current in Canberra. Full-time labouring in the building industry was down slightly: the number of students taken in the Commonwealth Public Service during the summer was one-third of last year's total. However, new opportunities for vacation work were found in the Australian-Japanese wood-chip mill at Eden, New South Wales, and sympathetic publicity resulted in a response from the general public offering work in homes and gardens so that the number of vacation jobs found was only twenty less than last year. The most startling increase in casual work has been in the field of coaching for school and higher school certificates—from twenty to seventy-nine!

The efficient English service received a very steady response from students throughout the year, with extremely heavy demand in First and Second Term. Academic staff showed a keen interest in the work and gave great encouragement to their students to attend where necessary. The work is almost exclusively by means of individual tuition and attendance is voluntary.

This is proving a rich field and it is clear that such a service can expect to make a significant contribution not only to the students, by assisting in the bridging operation from school to university, but also to staff, through courses in communication and expression for university administrators, and perhaps, also, to academics. The first such course for administrators was conducted by Mr Palfrey during eight weeks of the Second Term.

The efficient reading service moved from its Childers Street location to a small house near the Copland Building. One hundred and fifty-six undergraduates enrolled for the courses offered in First and Second Term and twenty-two graduates in Third Term. Sixty-seven students did not complete the course due to timetabling difficulties or unrealistic expectancies about their rate of improvement.

The year 1972 will see the appointment of a new director of the Counselling Service. This would seem to be an opportune time to reconsider the functions and reappraise the University's future needs in the area of student services.

UNIVERSITY UNION

In 1971 the Union had 4,002 undergraduate members, 820 postgraduate members, twenty-two staff and twenty-six life members, a total of 4,870 compared with 3,895 last year. This substantial increase of 975 members overall occurred because members of the Research Students' Association, at a general meeting early this year, resolved to become members of the Union in a body. The Union Board of Management was delighted to accept this proposal in the hope that it would achieve a more effective co-operation between various sections of the University in the field of extra-curricular activities, as well as in relation to the use of available amenities.

The present composition of the Board is: Mr W. R. C. Jay: The Vice-Chancellor's nominee; Mr G. A. Colman: Council representative; Mr W. C. Fairbanks: the Bursar's deputy; Mr W. P. Packard: Staff Association representative; Mr N. Gray: Sports Union representative; Mr A. N. Stokes: Research Students' Association representative; Mr M. Wright: Students' Representative Council; Mr R. Ahuja, Mr V. K. Bhalla, Mr M. E. Cunliffe, Mr J. Gorter, Mr P. J. Mayer, Mr J. Griffin, Mr P. Power, Mr R. C. Refshauge, Mr G. Smith, Miss J. Wookey: elected by the general membership.

Nominations to fill the elected positions were called in the middle of the year and as there were as many nominations as positions, the election was declared.

During the year the following changes in Board membership took place. In accordance with Clause 12(1) of the Constitution, the Bursar of the University, Mr W. S. Hamilton, appointed Mr W. C. Fairbanks, the University Budget Officer, as his deputy on the Board.

Mr R. Ahuja, who was elected Chairman for the current year, was unable to continue in his office due to business commitments and resigned his Chairmanship, while retaining his membership of the Board.

The Research Students' Association representation also changed during the year—Mr A. N. Stokes replacing Mr D. J. Scott on the Board.

The staff of the Union consisted of the Secretary to the Board, Mr E. C. de Toth; Assistant Secretary, Mr H. E. Falvey; and sixteen other permanent members.

Revenue was received mainly from four sources—annual membership fees, initial enrolment fees, development fees and an allocation from the service fee levied on all postgraduate students by the University.

Financial accounts for the calendar year 1971 are not yet available. Preliminary figures suggest, however, that the total revenue will show an increase of \$10,282 over that of the previous year. Running costs (without an anticipated trading loss) are likely to be over \$65,067, representing an increase of \$9,663 over the expenditure incurred during the previous year, but expenditure on capital items was decreased by about \$774. The bulk of the capital expenditure of \$4,640 was connected with the extension and improvement of the Union bar. This extension was necessary due to the substantial increase in use prompted both by the Aquarius Festival of University Arts, held on the campus from 15 to 23 May, and by the increasing popularity of the facilities available in the Union.

The increased usage of the Union bar has made the enforcement of tight controls of admission, as well as of liquor consumption, necessary. The Union has done this successfully, a fact which is shown by the efficient and trouble-free operation of this service right through the year.

The Union successfully co-operated with the organisers of the Aquarius Festival of University Arts to look after the material well-being of participants by providing a wide range of facilities well beyond its normal scope. This included the provision of temporary external eating facilities for over 6,000 visitors. It was regrettable and entirely beyond the Union's sphere of responsibility that

this costly facility was under-used and, as a result, it produced a loss to the organisers of the Aquarius Festival of University Arts. The Union's operation on this scale would have been impossible without the full co-operation of the University and the opportunity is taken to place on record the Union's indebtedness and appreciation to the University for its assistance on this important occasion.

As a result of the improvements in the Union's facilities, the number of functions held in the building increased substantially during the year. The Students' Association ran six functions with an attendance of about 1,800 people; individual clubs and societies ran seventeen functions with about 1,600 people present and the Union itself organised forty 'admission-free' functions and the Annual Dinner at subsidised prices, attended altogether by approximately 15,000 people. Among functions organised by the Union, the success of the traditional events of the Union calendar—the Staff/Student Cricket Match, the Art Exhibition, the Annual Union Dinner and a series of Staff/Student socials—merit special mention.

The success of these functions suggests that the Union as a community centre on the campus is doing its job to the satisfaction of the general membership.

In spite of the sharply rising costs in the economy, the increase in food and drink prices in the Union was kept below the level experienced in the community at large. This was due to the Board's policy of charging only direct costs to the catering service. By doing so the Union has assisted the less well-off section of the student population to make ends meet and it was, in fact, following principles applicable to departmental canteens of the Commonwealth Public Service.

This year has seen the finalisation of the building plans for a new Union. Over and above the Australian Universities Commission grant, members of the Union will contribute an amount of over \$280,000 to assist in financing the building. It is anticipated that building will commence on schedule and the new Union will be available for members' use at the beginning of the 1973 academic year. Increased usage of the present building has shown the urgent need for larger premises and better equipment. For these reasons, it is imperative that the scheduled completion date should be met.

The Board gratefully acknowledges the receipt of the substantial Commonwealth grant to facilitate the building of a new Union and also draws attention to the significant financial contribution of past, present and future members of this Union whose efforts and thriftiness have accumulated funds to provide better amenities and ensure the repayment of the \$250,000 bank overdraft.

At the moment the Board has under consideration the spending of additional capital funds from available reserves to remedy any shortcomings in the new building. Should these be insufficient and should running costs continue to rise, an upward adjustment of Union fees can hardly be avoided for 1973.

The Board, on behalf of the Union thanks the University Council for agreeing to guarantee this overdraft and thanks the Vice-Chancellor and all members of the University Administration for the valuable help the Union has received from the University throughout the year.

During 1971 the flatette accommodation in Graduate House for postgraduate students became available and the Association was concerned with the organising of the building, the selection of the secretary and the many details of furnishings and fittings. The University Administration was most co-operative and the adopted concept of a hall of residence essentially governed by the occupants was much to our liking. The 100% occupancy rate ever since the opening is obvious proof of the popularity of this type of accommodation.

*Research
Students'
Association*

Research scholars' grants and allowances were increased by 7.6% as from 8 October 1971, as a result of the University's willingness to keep stipends in line with the consumer price index.

The thesis typing scheme continues to operate satisfactorily but has undergone some minor revisions. The Association is now employing a part-time secretary to administer the scheme and she also has been invaluable in unburdening the executive of many other administrative tasks.

There has been a considerable increase over the last twelve months in the number of applications to our welfare fund for loans. This prompted a re-organisation of the fund and a rethink of the criteria for making grants.

The Credit Union agreed to interview and counsel all future applicants and to recommend a course of action to the Association's trustees. Students have benefited greatly from the Credit Union's willingness to act in this welfare capacity.

The Association prepared a submission on the housing situation for married scholars and certain financial concessions were granted. Certain anomalies still remain with regard to the eligibility for occupancy of University housing but these can only be satisfactorily removed by the building of further accommodation, a solution that we are assured is under review.

During the year the Association voted two sizeable grants to be given to the Aquarius Festival of University Arts organisers and the National Tribal Council—Aboriginal Community workshop and voter education campaign. The Association should shortly become a member of the Australian Union of Students independently from the Student's Association.

Finally, a survey is presently being undertaken as a basis for a submission on supervision of postgraduate students in the University. Various proposals for a change in the basic structure of the degree for Doctor of Philosophy are currently being considered.

For the Students' Association, 1971 was a year of continuous activity concerned with the Aquarius Festival of University Arts, anti-racist campaigns, and the inflationary spiral.

*Students'
Association*

The Association was faced by several crises during the year but, unlike the previous year, few were of its own making. The earlier problems of injunctions against the Association and internal Students' Representative Council wranglings were things of the past, and it was only in relation to *Woroni* that an attack was faced. At the moment when amendments to the University Act were before

the Parliament, the Orientation Week issue of *Woroni* raised strong objections from Federal Senators and threatened the passage of the amendments. This crisis was averted when the Association acted, at a general meeting called to discuss the question, to avoid a repetition of the sort of material objected to.

The year 1971 will be remembered as the year in which inflation hit the Students' Association. Hall fees, tuition fees and eventually Students' Association fees, were increased. However, with all these increases there was some glimmer of hope. The University Council recognised the need to examine the case for the abolition of tuition fees and the Association hopes that in 1972 further progress will be made in tackling this problem. With the depressed state of the economy and the resultant well-publicised difficulty in finding vacation employment—the necessary life blood of a student's finances—the increases in living and academic costs will have serious repercussions on the ability of students to continue their studies. The University has recognised this problem and loan assistance and the provision of further Lennox House cheap accommodation will hopefully alleviate some of the immediate difficulties. However, the Association believes that in the long term the problem will worsen and hopes that the Government will take action as quickly as possible.

Clubs and societies were active on campus during the year. The cultural clubs particularly were boosted by the Aquarius Festival of University Arts in the May vacation, and the Association agrees that, despite the financial problems and logistic difficulties, the festival was a great success as a creative and cultural experience.

Political activity was led by the Moratorium, Anti-Apartheid, and East Pakistan Relief campaigns. All these campaigns mobilised students in great numbers and the action, particularly in the campaigns to sever sporting links with South Africa, resulted in considerable publicity of the issues involved. At no time during the campaigns did the Association support the use of violence.

Attention also turned in 1971 to the question of disciplinary versus inter-disciplinary studies, with Dr S. V. Boyden's proposal for a course on the Study of Man opening the way to a broader-based, more comprehensive education. Students showed great interest in this question and 1972 should see it become a matter of considerable debate.

Sports Union

The year has been an active one in the Sports Union's capital development program. In addition to the new boat-shed on Sullivans Creek being completed (the largest Sports Union structure to date) a cricket pitch was constructed on North Oval to provide facilities for social cricketers and the finishing touches were added to the remade oval on North Road. Late in the year a contract was let for the construction of the new Union and Stage I of the Sports Centre in University Avenue. It is anticipated that the Sports Centre facilities, which will include six squash courts, will be available for use in the closing months of 1972.

The increased space in the new building will be greatly appreciated as over the past two years the Sports Union itself has acquired a number of items of sporting equipment. These are kept in the office and lent to groups, rather than formal clubs, wishing to play social matches, etc. Sports Council has noted an increasing demand for this type of recreation as opposed to competitive sport

and is devoting an increasing proportion of funds towards satisfying it, e.g. the new cricket pitch mentioned earlier. Coupled with this trend is a strong demand for individual and small group activities. The main area the Sports Union provides for this at the moment, is the Kingsley Street Hall where further improvements were made during the year to the weight-training-room. Unfortunately, the size of the main hall in the building restricts most indoor games, such as volley ball and badminton, but plans have been drawn up for Stage II of the Sports Centre which is a field house of adequate size to cater for this demand. A submission was made during the year to the Australian Universities Commission for funds to build Stage II in the 1973-75 triennium.

The year has been the second of the initial two-year contract with the Executive Secretary. Sports Council has been pleased with the development of Union activities during this period and from February 1972 the Executive Secretary will hold permanent appointment to the position.

As has been the case in previous years, the Sports Union has enjoyed and benefited from a close working relationship with the University Administration during the year.

PUBLICATIONS

FURNASS, S. B.

'Environmental education at the tertiary level.' In *Education and the Environmental Crisis*, Australian Academy of Science, Report 13, 101-6.

'Recreation for community health.' *Med. J. Aust.*, 2, 4, 208-11.

*University
Health
Service*

BUILDING PROGRAM SUMMARY

<i>Buildings Completed in 1971</i>	<i>Date Completed</i>
<i>Research Schools of Social Sciences and Pacific Studies</i>	
Extensions to H. C. Coombs Building	May 1971
<i>Research School of Pacific Studies</i>	
Construction of houses for New Guinea Research Unit .	May 1971
<i>School of General Studies</i>	
Biochemistry Building	May 1971
Extensions to Forestry Building	May 1971
<i>General University</i>	
Melville Hall	May 1971
Graduate House (Postgraduate Residence)	March 1971
Air-conditioning—R. G. Menzies Building of the University	
Library, Law Building and Chancelry Stage I	February 1971
Boat-house	September 1971
 <i>Buildings Under Construction in 1971</i>	 <i>Estimated</i>
<i>Research School of Physical Sciences</i>	<i>Completion Date</i>
Extension to Cockcroft Building	February 1972
Extension to Mathematical Sciences Building	February 1972
Building for Tandem Accelerator	July 1972
	<i>Estimated</i>
<i>John Curtin School of Medical Research</i>	<i>Completion Date</i>
Extension to Animal Breeding Establishment	March 1972
<i>Research School of Biological Sciences</i>	
Permanent Building	August 1972
<i>School of General Studies</i>	
Arts Building Stage III	February 1972
<i>General University</i>	
{ New Union Building	
{ Sports/Recreation Centre	Late 1972
{ University Health and Counselling Services	
<i>Affiliated College</i>	<i>Date Completed</i>
Burgmann College	June 1971

UNIVERSITY STATISTICS

FULL-TIME STAFF

AS AT 30 APRIL 1971

<i>Designation</i>	<i>Males</i>	<i>Females</i>	<i>Total</i>
<i>Teaching Staff</i>			
Professor	38	1	39
Associate Professor	5	..	5
Reader	31	..	31
Senior Lecturer	89	14	103
Lecturer	82	13	95
Senior Demonstrator, Senior Tutor	30	14	44
Demonstrator, Tutor, Teaching Fellow	3	7	10
Total Teaching Staff	278	49	327*
<i>Research Staff</i>			
The Institute of Advanced Studies			
Professor	52	..	52
Professorial Fellow, Reader, Senior Fellow	114	3	117
Fellow, Senior Research Fellow, Research Fellow	216	10	226
Junior Research Staff	41	90	131
Total Research Staff, The Institute of Advanced Studies	423	103	526**
The School of General Studies			
Senior Research Staff	3	1	4
Junior Research Staff	14	28	42
Total Research Staff, The School of General Studies	17	29	46
Total Research Staff, The Australian National University	440	132	572
<i>Technical Staff</i>			
Technical Officer	230	19	249
Assistant	185	116	301
Total Technical Staff	415	135	550
<i>Library Staff</i>			
Professional	12	48	60
Other	20	56	76
Total Library Staff	32	104	136

* Includes nine 'special full-time' *Teaching Staff* and four staff of the Centre for Continuing Education.

** Includes thirteen 'special full-time' *Research Staff* and seven staff of the Computer Centre.

FULL-TIME STAFF

AS AT 30 APRIL 1971—*continued*

<i>Designation</i>	<i>Males</i>	<i>Females</i>	<i>Total</i>
<i>Sundry Staff</i>			
Centre for Continuing Education†	2	5	7
Computer Centre††	8	4	12
Data Processing Unit	6	18	24
Counselling and Student Advisory Services	3	4	7
Health Services	1	2	3
Halls of Residence	..	5	5
Audio-visual Services	5	3	8
Multilith Service	6	2	8
Student Union, etc.	1	1	2
Translation Unit	1	..	1
Total Sundry Staff	33	44	77
<i>Central Administration Staff</i>			
Chief Administrative Officer	7	..	7
Senior Administrative Officer	5	2	7
Administrative Officer	29	2	31
Administrative Assistant	34	6	40
Clerk, Typist, etc.	89	213	302
Total Central Administration Staff	164	223	387
<i>Departmental Administration Staff</i>			
Administrative Officer	..	..	..
Administrative Assistant	..	..	..
Clerk, Typist, etc.	10	193	203
Total Departmental Administration Staff	10	193	203
<i>Development Work and Construction Staff</i>			
Professional Staff	6	3	9
Tradesman Staff	..	..	..
Other Staff	17	4	21
Total Development Work and Construction Staff	23	7	30
<i>Maintenance and Other Staff</i>			
Maintenance of Buildings	60	3	63
Caretaking and Cleaning	95	73	168
Gardens, Grounds and Playing Fields	42	..	42
Domestic Staff	59	103	162
Messengers, Porters, Attendants and other General Services	20	31	51
Stores	30	6	36
Total Maintenance and Other Staff	306	216	522
Total Staff	1,701	1,103	2,804

† Excludes four staff who are shown under *Teaching Staff*.

†† Excludes seven staff who are shown under *Research Staff*.

(A) THE INSTITUTE OF ADVANCED STUDIES—RESEARCH STAFF

AS AT 30 APRIL 1971

<i>Departments, etc.</i>	<i>Pro- fessors</i>	<i>Profes- sorial Fellows, Readers</i>	<i>Senior Fellows, Fellows, Senior Research Fellows, Research Fellows</i>	<i>Research Assistants, Research Officers</i>	<i>Total</i>
<i>The John Curtin School of Medical Research</i>					
Biochemistry	1	1	7	4	13
Clinical Science	1	1	2	2	6
Experimental Pathology	1	..	6	1	8
Human Biology . . . . .	..	1	2	4	7
Immunology	1	..	3	1	5
Medical Chemistry	1	2	10	2	15
Microbiology	1	1	7	2	11
Physical Biochemistry	1	1	5	3	10
Physiology	2	1	8	1	12
Other	1	..	1	..	2
Total	10	8	51	20	89
<i>The Research School of Physical Sciences</i>					
Applied Mathematics	1	..	1	..	2
Astronomy	1	4	13	5	23
Engineering Physics	1	..	9	4	14
Geophysics and Geochemistry	2	2	16	7	27
Mathematics	2	1	9	1	13
Nuclear Physics	2	1	13	4	20
Solid State Physics	1	..	1	1	3
Theoretical Physics	1	2	9	1	13
Diffusion Research Unit . . . . .	..	1	2	..	3
Electron and Ion Diffusion Unit . . . . .	..	..	3	..	3
Total	11	11	76	23	121
<i>The Research School of Social Sciences</i>					
Demography	2	1	5	3	11
Economic History	1	1	3	2	7
Economics	1	2	3	1	7
History	1	2	6	2	11
Law	1	1	3	1	6
Philosophy	2	1	6	1	10
Political Science	2	1	4	6	13
Sociology . . . . .	..	..	4	2	6
Statistics	2	..	2	..	4
Education Research Unit . . . . .	..	1	2	4	7
History of Ideas Unit	1	..	1	1	3
Urban Research Unit . . . . .	..	..	3	2	5
Other	1	..	2	10	13
Total	14	10	44	35	103

(A) THE INSTITUTE OF ADVANCED STUDIES—RESEARCH STAFF

AS AT 30 APRIL 1971—continued

<i>Departments, etc.</i>	<i>Pro- fessors</i>	<i>Profes- sorial Fellows, Readers</i>	<i>Senior Fellows, Research Fellows</i>	<i>Research Assistants, Research Officers</i>	<i>Total</i>
<i>The Research School of Pacific Studies</i>					
Anthropology and Sociology	1	1	6	2	10
Biogeography and Geomorph- ology	1	2	3	3	9
Economics	1	4	9	5	19
Far Eastern History	1	1	6	6	14
Human Geography . . . . .	..	1	3	3	7
International Relations	2	1	6	4	13
Linguistics	1	..	4	2	7
Pacific History	1	1	5	4	11
Prehistory	1	..	3	5	9
New Guinea Research Unit . . . . .	..	..	7	2	9
Director's Section	1	..	..	..	1
Total	10	11	52	36	109
<i>The Research School of Chemistry</i>					
Analytical Chemistry . . . . .	..	..	1	..	1
Inorganic Chemistry . . . . .	..	2	14	..	16
Organic Chemistry	1	1	9	..	11
Physical and Theoretical Chemistry	1	1	8	..	10
Total	2	4	32	..	38
<i>The Research School of Biological Sciences</i>					
Developmental Biology	1	..	5	1	7
Environmental Biology	1	..	7	2	10
Genetics	1	..	7	..	8
Neurobiology	1	1	4	1	7
Molecular Biology Unit . . . . .	..	1	..	1	2
Taxonomy Unit . . . . .	..	..	2	..	2
Other	1	..	..	1	2
Total	5	2	25	6	38
Total Research Staff	52	46	280	120	498

(B) THE SCHOOL OF GENERAL STUDIES—TEACHING STAFF

AS AT 30 APRIL 1971

<i>Departments, etc.</i>	<i>Pro- fessors</i>	<i>Associate Pro- fessors, Readers</i>	<i>Senior Lecturers</i>	<i>Senior Tutors, Demon- strators, Tutors, Teaching Fellows</i>	<i>Total</i>
<i>The Faculty of Arts</i>					
Classics	1	1	5	..	7
English	2	3	6	2	13
French	1	..	5	..	6
Geography . . . . .	..	1	5	2	8
Germanic Languages	1	..	5	..	6
History	3	2	13	5	23
Linguistics	1	..	3	..	4
Mathematics—					
Applied	1	1	3	..	5
Pure	1	..	8	2	11
Medieval Studies . . . . .	..	..	1	..	1
Philosophy	1	2	6	1	10
Political Science	2	2	9	2	15
Russian . . . . .	..	..	3	..	3
Sociology	1	..	2	..	3
Total	15	12	74	14	115
<i>The Faculty of Asian Studies</i>					
Asian Civilizations	1	3	5	1	10
Chinese	1	1	2	1	5
Indonesian Languages and Literatures	1	..	4	1	6
Japanese	1	1	2	1	5
South Asian and Buddhist Studies	1	..	3	..	4
Total	5	5	16	4	30
<i>The Faculty of Economics</i>					
Accounting and Public Finance	1	1	5	1	8
Economic History	1	1	5	..	7
Economics	2	1	9	5	17
Statistics . . . . .	..	2	5	1	8
Total	4	5	24	7	40
<i>The Faculty of Law</i>					
Total	4	1	14	2	21

(B) THE SCHOOL OF GENERAL STUDIES—TEACHING STAFF

AS AT 30 APRIL 1971—*continued*

<i>Departments, etc.</i>	<i>Pro- fessors</i>	<i>Assoc- iate Pro- fessors, Readers</i>	<i>Senior Lectur- ers, Lectur- ers</i>	<i>Senior Tutors, Demon- strators, Tutors, Teaching Fellows</i>	<i>Total</i>
<i>The Faculty of Science</i>					
Biochemistry	1	..	5	3	9
Botany	1	1	7	3	12
Chemistry	2	2	8	4	16
Forestry	1	1	11	4	17
Geology	1	3	4	3	11
Physics	1	2	7	2	12
Psychology	2	2	6	6	16
Theoretical Physics	1	..	2	..	3
Zoology . . . . .	..	2	8	2	12
Total	10	13	58	27	108
Total Teaching Staff	38	36	186	54	314

(C) UNIVERSITY CENTRES

AS AT 30 APRIL 1971

<i>Centre</i>	<i>Pro- fessors</i>	<i>Profes- sorial Fellows, Readers</i>	<i>Senior Fellows, Senior Research Fellows, Research Fellows</i>	<i>Research Officers, Research Assistants</i>	<i>Total</i>
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Research Staff

Computer Centre	1	4	2	7
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<i>Centre</i>	<i>Pro- fessors</i>	<i>Associate Pro- fessors, Readers</i>	<i>Lecturers, Senior Lecturers</i>	<i>Senior Tutors, Tutors, Demon- strators, Teaching Fellows</i>	<i>Total</i>
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Teaching Staff

Centre for Continuing Education . . .	1	..	3	..	4
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ENROLMENTS

To 30 APRIL 1971

	<i>Full-time</i>	<i>Part-time</i>	<i>Total</i>
Ph.D. Course—			
in the Institute of Advanced Studies	353	6	359
in the School of General Studies	138	44	182
in the Computer Centre	4	1	5
Total	495	51	546
Master Degree Courses—in the School of General Studies (excluding preliminary courses for the degree of Master)—			
Arts	43	41	84
Asian Studies	5	8	13
Economics	11	26	37
Law	2	8	10
Science	16	27	43
Total	77	110	187
Bachelor Degree Courses—in the School of General Studies—			
Arts	793	855	1,648
Arts/Law	168	27	195
Asian Studies	169	50	219
Economics	285	423	708
Economics/Law	59	3	62
Law	107	127	234
Science	531	125	656
Forestry	124	13	137
Total	2,236	1,623	3,859
Non-Degree Courses—			
Preliminary courses for the degree of			
Master	13	68	81
Miscellaneous (single units)	12	131	143
Courses of research not leading to a degree	6	..	6
Total	31	199	230
Students enrolled in both the Institute of Advanced Studies and in the School of General Studies* . . . . .	..	18	18
Total number of Students in the University	2,839	1,965	4,804

* This adjustment which is applicable to total enrolments has been applied only to the part-time component.

ASSISTED STUDENTS

To 30 APRIL 1971

	<i>Males</i>	<i>Females</i>	<i>Total</i>
<i>Higher Degree Students</i>			
Commonwealth Government Assistance	164	29	193
University Assistance	347	59	406
Other Assistance	9	..	9
Total Assisted Higher Degree Students	520	88	608
<i>Students other than Higher Degree</i>			
Commonwealth Government Assistance	849	414	1,263
State Government Assistance	227	175	402
University Assistance	131	61	192
Other Assistance	13	7	20
Total Assisted Students other than Higher Degree	1,220	657	1,877
Total Assisted Students at the University	1,740	745	2,485

DEGREES CONFERRED

YEAR ENDED 30 JUNE 1971

						<u>Number Conferred on</u>		<i>Total</i>
						<i>Males</i>	<i>Females</i>	
Doctor of Letters (<i>honoris causa</i>)	.	.	.	.	.	2	..	2
Doctor of Philosophy	.	.	.	.	.	71	10	81
Master	.	.	.	.	.	27	12	39
Bachelor	.	.	.	.	.	332	163	495
Total Degrees	.	.	.	.	.	432	185	617

FINANCIAL STATEMENTS

STATEMENT OF ASSETS AND LIABILITIES

AS AT 31 DECEMBER 1971 (i)

GENERAL FUNDS	\$	\$
<i>Current Assets</i>		
Cash at Bank and on Deposit		
Operating Funds	3,157,642	
Reserves	1,968,298	
Restricted Funds, Special Purpose Funds and Scholarship Funds	723,180	
		5,849,120
Cash Held in Imprests		18,556
Commonwealth Superannuation and Provident Account Reserve—Cash and Securities		7,426,231
Restricted Funds, Special Purpose Funds and Scholarship Funds—Investments (xi)		143,842
Halls of Residence Funds—Investments (vi)		13,293
Debtors		289,183
Prepayments		992,191
Materials in Stores and Service Pools (at cost)		705,242
		<hr/> 15,437,658
<i>Fixed Assets</i>		
Buildings (at cost or valuation)		
Buildings and Service Installations	42,344,311	
Dwellings	5,280,764	
		<hr/> 47,625,075
Teaching and Research Equipment and Furniture (at cost or valuation)		
The Institute of Advanced Studies	16,283,489	
The School of General Studies	4,996,631	
The Library	287,986	
Computer Centre	753,436	
Centre for Continuing Education	13,003	
Administration and General Services	909,367	
Residential Properties	534,583	
		<hr/> 23,778,495
The Library		
Books and Publications (at cost)		3,844,936
Halls of Residence		
Buildings (at cost)	6,235,822	
Furniture and Equipment (at cost)	871,021	
		<hr/> 7,106,843
		<hr/> 97,793,007
<i>Less</i>		
<i>Liabilities</i>		
Creditors and Accruals	462,795	
Provision for Return Fares	270,586	
Income Received in Advance		
Commonwealth Grant for Running Expenses—		
Advance for 1972	2,300,000	
		<hr/> 3,033,381
		<hr/> 94,759,626

continued on following page

STATEMENT OF ASSETS AND LIABILITIES

AS AT 31 DECEMBER 1971 (i)—*continued*

	\$	\$	\$
Capital Accumulation Account (ii)		83,830,107	
University House, Graduate House and Halls of Residence Funds (vi)		166,879	
Staff Centre Fund		33	
Siding Spring Lodge Fund (viii)		6,977	Dr
Australian National University Press Accumulated Fund (ix)		159,969	
Library Funds		2,523	
The John Curtin School of Medical Research— Director's Special Fund		888	
Reserve Funds—Cash (x)		1,968,298	
Restricted Funds, Special Purpose Funds and Scholar- ship Funds—Cash and Investments (xi)		867,022	
Commonwealth Superannuation and Provident Ac- count Reserve Cash and Securities	7,426,231		
Properties included in Fixed Assets	344,653		
		<u>7,770,884</u>	
			<u>94,759,626</u>
Trust and Agency Funds (xii)			<u>2,798,800</u>
Contingent Liability			
Guarantees—Staff Housing Loans Program \$319,040			

J. G. CRAWFORD
Vice-Chancellor

L. A. BELLINGHAM (Mrs)
Accountant

The above Statement of Assets and Liabilities and the accompanying Statement of Income and Expenditure have been examined and are in agreement with the accounts which have been audited. In my opinion, they show fairly the financial operations for the year ended 31 December 1971 and the state of the affairs of the Australian National University as at that date.

V. J. W. SKERMER
Auditor-General for the Commonwealth

29 June 1972

CAPITAL ACCUMULATION ACCOUNT

FOR THE YEAR ENDED 31 DECEMBER 1971 (ii)

	\$	\$	\$
Balance, 1 January 1971			76,353,921
<i>Add</i> —Transfer from Income and Expenditure Statement (iii)	3,082,471		
<i>Less</i> Adjustment—University House Telephones	3,505		
	<hr/>	3,078,966	
Gifts Received other than in Cash		9,346	
Commonwealth Grant for Capital Works and Services		4,789,000	
Purchases of assets from Restricted Funds and Special Purpose Funds		323,069	
Loan from Trust Funds repaid		63,517	
Graduate House repayments of Loan		5,347	
Purchase of assets from Halls of Residence Funds		210	
Profit on sale of houses to members of staff		130,217	
		<hr/>	8,399,672
			<hr/>
<i>Less</i> —Disposal of equipment and adjustment of book values		260,676	
Transfer to F. N. Tandem Injector Fund		200,000	
Design fees, costs funded by Capital Funds—Halls of Residence		9,676	
Proceeds of houses sold to staff and transferred to Staff Housing Replacement Reserve		453,134	
		<hr/>	923,486
			<hr/>
Balance, 31 December 1971 as Contra to Assets in Statement of Assets and Liabilities (i)			83,830,107
			<hr/>

STATEMENT OF INCOME AND EXPENDITURE

FOR THE YEAR ENDED 31 DECEMBER 1971 (iii)

	\$	\$	\$
<i>Income</i>			
Commonwealth Grant for Running Expenses			28,085,900
Student and Examination Fees Received			966,556
Rentals Received			328,182
Sundry Income			322,101
			<hr/>
			29,702,739
<i>Expenditure</i>			
The Institute of Advanced Studies (See Analysis Attached—iv)			
The John Curtin School of Medical Research	2,699,119		
The Research School of Physical Sciences	3,780,382		
The Research School of Social Sciences	1,657,286		
The Research School of Pacific Studies	1,980,840		
The Research School of Chemistry	1,163,102		
The Research School of Biological Sciences	1,121,776		
	<hr/>	12,402,505	
The School of General Studies (See Analysis Attached—iv)			
The Faculty of Arts	1,703,574		
The Faculty of Asian Studies	530,613		
The Faculty of Economics	588,618		
The Faculty of Law	384,766		
The Faculty of Science	2,733,491		
Language Laboratory	30,650		
	<hr/>	5,971,712	
Scholarships		1,238,948	
Postdoctoral Fellowships		87,675	
Centre for Continuing Education		132,112	
The Library			
Salaries and Wages	735,164		
Pay-roll Tax	17,605		
Superannuation Provision	74,402		
Binding Costs	32,780		
Administrative Expenses	50,171		
	<hr/>	910,122	
Administration			
Salaries	1,815,539		
Pay-roll Tax	44,532		
Superannuation Provision	212,568		
Administrative Expenses	353,572		
	<hr/>	2,426,211	
Carried forward		23,169,285	29,702,739

continued on following page

STATEMENT OF INCOME AND EXPENDITURE

FOR THE YEAR ENDED 31 DECEMBER 1971 (iii)—*continued*

	\$	\$	\$
Brought forward		23,169,285	29,702,739
Miscellaneous			
Pensions	5,167		
Council and Committee Expenses	13,720		
Conferences and Functions	33,807		
Subscriptions, Donations and Grants to other organisations	20,543		
Bad Debts and Fees written off	401		
University Calendar and Public Relations Materials	60,422		
Private Audit and Legal Expenses	27,629		
Overseas Travel—Research Fellows	3,048		
Subventions:			
Art Fund	5,300		
University Films	2,500		
Performing Arts Council	5,000		
Nichol Smith Seminar	500		
University House facilities provided for General University Purposes	48,000		
University House—Master's Stipend, Chancellor's Expenses and Secretarial Assistance	30,455		
Australian National University Press	81,600		
University Union—Secretary's Salary and Secretarial Assistance	17,395		
University Prizes	599		
Vice-Chancellor's Special Fellowship	3,321		
Creative Arts Fellowships	14,297		
Library Fellowship	5,650		
Asian Fellowship	4,350		
Cultural Exhibitions	823		
The Florey Memorial Fund Expenses	3		
Research Students' Thesis Typing Scheme	2,948		
Assistance to ANU Students' Association	668		
Provision for School of General Studies Research Fund	20,000		
Provision for International Conference in Canberra	10,000		
Provision for Siding Spring Tourist Facilities	5,000		
Provision for Vertebrate Palaeontology	20,000		
Provision for Computer Fund	750,000		
Provision for Copper Project	3,000		
Grant for English/Malay Dictionary	59,900		
		1,256,046	
Carried forward		24,425,331	29,702,739

continued on following page

STATEMENT OF INCOME AND EXPENDITURE

FOR THE YEAR ENDED 31 DECEMBER 1971 (iii)—*continued*

	\$	\$	\$
Brought forward		24,425,331	29,702,739
General Services and Maintenance			
Translation Unit	7,751		
Data Processing Unit	163,619		
University Counselling Service	54,931		
University Health Service	34,100		
Visual Aids Unit	55,105		
Efficient Reading Course	17,899		
Maintenance—Buildings	1,172,632		
Maintenance—Other	337,860		
Watchmen	47,141		
Freight, Supply and Disposal Expenses, General	3,536		
Telephone Exchange Costs	117,690		
Computer Centre	210,538		
Northbourne House—Interest on Loan and Outgoings	5,126		
Multilith Services	41,195		
		<u>2,269,123</u>	
		26,694,454	
Less Refunds outstanding		<u>75,225</u>	
			<u>26,619,229</u>
			3,083,510
Staff Centre (vii)			
Operating Loss			<u>1,039</u>
Transfer to Capital Accumulation Account (ii), the predominant part of this balance having been used for the purchase of equipment which is capitalised in the Statement of Assets and Liabilities			<u>3,082,471</u>

ATTACHMENT TO INCOME AND EXPENDITURE STATEMENT

31 DECEMBER 1971 (iv)

	<i>Research and Teaching Materials</i>	<i>Salaries</i>	<i>Pay-roll Tax</i>	<i>Super- annuation Provision</i>	<i>Field Research and Travelling Expenses</i>	<i>Adminis- trative and Service Expenses</i>	<i>Total</i>
	\$	\$	\$	\$	\$	\$	\$
THE INSTITUTE OF ADVANCED STUDIES							
<i>The John Curtin School of Medical Research</i>							
Department of Biochemistry	47,672	186,783	..	19,340	143	..	253,938
Department of Clinical Science	21,838	105,431	..	10,379	56	6,341	144,045
Department of Experimental Pathology	25,984	154,293	..	18,206	..	..	198,483
Department of Human Biology	14,485	67,798	..	7,186	1,082	..	90,551
Department of Immunology	14,454	87,356	..	8,943	..	..	110,753
Department of Medical Chemistry	18,786	220,115	..	22,595	..	..	261,496
Department of Microbiology	65,382	200,352	..	18,751	..	..	284,485
Department of Physical Biochemistry	17,184	118,634	..	14,095	..	..	149,913
Department of Physiology	26,370	221,117	..	26,883	..	..	274,370
Director's Group . . . . .	..	19,860	..	2,587	..	..	22,447
Electron Microscope Unit	8,885	17,173	..	4,189	..	..	30,247
General Administration	1,439	230,599	48,485	23,748	3,927	200,042	508,240
Animal Breeding Establishment . . . . .	..	91,376	..	7,182	..	31,769	130,327
Workshops . . . . .	..	178,619	..	24,887	..	36,318	239,824
	262,479	1,899,506	48,485	208,971	5,208	274,470	2,699,119
<i>The Research School of Physical Sciences</i>							
Department of Applied Mathematics	375	22,974	..	2,646	..	..	25,995
Department of Astronomy	60,888	529,635	..	73,392	458	54,246	718,619
Department of Engineering Physics	84,128	339,801	..	49,404	..	20,605	493,938
Department of Geophysics and Geochemistry	89,138	423,799	..	42,914	34,005	..	589,856
Department of Mathematics	472	155,257	..	17,933	..	2,914	176,576
Department of Nuclear Physics	47,027	297,537	..	33,427	..	..	377,991
Department of Solid State Physics	19,277	45,385	..	4,071	..	..	68,733
Department of Theoretical Physics	516	142,851	..	16,348	..	..	159,715
Diffusion Research Unit	10,407	47,013	..	5,164	..	..	62,584
Electron and Ion Diffusion Unit	9,466	52,895	..	5,644	..	..	68,005
General Administration	214,138	191,162	59,860	15,996	10,593	239,985	731,734
Workshops	10,709	175,006	..	26,501	..	..	212,216
Electronics Workshops	23,876	63,854	..	6,690	..	..	94,420
	570,417	2,487,169	59,860	300,130	45,056	317,750	3,780,382

continued on following page

ATTACHMENT TO INCOME AND EXPENDITURE STATEMENT

31 DECEMBER 1971 (iv)—continued

	<i>Research and Teaching Materials</i>	<i>Salaries</i>	<i>Pay-roll Tax</i>	<i>Super- annuation Provision</i>	<i>Field Adminis- trative and Research Travelling Expenses</i>	<i>Service Expenses</i>	<i>Total</i>
	\$	\$	\$	\$	\$	\$	\$
<i>The Research School of Social Sciences</i>							
Department of Demography	2,708	132,434	..	13,059	10,576	..	158,777
Department of Economic History	1,352	82,981	..	9,699	2,000	..	96,032
Department of Economics	1,044	90,782	..	11,813	1,372	..	105,011
Department of History	1,559	120,529	..	19,991	7,590	..	149,669
Department of Law	616	80,761	..	8,085	2,993	..	92,455
Department of Philosophy	268	118,638	..	18,769	1,146	..	138,821
Department of Political Science	3,263	144,429	..	15,516	2,648	..	165,856
Department of Sociology	2,758	59,269	..	4,388	2,272	..	68,687
Department of Statistics	115	60,955	..	6,089	481	..	67,640
Education Research Unit	1,238	59,760	..	4,961	2,468	..	68,427
History of Ideas Unit	271	38,256	..	3,166	273	..	41,966
Urban Research Unit	974	52,940	..	8,801	4,842	..	67,557
Australian Dictionary of Biography	1,244	63,190	..	6,175	4,288	..	74,897
Director's Section . . . . .	..	17,318	..	1,965	..	..	19,283
General Administration . . . . .	..	105,738	33,416	10,034	2,017	104,380	255,585
Archives Section . . . . .	..	38,951	..	2,355	..	5,966	47,272
Visitors . . . . .	..	19,791	..	..	..	..	19,791
Programming Section . . . . .	..	15,887	..	2,430	..	1,243	19,560
	17,410	1,302,609	33,416	147,296	44,966	111,589	1,657,286
<i>The Research School of Pacific Studies</i>							
Department of Anthropology and Sociology	1,590	98,191	..	11,510	18,335	..	129,626
Department of Biogeography and Geomorphology	16,198	131,021	..	9,935	14,551	1,196	172,901
Department of Economics	1,968	198,653	..	23,001	9,368	..	232,990
Department of Far Eastern History	5,869	150,190	..	14,706	25,057	..	195,822
Department of Human Geography	8,044	108,589	..	11,727	13,185	608	142,153
Department of International Relations	3,893	158,290	..	17,586	14,213	2	193,984
Department of Linguistics	5,750	84,735	..	9,181	16,533	..	116,199
Department of Pacific History	2,857	119,662	..	11,378	11,876	..	145,773
Department of Prehistory	7,798	113,063	..	11,552	8,611	515	141,539
New Guinea Research Unit	8,123	91,714	..	7,413	16,313	..	123,563
Director's Section . . . . .	..	23,210	..	2,205	..	..	25,415
General Administration . . . . .	..	109,524	31,664	163	7,808	122,277	271,436
Visitors . . . . .	..	24,727	..	..	..	..	24,727
New Guinea School Service Unit . . . . .	..	28,250	..	1,470	..	17,244	46,964
Programming Section . . . . .	..	15,888	..	627	..	1,233	17,748
	62,090	1,455,707	31,664	132,454	155,850	143,075	1,980,840

continued on following page

ATTACHMENT TO INCOME AND EXPENDITURE STATEMENT

31 DECEMBER 1971 (iv)—continued

	Research and Teaching Materials	Salaries	Pay-roll Tax	Super- annuation Provision	Field Adminis- trative Research and Travelling Expenses	Service Expenses	Total
	\$	\$	\$	\$	\$	\$	\$
<i>The Research School of Chemistry</i>							
Research Units . . . . .	..	531,986	..	58,064	..	..	590,050
General Administration . . .	188,934	135,722	18,284	8,942	2,559	114,579	469,020
Workshops . . . . .	..	90,291	..	13,741	..	..	104,032
	188,934	757,999	18,284	80,747	2,559	114,579	1,163,102
<i>The Research School of Biological Sciences</i>							
Research Units . . . . .	..	553,848	..	52,236	..	..	606,084
General Administration . . .	149,978	111,695	18,568	9,191	19,233	87,018	395,683
Workshops . . . . .	..	57,472	..	6,801	..	..	64,273
Plant and Animal House . . .	..	9,739	..	1,239	..	..	10,978
Central Services . . . . .	..	42,552	..	2,206	..	..	44,758
	149,978	775,306	18,568	71,673	19,233	87,018	1,121,776
<i>Total—The Institute of Advanced Studies</i>							
	1,251,308	8,678,296	210,277	941,271	272,872	1,048,481	12,402,505
<i>THE SCHOOL OF GENERAL STUDIES</i>							
<i>The Faculty of Arts</i>	8,158	1,380,810	34,111	163,402	15,438	101,655	1,703,574
<i>The Faculty of Asian Studies</i> . .	344Cr	437,792	10,664	44,289	3,379	34,833	530,613
<i>The Faculty of Economics</i> . . .	1,238	493,457	11,928	55,165	1,997	24,833	588,618
<i>The Faculty of Law</i>	1,500	314,027	7,552	31,582	3,267	26,838	384,766
<i>The Faculty of Science</i>	207,252	2,018,995	48,987	209,027	39,245	209,985	2,733,491
<i>The Language Laboratory</i> . . .	3,218	24,330	..	2,278	317	507	30,650
<i>Total—The School of General Studies</i>							
	221,022	4,669,411	113,242	505,743	63,643	398,651	5,971,712

UNIVERSITY HOUSE, GRADUATE HOUSE AND HALLS OF RESIDENCE CONSOLIDATED OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (v)

	University House	Graduate House	Bruce Hall	Burton Hall	Garran Hall	Total
	\$	\$	\$	\$	\$	\$
<i>Income</i>						
Tariff received—Residents	150,002	51,645	163,212	171,272	171,271	707,402
—Visitors	56,418	49	60,573	39,383	39,383	195,806
Membership Fees	7,096	..	..	..	..	7,096
Registration Fees . . . . .	..	..	1,830	2,378	2,377	6,585
Reimbursement of Board—House Staff	5,227	..	2,829	2,899	2,899	13,854
Income from Casual Meals and Catering	54,294	..	46,202	14,533	14,533	129,562
Sundry Income	628	..	1,114	110	110	1,962
Beverage Sales—Net Proceeds . . .	21,966	..	4,076	1,699	1,699	29,440
Canteen Sales—Net Proceeds . . .	..	..	476	367	368	1,211
Subvention from University	48,000	..	..	..	..	48,000
Subsidy based on U.F.A. Act 1966 S.8	..	..	11,450	12,050	12,050	35,550
	343,631	51,694	291,762	244,691	244,690	1,176,468
<i>Less Expenditure—</i>						
<i>Operating Costs</i>						
Cost of Foodstuffs	65,086	..	70,953	61,965	61,964	259,968
Fuel, Light, Power and Heating . . .	17,972	7,632	15,401	16,707	16,707	74,419
Cleaning, Laundry and Sundry Materials	7,987	2,292	10,130	7,577	7,578	35,564
Domestic Staff Wages	159,401	..	123,814	95,234	95,234	473,683
Provision for Long Service Leave—						
Domestic Staff	2,000	..	860	830	830	4,520
Losses, Breakages and Replacements .	4,417	22	3,732	912	912	9,995
Local Transport, Freight and Supply						
Expenses	1,848	..	581	452	451	3,332
Other Operating Expenses	3,705	147	469	309	310	4,940
	262,416	10,093	225,940	183,986	183,986	866,421
<i>Administrative Costs</i>						
Administrative Salaries	33,699	3,233	32,416	24,782	24,783	118,913
Sub-Wardens' Subsidy . . . . .	..	..	1,600	2,150	2,150	5,900
Pay-roll Tax, Workmen's Compensation						
Insurance and Superannuation . . .	10,373	193	9,587	5,688	5,688	31,529
Postages, Telegrams and Telephones .	1,793	200	1,610	1,561	1,561	6,725
Stationery, Printing and Office Expenses	1,488	134	992	856	855	4,325
Newspapers and Periodicals	808	..	30	1	1	840
Master's and Fellows' Entertainment						
Expenses	1,335	..	..	..	..	1,335
Warden's Entertainment Expenses . .	..	..	402	400	400	1,202
Advertising, Appointments, Travelling,						
etc.	1,190	..	260	246	246	1,942
Residents' Committee Expenses . . .	570	..	..	..	..	570
Accounting Service Fee	4,434	775	4,181	3,457	3,458	16,305
Provision for—Long Service Leave—						
Administrative Staff	300	..	271	330	330	1,231
—Study Leave . . . . .	..	..	221	343	343	907
Relieving Warden's Salary . . . .	..	..	858	1,011	1,011	2,880
Other Expenses . . . . .	..	140	193	114	114	561
	55,990	4,675	52,621	40,939	40,940	195,165

continued on following page

UNIVERSITY HOUSE, GRADUATE HOUSE AND HALLS OF RESIDENCE
CONSOLIDATED OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (v)—continued

	<i>University House</i>	<i>Graduate House</i>	<i>Bruce Hall</i>	<i>Burton Hall</i>	<i>Garran Hall</i>	<i>Total</i>
	\$	\$	\$	\$	\$	\$
<i>Property Maintenance and Service Costs</i>						
Maintenance and Electricity—						
Warden's House . . . . .	..	..	..	569	569	1,138
Rates and General Services	466	4,851	466	166	166	6,115
Repayment of Loan . . . . .	..	19,644	..	..	..	19,644
Maintenance of Grounds . . . . .	..	694	5,531	2,056	2,055	10,336
Provision for Replacement of Equip- ment	19,600	1,500	8,527	7,003	7,003	43,633
Provision for Building Maintenance	9,700	6,150	12,073	10,857	10,857	49,637
	29,766	32,839	26,597	20,651	20,650	130,503
Total Expenditure	348,172	47,607	305,158	245,576	245,576	1,192,089
Net Operating Loss—						
Transferred to Accumulated Profits and Losses (vi)	4,541	..	13,396	885	886	19,708
Net Operating Profit—						
Transferred to Accumulated Profits and Losses (vi) . . . . .	..	4,087	..	..	..	4,087

UNIVERSITY HOUSE, GRADUATE HOUSE AND HALLS OF RESIDENCE FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (vi)

	Balances as at 1 Jan. 1971	Income, Interest and Subsidies Received during 1971	Disbursed or Trans- ferred during 1971	Balances as at 31 Dec. 1971
	\$	\$	\$	\$
<i>University House</i>				
Profits Equalisation Fund	1,958 Dr	..	..	..
Less—1971 Trading Loss . . . . .	..	..	4,541	..
Add—Interest . . . . .	..	938	..	..
Adjustment of 1970 Profit . . . . .	..	3,505	..	..
	1,958 Dr	4,443	4,541	2,056 Dr
Internal Maintenance of Buildings Fund	2,815	9,700	9,199	3,316
Replacement of Equipment Fund	27,084	19,600	2,075	44,609
Long Service Leave Fund	3,700	2,300	2,693	3,307
Staff Amenities Fund	232	3,437	3,263	406
Fund for Purchase of Gifts	14	..	..	14
Improvements Fund . . . . .	..	20	..	20
	31,887	39,500	21,771	49,616*
<i>Bruce Hall</i>				
Accumulated Profits and Losses	6,083	..	..	..
Less—1971 Trading Loss . . . . .	..	..	13,396	..
Transfer Visitors' Income Equalisation Fund . . . . .	..	..	958	..
	6,083	..	14,354	8,271 Dr
Visitors' Income Equalisation Fund	5,752	958	..	6,710
Building Maintenance Fund	6,339	12,073	13,942	4,470
Maintenance and Replacement of Equipment Fund	12,038	8,527	5,082	15,483
Long Service Leave Fund	2,067	1,131	295	2,903
Study Leave Fund	435	221	..	656
Relieving Warden's Salary Fund	2,272	858	..	3,130
Staff Amenities Fund	49	452	391	110
Junior Common-room Fund	128	1,571	1,674	25
Fellows' Fund	1,755	587	..	2,342
Art and Library Fund	474	199	100	573
	37,392	26,577	35,838	28,131

continued on following page

* \$13,293 invested in BHP 7% debentures maturing 1 April 1977 (Face Value \$13,400).

UNIVERSITY HOUSE, GRADUATE HOUSE AND HALLS OF RESIDENCE FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (vi)—continued

	Balances as at 1 Jan. 1971	Income, Interest and Subsidies Received during 1971	Disbursed or Trans- ferred during 1971	Balances as at 31 Dec. 1971
	\$	\$	\$	\$
<i>Burton Hall</i>				
Accumulated Profits and Losses	59	..	..	..
Less—1971 Trading Loss . . . . .	..	..	885	..
Bad Debts Written Off . . . . .	..	..	108	..
Transfer to Visitors' Income Equalisa- tion Fund . . . . .	..	..	383	..
	59	..	1,376	1,317 Dr
Maintenance of Building Fund	7,217	13,202	5,789	14,630
Maintenance and Replacement of Equipment Fund	12,413	7,003	1,552	17,864
Study Leave Fund	686	343	900	129
Long Service Leave Fund	1,829	1,160	..	2,989
Relieving Warden's Salary Fund	1,628	1,011	..	2,639
Junior Common-room Fund	74	1,520	1,569	25
Art and Library Fund	1,118	785	90	1,813
Society Fund	110	..	..	110
Basic Kit Fund	2,153	..	2,153	..
Visitors' Income Equalisation Fund . . . . .	..	383	..	383
	27,287	25,407	13,429	39,265
<i>Garran Hall</i>				
Accumulated Profits and Losses	1,068	..	..	..
Less—1971 Trading Loss . . . . .	..	..	886	..
Bad Debts Written Off . . . . .	..	..	108	..
Transfer to Visitors' Income Equalisa- tion Fund . . . . .	..	..	383	..
	1,068	..	1,377	309 Dr
Maintenance of Building Fund	7,217	13,203	5,790	14,630
Maintenance and Replacement of Equipment Fund	12,413	7,003	1,552	17,864
Study Leave Fund	686	343	..	1,029
Long Service Leave Fund	1,829	1,160	..	2,989
Relieving Warden's Salary Fund	620	1,011	1,137	494
Staff Amenities Fund	28	..	..	28
Junior Common-room Fund	7	1,432	1,350	89
Art and Library Fund	551	702	488	765
Basic Kit Fund	2,557	..	2,557	..
Visitors' Income Equalisation Fund . . . . .	..	383	..	383
	26,976	25,237	14,251	37,962

continued on following page

UNIVERSITY HOUSE, GRADUATE HOUSE AND HALLS OF RESIDENCE FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (vi)—continued

	<i>Balances as at 1 Jan. 1971</i>	<i>Income, Interest and Subsidies Received during 1971</i>	<i>Disbursed or Trans- ferred during 1971</i>	<i>Balances as at 31 Dec. 1971</i>
	\$	\$	\$	\$
<i>Graduate House</i>				
Accumulated Profits and Losses—1971 Trading Profit . . . . .	..	4,087	..	4,087
Maintenance of Building Fund . . . . .	..	6,150	188	5,962
Maintenance and Replacement of Equipment Fund . . . . .	..	1,524	..	1,524
Residents' Amenities Fund . . . . .	..	413	81	332
	..	12,174	269	11,905
Total Halls of Residence Funds	123,542	128,895	85,558	166,879

STAFF CENTRE

OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (vii)

	\$	\$	\$
<i>Income</i>			
Accommodation		633	
Membership Fees		9,853	
Reimbursement of Board—House Staff		832	
Income from Casual Meals and Catering		48,388	
Punchboard Receipts		530	
Sundry Income		611	
Beverage Sales—Net Proceeds		31,288	
		<hr/>	92,135
<i>Less—Expenditure</i>			
<i>Operating Costs</i>			
Cost of Foodstuffs	25,893		
Fuel, Light, Power and Heating	2,877		
Cleaning, Laundry and Sundry Materials	2,348		
Domestic Staff Wages	23,595		
Barmen's Wages	14,938		
Losses, Breakages and Replacements	1,720		
Local Transport, Freight and Supply Expenses	269		
Other Operating Expenses	841		
	<hr/>	72,481	
<i>Administrative Costs</i>			
Administrative Salaries	11,668		
Pay-roll Tax, Workmen's Compensation Insurance and Superannuation	2,130		
Postages, Telegrams and Telephones	820		
Stationery, Printing and Office Expenses	809		
Newspapers and Periodicals	221		
Governing Body Expenses	305		
Accounting Service Fee	2,169		
Cellar Committee Expenses	99		
Other Expenses	1,770		
	<hr/>	19,991	
<i>Property Maintenance and Service Costs</i>			
Rates and General Services	25		
Sundry Repairs	644		
Building Maintenance	33		
	<hr/>	702	
Total Expenditure		<hr/>	93,174
<i>Net Operating Loss—</i>			
Transferred to University's Statement of Income and Expenditure (iii)			<hr/> 1,039

SIDING SPRING LODGE
OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (viii)

	\$	\$	\$
<i>Income</i>			
Tariff—ANU Staff		7,845	
—Astronomers Anglo-Australian Telescope Project		120	
—Visitors		1,010	
Domestic Staff Board		835	
Casual Meals		97	
		<u>9907</u>	
<i>Less—Expenditure</i>			
<i>Operating Costs</i>			
Foodstuffs Purchases	2,617		
Fuel, Light, Power and Heating	3,587		
Cleaning, Laundry and Sundry Materials	162		
Domestic Staff Wages	4,699		
Losses, Breakages and Replacements	147		
Freight and Supply Expenses	121		
Other Operating Expenses	96		
	<u>11,429</u>		
<i>Administrative Costs</i>			
Administrative Salaries	2,322		
Pay-roll Tax, Workmen's Compensation, Insurance and Superannuation	511		
Postages, Telegrams and Telephones	650		
Stationery, Printing and Office Expenses	7		
Newspapers and Periodicals	52		
Advertising, Appointment and Travel Expenses	614		
Accounting Service Charge	149		
Provision for Long Service Leave	200		
Other Administrative Expenses	542		
	<u>5,047</u>		
<i>Property Maintenance and Service Costs</i>			
Rates and General Services	580		
Maintenance of Grounds	1		
Provision for Replacement of Equipment	1,000		
Provision for Building Maintenance	2,500	4,081	20,557
Net Operating Loss—		<u>10,650</u>	
Transferred to Accumulated Profits and Losses			10,650

	<i>Income Interest and Subsidies Received during 1971</i>	<i>Disbursed or Trans- ferred during 1971</i>	<i>Balances as at 31 Dec. 1971</i>
	\$	\$	\$
<i>Statement of Funds</i>			
Accumulated Profits and Losses		10,650	10,650 Dr
Fund for Long Service Leave	200		200
Maintenance of Building Fund	2,500	10	2,490
Maintenance and Replacement of Equipment Fund	1,000	17	983
<i>Total Funds</i>	<u>3,700</u>	<u>10,677</u>	<u>6,977 Dr</u>

THE AUSTRALIAN NATIONAL UNIVERSITY PRESS
OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (ix)

	\$	\$	\$	\$	\$
<i>Income</i>					
Sales of Publications				141,459	
Permission Fees Received				232	
Income from Rights				1,570	
Miscellaneous Income				89	
				<u> </u>	143,350
<i>Cost of Sales</i>					
Stock of Publications 1 January 1971			168,146		
Book Manufacturing Costs			79,651		
Editorial Expenses			290		
			<u> </u>	248,087	
<i>Less—Stock on Hand 31 December 1971</i>					
Finished Books		160,307			
Works in Progress	5,476				
<i>Less—External Subsidies Applicable to Works in Progress</i>	<u>3,430</u>	<u>2,046</u>			
		162,353			
<i>Less—Write off Value of—</i>					
Unbound Stock	12,232				
Bound Books	<u>6,656</u>	<u>18,888</u>			
			143,465		
Total External Subsidies Received			<u>8,279</u>		
				151,744	
				<u>96,343</u>	
<i>Add—Commission on Sales</i>		1301			
Royalties		<u>6,580</u>		<u>7,881</u>	
					104,224
					<u> </u>
Gross Operating Profit					39,126

continued on following page

THE AUSTRALIAN NATIONAL UNIVERSITY PRESS
OPERATING STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 1971 (ix)—*continued*

	\$	\$	\$	\$	\$
Gross Operating Profit—Brought forward					39,126
<i>Administrative Expenses</i>					
Salaries			93,514		
Superannuation			14,501		
Pay-roll Tax			2,338		
Workmen's Compensation			170		
				110,523	
Stationery and Office Supplies				4,197	
Advertising				8,874	
Subscriptions to Trade Publications				547	
Electricity and Heating				200	
Cleaning and Maintenance				1,501	
Freight and Supply Expenses				3,303	
Postages and Telephones				7,049	
Bank Charges				66	
Other Expenses				85	
Travelling Expenses				2,521	
Appointment Expenses				262	
					139,128
Net Operating Loss					100,002
Add—Bad Debts Written Off					347
Net Transfer to Accumulated Funds					100,349
ANU Press Accumulated Funds 1 January 1971				178,718	
Add—University Subvention				81,600	
				260,318	
Less—Operating Loss				100,349	
ANU Press Accumulated Funds 31 December 1971				159,969	

STATEMENT OF UNIVERSITY RESERVES

AS AT 31 DECEMBER 1971 (x)

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
<i>University Reserves</i>				
University General Reserve	193,024	63,516 Dr	..	129,508
The John Curtin School of Medical Research	20,000	..	..	20,000
The Research School of Physical Sciences	20,000	..	..	20,000
The Research School of Social Sciences	4,630	2,680	4,310	3,000
The Research School of Pacific Studies	10,000	..	3,150	6,850
The Research School of Chemistry	10,000	..	..	10,000
The Research School of Biological Sciences	10,000	..	..	10,000
The School of General Studies	10,000	..	4,621	5,379
<i>Special Purpose Reserves</i>				
Equipment Reserve 1970/1972 Triennium Re- search School of Physical Sciences . . . . .	..	200,000	200,000	..
School of General Studies Research Fund . . . . .	..	20,000	..	20,000
University Art Reserve	173 Dr	5,300	3,613	1,514
University Film Reserve	11,040	2,500	..	13,540
University Theatre Group Reserve	463	..	..	463
University Performing Arts Council Reserve	9,892	5,000	450	14,442
Computer Facilities Fund	1,147	750,000	..	751,147
Chancelry Mural Fund	4,014	..	..	4,014
Nichol Smith Seminar Fund	1,161	1,402	922	1,641
Proposed Faculty of Medicine Seminar	666	665 Dr	1	..
Medical Education Fund	2,120	117	10	2,227
Staff Centre Building Fund	4,009	..	..	4,009
Staff Housing Replacement Reserve	531,173	495,044	170,523	855,694
Tandem Generator Tube Replacement Reserve	56,358	24,066	7,635	72,789
Waigani Seminar	7,081	..	..	7,081
Fund for International Conference to be held in Canberra . . . . .	..	10,000	..	10,000
Fund for Siding Springs Tourist Facilities Building . . . . .	..	5,000	..	5,000
	906,605	1,456,928	395,235	1,968,298

Prepayments from University Reserves \$334,100

STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
General Funds				
Mount Stromlo Observatory Fund for Accumulated Furlough	2,923	163	..	3,086
Rockefeller Foundation Grant for General Purposes	5,069	..	..	5,069
Royalty Fund from the Patent of Influenza Vaccine	86,816	21,313	110,126	1,997 Dr
Copper Refining Project—Dr A. J. Parker . . . . .	..	3,004	2,254	750
Duval Gift to the University	106,004	5,477	..	111,481
Students' Representative Council Contributions for the Performing Arts Centre	7,547	8,395	..	15,942
Australia and New Zealand Bank Ltd grant for art purchases	600	100	..	700
The John Darling Art Fund	21,767	4,672	4,800	21,639
Mount Isa Mines Limited grant	250	50	..	300
Mobil Oil Australia grant to University Counselling Service	300	..	..	300
Fibre Makers Ltd grant to University Counselling Service . . . . .	..	25	..	25
Undistributed interest on restricted funds	2,596	2,380	..	4,976
Webster, Laver Influenza Vaccine Distribution . . . . .	..	18,057	..	18,057
Department of Microbiology Fund Influenza Vaccine Distribution . . . . .	..	14,446	..	14,446
John Curtin School of Medical Research Fund Influenza Vaccine Distribution . . . . .	..	14,446	..	14,446
Vice-Chancellor's Special Fund Influenza Vaccine Distribution . . . . .	..	43,337	..	43,337
Patent Establishment Fund—Influenza Vaccine . . . . .	..	3,389	..	3,389
Grants for the Library				
Gift from Professor K. Mahler for the Joseph Needham Collection	6,092	338	47	6,383
Donations for McDonald Collection	1,669	88	..	1,757
American Council of Learned Societies grant for purchase of American literature	631 Dr	5,614	4,983	..
Grants for Research				
THE INSTITUTE OF ADVANCED STUDIES				
<i>The John Curtin School of Medical Research</i>				
Department of Clinical Science				
National Heart Foundation grant for research—Professor H. M. Whyte and Dr R. B. Goldrick	3,796	195	1,871	2,120
National Heart Foundation grant for research—Dr. R. B. Goldrick	126 Dr	..	186 Cr	60
National Heart Foundation grant for research—Dr P. J. Nestel	107	5,428	5,994	459 Dr
World Health Organization grant for Autoanalyser . . . . .	..	9,117	9,117	..
Department of Microbiology				
U.S. National Institutes of Health grant for research—Professor R. Montgomery	887	..	887	..

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
World Health Organization grant for maintenance of regional reference laboratory for anthropod-borne viruses	4,290	209	1,940	2,559
U.S. National Institutes of Health Fellowship—Dr A. T. Ichiki	95 Dr	..	95 Cr	..
National Multiple Sclerosis Society (USA) grant for research—Dr P. D. Scotti	443	441	..	884
Various Grants for Support of Travel . . . . .	..	1,774	914	860
World Health Organization grant for the study of Asian influenza viruses—Dr R. G. Webster and Dr W. G. Laver . . . . .	..	885	687	198
Department of Physical Biochemistry				
Medical Research Council grant for research—Professor K. P. Strickland	4,403	95	4,418	80
Australian Dairy Board grant for research in lactoglobulins of milk—Dr H. A. McKenzie	173 Dr	1,500	1,377	50 Dr
Department of Physiology				
Burroughs Wellcome Fellowship	3,443 Dr	8,500	5,537	480 Dr
U.S. National Institutes of Health grant for research in neurochemistry of central synaptic transmission—Dr G. A. R. Johnston	182	147 Dr	35	..
U.S. National Institutes of Health grant for research—Dr S. M. Sherman	44 Dr	882	..	838
Miscellaneous				
Anonymous donation for general purposes	100	..	..	100
<i>The Research School of Physical Sciences</i>				
Department of Astronomy				
International Astronomical Union grant for distinguished visitors	14	..	..	14
Grant for 150-inch Telescope	15,153	53,130	4	68,279
Lowell Observatory grant—Mount Stromlo equipment rehabilitation fund	36,290	16,800	994	52,096
Department of Geophysics and Geochemistry				
Metropolitan Water, Sewerage and Drainage Board and Snowy Mountains Hydro-Electric Authority grants for seismological research	8,874	2,432	2,984	8,322
Electron Probe Micro Analyser fund	2,932	95	873	2,154
National Science Foundation grant for research—Dr R. J. Twiss	177	..	..	177
<i>The Research School of Social Sciences</i>				
General				
John Curtin Memorial Lecture—The Honourable Dr J. J. Dedman	44 Dr	100	56	..
Department of Demography				
Australian Institute of International Affairs grant for research into migration problems	497	1,500	1,997	..
Director's Special fund	433	823	456	800

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
Australian Family Formation Project . . . . .	..	47,000	73,440	26,440 Dr
Department of Immigration grant for Population En- quiry . . . . .	..	25,427	16,446	8,981
The Population Council Inc. grant for the Fiji Family Planning Project . . . . .	..	2,218	3,099	881 Dr
The Asian Population and Programs Project . . . . .	..	13,597	2,841	10,756
Population Council Fund for Production of West Afri- can Book on Population Growth . . . . .	..	5,169	2,156	3,013
Ford Foundation grant for Research Proposal 'Changes and Prospective Changes in Family and National Population Formation in Australia' . . . . .	..	6,236	404	5,832
Department of Economic History				
Wm Cooper & Nephews (Aust.) Pty Ltd grant for re- search	1,813	39	..	1,852
Goldsbrough Mort grant for research of wool industry history	559	13	..	572
Anonymous grant for publication of monographs on historical statistics	169 Dr	..	13	182 Dr
Anonymous grant for study of the supply, utilisation and earnings of graduates	1,199 Dr	4,613	4,826	1,412 Dr
Amalgamated Engineering Union grant to assist in re- search and publication of labour history and the economics of labour	1,965	109	..	2,074
Grant to Department of Economic History—Dr R. G. Gregory and Mr B. D. Haig	108	..	..	108
Department of Economics				
Australian Banks' grant for visiting professors	331	..	..	331
Department of History				
W. M. Hughes grant for W. M. Hughes biography	19	..	19	..
Assistance for preparation of guide to manuscripts re- lating to Australia and South-West Pacific	2,931	12	2,769	174
Department of Political Science				
Federal Election Survey fund	1,939	103	209	1,833
Department of Sociology				
Council for Aboriginal Affairs grant for research—Mrs K. Kitaoji	2,947	3,182	4,023	2,106
Council for Aboriginal Affairs grant for research—Dr F. L. Jones	550	368	550	368
Department of Statistics				
Grant from Department of Supply for statistical re- search . . . . .	..	4,485	8,523	4,038 Dr
Education Research Unit				
Commonwealth Advisory Committee on Advanced Education grant for research into characteristics of students entering colleges of advanced education— Dr H. Maddox	3,921	143	1,875	2,189
Nuffield Foundation grant for an investigation into students who 'drop out' from professional courses at a number of Australian Universities	3,500	500 Cr	4,000

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
Espada Educational Trust Fund grant—Mr D. S. Anderson	330	400	118	612
Ontario Institute for Studies in Education grant—Dr C. S. Smith	1,437	79	..	1,516
Commonwealth Advisory Committee on Advanced Education grant to undertake Cost Benefit Analysis of Resource Allocation in Colleges of Advanced Education—Dr C. S. Smith . . . . .	..	6,748	295	6,453
Urban Research Unit				
Robert Schalkenbach Foundation grant for urban research	489	15	504	..
Australian Institute of Urban Studies grant for the study of urban development in Melbourne	5,532	24,188	25,687	4,033
Australian Dictionary of Biography				
Grant for Australian Dictionary of Biography	2,748	153	..	2,901
Australian Dictionary of Biography	208 Dr	366	352	194 Dr
Ford Grant No. 3				
Continuation of the study of the Indonesian economy . . . . .	..	1,069	5,092	4,023 Dr
Demographic study of Indonesia . . . . .	..	874	1,202	328 Dr
Continuation of the study of Contemporary China . . . . .	..	7,625	2,720	4,905
<i>The Research School of Pacific Studies</i>				
<i>General</i>				
The Ford Foundation grant for international research and training program	15,463	61	54,955	39,431 Dr
Anonymous grant for research on the political, social and economic development in New Guinea	5,601 Dr	10,950	5,049	300
Bougainville Copper grant to Research School of Pacific Studies for seminars	1,012	2,988	700	3,300
Director's Special Fund	3,740	265	3 Cr	4,008
Bougainville Copper grant to Research School of Pacific Studies for intensive studies	279 Dr	15,896	14,626	991
Bougainville Copper grant to Research School of Pacific Studies for project investigations	5,711	5,700 Dr	11	..
Arthur F. Yencken Memorial Lecture Fund	254	1	255	..
Department of Anthropology and Sociology				
E. M. Symon bequest for research	1,413	78	..	1,491
Department of Economics				
Various grants for study of American investment in Australia	2,596	144	..	2,740
World Bank grant for research—Dr B. A. Lockwood	2,722 Dr	4,642	1,920	..
Anonymous grant for study of economy of Indonesia	9,470	3,622	1,304	11,788
Rural Credits Development Fund grant for study of nucleus estate development in rural sector of Papua and New Guinea	385	..	5,831	5,446 Dr
Department of Far Eastern History				
Morrison Papers project	111	111

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
Department of Human Geography				
Anonymous grant for a monograph on the freight industry—Dr P. J. Rimmer	416	..	416	..
Rural Credits Development Fund grant to cover costs of aerial photographs of the Chimbu Sub-district in New Guinea	35	..	35	..
Rural Credits Development Fund grant for research in transport and land use in northern Australia	324	124 Dr	200	..
Department of Linguistics				
Australian Institute of Aboriginal Studies grant for linguistics research	1,853 Dr	6,164	3,553	758
Australian Institute of Aboriginal Studies travel grant—Dr D. T. Tryon	15 Dr	15	..	..
Department of Pacific History				
Rockefeller Foundation grant—Dr F. J. West . . . . .	..	5,687	5,687	..
Republic of Nauru fund—Professor J. W. Davidson	9,397	746	..	10,143
Pacific Manuscripts Bureau	11,145	16,006	19,594	7,557
New England Microfilming Project	6,854	8,894	9,699	6,049
Department of Prehistory				
CSIRO grant for co-operation with Division of Plant Industry in Carbon-14 Work	98	3,500	201	3,397
New Guinea Research Unit				
Rural Credits Development Fund grant for study of economic aspect of indigenous agriculture in Territory of Papua and New Guinea	270	..	..	270
Mr and Mrs C. Banks grant for field-work in Territory of Papua and New Guinea	679	..	..	679
Rural Credits Development Fund grant for study of co-operatives in the Territory of Papua and New Guinea	10,873	524	2,167	9,230
The Research School of Chemistry				
Rural Credits Development Fund grant for the spread of innovations amongst New Guinea villages . . . . .	..	12,128	6,915	5,213
The Research School of Biological Sciences				
Australian Water Resources Council grant for project on the evapotranspiration from vegetated areas	569	194 Dr	375	..
World Wild Life grant for a survey of the status of the salt-water crocodile in north-west Western Australia	488	..	..	488
World Wild Life grant for a survey of the sea turtle resources of Queensland	284	156 Dr	128	..
Australian Academy of Science grant for photosynthesis conference	247	..	227	20
Office of Aboriginal Affairs grant to investigate the population dynamics of salt-water crocodiles and green sea turtles	21,159	15,462	43,303	6,682 Dr
U.S. National Institutes of Health grant for research—Dr J. C. Loper	881	740	141

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
THE SCHOOL OF GENERAL STUDIES				
<i>The Faculty of Arts</i>				
Commonwealth Literary Fund grant for lectures	65	..	..	65
Department of Classics				
Fund for purchase of classical antiquities	1,163	1,888	763	2,288
Department of Geography				
Ford Foundation grant for research—Mr. E. C. Chapman	1,183	66	..	1,249
Wool Board Interdisciplinary Committee for study of Yass Valley				
Grant for the economic survey of Cooma	107	232 Dr	125 Cr	..
Department of Pure Mathematics	110	..	110	..
Pure Mathematics Publications Account	74	20	3	91
Department of Sociology				
Department of Health grant for Drug Control Project . . . . .	..	7,163	1,848	5,315
<i>The Faculty of Asian Studies</i>				
Department of Indonesian Languages and Literatures				
John Galvin Trust grant for English/Malay Dictionary	23,771 Dr	61,194	25,835	11,588
<i>The Faculty of Economics</i>				
Department of Economic History				
Anonymous grant for assistance in editing a volume on Australian economic growth	721	723 Dr	2 Cr	..
Department of Economics				
Anonymous grant for study of Australian manufacturing industry	1,663	92	20	1,735
Australian Academy of Science grant for study of Japanese innovation	2,222	1,600	3,108	714
Anonymous grant for study of money and finance in New Guinea—Dr D. W. Stammer	102	..	20	82
Anonymous grant for study of company reporting in Australia	129	..	129	..
Rural Credits Development Fund grant for study of economic effects of taxation and other fiscal devices on agricultural production in Australia				
Grant for study of Japanese agriculture trade policy	217	..	1	216
Australian Institute of International Affairs project Japan and Australia in a Pacific Economic Community—Dr P. D. Drysdale	45 Dr	..	4,748	4,793 Dr
CSIRO grant for the development and testing of methods of utilising the economic potential of research projects as an aid to the planning of research programs	2,967	78	1,583	1,462
Anonymous grant for Industrial Research and Development in Australia—Dr C. A. Tisdell	6,727	2,197	8,796	128
Asian Development Bank grant for the study of trade in South-East Asia . . . . .	..	6,251	483	5,768
Department of Statistics	97 Dr	1,710	1,432	181
Wool Research Fund grant for national drought reserve study				
	1,298	1,269	2,411	156

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
<i>The Faculty of Science</i>				
Department of Botany				
A.P.M. Forests Pty Ltd grant for research in eucalypti at Coffs Harbour	744	..	744	..
Food and Agricultural Organisation grant for collection of special tree seeds	726	1,024	753	997
Champion Research Fund	1,039	57	..	1,096
Department of Botany Native Plant Development Project . . . . .	..	500	..	500
Department of Chemistry				
Wool Research Committee grant for wool research	3,988	10,079	14,721	654 Dr
Abbott Laboratories grant for research in organic chemistry—Associate Professor W. D. L. Crow	47	..	..	47
Department of Forestry				
Department of Foreign Affairs grant for project on forest resources information with Asian and Pacific Council Registry of Scientific and Technical Services	1,729 Dr	2,096	..	367
National Capital Development Commission grant for the study on land use and development plan for the Australian Capital Territory	129	250	263	116
Various grants for research on fungus phytopthera	3,514	6,184	6,530	3,168
Western Australia Forests Department grant for the study of the fungus phytopthera affecting jarrah	1,558	1,013	2,571	..
National Capital Development Commission and Department of the Interior grant for the study of multiple land use in Canberra region	2,593	25	2,618	..
Nuffield Foundation grant for inventory of indigenous uneven aged broadleaved forests	804	..	208	596
A.P.M. Forests Pty Ltd grant for the study of wood density of <i>pinus radiata</i>	35	..	35	..
Grants to support a project in the Shoalhaven Catchment—Professor G. A. Petrides . . . . .	..	700	..	700
Department of Geology				
Aberfoyle Management Pty Ltd grant—Dr P. W. E. Kingston	244	..	244	..
Planet Management and Research Pty Ltd grant for work spectrometer	4,174	1,212	3,861	1,525
Western Mining Corporation Limited grant to support geological education	311	500	218	593
Eso Standard Oil (Australia) Ltd grant for advancement of earth sciences	265	501	686	80
Gifts for Fossil Appeal Research-Vertebrate Palaeontology Unit—Professor D. A. Brown . . . . .	..	22,160	..	22,160
Department of Physics				
Australian Atomic Energy Commission grant for research on the impurity diffusion in magnesia	441	431 Dr	10	..

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
Department of Psychology				
Social Science Research Council grant to assist in pro- cessing data from a study of attitudes towards Aborigines	145	..	..	145
Office of Aboriginal Affairs grant for the Hermannsburg Project—Associate Professor G. N. Seagrim	615	..	615	..
Northern Territory Administration grant for Aboriginal infant morbidity and mortality project	4,222 Dr	13,441	13,454	4,235 Dr
Department of Zoology				
Rural Credits Development Fund grant for the project on the biological control of muscid flies	79	..	5	74
CSIRO grant for marsupial research	1,384	..	1,549	165 Dr
Indonesian Expedition—Mr D. M. Smyth	1,049	3,032	3,701	380
Rural Credits Development Fund grant for aphid research	17	..	..	17
Rural Credits Development Fund grant for research— Professor J. D. Smyth	767	..	..	767
U.S. National Institutes of Health grant for research <i>in vitro</i> cultivation of <i>Echinococcus granulosus</i>	1,980	1,740 Dr	225	15
Australian Meat Board grant for immunological and <i>in vitro</i> culture studies in relation to the control of systicercosis in sheep	9,822	20,093	28,201	1,714
Rural Credits Development Fund grant for the project investigation of the physiology and metabolism of economically important helminths with the ultimate aim of improving methods of control . . . . .	..	4,417	2,937	1,480
AUSTRALIAN RESEARCH GRANTS COMMITTEE GRANTS				
THE INSTITUTE OF ADVANCED STUDIES				
<i>The Research School of Social Sciences</i>				
Department of Economic History				
For history of land use on Monaro—Emeritus Profes- sor Sir Keith Hancock	140	400	136	404
CENTRE FOR CONTINUING EDUCATION				
For a history of adult education in Australia—Mr B. H. Crew	1,060	25	460	625
THE SCHOOL OF GENERAL STUDIES				
<i>The Faculty of Arts</i>				
Department of English				
For the handbook on Aristotle's poetics in England— Mr J. C. Eade	88	88 Dr	..	..
For a preliminary investigation of the vocabulary of Australian english before 1830—Dr W. S. Ramson	88 Dr	4,926	5,745	907 Dr
For an Anthology of Criticism on Ben Johnson—Pro- fessor C. I. E. Donaldson	1,750	1,750	..

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
Department of Germanic Languages				
For a vocabulary and grammar relating to the German work of Andreas Cryphius—Professor H. Kuhn	425	4,471	5,251	355 Dr
Department of History				
The Evidence of the Reports of Commissioner Biggs on the Colonies of New South Wales and Van Dieman's Land 1822-1823—Dr J. D. Ritchie . . . . .	..	500	500	..
For British colonial native policies in East Africa 1919-1939—Mr I. R. Hancock	840	3,575	1,901	2,514
For Manuscripts in South Celebes—Dr C. C. Macknight . . . . .	..	..	851	851 Dr
Biography Sir Baldwin Spencer—Professor D. J. Mulvaney . . . . .	..	..	192	192 Dr
Department of Linguistics				
For a Linguistic Description of the Yiden language—Professor R. M. W. Dixon . . . . .	..	673	673	..
For distinctive features in Dutch—Dr H. Bluhme	137	137 Dr	..	..
For study of the phenomena of linguistic change—Dr K. H. M. Rensch	335 Dr	4,009	3,034	640
Department of Philosophy				
For edition of a volume on Scandinavian Realism and publication of writings by A. Hagerstrom—Dr T. R. Mautner	357	225	248	334
<i>The Faculty of Asian Studies</i>				
Department of Asian Civilizations				
For participation in Thai-British archaeological expedition investigating the late Neolithic and early metal age of Thailand—Dr H. H. E. Loofs	473	309	797	15 Dr
For annotated selected bibliography of Chinese history—Associate Professor O. B. van der Sprenkel	886 Dr	9,877	9,707	716 Dr
Department of Chinese				
For an anthology of Chinese verse in translation—Dr J. D. Frodsham	654	2,081	2,314	421
<i>The Faculty of Law</i>				
For report on legal education in Australia and the role of university law schools—Professor J. E. Richardson . . . . .	..	7,912	3,758	4,154
<i>The Faculty of Science</i>				
Department of Biochemistry				
For the study on the control of enzyme synthesis in <i>Drosophila Melanogaster</i> —Dr A. J. Howells	66	1,518	1,280	304
For the study of biosynthesis of the membranes of mitochondria—Dr F. L. Bygrave	826	8,139	9,063	98 Dr
For the study of biochemical aspects of insect metamorphosis—Professor L. M. Birt	259 Dr	4,857	5,238	640 Dr

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
For studies on the mechanism of oxidative phosphorylation—Dr F. L. Bygrave and Professor Emeritus R. N. Robertson . . . . .	...	4,000	3,056	944
For study of energy producing mechanisms in the spleen—Dr M. J. Weidemann . . . . .	..	14,010	14,198	188 Dr
For biochemical studies on the multiplication of arbovirus in cultured vertebrate and mosquito cells—Dr L. Dalgarno . . . . .	..	2,607	2,447	160
Department of Botany				
The histochemistry and plant reproduction with particular reference to apomixis and flowering—Dr R. B. Knox and Dr D. M. Paton . . . . .	..	27,325	27,325	..
Department of Chemistry				
For the mechanisms of high energy reactions—Associate Professor W. D. L. Crow	677 Dr	8,662	9,310	1,325 Dr
For time resolved electronic spectroscopy—Dr B. K. Selinger	7 Dr	1,985	1,719	259
For electrocyclic fragmentation reactions induced by thermal photochemical or gamma-radiation processes—Dr R. N. Warrener	82 Dr	5,978	6,752	856 Dr
For the synthesis of dibenzofuran derivatives—Dr J. A. Elix . . . . .	..	4,963	5,327	364 Dr
For a nitrogenase enzyme model system—Dr J. A. Broomhead	164 Dr	4,766	5,005	403 Dr
For study on nuclear magnetic spectroscopy of enzymes—Dr J. H. Bradbury . . . . .	..	4,994	3,554	1,440
Department of Forestry				
For research on the ecology of trees—Professor J. D. Ovington	102	102 Dr	..	..
For a survey of the distribution of the soil-borne fungus <i>Phytophthora cinnamomi</i> —Dr B. H. Pratt and Dr W. G. Heather	63 Dr	5,452	6,174	785 Dr
For study of the effects of prescribed burning in forests on litter fauna—Dr M. T. Tanton . . . . .	..	5,463	5,503	40 Dr
For study of micro-organism and soil water potential—Dr D. M. Griffin . . . . .	..	2,100	2,251	151 Dr
Department of Geology				
For geochemical investigations of granite rocks and associated mineral deposits—Dr A. J. R. White	1,165	7,151	8,132	184
Department of Physics				
For research on the production and properties of very strong shock waves—Dr R. J. Sandeman	10 Dr	13,518	13,610	102 Dr
For study of hypervelocity aerodynamics—Dr R. J. Stalker and Dr H. G. Hornung	1,608	10,995	10,156	2,447
For study of ion scattering from single crystal surfaces—Dr R. J. MacDonald	5,175	5,105	70

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STATEMENT OF FUNDS GRANTED FOR RESTRICTED PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
Department of Psychology				
For studies in space perception—Associate Professor G. N. Seagrim	2,075	1,303 Dr	508	264
For study of environmental heat, body temperature and behaviour—Professor K. A. Provins	93 Dr	..	93 Cr	..
Department of Theoretical Physics				
For the study of optical aberration theory—Professor H. A. Buchdahl and Dr P. J. Sands	682 Dr	9,131	10,134	1,685 Dr
Department of Zoology				
For study of the relationship between endocrine and environmental stimuli in the appearance and develop- ment of enzyme—Dr P. A. Janssens	368	1,968	2,128	208
For studies on speciation and phyletic relationships among indigenous perciform fishes—Dr A. H. Weatherley . . . . .	..	1,831	840	991
	466,613	872,641	827,972	511,282

STATEMENT OF FUNDS FOR SPECIAL PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
SPECIAL PURPOSE FUNDS	\$	\$	\$	\$
Centre for Continuing Education—Schools and Seminars	25,527	79,415	73,643	31,299
Centre for Continuing Education—UNESCO Seminar	4,516	243	547	4,212
28th International Congress of Orientalists	58,846	13,405	64,615	7,636
Wenner-Gren Foundation grant to Far Eastern Prehistory Association to aid attendance of Asian prehistorians in conjunction with 28th International Congress of Orientalists	4,343	173	4,172	344
Calouste Gulbenkian Foundation of Lisbon grant to Far Eastern Prehistory Association to aid attendance of Portuguese and British scholars in conjunction with 28th International Congress of Orientalists	2,015	..	2,015	..
Council on Library Resources grant, to aid attendance for members of the library seminars in conjunction with 28th International Congress of Orientalists	7,104	111	4,793	2,422
National Summer School for talented students of mathematics	9,714	8,189	9,366	8,537
Summer School in Theoretical Chemistry	1,246 Dr	1,246	..	..
Wood Science Utilisation Seminar	20	..	..	20
Conference on picture language machines	62	..	62	..
Training Course for 'Expo' personnel	356	..	356	..
Conference on Australian and New Zealand-American relations	42 Dr	42	..	..
Seminar on Mathematics for social scientists	9,495	752	6,353	3,894
Pacific Trade and Development Fund—Dr P. D. Drysdale	17	275	7	285
The National Conference on crime prevention	500	..	..	500
Support to the Universities Service Centre—Hong Kong	..	50	..	50
University of Ghana for Thesis Support—Mr S. K. Gaisie	..	582	..	582
Research School of Social Sciences Faculty Fund	..	28	..	28
Research School of Pacific Studies Faculty Fund	..	72	..	72
Department of Biochemistry Fund	..	60	..	60
Australian Capital Territory Postgraduate Committee in Medicine	5,090	6,286	8,504	2,872
Linguistic Circle Publications Fund	210	3,373	3,009	574
Collections for Art Material in New Guinea schools	25	..	25	..
Research Scholars' Thesis Typing Scheme	24,329	11,926	9,318	26,937
Gift of books to Russia	241	..	14	227
<i>The Australian Economic Review</i> Fund	9,073	1,021	..	10,094
Functions and Farewells	..	1,872	1,748	124
Fund for Purchase of Portrait of Emeritus Professor Sir Mark Oliphant	..	1,189	1,200	11 Dr
Professor P. H. Partridge Special Fund	..	860	..	860
Australian Mineral Industry Research Fund	..	1,184	..	1,184
Grant for Publication of <i>Campanian and Lucanian Pottery</i>	1,235	69	..	1,304
Vice-Chancellor's Special Fund	1,199	3,848	1,764	3,283
Professor J. W. Davidson's Fund for Publications Assistance	3,349	1,190	7 Cr	4,546

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STATEMENT OF FUNDS FOR SPECIAL PURPOSES

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—*continued*

	<i>Fund Balances 31 Dec. 1970</i>	<i>Subsidies and Donations Received during 1971</i>	<i>Funds Disbursed or Trans- ferred during 1971</i>	<i>Fund Balances 31 Dec. 1971</i>
	\$	\$	\$	\$
SPECIAL PURPOSE FUNDS—<i>continued</i>				
Grant by Professor B. H. Neumann to the Department of Mathematics	1,640	91	..	1,731
Research School of Social Sciences special travel fund	676	..	56	620
General Purpose Fund, Department of Botany—Professor L. D. Pryor	1,660	1,800	1,099	2,361
Grant to Department of Clinical Sciences—Professor H. M. Whyte . . . . .	..	1,018	197	821
Professor F. J. Fenner's Fund to provide books for the library of the proposed Centre of Natural Resources . . . . .	..	2,060	..	2,060
Laos Australian Forest School Project at Dong Dok . . . . .	..	484	600	116 Dr
Wenner-Gren Foundation grant—Dr D. Y. Wu . . . . .	..	3,597	2,918	679
Fund for repair of New Guinea Research Unit houses	12,828	11,191	15,252	8,767
Fund for repair of Fijian house	17	..	..	17
New Guinea Artefacts Fund	300	..	151	149
Ian Potter Foundation grant—Emeritus Professor Sir Mark Oliphant	93 Dr	1,000	907	..
Myer Foundation grant—Mr M. Sawyer	2,033	..	2,033	..
Scheduling of Examinations by Computer	44	206	250	..
Laos-Australian Reafforestation Project	2,111 Dr	4,572	4,202	1,741 Dr
Anglo-Australian Telescope Project—Photometric Instrumentation Fund	7,591	59,053	15,711	50,933
Science Research Council of UK for 48-inch Telescope Project . . . . .	..	103,623	130,518	26,895 Dr
The Ditchley Foundation Conference . . . . .	..	4,062	1,623	2,439
The Saionji-Hamersley Memorial Scholarship Fund . . . . .	..	768	1,584	816 Dr
Australia - Japan Business Co-operation Committee Scholarship Fund . . . . .	..	507	950	443 Dr
Staff Amenities Fund	31,504	11,916	..	43,420
Department of Japanese publishing account	1,412	449	..	1,861
Pacific History Publications Promotion Fund	187	78	3 Cr	268
Far Eastern History Publication	65	304	..	369
Publication of <i>Luksave</i>	494	1,347	1,173	668
Law Publication Fund	9,745	8,257	5,239	12,763
Urban Research Monograms/Business Activities . . . . .	..	1,960	253	1,707
Publication— <i>The Politics of Melanesia</i> . . . . .	..	164	..	164
Department of Prehistory— <i>Terra Australis</i> . . . . .	..	2,115	84	2,031
Department of Economic History Publications . . . . .	..	106	464	358 Dr
National Heart Foundation grant for publication of a modified fat cook book—Natalie L. Havenstein . . . . .	..	583	..	583
Sales of Report on Indian Agriculture . . . . .	..	8	29	21 Dr
Special Fund—Retention Money	36,090	91,552	27,939	99,703
Sports Union . . . . .	..	28	..	28
	270,060	450,360	404,733	315,687

STATEMENT OF FUNDS FOR SCHOLARSHIPS

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
GRANTS FOR SCHOLARSHIPS				
THE INSTITUTE OF ADVANCED STUDIES				
<i>The John Curtin School of Medical Research</i>				
National Heart Foundation Fellowship—Dr P. Sinnett	867 Dr	6,835	6,122	154 Dr
CSIRO grants-in-aid for scholars	1,137	613	..	1,750
British Commonwealth Scholarships and Fellowships and Colombo Plan Scholarships	1,095	1,000	274	1,821
<i>The Research School of Physical Sciences</i>				
CSIRO grants-in-aid for scholars	2,316	525	266	2,575
Queen Elizabeth II Fellowship grant—Dr K. C. Freeman	277	369	106	540
Queen Elizabeth II Fellowship grant—Dr A. F. Collings	640	..	471	169
Queen Elizabeth II Fellowship grant—Dr G. D. Symons	10 Dr	1,036	539	487
Queen Elizabeth II Fellowship grant—Dr J. M. Morris	649	3,937	4,589	3 Dr
Australian Institute of Nuclear Science and Engineering Fellowship—Dr L. E. Carlson	5,215	8,503	7,806	5,912
British Commonwealth Scholarships and Fellowships and Colombo Plan Scholarships	3,696	1,000	1,476	3,220
General Motors-Holden Research Fellowship—J. L. Davy	..	3,450	2,709	741
Queen Elizabeth II Fellowship grant—Dr P. Richmond	..	5,867	5,861	6
Queen Elizabeth II Fellowship grant—Dr. C. Pask	..	6,308	4,157	2,151
Queen Elizabeth II Fellowship grant—Dr M. O. Diesendorf	..	2,868	2,256	612
<i>The Research School of Social Sciences</i>				
British Commonwealth Scholarships and Fellowships and Colombo Plan Scholarships	3,604	500	187	3,917
Leverhulme Trust Fellowship grant—Professor K. Katsuda	..	3,116	3,218	102 Dr
<i>The Research School of Pacific Studies</i>				
British Commonwealth Scholarships and Fellowships and Colombo Plan Scholarships	726	1,250	4,618	2,642 Dr
Reserve Bank Senior Fellowship in Agriculture—Dr M. L. Parker	..	13,168	6,971	6,197
Council of Aboriginal Affairs and Institute of Aboriginal Studies Fellowship—Emeritus Professor W. E. H. Stanner	..	2,000	..	2,000
Zoecon Chemical Research Fellowships	20 Dr	..	..	20 Dr
<i>The Research School of Chemistry</i>				
CSIRO grants-in-aid for scholars	700	175	..	875
Leverhulme Trust Fellowship grant—Professor S. Otsuka	..	3,739	3,152	587
<i>The Research School of Biological Sciences</i>				
Queen Elizabeth II Fellowship grant—Dr R. A. Fischer	..	195	195	..
Queen Elizabeth II Fellowship grant—Dr G. M. Polya	..	5,534	9,114	3,580 Dr
CSIRO grants-in-aid for scholars	..	175	..	175
Queen Elizabeth II Fellowship grant—Dr B. G. Rolfe	2,680	2,680 Dr

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STATEMENT OF FUNDS FOR SCHOLARSHIPS

FOR THE YEAR ENDED 31 DECEMBER 1971 (xi)—continued

	Fund Balances 31 Dec. 1970	Subsidies and Donations Received during 1971	Funds Disbursed or Trans- ferred during 1971	Fund Balances 31 Dec. 1971
	\$	\$	\$	\$
THE SCHOOL OF GENERAL STUDIES				
British Commonwealth Scholarships and Fellowships and Colombo Plan Scholarships	3,490	5,438	2,986	5,942
National Parks and Wildlife Service Studentship Awards	1,128	1,107 Dr	21	..
Leverhulme Trust Fellowships grant	4,978	3,891	6,332	2,537
Leverhulme Trust Fellowship (Keio University)	803	..	..	803
Drapers Company Scholarship—Dr R. D. N. Topham . . . . .	..	2,033	1,790	243
Imperial Chemical Industries of Australia and New Zealand Limited Research Fellowship	367	..	270	97
CSIRO grants-in-aid for scholars	218 Dr	1,137	916	3
Ampol Scholarship . . . . .	..	2,400	1,200	1,200
Esso Standard Oil (Australia) Ltd Scholarship to the Department of Geology	600	..	..	600
NATO Postdoctoral Fellowship grant—Dr J. B. Haviland . . . . .	..	170	..	170
Australian Wool Board Scholarship—Dr D. D. Heath	11Dr	..	11 Cr	..
Australian Wool Board Postdoctoral Fellowship grant— Dr G. B. Fox . . . . .	..	9,806	7,927	1,879
Australian Wool Board Scholarship—Mr G. E. Ford	706 Dr	2,840	1,640	494
Australian Wool Board grant—support for supervisor of Mr G. E. Ford	437	800	810	427
Department of Interior Scholarship—Mr P. A. Taylor . . . . .	..	4,500	3,396	1,104
	30,026	104,071	94,044	40,053
<i>Summary</i>				
Restricted Funds	466,613	872,641	827,972	511,282
Special Purpose Funds	270,060	450,360	404,733	315,687
Scholarships	30,026	104,071	94,044	40,053
	766,699	1,427,072	1,326,749	867,022

Prepayments from Restricted Funds and Special Purposes

Funds	\$1,996
Restricted Funds—Invested as at 31 December 1971	\$143,842

STATEMENT OF TRUST AND AGENCY FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (xii)

	<i>Income Received</i>			<i>Disburse- ments</i>	<i>Trans- ferred to Reserve</i>	<i>Fund Balance 1 Jan. 1971</i>	<i>Fund Balance 31 Dec. 1971</i>
	<i>Subsidies, Donations and Sub- scriptions</i>	<i>Interest and Capital Appreci- ation</i>	<i>Total</i>				
	\$	\$	\$	\$	\$	\$	\$
<i>University Funds</i>							
The Supplementary Superannuation Benefits Fund	2,281	12,298	14,579	12,559	2,020	200,690	202,710
1966 Supplementary Superannuation Benefits Fund	301,806	84,862	386,668	254,240	132,428	1,292,182	1,424,610
The Staff Superannuation Scheme—Members' Accumulations	157,104	26,217	183,321	4,435	178,886	376,557	555,443
Non-Academic Staff Retirement Provision—Cash Accumulations	93,937	11,452	105,389	19,652	85,737	184,654	270,391
Mount Stromlo Observatory Fund . . . . .	..	310	310	..	310	5,760	6,070
<i>Gifts and Endowments</i>							
The Lord Rutherford Memorial Trust Fund . . . . .	..	834	834	751	83	15,009	15,092
Morrison Oration Trust Fund . . . . .	..	80	80	..	80	1,497	1,577
Sir Littleton Groom Memorial Scholarship Trust Fund . . . . .	..	149	149	..	149	2,973	3,122
Norwegian-Australian Cultural Trust Fund . . . . .	..	271	271	..	271	4,932	5,203
Danish-Australian Cultural Trust Fund . . . . .	..	274	274	759	485 Dr	5,212	4,727
Swedish-Australian Cultural Trust Fund . . . . .	..	182	182	..	182	3,555	3,737
Canberra University College Public Subscription Fund . . . . .	..	2	2	..	2	102	104
R. G. Menzies Scholarship Fund	280	2,052	2,332	1,810	522	35,219	35,741
Alexander McTaggart Memorial Fund . . . . .	..	539	539	..	539	5,994	6,533
The Florey Memorial Fund	2,703	10,175	12,878	3,752	9,126	158,269	167,395
A. M. Cohen Trust Fund . . . . .	..	216	216	..	216	4,530	4,746
Pension Fund	6	5,250	5,256	3,621	1,635	..	1,635
S. J. Butlin Fund	42,157	190	42,347	..	42,347	..	42,347

continued on following page

STATEMENT OF TRUST AND AGENCY FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (xii)—continued

	<i>Income Received</i>		<i>Total</i>	<i>Disburse- ments</i>	<i>Trans- ferred to Reserve</i>	<i>Fund Balance 1 Jan. 1971</i>	<i>Fund Balance 31 Dec. 1971</i>
	<i>Subsidies, Donations and Sub- scriptions</i>	<i>Interest and Capital Appreci- ation</i>					
	\$	\$	\$	\$	\$	\$	\$
<i>Prize Funds</i>							
The John Deans Prize Fund . . . . .	..	8	8	9	1 Dr	206	205
The Lady Isaacs' Prize Fund . . . . .	..	8	8	..	8	267	275
The Robert Ewing Prize Fund . . . . .	..	15	15	27	12 Dr	564	552
The Andrew Watson Prize Fund . . . . .	..	5	5	6	1 Dr	112	111
The George Knowles Memorial Prize Fund . . . . .	..	11	11	..	11	467	478
The W. J. Lind Prize Fund . . . . .	..	5	5	5	..	111	111
The Alliance Française Prize Fund . . . . .	..	10	10	11	1 Dr	224	223
The Tillyard Prize Fund . . . . .	..	48	48	48	..	821	821
The J. B. Chifley Memorial Prize Fund . . . . .	..	18	18	38	20 Dr	750	730
Rachel Dorph Memorial Prize Fund . . . . .	..	11	11	..	11	218	229
The W. B. Clarke Prize Fund	56	..	56	..	56	..	56
Peter William Stroud Memorial Prize Fund . . . . .	..	294	294	800	506 Dr	6,250	5,744
Priscilla Fairfield Bok Prize Fund . . . . .	..	63	63	..	63	1,150	1,213
Schlich Memorial Prize Fund . . . . .	..	24	24	..	24	616	640
Australian Society of Accountants' Prize Fund	50	..	50	..	50	4	54
Canberra Association of University Women—Tillyard Prize Fund	367	..	367	..	367	..	367
Hanna Neumann Memorial Fund	602	..	602	..	602	..	602
Sundry Prize Funds	1,211	..	1,211	130	1,081	49	1,130
<i>Agency Funds</i>							
The Saionji Hamersley Scholarship Fund	354	..	354	..	354	354 Dr	..
The Vice-Chancellor's Discretionary Fund . . . . .	..	1,276	1,276	..	1,276	32,800	34,076
The Department of Biochemistry Fund . . . . .	..	..	..	43	43 Dr	43	..
The Research School of Social Sciences Faculty Fund . . . . .	..	..	..	28	28 Dr	28	..
The Research School of Pacific Studies Faculty Fund . . . . .	..	..	..	73	73 Dr	73	..
Australia Japan Business Co-opera- tion Committee	64	..	64	..	64	64 Dr	..
	602,978	157,149	760,127	302,797	457,330	2,341,470	2,798,800

continued on following page

STATEMENT OF TRUST AND AGENCY FUNDS

FOR THE YEAR ENDED 31 DECEMBER 1971 (xii)—continued

	Face Value	Purchase Price Appreciated to Date	Purchase Price	Total
	\$	\$	\$	\$
<i>Investments</i>				
The Supplementary Superannuation Benefits Fund	213,400	211,449		
1966 Supplementary Superannuation Benefits Fund	1,464,550	1,442,415		
The Staff Superannuation Scheme—Members' Accumulations	550,720	533,045		
Non-Academic Staff Retirement Provision—Cash Accumulations	269,800	259,239		
Mount Stromlo Observatory Fund	5,490	5,490		
The Lord Rutherford Memorial Trust Fund	14,960	14,525		
Morrison Oration Trust Fund	1,400	1,400		
Sir Littleton Groom Memorial Scholarship Trust Fund	2,720	2,709		
Norwegian-Australian Cultural Trust Fund	4,650	4,607		
Danish-Australian Cultural Trust Fund	4,600	4,572		
Swedish-Australian Cultural Trust Fund	3,250	3,241		
Priscilla Fairfield Bok Prize Fund	1,150	1,150		
The Vice-Chancellor's Discretionary Fund	18,200	18,222		
R. G. Menzies Scholarship Fund	35,200	35,057		
The Florey Memorial Fund	162,300	162,454		
Alexander McTaggart Memorial Fund	6,500	6,012		
S. J. Butlin Fund	42,000	42,000		
				2,747,587
Schlich Memorial Prize Fund	480		480	
Canberra University College Public Subscription Fund	36		36	
The John Deans Prize Fund	160		160	
The Lady Isaacs' Prize Fund	248		248	
The Robert Ewing Prize Fund	456		456	
The Andrew Watson Prize Fund	100		100	
The George Knowles Memorial Prize Fund	420		420	
The W. J. Lind Prize Fund	100		100	
The Alliance Française Prize Fund	200		200	
The Tillyard Prize Fund	840		788	
The J. B. Chifley Memorial Prize Fund	700		700	
Rachel Dorph Memorial Prize Fund	200		200	
Peter William Stroud Memorial Prize Fund	5,000		5,000	
A. M. Cohen Trust Fund	4,000		4,000	12,888
	2,813,830			2,760,475
Loans from the Vice-Chancellor's Discretionary Fund				12,483
Interest due to Funds				761
Cash at Bank				25,081
				2,798,800