The Honourable Eric Bedford, B.A., M.L.A., Minister for Education,

In accordance with section 34 of the University of Wollongong Act 1972, the Council of the University has the honour to present to you the Annual Report of the proceedings of the University for the period 1st January to 31st December, 1976.

Chancellor

Vice-Chancellor

ANNUAL REPORT 1976

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The University of Wollongong

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VICE-CHANCELLOR'S STATEMENT

Introductory Statement

In only its second year as an independent university, the University of Wollongong found itself forced to a "standstill" position, with an enrolment plateau of 2,300 EFTS, and diminished or no prospects for maintaining the improved levels of its real funding. These prospects have necessitated revision of much earlier planning. What had previously been seen as a period of consolidation of academic activities, preparatory to the establishment of new departments in the Faculties of Humanities, Social Sciences, Science and Mathematics, now appears as the completion of the shaping of the University. Consequently, the University's development plan for site and buildings which had assumed a student population of about 4,000 rather than 2,300 is now being reconsidered as are our working relationships with the Wollongong Institute of Education and the Wollongong Technical College. It has also been necessary to reappraise the extent to which the University can respond to particular educational needs in the region - for example, in the fields of Multi-Cultural Studies and further and continuing education.

Despite the greatly changed prospects, it is now clear that the University is soundly established as an institution of higher education and research. Moreover, we retain our conviction that, as a member of the group of institutions providing tertiary education in the region, the University has a very important part to play in regional development. We are confirmed in this belief by the many expressions of appreciation and support which have come to us from various quarters during the last year: from the local Parliamentarians, from the Wollongong City Council and other Local Government authorities, and from migrant groups, industry, schools and health services. Indeed, the University's first graduation ceremony, which was a highlight of the University year, emphasised this point. The ceremony took place in the city's Town Hall in the presence of the Lord Mayor and the citizens of the Illawarra Region. The Governor of N.S.W., Sir Roden Cutler (as our Visitor) installed our first Chancellor, Mr. Justice Hope. We celebrated the full establishment of an independent university with both academic and social responsibilities.

The Council

During 1976, Council members took an active interest in academic developments, especially those linking the University more closely with the region, such as the introduction of Italian language studies. Council also supported developments more directly concerned with the personal welfare of staff and students; for example, it approved the establishment of a University Health Service and an on-campus Child-Care Centre. Meanwhile Council's committees continued their oversight of the University's activities including major matters such as staff conditions and financial management. Council's Ceremonials Committee saw the fulfillment of a year's work and planning at the Graduation Ceremony, and the Legislation Committee began drafting important additions to the University's By-Law.

The Council met six times during 1976 and, as at 31st December, 1976, its membership comprised:

Ex Officio

| The Hon. Justice R.M. Hope, Chancellor |
| Emeritus Professor L.M. Birt, Vice-Chancellor |

Elected by the Legislative Council

| The Hon. Mr. M.F. Willis |

Elected by the Legislative Assembly

| The Hon. Mr. L.B. Kelly |

Appointed by the Governor on the Nomination of the Minister for Education

| Dr. E. Beale |
| Mr. B.S. Gillett |
| Dr. D. Parry |
| Mr. W. Pike |

Elected by the Students of the University

| Mr. A.C. Macdonald |
| Ms. R.L. Rowland |

Elected by Convocation

| Mr. W.B. Burgess |
| Mr. W.E. Parnell |
| Mr. W.G. Petersen |
Elected by the Full-time Academic Staff of the University

- Associate Professor J.S. Hagan
- Professor S.C. Hill
- Professor J.B. Ryan
- Professor B.H. Smith
- Mr. C.J. Lambert

Elected by the Full-time General Staff of the University

- The Hon. R.F.X. Connor
- Professor F.J. Fenner
- Mr. R.A. Hohnen

The Senate and the Academic Structure

The Academic Senate which operated throughout 1976 was one of the few almost entirely elected bodies of its type in Australian Universities. Its membership comprised the Vice-Chancellor, seven Professors, three students and eight other members elected by the Academic Assembly. Difficulties in communication, particularly between the departments and the executive, stimulated a reappraisal of the Senate's composition. Discussion of proposed changes took place at Faculty, Academic Assembly and Senate level. As a result, Senate decided on 28th July, 1976, to recommend a change to an ex-officio membership of the Vice-Chancellor, all Departmental Chairmen, the University Librarian and all Faculty Chairmen and an elected membership of one academic staff member of each Faculty and one student member from each Faculty. The University Council approved the change in Senate's structure but further decisions involving Faculty and Committee structures were postponed until the newly constituted Senate meets on 25th May, 1977. The Academic Senate met fourteen times during 1976 and, as at 31st December, 1976, its membership comprised:

Ex Officio
- The Hon. Justice R.M. Hope, Chancellor
- Emeritus Professor L.M. Birt, Vice-Chancellor

Members elected by the Professors
- Professor G. Brinson, Department of Metallurgy, Chairman of Senate
- Professor A.D. Brown, Department of Biology
- Professor P. Fisher, Department of Physics
- Professor A. Keane, Department of Mathematics
- Professor J.L.C. Chipman, Department of Philosophy
- Professor M.G.A. Wilson, Department of Geography

Members elected by the Students of the University
- Ms. P. Griffith
- Mr. G. Mitchell
- Ms. J.A.E. Symes

Members elected by the Members of the Academic Assembly
- Mr. A.J. Anderson, Department of Accountancy
- Associate Professor P.D. Bolton, Department of Chemistry
- Associate Professor D.J. Clarke, Department of Mathematics
- Dr. J.R. Panter, Department of History and Philosophy of Science
- Dr. G. Doherty, Department of Mathematics
- Dr. F.M. Hall, Department of Chemistry
- Dr. B.J. Opie, Department of English
- Associate Professor E.R. Phillips, Department of Geology

The Academic Assembly

The Academic Assembly, the University forum for open discussion between staff and students, met twice during 1976 and its main topic for debate was the proposed change to the academic structure. The membership remained unchanged - all members of the University's academic staff, the University Librarian and twenty student members. In 1976 Professor Ryan completed the second year of his term as Chairman of the Academic Assembly.
the University Librarian and twenty student members. In 1976 Professor Ryan completed the second year of his term as Chairman of the Academic Assembly.

1976 Initiatives

The University's concern with internal communication was accompanied by an awareness of the need for improving its external communications with a community containing a high proportion of people born and brought up outside monolingual Australia. Intensive investigation and support by members of the University during 1976 resulted in the formulation of a proposal for the establishment of a Centre for Multi-Cultural Studies to provide for research and teaching in the areas of intercultural and migrant studies. An exciting and highly appropriate concept for Wollongong, this proposal is expected to receive the approval of the Council in 1977.

Another undertaking of particular relevance to the Illawarra region was the Lake Illawarra Environmental Assessment Project in which geographers, geologists, chemists and economists from the University participated. The Project's findings were recorded in the *Illawarra Lake Report*, a work printed by the University Printery, which was presented to the Lord Mayor of Wollongong on 8th October, 1976.

This University's appointment of a full-time Schools Liaison Officer - the first in any N.S.W. University - had three noteworthy consequences in 1976. A "Schools' Liaison Committee" and the Schools Liaison Officer, with the co-operation of Local High Schools, arranged successful visits to the University and the City of Wollongong by Secondary School students from country areas. A public seminar was also held at the University on the topic, "The University Degree: Training for Vocation or for Life". Possibly the most "dramatic" initiative in this area, however, was the production of a video-tape entitled "University: A New Way of Life". Planned initially as an introduction to the University environment for potential students, this video-tape was shown on the local television station and won the 1976 Television Society of Australia Penguin Award for the Best Regional Station Programme. "University: A New Way of Life" is a tangible result of the healthy relationship that has developed between the University and the local media and an example of the productive co-operation between the University and other community and educational bodies. W.I.N. Channel 4, the local channel, not only provided the incentive and the professional expertise but also funded the entire project. The University's major contributions were the script, casting, production assistance and setting but the principal actors came from the Wollongong Institute of Education. Others involved ranged from a local railway station master to the Principal and pupils of a nearby High School.

The need for further co-operative efforts in post-secondary education in Wollongong was emphasised by a Forum held on 6th December, 1976, to consider the possibilities of association between the University and the Wollongong Institute of Education. Attended by staff members from both institutions, this Forum developed into an open exchange of views and proposals. The result was a recommendation that a cost/benefit investigation of the possible effects of "rationalisation" be conducted. In this context "rationalisation" was seen as ranging from the maintenance of the existing relationship, through amalgamation (which might take a variety of forms) to a closing down of the Institute or the University or both. In its report on the 1977/79 triennium, the Universities Commission had recognised that:

"...such investigations necessarily involve a major commitment of time and resources, and therefore, require special support from the Government before they are undertaken." (Para. 3.12, Universities Commission Report 1977/79). The University and the Wollongong Institute of Education moved accordingly to request financial assistance from the New South Wales Higher Education Board and the Universities Commission to support the proposed cost/benefit study. At the end of 1976, however, negotiations were still underway.
Academic Activities 1976

In 1976 the Departments of French, Philosophy and Sociology received the support needed to establish the first years of their courses and to plan later year offerings. Awareness of the character of the community contributed to the requests - subsequently approved by Council - by the Department of French that its name be changed to the Department of European Languages and that a second language - Italian - be introduced in 1977. Established departments also respond to changing student interest. For example, the Department of Physics offered a new subject, "The Art of Physics", in 1976 and the Committee of General Studies introduced a two-part course, "Women in Society".

In the postgraduate area, three new degrees were approved in 1976, namely the Master of Education, the postgraduate Bachelor of Education, which represents the University's first move into the area of Bachelor postgraduate degrees, and the Master of Metallurgy, the postgraduate partner of the already established Bachelor of Metallurgy. A graduate Diploma in Mathematics was also approved in 1976 and the graduate Diploma in Accountancy, approved in 1975, admitted its first students during the year.

Enrolments and Student Issues

Academic activities during the year entered into areas of current student and community interest and exploited the specialisations of Wollongong staff. These developments, however, were necessarily contained by the University's recognition of the Universities Commission's statement that "one consequence of holding intakes constant will be that the smaller newer Universities will have to operate at levels of enrolments which will be a good deal lower than those for which they were planned and which will be relatively uneconomic and prevent a desirable diversification of the University's academic work."

Despite external restrictions, the University's enrolment figures increased by approximately 143 (7%) in 1976. The undergraduate enrolments reached 2111 and the higher degree number was 157. The Faculty mix yielded a science based load of 31.1% (31.0% in 1975) and the proportion of part-time students remained high (41%, a slight decline from 1975's 46%). Enrolments via the Special Admissions Programme introduced in 1975 were maintained (at 83) and these mature age students showed a significantly superior performance to the first year student intake as a whole.

While attempts were being made to respond to community demands by diversifying subject offerings and liberalising admission requirements, the University became increasingly concerned - along with other tertiary institutions - with students' academic performance. Senate and the Faculties began to investigate possible means of improving the situation with Senate's Working Parties on Student Workloads and Remedial English considering major factors that might contribute towards poor standards of performance. The whole matter is here, as elsewhere, still under examination.

Another aspect of student performance which warranted attention, namely the "drop-out rate", became apparent during 1976. A study of this problem is expected to be completed in 1977.

Building Programme

1976 was a year of official openings. On 31st March the Lecture Theatre complex known as the Pentagon was opened by the New South Wales Premier, Mr. Neville Wran. Comprising five lecture theatres and equipped to house an extensive audio-visual system, the Pentagon has proved a versatile structure acting as a venue for public seminars and conventions, and as an enrolment centre and exhibition hall. In April, another multi-purpose building - the third stage of the University Union - together with the distinctive red-and-blue-trimmed Sports Pavilion were opened by the Lord Mayor of Wollongong. A somewhat traditional building (in purpose if not design) the Social Sciences building was opened on the 3rd September by Senator Carrick, Federal Minister for Education. This occasion, one that might have been expected to be rather more
formal than the other official openings, was enlivened by a spirited discussion between the
Minister and members of the University.

No new buildings were commenced in 1976 and new capital expenditure was restricted to a grant
of $39,500 (June 1975 price levels). Alterations were confined to those necessary for effective use
of the spaces vacated by departments moving into the new buildings of the completed 1973-1975
programme.

The alterations provided additional areas for the Departments of Biology, Electrical Engineering
and Geology as well as providing space for the newly established Administrative Data Processing
Unit. Temporary paths and some limited paving adjacent to the new buildings of the 73-75 pro-
gramme were also provided.

The publication by the Universities Commission of its recommendations for 1977-79 in July
1976 enabled planning to proceed for site works to the value of $300,000 (December 1975 prices)
and, in December 1976, it was possible to let a contract for more of the work planned. It was
necessary to allocate the whole grant to overcome some of the longstanding deficiencies in site
works, so that no minor building works were possible.

The University continued to enrol additional students and staff to the limit imposed by the re-
current funds allocated and in consequence existing buildings are being used more intensively. In
comparison with other Universities, Wollongong is still short of space and this situation will con-
tinue at least until 1979. In consequence, the University has introduced regular reviews of the use
of the available space and makes internal reallocations to alleviate some of the difficulties encoun-
tered by the new and most rapidly expanding departments.

Conclusion - Graduation and Installation of Chancellor

Perhaps the most significant occasion in 1976 was the ceremony in which the University's first
Chancellor was officially installed and its first graduates received their degrees. Proceeded by a
colourful academic procession down one of the city's streets, the ceremony itself took place in the
Wollongong Town Hall. "Town" and "Gown" combined most successfully: the University provid-
ed the academic pageantry and the city provided the venue with its magnificent pipe organ. It was
a time for the University to acknowledge its indebtedness to the city and the region. This it gladly
did, firstly for the contributions of local government, commercial interest, industrial concerns
and private citizens who had not only argued strongly for but had also raised and provided funds
for a University College at Wollongong; many of these "pioneers" sat among the audience during
the ceremony. Secondly, the University thanked those members of the University of N.S.W. and
the Wollongong University College who, whilst holding positions of authority during the critical
phases of the movement towards independence, had contributed substantially to its successful
launching. Sir Robert Webster, former Chancellor of the University of New South Wales, Professor
C.A.M. Gray, former warden of Wollongong University College, Professor Rupert Myers, Vice-
Chancellor of the University of New South Wales and Dr. D.E. Parry, Chairman of the College
Council and the first Council of the University and its first Deputy Chancellor, all received Honor-
dary Degrees of Doctor of Science.

The University's academic dress worn for the first time at the ceremony. The distinctive royal
blue gowns with the various hoods of old gold, green, red, silver and blue brightened the scene
with the University's first Ph.D graduate resplendent in blue trimmed with red satin, and a blue
and red trencher.

The University's first Chancellor, Mr. Justice Robert Hope, was robed in the gold and black
Chancellor's gown by the University's Visitor, the Governor of New South Wales, Sir Roden
Cutler. After his installation, the Chancellor delivered a speech that might be said to provide both
the keynote for and the summary of the University's activities in 1976. He stated that "the install-
ation of the first Chancellor of a University is in truth an occasion for the celebration of its found-
ation, and that is what this celebration is. We celebrate the foundation of a University in and for
this city and region, and we celebrate also the addition of this University to that association of
Universities which has been so invaluable to Australia."
UNIVERSITY FACILITIES AND SERVICES

The University Library

Major Ongoing Activities

In 1976 planning for the automation of cataloguing was given further momentum as the result of co-operation with Macquarie University Library and the appointment of additional staff to work on the project in the Administrative Data Processing Unit.

The projected sequence for introduction of automated Library procedures is cataloguing, acquisitions, circulations, serials and information retrieval, in that order.

New Developments

A significant new development was the establishment of an office for the Archives Unit on the first floor of the University Library; a more effective service is now provided even though archival material still remains located four kilometres from the University.

Library co-operation in the Illawarra Region received a distinct boost with the establishment of the Illawarra Regional Librarians Co-operation Committee which has representatives from various kinds of libraries in the Illawarra community including public, special, school and tertiary.

During the year, despite general financial difficulties, the important posts of Chief Cataloguer and Systems Analyst were filled.

Facilities

The University Library building increased dramatically in 1976 with the opening of Stage II and the total Library staff and services have now been brought together under one roof for the first time.

The Union and Sports Association

The Union and Sports Association were jointly administered during 1976 and, at the beginning of the year, all University employees were granted membership of both bodies.

The Secretary Manager/Executive Secretary of the Union and the Sports Association, Mr. Ian Dunn, resigned from his posts to take up a senior lectureship in the Department of Accountancy and his replacement, Mrs H. Susan Stevenson, commenced duties in November.

In 1976 there were twenty-five Clubs affiliated to the Union and Sports Association offering a variety of sporting and cultural activities. Clubs took part in district competitions and inter-varsity sport at international level, four members were selected in teams representing Australian Universities in basketball, cricket and soccer in Canada and New Zealand and a fifth member was chosen as team manager. In addition one member of the Association was selected for the Australian Women’s Judo team touring Europe and Japan. Cultural and social events included exhibitions, lectures, films and concerts and formal dinners were held by both the Union and the Sports Association.

The liquor permit was granted during the year covering the Union and the Sports Pavilion and extensive work was carried out on the Union Hall to bring it to the standard required for a Public Halls Licence. It is hoped this will be granted in early 1977.
The Computer Centre

Usage

Use of the Univac 1106 computer resources has increased by 39% during 1976, compared with 1975. Except for Humanities, all faculties in the University increased their usage of the central site computer during the year; the breakdown by types of user was as follows: Students (11%); Research Students (20%); Academic Staff (48%); Administrative Staff (6%); External Users (5%); Computer Centre (10%).

Most of the work of the research students and academic staff was processed at night-time or week-ends, when the computer was unattended. About 42% of the total work was processed in “unattended mode”.

Project WOLFE

In June the University took delivery of a mini-computer, an Interdata 7/16. This is being developed as a “front-end” to the Univac 1106, primarily for the University Administration and Library applications. A software package WOLFE (Wollongong Front-End) is being developed by the University Computer Centre to provide a comprehensive range of facilities for both the programmers and data-input operators in Administration. A basic version of WOLFE is available for the collection of data relating to the 1977 student enrolments.

External Users

Four external users - Wollongong City Council, Huntley Colliery, the Local Government Employees Medical and Hospital Club and the Health Commission - have terminals connected by Telecom line to the University Computer. Batch services are also provided to the Wollongong Institute of Education, some local schools and Shellharbour Library. Wollongong City Council have placed an order for an Interdata mini-computer and for the WOLFE software to interface it to the Univac 1106.

Additional Staff and Equipment

Two new vacancies have been established, for a Social Science Programmer and a Programmer-In-Training. These will bring the staff establishment of the Computer Centre to a total of ten. Orders have been placed with Univac for a second block of core memory (to increase the capacity to 262,000 words) and two additional disc drives (to increase the capacity to about 300 million bytes).

The Counselling Centre and the Accommodation Service

Counselling Centre

In 1976, 520 persons were seen individually by the two counsellors, involving 1176 interviews. In July, 1976, the Senior Counsellor resigned and the position was filled by the part-time Counsellor in September, 1976. This meant that from July 19th until December 31st, 1976, there was only one counsellor on staff. Approval was granted for a second, full-time counsellor to be appointed to take up duties in January, 1977.

The Counselling Centre Secretary continued to co-ordinate both a student accommodation service and a student employment service and both services were used to capacity.
The major development in 1976 was the introduction of a medical service in August, 1976, operating out of the Counselling Centre. The University has equipped a doctor's surgery on campus and has invited interested local practitioners to offer their services on an hourly basis to members of the University. The service commenced operating with seven doctors each giving one hour of their time per week. By the end of 1976 there were 193 visits to the general surgery and 42 to the family planning clinic.

Accommodation Service

In 1976, the Accommodation Service offered a range of accommodation options to students.

International House, the University's affiliated college, continued operation as a co-educational, non-denominational college run by the Council of International House and owned by the Y.M.C.A. of Wollongong. The College provides accommodation for approximately 200 graduate and undergraduate students plus ten resident tutors.

Located in the Counselling Centre, the Accommodation Service handled a variety of private board accommodation on either a seven or five-day basis.

During the year, the Vice-Chancellor set up an Accommodation Committee to advise him on the development of staff and student accommodation, especially the construction and management of non-collegiate accommodation, and on a scheme for sub-leasing university-leased flats and colleges to students. The Committee's recommendations on the latter proposal resulted in the approval of a trial scheme in which five properties were ultimately leased by the University and sub-let to students during the year.

There was no known short-fall of accommodation for students during the year, however, it was felt that due to financial stringencies, students were sometimes obliged to accept second-rate accommodation.
## UNIVERSITY STATISTICS

**Full-time staff as at 30th April, 1976**

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<tr>
<td>Professor</td>
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<tr>
<td>Professorial Fellow, Reader, Senior Fellow</td>
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<td>Fellow, Senior Research Fellow, Research Fellow</td>
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<td>Supporting Academic Activities</td>
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<tr>
<td>Clerk, Typist, etc.</td>
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<td><strong>TOTAL STAFF</strong></td>
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<td><strong>Teaching-and-research Staff</strong></td>
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<td><strong>Academic Activities</strong></td>
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<tr>
<td>Department of General Studies</td>
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<td>Faculty of Mathematics</td>
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<td>Faculty of Social Science</td>
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<tr>
<td>Department of Mechanical Engineering</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>Department of Education</td>
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<td><strong>TOTAL FOR ACADEMIC ACTIVITIES</strong></td>
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Enrolments to 30th April, 1976

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<th>FULL-TIME</th>
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<td>- Course</td>
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<td><strong>TOTAL</strong></td>
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<th>Bachelor Degree Courses</th>
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<td>Arts</td>
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<td>784</td>
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<td>Commerce</td>
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<td>160</td>
<td>357</td>
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<td>Engineering</td>
<td>233</td>
<td>205</td>
<td>438</td>
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<td>Metallurgy</td>
<td>22</td>
<td>88</td>
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<td>Science</td>
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<td>105</td>
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<td><strong>TOTAL</strong></td>
<td><strong>1165</strong></td>
<td><strong>824</strong></td>
<td><strong>1989</strong></td>
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| Non-degree Courses     |       |       |       |
|                        | 2      | 2     | 4     |

<table>
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<tr>
<th><strong>TOTAL UNDERGRADUATES</strong></th>
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<tr>
<td></td>
<td>1167</td>
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<thead>
<tr>
<th>Other Courses</th>
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<tbody>
<tr>
<td>Post-graduate Diploma</td>
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<td>94</td>
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<tr>
<td>Masters preliminary/qualifying</td>
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<td>24</td>
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<td><strong>118</strong></td>
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<th>NET TOTAL ENROLMENTS AT THE UNIVERSITY *</th>
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<tr>
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<td>971</td>
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* adjusted by 6 for students counted in more than one course
# Appointments, Resignations and Promotions

## APPOINTMENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. D.M. Cavanagh</td>
<td>Lecturer</td>
<td>Education</td>
</tr>
<tr>
<td>Dr. J.A. Bradshaw</td>
<td>Lecturer</td>
<td>European Languages</td>
</tr>
<tr>
<td>Mr. I.L. Dunn</td>
<td>Snr. Lecturer</td>
<td>Accountancy</td>
</tr>
<tr>
<td>Dr. D.E. Lewis</td>
<td>Lecturer</td>
<td>Economics</td>
</tr>
<tr>
<td>Mr. A.J. Anderson</td>
<td>Lecturer</td>
<td>Accountancy</td>
</tr>
<tr>
<td>Ms. S.M. Uniacke</td>
<td>Lecturer</td>
<td>Philosophy</td>
</tr>
<tr>
<td>Dr. I.G. Eliot</td>
<td>Lecturer</td>
<td>Geography</td>
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</table>

## RESIGNATIONS

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Department</th>
</tr>
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<tbody>
<tr>
<td>Dr. P.F. Pentony</td>
<td>Lecturer</td>
<td>Mathematics</td>
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## PROMOTIONS

<table>
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<tr>
<th>Name</th>
<th>Department</th>
<th>Position</th>
<th>Previous Appointment</th>
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<tbody>
<tr>
<td>Arnold, P.C.</td>
<td>Mech. Engineering</td>
<td>Reader</td>
<td>Snr. Lecturer</td>
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<tr>
<td>Bunder, M.N.</td>
<td>Mathematics</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<tr>
<td>de Lacey, P.R.</td>
<td>Education</td>
<td>Reader</td>
<td>Snr. Lecturer</td>
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<tr>
<td>Diespecker, D.D.</td>
<td>Psychology</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<tr>
<td>Doherty, G.</td>
<td>Mathematics</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<tr>
<td>Dunne, D.P.</td>
<td>Metallurgy</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<td>Facor, R.A.</td>
<td>Geology</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<tr>
<td>Kontoleon, J.</td>
<td>Elect. Engineering</td>
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<td>Lowrey, M.J.</td>
<td>Civil Engineering</td>
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<tr>
<td>Mathur, J.N.</td>
<td>Physics</td>
<td>Snr. Lecturer</td>
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<td>McLean, K.J.</td>
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<tr>
<td>Pearson-Kirk, D.</td>
<td>Civil Engineering</td>
<td>Snr. Lecturer</td>
<td>Lecturer</td>
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<td>Tognetti, K.P.</td>
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<td>Reader</td>
<td>Snr. Lecturer</td>
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<tr>
<td>Young, R.W.</td>
<td>Geography</td>
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<td>Lecturer</td>
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### Degrees Conferred

University of Wollongong Graduates

The following candidates were admitted to University of Wollongong degrees by the Chancellor at the Graduation Ceremony held on 11th June, 1976.

#### Bachelor of Arts

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Julian Arul</td>
<td>Helen Mary Murphy</td>
<td>Perpetua Mary O’Loughlin</td>
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<tr>
<td>Julie Christine Blatch</td>
<td>Susan Bronwyn Owen</td>
<td>Carl Phillip Phillips</td>
</tr>
<tr>
<td>Marie Antoinette Carvalho</td>
<td>John Roberts</td>
<td>John Roberts</td>
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<tr>
<td>Arthur John William Clegg</td>
<td>Jennifer Ruth Ryall</td>
<td>Graham Peter Slattery</td>
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<tr>
<td>Gerald Maxwell Doyle</td>
<td>Rosalind Smithers</td>
<td>Ralph Graham Stevenson</td>
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<tr>
<td>Patricia Maree Farrell</td>
<td>Kenneth William Tate</td>
<td>Suzanne Elizabeth Walker</td>
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<tr>
<td>Linda George</td>
<td>Kevin Jon Watler</td>
<td>Carolyn Wright</td>
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<tr>
<td>Claire Ida Halon</td>
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<tr>
<td>Rhonda Grace Kinloch</td>
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<tr>
<td>Elizabeth Rosemary Le Page</td>
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<tr>
<td>David Harish Mayadas</td>
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<tr>
<td>Thomas Moore</td>
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<tr>
<td>Wendy Jane Moxon</td>
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#### Bachelor of Commerce

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<tr>
<td>Hugh Vallance Brandon</td>
<td>Ezio Girotto</td>
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<tr>
<td>Garry William Costello</td>
<td>John Cameron Rankin</td>
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#### Bachelor of Engineering

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<tbody>
<tr>
<td>Heikki Juhani Nivala</td>
<td>Max Leon Raicevich</td>
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#### Bachelor of Science (Engineering)

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<tbody>
<tr>
<td>John Dovicin (Posthumous)</td>
<td>Milan Ivan Hajdarovic</td>
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#### Bachelor of Metallurgy

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<td>Gerard Ryall Biddle</td>
<td>David Mather</td>
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<tr>
<td>Ian Alexander Chapman</td>
<td>John Mazzieri</td>
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<tr>
<td>John Frank Dengate</td>
<td>Robert Eric McArdle</td>
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<td>Garry William Dawson</td>
<td>Jeffrey Edmund Ryall</td>
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<td>Robert James Everett</td>
<td>Paul Denis Wand</td>
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<td>Gordon Edwin Glasgow</td>
<td>George William White</td>
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<tr>
<td>Robert Glasgow</td>
<td>Peter William Wilson</td>
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<td>Oscar Reginald Gregory</td>
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#### Bachelor of Science

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<tr>
<td>Holger Bandte</td>
<td>Sally Joan Meldrum</td>
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<tr>
<td>Peter Maddrell Bunn</td>
<td>Andrew Oppitz</td>
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<tr>
<td>Gilbert Francis Burrows</td>
<td>Ian Conrad Piper</td>
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<tr>
<td>Alice De Kleuver</td>
<td>Anthony Gerard Rossi</td>
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<tr>
<td>Peter Francis Garrety</td>
<td>Kevin Charles Smith</td>
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<td>Thomas Joseph Hunt</td>
<td>Lesley Eileen Vagg</td>
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<td>Murray Ord Jones</td>
<td>Barry Arthur Voller</td>
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<td>Khene Khammana</td>
<td>Philip John Woollett</td>
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<td>Gerard Jacob Kuip</td>
<td>Annette Joy Yeomans</td>
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<td>Ken Wilson MacLean</td>
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University of Wollongong Graduates (Cont’d)

Bachelor of Arts (Honours)

Kim Benjamin (Honours Class II, Division 1)
Yvonne Norma Benjamin (Honours Class I)
Hazel Frances Brown (Honours Class I)
Judith Anne Harrison (Honours Class II, Division 1)
Trevor John Irwin (Honours Class II, Division 1)
Robert Martin (Honours Class II, Division 1)
Sarah McKune (Honours Class II, Division 1)
Robert Bruce McLeod (Honours Class III)
Bohdan Natalenko, BA N.S.W. — (Honours Class II, Division 1)
Terence Gilbert Norwood (Honours Class II, Division 1)
Peter John Stratton (Honours Class II, Division 1)

Bachelor of Engineering (Honours)

Geoffrey David Medlow (Honours Class I and University Medal)
Ian James McAlister (Honours Class II, Division 1)
Tran Dinh Phu (Honours Class I and University Medal)

Bachelor of Metallurgy (Honours)

Philip Melville Draper (Honours Class III)
Robert John Nightingale (Honours Class I and University Medal)

Bachelor of Science (Honours)

Richard Berry (Honours Class II, Division 2)
John Douglas McWilliam (Honours Class II, Division 2)
Michael George Michie (Honours Class II, Division 2)
Peter Stanley Moore (Honours Class I)
Gary David Powis (Honours Class II, Division 1)
Peter Summerside (Honours Class I)

Doctor of Philosophy

Kenneth James Maher, MSc N.S.W.

University of Wollongong Diplomates

The Diploma in Education was awarded to the following candidates:

William Russell Agnew, BA N.S.W.
Colin William Ah Tong, BCom N.S.W.
Beverley Jean Allen, BA N.S.W.
Sonia Arkell, BSc N.S.W.
Terrence Marlow Ashby, BSc Syd.
Jacquelyn Anne Atkins, BA N.S.W.
William Thomas Baker, BA A.N.U.
Marilyn Ann Bolton, BA A.N.U.
Margaret Mary Broome, BSc N.S.W.
James Alan Caldwell, BSc N.S.W.
Wendy Lea Campbell, BA N.S.W.
Hilda Chikosh, BA N.S.W.
Eileen June Coggan, BSc N.S.W.
Joy Narelle Collett, BA N.S.W.
Bronwyn Margaret Cook, BSc N.S.W.
Judith Mary Cook, BA N.S.W.
Garry William Costello, BCom W’gong
Keith George Doe, BSc N.S.W.
Lorraine Fayw Dwyer, BA N.S.W.
Graeme Maurice Eaton, BSc N.S.W.
Kay Elizabeth Elliott, BA N.S.W.
Eleonora Veronica Evans, BSc N.S.W.
Nadia Rosanne Giaron, BA N.S.W.
Kevin James Graham, BA N.S.W.
Geoffrey Walter Leach, BSc N.S.W.
James Harold Leigh, BA Ambassador
Theresa Ann Lydon, BA N.S.W.
Alison Isabel MacDonald, BSc N.S.W.
Carol Anne Mason, BSc N.S.W.
Ian Douglas McKinlay, BA N.S.W.
Megan McPherson, BA Mon.
Jennifer Frances Merritt, BA N.S.W.
Lynn Marie Morris, BA N.S.W.
Deborah Mulhall, BA N.S.W.
Paul Joseph Myers, BA N.S.W.
Kerrie Frances O’Hanlon, BCom N.S.W.
Manuel Pacheco, MA Santo Tomas
Elaine Lynette Paxton, BSc N.S.W.
Graham Andrew Pegler, BSc N.S.W.
Anthony Robert Porter, BSc N.S.W.
Carol Ann Proser, BA N.S.W.
Michael David Ratter, BA N.S.W.
Paula Annette Redpath, BA N.S.W.
Maria Rontziokos, BA N.S.W.
Julien Anthony Samuel, BCom N.S.W.
Susan Gal Sheridan, BSc N.S.W.
Delwyn Alma Smith, BA N.S.W.
Martin Sormus, BSc N.S.W.
University of Wollongong Diplomates (Cont’d)

Pamela Anne Halter, BA Syd.
Carole Teresa Hales, BA N.S.W.
John Rutherford Hales, BSc N.S.W.
Kasia Kazimierz Halon, BSc N.S.W.
Johanne Leslie Heggie, BSc N.S.W.
Ellen Petronella Heninger, BA N.S.W.
Anne Louise Heinis, BSc N.S.W.
Russell Edmund Herringe, BSc N.S.W.
Peter Noel Hyland, BSc N.S.W.
Robyn Margaret Hyland, BSc N.S.W.
Kenzie Joan Ingold, BA N.S.W.
Anne Patricia Jackups, BSc Q’ld
Akrivula Kambesis, BA N.S.W.
Henricia Petronella Kay, BA N.S.W.
Mary Dianne Kennedy, BA Syd.
Robert James Kinloch, BA N.S.W.
Leigh Janet Speed, BA Syd.
William James Standing, BA A.N.U.
Kathleen Mary Standing, BA N.S.W.
(posthumous)
Dianne Stewart, BA N.S.W.
Roslyn Susan Stoddart, BSc N.S.W.
David Charles Struthers, BSc N.S.W.
Josephine Anne Elizabeth Symes, BPharm Syd.
Susan Julie Thompson, BA N.S.W.
Lesley Ellen Vagg, BSc W’gong
Catherine Mary Wade, BA N.S.W.
Reneld Perdriau Whymann, BSc N.S.W.
Janette Elizabeth Williams, BA N.S.W.
Josephine Laura Woodcock, BA Syd.

University of New South Wales Graduates

The following candidates took out degrees of the University of New South Wales after having undertaken and completed studies at the University of Wollongong.

Doctor of Philosophy
Neil William Bennett, BSc Syd.
Erling Kohn, BEngSc W. Ont.
Gary Martin Schier, BSc N.S.W.
Kenneth Mapson Williams, BSc N.S.W.

Master of Arts
Lynn Margaret Geoffrey, BA DipEd N.S.W.
Douglas William Jenkins, BA DipEd N.S.W.

Bachelor of Arts
Victor James Callan (Honours Class I)
Elizabeth Mathieson (Honours Class II, Division II)
Noel Francis Meddows (Honours Class II, Division II)
Christine Alice Oke (Honours Class I)
Sylvia Anne Rice (Honours Class II, Division I)
Allen Stanley Joseph Walpole (Honours Class II, Division II)
Rosemarie Widdowson (Honours Class II, Division II)

Mark Joseph Askew
Glyn Raymond Bradford
Patricia Louise Bresnahan
Anne Marie Buchhorn
Judith Mary Cook
George Patrick Cullen
Gregory Brian Daly
Roger Graham Delbridge
Niki Domyssoptulos
Lindy Anne Edwards
Edmund Esterbauer
Julie Ann Evans
David Richard Fuller
Raymond Clifford Gull
Ross David Garrey
Kenneth David Griffiths
Warwick Haid
Karin Helen Hennings
Busisswe Magdalina Hove
John Joseph Jansen
Catherine Becky Jardine
Barry Robert Jones
Diny Maria Jones
Rosslyn Mavis Kennedy
Philip Leslie King
Wendy Margaret Kon
Susan Mary Matthews
James Harold Milne
Margaret Alexandra Morrison
Peter Keith Mostyn
Franca Parasmo
Sandra Jacqueline Paul
Sharon Lea Perusco
Charlotte Hermna Poelakker
John Rasa
Ian Harry Sawkins
Penelope Ann Scott
Louise Anne Seay
David Kenneth Smith
Michael Norman Tarrant
Tony Max Thornton
Carol Ann Watson
Valerie Kay Wescor
Merrie Ann Williams
University of New South Wales Graduates (Cont’d)

Bachelor of Commerce
Christopher Joseph Gandy (Honours Class II, Division I)
Anne Louise Williams (Honours Class II, Division I)

David Charles Cheney (With Merit)
Robert Allen Collins (With Merit)
Alan William Fardoe (With Merit)
Graham Driver Higham (With Merit)
Sigrid Keilich (With Merit)
Darvyle James Lawson (With Merit)
Nigel Hugh MacFarlane (With Merit)
George Joseph Peat (With Merit)
Joseph Anthony Russo (With Merit)
Patricia Francesca Sieber (With Merit)
Bruce Roger Sedon (With Merit)
Nicholas John Watson (With Merit)
Frederick Everson Apolloni
Robynne Joy Barnes
Maxim James Carling
Colin John Cheetham
Suzanne Effie Corderoy
Simon Richard Malcolm Frost
Peter Richard Fullord
Garry Francis Funnell
Dolores Maria Gallagher
Alan David Gamble
William Edward Grant
Michael Leonard Hart
Robert Bruce Hinchcliffe
Lim Kim Yee
Jane Alison Molloy
Paul John Nichol
Adrian James Roberts
Silvano Bruno Rostinella
Alan Thomas Schofield
Theodore Simos
David John Stevenson
Geoffrey Tattersall
Geoffrey David Wayne
Stewart James Wilkie
Bruce James Williamson
Geoffrey Charles Wood
Graham Stewart Williams
Dennis William Yarrow

Master of Engineering Science
Lawrence Alfred Humphrey, BSc(Eng) N.S.W.
Alan Stuart Kaaden, BE Melb.

Bachelor of Engineering
Roy Andersen (Honours Class II, Division I)
Malcolm Black Kerr (Honours Class I)
Larry Stephen Parkes (Honours Class II, Division II)
Nguyen Quang Thoi (Honours Class II, Division I)

Allan Stuart Anderson
James Chin-Ming Kwok
Darron Roland Peckman
Samuel Stanmore Reeve

Bachelor of Science (Engineering)
Robert William Innes (With Merit)
Emo Henrik Okkonen (With Merit)
Thomas Sanvitale (With Merit)
Steven Clifford Tomkins (With Merit)
Stephen John Townsend (With Merit)

Russell Joseph Hill
Terrence Frederick Humphrey
Stephen Henry Lockrey
Peter Paul Tecles

Bachelor of Science (Technology)
Luigino Pasquale Amadio
Christopher John Barrett
John Francis Ellison
William Duncan Menzies Speirs

Master of Science
Li Kwok Lit Joseph Lising, BSc N.S.W.

Master of Science (Operations Research)
Ferdinand Marie Van Helden, BSc DipEd N.S.W.
Paul Wakenshaw, BE N.S.W.
Graham Kenneth Winley, BA Macq.

Bachelor of Science
Pietro Cerone (Honours Class II, Division I)
Ross James Dooley (Honours Class II, Division I)
Bruce Ross Markey (Honours Class I)
John William Paine (Honours Class I)
Ian Alan Uebel (Honours Class III)
Mario Zahra (Honours Class II, Division II)

Ronald David Bennett
Gwyn John Brickell
Alexander Malcolm Cheshire
Bronwyn Margaret Cook
Peter Damien Cooney
Brian Davies
Walter John Erven
Gregory Vincent Falk
Bruce Stanley Hammond
Stewart John Ison
Michael William Johnson
Barry Jongsma
Wolfgang Rudolf Kornek
Hagen Kreusser
Peter Christopher Langenegger
Patrick John McNamara
Peter Pavlik
Phillip Matthew Pratt
Nigel James Smith
Louisos Michel Tiris
Janelle Maree Whitehead
ACADEMIC ACTIVITIES 1976

FACULTY REPORTS

FACULTY OF ENGINEERING

Department of Civil Engineering

General

In 1976, the Department offered, for the first time, the new course in Civil Engineering that had been developed during the previous year. The Department also implemented the Wollongong course in Mining Engineering, which is oriented towards coal mining and practice in professional subjects in mining engineering. The new Master of Engineering programme carried this heavy emphasis on professional subjects into the postgraduate area.

Facilities and Equipment

During the year, the Department acquired the following new items of equipment:

- Hewlett Packard Calculator and plotter.
- 1000-kN combined prestressing bed and testing rig.
- Construction of free surface model testing unit.

Research

Research during the year concentrated on the following topics of investigation:

- Investigations Concerning Natural Slopes.
- Investigation of Leachate Formation of Waste Disposal Deposits.
- The Use of Granulated Blast Furnace Slag as a Sand Replacement in Concretes.
- Noise Analysis and Monitoring.
- Load Absorbers for Bridges.
- Statistical Analysis of Concrete Strength versus Weight.
- Assessing the Demand for Facilities and Services in an Urban Area Pavement Design.
- The Application of Fracture Toughness methods in Concrete.
- Computer Designs of Prestressed Concrete Box Girders (Australian Road Research Board Project 256)

Research thesis undertaken within the Department investigated the following topics:

- Factors Affecting Strength of Rocks.
- Progressive Failure in Slope Stability Analysis.
- Study of the relationship between mechanical properties.
- Structure and deformation behaviour of the natural soil.
- The distribution characteristics and stability of debris mantled slopes in northern Wollongong.
- Application of Fracture Mechanics to Granulated Blast Furnace Slag Concretes.
- Comparison of Bond tests Cantilever and A.S.T.M. methods.
- Frictional properties of concrete pavements made with various aggregates.
- Strength, workability and yield of concrete made with varying additions of slag aggregate.
- The Effect of Composition of Traffic on Highway Design Standards.
- The Effects of Cracking on the Rigidities of Concrete Multicellular Bridge Decks (University Research Committee Project).
Department of Electrical Engineering

General

Electrical Engineering Subjects were offered at the 100 level for the first time; so necessitating other minor changes in the course structure.

Research

Research during the year concentrated on the following topics of investigation:

Problems associated with the electrostatic precipitation of particulate solids.

Systems Engineering: Reliability, identification and optimisation.

Variable speed and special purpose a.c. machines.

Research theses undertaken within the Department investigated the following topics:

Doctor of Philosophy


Using a Hybrid Computer.

An Investigation of Optimum Machine Controls.

Some Effects of Voltage Wave Form on Corona Characteristics.

Master of Engineering

Analysis of a Quasi Two Phase Induction Motor.

A Computer Controlled Infra-red Sensing System.

Hybrid Computer System Design.

Computer Control of Cooling Mass on a Hot Strip Galvanising Line.

Fault Identification Studies of Electronic Systems.

Some Aspects of the Control of a Hot Rolling Mill.

Digital Analysis of Electronic Networks for Reliability Studies.
Department of Mechanical Engineering

General

The first year of the revised full-time Bachelor of Engineering course in Mechanical Engineering and Stages I and II of the revised part-time course were implemented in 1976. The second, third and fourth years of the full-time B.E. course and Stages III to VI of the part-time course have also been revised and the new course will be offered for the first time in 1977.

The revised Master of Engineering course in Mechanical Engineering was also introduced during the year.

Facilities and Equipment.

Systems and Computing Laboratory. To facilitate the control of large scale systems, an interactive computing system is being developed. This interactive system will be integrated into all aspects of research and teaching within the department.

New equipment purchased in 1976: Tektronix graphics terminal type 4010-1.

The Materials Handling System Laboratory offers unique facilities for determining the flow properties of bulk solid materials and for undertaking investigations relating to the performance of bin, feeder and conveying systems for bulk solids. Several research students are currently working on bulk solids handling projects. During the year several consultancies for industry were undertaken using the expertise in bulk solids handling which is available within the department.


The Fluid Mechanics and Thermodynamics Laboratories took delivery of a number of items of basic equipment during the year. Their inclusion in the facilities will greatly enhance the scope and range of experiments available for undergraduate tuition.

New equipment purchased in 1976: Pipe flow and nozzle apparatus and fan test rig, air flow measurement equipment, flow through venturi apparatus, friction loss in pipes, test rig, Benoulli’s apparatus, Ellison’s annubar model 74, gas turbine modifications, Bundenberg dead weight tester and associated equipment.

The Environmental Engineering Laboratory has been used by both undergraduate and postgraduate students from within and outside the department working on a range of environmental problems largely in the field of water pollution. Much of this work has been supported by outside bodies.


Control Engineering Laboratory. In order to strengthen the presentation of course material for Control Systems I and II there existed an urgent need for suitable demonstration equipment in this Laboratory. The equipment purchased was of a type that additions and modifications could be made thereby broadening its use to include project work for final year students. In addition, the basic hardware could be incorporated in research projects where it is desired to model and control industrial processes.
New equipment purchased in 1976: Modular servo, pneumatic process simulator, pressure transducer.

The Dynamics Laboratory contains a Universal Vibrations Machine. This apparatus allows students to observe one or two rotor vibrations, beam vibrations, determine centres of percussion of swinging bodies and conduct experiments on torsional vibrations. This laboratory will be developed to incorporate experiments into the dynamics strand at all levels of the Mechanical Engineering course.

A Coriolis acceleration test bench, cam mechanism, simple mechanism acceleration test bench, a static and dynamic balancing rig, a rig to examine critical speeds of shafts, a gear mechanism, as well as various simple mechanism for demonstrative purposes are to be included in this laboratory.


General instrumentation. In addition to the above, over $7000 was spent on general instrumentation during 1976.

Engineering Workshop. The past year has been a year of increased workshop activity by both departments of Civil and Mechanical Engineering. Many large projects were undertaken and completed satisfactorily despite the limited machine capacity of the shop which has arisen due to the lack of funding for new machine tools over the past years.

Student Performance.

Student performance during 1976 was consistent with that of previous years. The design competition, forming part of the subject MECH 122 Design I, was conducted again. Twelve groups of three students each set about to solve a broad range of design problems that were largely selfposed. The enthusiasm of and effort put in by the students was gratifying to see, and, it is felt, eased them into the many facets of engineering. The department awarded a number of merit certificates with book prizes and a perpetual trophy to the final winners. The involvement of a number of outside groups, including the news media, helps to emphasize to the students the need for communication and, in turn, makes the final presentation night one for community involvement.

Research.

The major topics of investigation were:

Control of large scale systems. Work on the control of large scale systems with particular application to process systems has been initiated and some equipment purchased. It is hoped that some early results will be available by late 1977. The work is concerned with the development of mathematical models which describe the dynamic behaviour of the processes under consideration and the use of these models in the design of multivariable control systems. Use is made of the Inverse Nyquist Array in this design work. A grant towards this work will be provided in 1977 by the Electrical Research Board.

Design of Bulk Solid Storage Systems. Theories are being developed to improve the design of storage bins for bulk granular materials. Both analytical and numerical solutions are being developed for such parameters as flow factor, stress function, flow function, flow rate and bin wall loads. Computer programs are being developed to allow the design of bins to be undertaken more easily and to allow an element of optimisation to be included in the design.

Environmental Engineering. A wide range of environmental engineering projects are being conducted, including

The Detoxification of Industrial Effluents,
The Clarification of Industrial Effluents,
Lost Cost Treatment Systems for Industrial Wastewater.
Naval Hydrodynamics. An investigation into the free surface effect on added masses of various geometries is being undertaken. The problem is reformulated into an integro-differential equation which can be solved numerically. Computer programs for this purpose are in preparation.

Research theses undertaken within the Department were:

**Doctor of Philosophy.**

Storage and flow of bulk Granular Solids.
Identification and Optimisation of Bulk Granular Materials Handling Systems.

**Master of Engineering.**

An Investigation of some flow promotion techniques for bulk solid bins.
Dynamic analysis of a Paint Line.
Compressible Flow through a Two-Dimensional Nozzle.
Analysis of Gas Turbine Noise.
Analysis and Design of Flow Velocity Head Sensors.
Optimum Design of Worm Gears.
The Application of Finite Element Analysis to Problems of Multi-Dimensional Heat Conduction with Non-Linear Boundary Conditions.

**Master of Engineering Science.**

The application of computers to the prediction of wall loads in mass flow bins.

**Bachelor of Engineering.**

Predicting the wall pressures in funnel flow bins.
Pilot Plant Studies for the Detoxification of Industrial Effluents.
Computer Aided Design of Bevel Gears.
Velocity Detector for Non-Cohesive Granular Materials.
Interactive Root-Loci Plots.
The Determination of Sludge Dewatering Rates.
Design of a Mach 2.5 Supersonic Blow-Down Wind Tunnel.
Domestic and Industrial Applications of Solar Energy.
Comparison of Methods in Particle Size Measurement in the Sub-Sieve Range.
A critical investigation of the Warren Spring Yield Locus Equation.
Predicting the Flow Rate of Bulk Solids from Bins.

Department of Metallurgy.

**General.**

*Introduction.*

The world wide contraction in enrolments in science-based subjects continued during 1976, and clearly influenced enrolments in Australia. This trend, no doubt, partly accounts for the small number (20) of new enrolments in Metallurgy for 1976, although the static situation in local industry was also an important factor. Nevertheless, undergraduate enrolments in the Department at Wollongong are more satisfactory than in most (if not all) departments in Australia, and discussions with industry suggest that the situation will improve markedly in future years.

**Undergraduate Course.**

Implementation of the revised Metallurgy course began in 1976, and will be mostly completed by 1978. A few additional syllabus changes were approved by Senate during the year, in particular a more substantial project will be introduced into stage 6 of the part-time course, and year 3 of the full-time course from 1977 onwards. Both staff and students agree that the project is a most useful part of the course and that the increase in time allocated is a valuable improvement.
Graduate Studies.

It is worrying that enrolments for higher degrees remain low; 8 persons were registered in 1976.

Until recently local industries often seconded members of staff (either full or part time) to the Department for postgraduate study. With the present depressed economy this source of graduate students has almost dried up, and it appears that few students wish to undertake higher degrees without support from the metallurgical industry. Since this decrease in enrolments for higher degrees will probably continue for some time at least, the direct research activities of staff members will become even more important than in the past, and an increase in the funds available to support this activity is very desirable.

Facilities and Equipment.

During the past two years resource allocations have allowed a considerable improvement in the Department's workshop facilities. This has assisted considerably both our undergraduate and research activities as can be gauged from the following list of substantial items of equipment completed during 1976:

A 20 kN tensile testile machine capable of rapid speed changes up to a ratio of 1000 : 1. (This is the second machine of this type designed and constructed in the Department).

Research.

Major research topics in the Department included:

Metallographic studies of structural changes in industrially important materials, and the association between structure and useful properties. Particular studies of martensitic transformations and recrystallization.

Fluid flow in packed beds with particular emphasis on velocity distribution and contact efficiency.

Process modelling of industrially important metallurgical processes.

Solidification of alloys.

Mechanical behaviour of ductile sheet metals.

Mechanical testing with computer control.

Deformation and fracture at elevated temperatures.

It is pleasing that work on the structure of steels extending over several years has suggested beneficial modifications to hot rolling schedules used for the production of several special steel products.
FACULTY OF HUMANITIES

Department of English.

General.

In 1976 the Department extended its policy of distinguishing formally the two disciplinary strands that constitute English. The 200-level English Language subjects - Old English and Middle English - were offered for the first time as the sequels to 100-level English Language studies and as parallel studies to the established 200-level English Literature Subjects.

The Department's examination results for the year were largely based on continuous assessment. This included tutorial attendance, tutors' comments, written tutorial/seminar papers, long essays and various types of class tests. There were very few formal examinations.

Student Performance.

The Department was concerned about the poor performance of students in English 100-level subjects and the low level of literacy overall. It is the Department's view that the problem stems from the fact that the majority of students are ill-equipped to deal with subjects presented at University level.

Research.

The major topics of investigation during the year were:

Old English Poetry.
Personal Relationships in Old English Poetry.
Early Tudor Poetry in Manuscript.
Art and Nature in Sixteenth and Seventeenth Century Literature.
The Traditional Popular Ballad.
Attitudes to Nature in Australian Fiction.
The Poetry of Sylvia Plath.
The Metaphysicals.
The Restoration.
Critical Thought in the 17th and 18th Centuries.

Professor Southall has completed a critical study of the literature of the eighteenth and nineteenth centuries entitled Literature, the Individual and Society. It is intended as a continuation of his book Literature and the Rise of Capitalism and is at present with the publisher.

Research theses undertaken within the Department were concerned with the following topics:

Master of Arts.

The relationship between Anglo-Saxon culture and the form and theme of Old English poetry.
Attitudes to landscape in the novels of Patrick White and Randolph Stone.

Department of European Languages.

General.

The Department continued to establish itself in most satisfactory fashion during 1976. The introduction of an audio-visual elementary French course increased first-year numbers considerably since it drew students from an area previously untapped.

The Department still suffers, however, from the absence of a second foreign language on campus, since many students are for this reason lost to Sydney universities where study of two or more foreign languages is possible. In 1977, with the introduction of Italian, this impediment to growth...
will largely disappear so that bigger numbers are expected. In anticipation of this development the Department changed its name during the year from the Department of French to the more comprehensive, Department of European Languages.

Early in 1976 the Department provided the initiative for the formation of a branch of the Alliance francaise in Wollongong. Conversation classes in French for adults have been established and also classes for children on Saturday mornings. Such an organization, which as at present 90-100 members, is serving to promote the cause of French in the region and hence to facilitate one area of the Department's activity.

Student Performance.

Enrolments in the post-H.S.C. courses French III and French 112 fell from the level attained in 1975. Enrolments in Elementary French (French 103) were, however, pleasing. It is likely that student numbers in this latter course will continue to rise. The retention rate from 1st to 2nd year was considered satisfactory.

The Department follows a policy of progressive assessment, so that indolent or incapable students tend to drop out rather than fail at the end of the course.

Research.

The major topics of investigation during the year were:

- Myth and mythological structures in 19th and 20th century novel and theatre.
- Literature, painting and film in 20th century France.
- The "Nouveau roman".
- Linguistics as applied to the teaching of French as a second language.
- Intonation analysis.
- Audio-visual methods in the teaching of French.

Department of History.

General.

At the beginning of May, 1976, the History Department's enrolments stood at 336, compared with 264 in the previous year.

For the first time in 1976 there were sufficient fourth year students to warrant the mounting of a two hour weekly Honours seminar, which was attended by all staff members, eight students and occasional visitors from other Universities. One good first-class and two good second-class Honours degrees emerged from this seminar following reports from external examiners. Notable staff achievements include the acceptance for publication of Associate Professor C.P. Kiernan's official biography of A.A. Calwell and the choice of Associate Professor J.S. Hagan to write the official history of the Australian Council of Trade Unions. The Department was able to maintain student pass rates in all subjects. It was, moreover, delighted to note the successful completion of two Ph.D. theses and to accept two new Ph.D. candidates.

Research.

The major topics of investigation during the year were:

- A History of Wollongong.
- A study of the impact on the community of the Mt. Kembla mine disaster of 1902 and the growth of a legend about the disaster.
- The St. Andrews University Missionary Association 1823-8: a study of the origins and nature of missionary zeal.
A history of the A.C.T.U.
A Biography of A.A. Calwell.
A life of A.A. Ioffe.
Translating and editing the four-volume "Zapiskii o Grazhdonskoi Voine" by Antonev-Ovseevsky.

The research theses undertaken within the Department were:

**Doctor of Philosophy.**

- The Idea of the State in Catholic Social Teaching in Australia with particular reference to the conception of Subsidiarity.
- The History of the Australian Meat Industry Employees' Union. (Completed).
- Sectarianism and the Development of Elementary Education in N.S.W. 1788-1918. (Completed).
- History and the Gothic Past in Eighteenth-Century French and British Thought.

**Master of Arts.**

- Women in Australian Politics.
- A Study of Theological Education in Australia.
- Popular Religious Attitudes in Australia in the 1980s.

**Bachelor of Arts (Honours).**

- The Formation of the Political Labour League of N.S.W.: the N.S.W. Labour Party to 1895.
- Some Aspects of Infant Mortality in N.S.W.
- An examination of the reasons for the Dismissal of J.T. Lang, Premier of N.S.W., by Governor Sir Philip W. Game on 13 May 1932.
- The Southern District Miners in the Depression 1929-33.

**Department of History and Philosophy of Science.**

**General.**

In 1975, the department offered a 100-level first session course in Greek Science and a 100-level second session course in Introductory Philosophy of Science. This arrangement was abandoned in 1976 for two reasons. The first was that it was believed that the period covered by the Greek Science course was too long to be dealt with adequately in one session. The second and more important was that for many first year students, final assessment in July was too early. Many students improve steadily over the year and to be assessed before that improvement is complete is considered unfair.

The subjects HPS251, HPS252, HPS351 and HPS352 - Philosophical and Ideological Perspectives of Science 1A, 2A, 1B and 2B respectively were introduced in 1976.

**Research.**

The major topics of investigation during the year were:

- Early Nineteenth Century British philosophy of science.
- Professionalization of science in Britain, 1870-1914.
- Assimilation of German Romantic ideas into British biology in the nineteenth century.
- The historiography of science: Genetics and reduction.

The Research theses undertaken within the Department were concerned with the following topics:

- The Professionalization of Science in Britain, 1870-1914.
Department of Philosophy.

General.

1976 was the inaugural year for the Department of Philosophy. The Professor of Philosophy had taken up duty in October, 1975, but the Department's first undergraduate subject, Philosophy 103, was not offered until the new year. Seventy-six students were enrolled in this first year subject and one postgraduate student enrolled in PHIL999 Major Thesis (Master of Arts).

Facilities and Equipment.

Departments of Philosophy need little in the way of equipment. Equipment purchased during 1976 was primarily related to office efficiency (dictaphone, forlograph spirit duplicator) and to teaching (overhead projector, cassette recorders).

Like most new departments, Philosophy has had a certain number of largely unavoidable difficulties with accommodation. None was available for part-time staff employed as tutors and, consequently, student interviewing was particularly difficult. For the first month of teaching in 1976 the department operated out of the Administration Building, after which it moved to Building 9 where it expects to remain until the completion of Social Sciences Stage II.

Student Performance.

Of the first year subject Philosophy 103, 65 of the students enrolled on 30th April completed the course, and 50 of those who completed the course obtained a pass or better. It is interesting to note that a disproportionately high number of distinctions and higher distinctions went to mature age students.

The papers in Philosophy 103 were externally as well as internally marked, in order to guarantee parity of standards with well established departments of Philosophy. The marks of internal and external assessors were for the most part extremely close (only in one case was there a discrepancy of greater than 4%).

The Department noted with concern the number of students who had demonstrated the ability to obtain credit or distinction levels fairly early in the year, but then decided to aim at a mere pass. It noted with equal concern the emergence of an attitude to the effect that the superior passing grades were 'elitist' and that their deliberate pursuit was morally objectionable.

Problems of literacy were not particularly in evidence. The main general cause of failure was insufficient work.

Research.

The major topics of investigation during the year were:

Language and Thought. An examination of the relationship between thinking and the capacity for linguistic or symbolic representation. The work of Rene Descartes and the contemporary American philosophers Gilbert Harman and Donald Davidson is given special attention. Work on this topic formed the subject of Professor Chipman’s presidential address to the Australasian Association of Philosophy at its annual conference in the University of Melbourne in August 1976.

Private Enterprise and Liberty. A re-examination and defence of the thesis that socialism and welfarism are incompatible with individual freedom. Work in progress was presented to a conference of the Centre for Independent Studies at Macquarie University in October 1976.
Mental Phenomena and Materialism. A critique of the thesis of Keith Campbell and others ('the new epi-phenomenalism') to the effect that the raw feels of subject experience are incompatible with a thorough-going materialism of the mind. Work in progress was presented in an address to the Russellian Society of Sydney University in September 1976.

Skepticism. An examination of an attempt to defend total skepticism by the contemporary New York philosopher Peter Unger. Work in progress formed the basis of an address to the Anderson Philosophy Club in Sydney in November 1976.

Privacy. The Concept of Privacy and the Right to Privacy. Work in progress formed the basis of the inaugural address to the Wollongong University Philosophy Society.

Moral and Social Philosophy. Issues arising from the Catholic Doctrine of Double Effect as it relates to Responsibility and Moral Imputability and to exceptionless Moral Rules. The examination is conducted in the context of issues relating to the morality of killing: abortion, euthanasia, and war and morality.

Responsibility. An examination of the Concept of Responsibility with special reference to Action, Motive, Intention and Excuse, and Agent Responsibility and Moral imputability. This is work in progress towards an M.A. (La Trobe) which in 1976 was supervised by Mr. Peter Singer (subsequently Professor of Philosophy at Monash University).

The research thesis undertaken with the Department was concerned with the following topic:

Master of Arts.

Kant's Transcendental Deduction of the Categories.
Faculty of Mathematics
Department of Mathematics

General

In 1976, three 100-level subjects in Computing Science were offered for the first time. In the postgraduate area, courses leading to a Master of Science degree by coursework and a Diploma in Mathematics were introduced.

Facilities and Equipment

Computing Science

A computing science laboratory was approved by the Resources Committee and its development was initiated.

Hardware consisting of 8 VDU terminals and an Interdata 7/32 mini-computer with 196k bytes of memory storage and a 10 M byte disk file was purchased and installed in Room 111 A.C.S. building in September 1976.

Software development is currently in progress and the laboratory will be phased into computing science courses during 1977.

Oceanography

Equipment obtained during the year included a 5 metre half-cabin boat for experimental oceanography in three areas viz., Jervis Bay, Lake Illawarra, and a 12 Km x 12 Km ocean area between Five Islands, Port Kembla and Bass Point. Other equipment to arrive in the department included tow Alexeev current meters again for experimental oceanography. These were ordered two years before and were funded from departmental equipment allocations in 1974. A storage room-cum-laboratory for oceanographic ancillary equipment has been provided. So far this room is unable to be used as a laboratory as it is not sand-proof and not properly accessible by car. The major effort in the research programme is expended in the technical and mechanical maintenance of the equipment as no assistance has been available through the University.

Research

The major topics of research during the year were:

Applied Mathematics

The Numerical Solution of Partial Differential Equations.
Finite Element Methods.
Interactive Computer Languages for Experimental Numerical Mathematics.
Simulation.
Population Dynamics.
Large Elastic Deformations of Rubber-like Materials.
Edge Waves.
Computing Software Development.
Minicomputer Operating System Portability.

Pure Mathematics

Characterization of Moment.
Invariant Linear Functionals.
Combinatory Logic.
Mean Periodic Functions with Applications.

Research theses undertaken within the Department were concerned with the following topics:
Doctor of Philosophy

Multi-Dimensional Newton Diffusion,
Differential Equations,
Application of Energy Dependent Potentials,
A Problem in Sequential Analysis,
A Correction to the Narrow Resonance Approximation for the Calculation of Resonance Absorption,
Upwelling,
A Laboratory for Computing Science
Some Results in Neighbourhood Lattices,
Flow over Submerged Plates and Barriers,
Boundary Effects of Shelf Waves,
Application of the Finite Element Method to the Design of Gas Slider Bearings.

Master of Science

Applications of Transfinite Numbers and Infinitesimals.
In its second year of operation, the Department of Biology introduced the third and fourth subjects - Bioenergetics III and Bioenergetics IV.

The Department also held a three-day conference on Energy in Biological Systems at the University on 4th - 6th February. This conference attracted some fifty-five visitors to the University from elsewhere in Australia and abroad.

Facilities and Equipment

One laboratory (research), three offices and one room which was converted to an animal room were added to the departmental space in 1976.

The following equipment was purchased in 1976:

- Physiograph (2)
- Gamma particle counter
- Swing-out rotor for Sorvall centrifuge
- Oscilloscope
- Gilford Spectrophotometer
- Gas chromatograph
- pH meter (2)
- Chart recorder (2)
- Oxygen analyser
- Radioactivity monitor
- "Polytron" Tissue disintegrator (ARGC)
- Construction and installation of a microcalorimeter completed (ARGC)

Research

The major topics of investigation during the year were:

- Environmental physiology of marsupials
- Thyroid function in vertebrates
- Photosynthesis: regulation and metabolite fluxes in isolated chloroplasts
- The physiological basis of microbial response to water stress
- Social and migratory behaviour affecting spatial distribution of field crickets.

Student research projects undertaken within the Department investigated the following topics:

**Doctor of Philosophy**

- The regulation by water availability of glycerol metabolism in yeast
- Studies of the physiology of the dermatophyte, Candida albicans

**Master of Science**

- Studies of bacterial viability as a function of growth rate

Department of Chemistry

In 1976, the Department of Chemistry continued to offer a full undergraduate programme and its postgraduate research continued to attract many enrolments.
Two members of the Department, Dr. P.G. Burton and Dr. P. Rowley, were awarded Fulbright travel grants for study in the U.S.A.

Facilities and Equipment

During the year, the Department moved into Stage II of the Science building extension.

Research

Major topics of investigation were:

Work on the application of gas chromatography-mass spectrometry and computer techniques for the diagnosis of metabolic disorders has been continued.
A computerised data system was developed for the Dupont magnetic sector mass spectrometer in collaboration with Dr. G. Trott, Department of Electrical Engineering.
A flexible disk mass storage system and a Tektronix graphical display unit with hard copy attachment were added to the computer hardware of the system.
An additional collection of approximately 20000 mass spectra were obtained from N.I.H. and some time has been spent in sorting and integrating these into the Department's collection and in investigating new search procedures.
The cost/effectiveness of bond functions in electronic structure computation was established even in hard to model molecules such as $H_2O_2$ and $SO_2$.
A major study of ozone confirmed the existence of a secondary cyclic structure which is potentially of great importance in understanding ozone's reactions.
New methods for electronic structure investigation of large molecules containing metals have been developed.
Previously unavailable information on the nature of bonding in transition metal complexes may lead to a quantitative theory of bonding in such systems being devised.
Laboratory and pilot plan studies of novel chemical processes for the treatment of industrial process water and new analytical methods for automated trace analysis have been undertaken.

Other research activities during 1976 have included:

The synthesis of new drugs with neoplastic activity and the isolation and structure determination of pharmacologically active natural products; spectro- and magnetochemical studies of polynuclear and polydentate complexes of transition metals, the design and manufacture of a high temperature drop calorimeter for thermodynamic studies on solids; differential thermal and thermogravimetric analysis for the characterisation of supported catalysts e.g. iron oxides on alumina and platinum on alumina and calorimetric studies of electrolytes in aqueous solutions, with particular attention to measurement of heat of ionisation of $HIO_3$.

The research theses undertaken with the Department were:

Doctor of Philosophy

A Study of the Transition Metal Complexes of some Multidentate Ligands.
The Application of Gas Chromatography and Mass Spectrometry to the Study of Human Diseases:-
The Identification and Quantitation of the Urinary Volatiles Associated with a number of Genetic Defects.
Stereospecificity of some Enzymes-catalysed Hydrolysis Reactions.
The Use of Stable Isotopes in the in vivo study of Metabolic Disorders.
Chemical Studies on the Flocculation of Argillaceous Slurries.
Application of Chemical Ionization Mass Spectrometry to the Quantitative Analysis of Metabolites in Biological Fluids.
Substituent Effects on the Thermodynamic Functions of Ionization of Phenols.
The Use of CI-MS for the study of Genetic Defects - The Analysis of Amniotic Fluid for Antenatal Diagnosis of Heritable Disorders in High Risk Pregnancies.
Master of Science

Synthesis of Heterocyclic Compounds.
The Application of Ketimine Derivatives to Solid Phase Peptide Synthesis.
The Preparation of Derivatives of Carboxylic Acid and Phenols suitable for High Pressure Liquid Chromatography.
Studies into the Electronic Structure of Transition Metal Complexes.
Determination of Serum Trace Metals (Zinc, Iron and Lead) by Atomic Absorption Spectroscopy.
Indolizidine Derivatives.
Development of a Computerized Magnetic Mass Spectrometer System.
Metal Complexes of Some Polydentate Ligands.
The Constituents of Lauraceae.
A physico-chemical investigation of the recovery of hydrous tin oxides from electroplating liquors and rinse waters.

Bachelor of Science (Honours)

Studies into the Electronic Structure and Properties of Ozone and its Metastable Cyclic Conformer.
Anodic Stripping Voltammetry.

Department of Geology

Facilities and Equipment

Rooms G05 and G06 underwent renovations for preparation of thin-sections and polished blocks. The saw was reconditioned and a new large lap built by Mechanical Engineering. A Vibromet polishing lap was installed in the fine-polishing room (G05). Renovation of G13 saw the chemical, rock and sediment analysis laboratory improved.

Renovations in G07 allowed for the installation of Atomic Absorption facilities.

The compactus holding the geological specimens is now virtually filled.

The X-ray diffraction unit was installed in Room G11. The Department has carried out over 620 hours of machine times since September 1976. It is an extremely useful tool for most members of the Department. Room 209 was converted into an optical research laboratory. Fluorescence equipment useful in reflectance studies was added to a research microscope in this laboratory.

Research

Major topics of investigation during the year were:

Coal geology and coal petrographic studies on both coal seams and rocks containing carbonaceous matter.
Thermal regimes in Australian sedimentary basins with particular reference to oil exploration.
Cambro-Ordovician trilobites of New Zealand.
Ordovician to Devonian stratigraphy of the Capertee High, New South Wales.
Sedimentological investigation of the Pernjara Group, Amadeus Basin.
Sediment dispersal patterns and clay mineralogy in Lake Illawarra.
Sedimentology of Ragged Range Conglomerate Member, Bonaparte Gulf Basin.
Palaeomagnetic studies of the Sydney Basin, New South Wales.
Thermal properties and thermal evolution of the Sydney Basin, New South Wales.
Palaeomagnetic studies of the River Valley area, Ontario, Canada.
Geophysical survey of the University of Wollongong campus.
Textural, mineralogical and petrological studies of gneisses from Broken Hill.
An occurrence of eudialyte and manganese peclolite from southeastern Queensland.
Geochemical and petrographic studies on igneous and sedimentary rocks of the South Coast.
Research theses being undertaken within the Department comprised:

**Doctor of Philosophy**

- A study of a base metal ore deposit in the Mt. Isa region.
- Geochemistry of recent sediments in Lake Illawarra.
- Studies in coal measure sedimentation.
- Thermal regimes in Australian sedimentary basins.
- Mineralization in the Palaeozoic rocks in New South Wales.
- Aspects of sedimentology of coal measure sequences.
- Igneous rocks of the southern Sydney basin.
- Late Silurian to early Devonian faunas of central Victoria.
- Geological controls of coal accumulation, Moranbah region, Queensland.
- Low grade metamorphism in sedimentary sequences.
- Relationship between coals and associated hydrocarbon source rocks.

**Master of Science**

- A study of the post-Permian quartzites of southern New South Wales.
- The geology of the Capertee valley.
- A study of coal rank variation in the southern central Sydney basin, New South Wales.
- The geology of the Ardrossan dolomite and its development as a refractory in the steel industry.

**Masters Preliminary**

- Magnetism in rocks.

**Bachelor of Science (Honours)**

- The geology of an area around Cudegegong, central western New South Wales.

**Department of Physics**

**General**

The Department retained the 1975 course structure but introduced a new subject, PHYS 151, The Art of Physics, which proved popular with students.

**Facilities and Equipment**

Early in 1976, the department was able to occupy the physics section of the Science Building Stage II. This provided much needed relief from some considerable congestion. The floor space available to the workshop became significantly larger, permitting much safer conditions for the workshop personnel. The extension provided four research laboratories thus trebling this type of space. During 1976, the department had had its four tutorial rooms returned to it. These rooms were adapted for dual usage as tutorial rooms and first year optics laboratories since the existing laboratories were totally unsuitable for optics experiments. Later in the year, the Buildings and Sites Committee assigned three of these rooms permanently to the department. In addition, three small rooms, vacated by the Department of Education, adjacent to the second and third year laboratories were converted into optics laboratories for second and third year students thus freeing the old optics laboratory for research purposes and locating all second and third year laboratories on the same floor.

The Departmental computer was delivered in 1976. This consists of a Nova 3/12 with 16K core interfaced to a teletype, a V.D.U., several D.V.M.'s (for data collection) and a dual drive diskette. Some substantial equipment was added to the third year teaching laboratory in the form of a lock-in amplifier, a wavelength modulated 0.5 metre spectrometer and an X-Y recorder. This equipment is also suitable for research purposes. Equipment was also purchased for the first and
second year laboratories and included a precision potentiometer, digital meters and a variety of optical equipment. Also, a significant quantity of lecture demonstration equipment was purchased. Some funds were spent on upgrading the 18" telescope, namely the purchase of an automatic guider and the commitment to replace the primary mirror with one of high quality glass. Also a diamond saw was ordered to facilitate preparation of optical components and samples.

Research

Major areas of investigation during the year were:

Astronomy

Research was conducted in several areas of astronomy. In particular, work has almost been completed on the construction of a colour contour map of the southern skies. This work has been greatly aided by the development of a technique for hypersensitising the photographic plates used in the recording of data; the technique appears to improve the speed of the plates by a factor of five. The Department as a whole, took part in an expedition to Bombala to assist with observations associated with the total solar eclipse that occurred there in late October. A number of experiments were set up but many could not be carried out because of overcast conditions at the time of totality. The experiments were designed to study such features as the chromospheric boundary, shadow bands, light intensity and the infrared and polarization properties of the outer corona. In addition to the above, some instrumental aspects involving both the 18" and 10" telescope were improved. Observations of the comet D'Arrest, made just after installation of a new Newtonian secondary mirror, revealed a rare ejection. This was reported in the International Astronomical Union Circulars (No. 2990).

Nuclear Physics

During 1976, a member of the Department, Dr. Mathur, spent six months at a nuclear research facility in Tehran and another six months at Kiel University in Germany also working on nuclear research. The research being conducted on the angular distribution of fission fragments, has been completed very successfully. A significant result was obtained. A curve fitting programme was used to obtain excellent fits to both the angular distribution data on $^{232}$Th and the data of other workers on cross-sections. The successful nuclear model requires that the fissioning nucleus be described by a triple hump barrier.

Solid State Physics

A high resolution grating spectrometer was received during 1976 purchased from an ARGC grant. The external optics for this instrument is being assembled. A small grating spectrometer for the very far infrared (on loan from Purdue University) was interfaced to the Nova computer for data collection. This is currently being used to study the piezospectroscopy of shallow donors and acceptors in germanium. Another small grating spectrometer is being modified to provide wavelength modulation absorption lines of chemical impurities in silicon and germanium. Research is also in progress in evaluating the merits of a number of "off-the-shelf" near-infrared solid state detectors with a view to using the best of these at the observatory to study the infrared characteristics of a number of select stars. In addition, experimental work continues in the area of radiation transfer in forests involving, for example, how solid pollutants affect this. Theoretical work in solid state physics is in progress, too. Two topics are being studied. One of these, an investigation of the influence of uniaxial compression on the infra-red spectra of impurities in semiconductors, is almost complete. The results obtained explain the origin of an observed stress-dependent component of one of the excitation lines of singly ionised zinc in germanium. The parent of this component is almost unobservably small at zero stress but acquires strength as the applied strain increases. The second topic is the development of computer programmes for the calculation of electronic properties of small clusters of atoms in solids or molecules.

In addition to the above areas of research, a programme was initiated in 1976 on the study of the physics of violins.

Topics investigated for research theses undertaken within the Department were:
Doctor of Philosophy

The Capture Cross-Section of Different Nuclei in the Kilovolt Region.
Angular Distribution of Fission Fragments.
Neutron Emission from Fission Fragments.
The Energy Spectrum of Neutrons in a Pulsed Fast Assembly.

Master of Science

The Measurement of Fission Neutron Spectrum of $^{252}$Cf and to Determine the Average Neutron Energy.
An Infrared Wavelength Modulation Spectrometer for the Study of Impurity Spectra of Semiconductors.
Scattering of Light by Solids.
A Survey of Infrared Astronomical Objects.
A Study of Some Infrared Detectors.
A Tracking System for the Wollongong University 18 inch Telescope.
FACULTY OF SOCIAL SCIENCES

Department of Accountancy

General

The first students to complete the requirements for a B.Com (Hons) degree in Accountancy finished in 1976 with 5 students completing. The first enrolments in the Diploma in Accountancy were accepted and one full time student completed the Diploma.

Facilities and Equipment

The Department moved to the new Social Sciences Building at the beginning of 1976. Provision was made in this new building for an Accounting Laboratory, but lack of sufficient staff including specialised staff precluded its development in 1976.

Research

Major topics of Investigation were:

Australian Company Financial Reporting.
Partnership Basis of Tax Assessment for Certain Companies.

The topics of research theses being undertaken within the Department comprised:

Master of Commerce (Honours) (U.N.S.W.)

The Impact of a Computer Installation on the Organisational Structure and the Accounting Function of a Steel Plant.
A Critical Appraisal of the Australian Corporate Income Tax.
The Learning Curve.

Bachelor of Commerce (Honours) (Wollongong).

The Theoretical and Practical Aspects of Income Tax Allocation.
An Examination of the Treatment of Exploration and Development Costs in Published Accounting Reports of Companies Involved in the Extractive Industries.
An Examination of the Treatment of Monetary Assets and Liabilities in Current Value Accounting.
An Examination of the Nature and Function of "Elementary Aphorisms" (Undefined Primitive Notions) in (Accounting) Theory Construction.

Department of Economics

General

The effects of the introduction of a new first year degree course in 1975 flowed through to the second year course. This was mainly due to:

(a) elimination of all the "general introductory" material, which was largely redundant because of the teaching in the social sciences in secondary schools, and
(b) absorption of the content of the second session subjects ECON202 Macroeconomics and ECON212 Microeconomics into the new first and second year subjects.

The new second-year subjects (Macroeconomics, Microeconomics, Public Finance, International Economics) represented a substantial increase in student work load. This was considered necessary in view of the nature of developments in the subject.
Concurrent changes at 300-level included an expansion in enrolments in the area of quantitative analysis, due in particular to prior development in 100 level and 200 level work in statistical analysis and econometrics.

This was also the first year of the coursework M.Com. degree. The introduction of ECON900 level courses in Industrial Economics, Econometrics, History of Economic Thought, and Economics of Social Welfare was a challenge to the lecturing staff.

Community work is reflected in membership by members of staff of a number of government committees and assistance to Commonwealth, State, and Local Government projects. Some examples are:

- Regional Advisory Council (Department of Decentralisation and Development).
- Regional Planning Committee (State Planning and Environment Council).
- Illawarra Lake Project (Wollongong City Council).
- Higher Education course assessment committees (Higher Education Board).
- Migrant Studies Seminar (Commonwealth Government).
- Urban Transport Advisory Committee (N.S.W. Transport Commission).
- Regional Education Committee (inter-departmental).
- Regional Research Committee (inter-departmental).

**Facilities and Equipment**

The development of teaching in Economics depends increasingly on practical assignments, group work, and workshop-type activity. In spite of the lack of facilities, and because of the extraordinary keenness of ingenuity of staff members much has been done by the Department in these terms, in spite of the lack of staff, particularly in

- Industrial Economics
- Natural Resource Economics
- Economics of Social Welfare

The shift to the Social Sciences Building, and the acquisition of a computer laboratory, was a landmark for the Department. The loss of the large open space in the A.C.S. building, when the main computer was installed, was compensated partially by the gain of two small rooms for research personnel, and a second secretary's room which provided space for much of the research material.

**Research**

Research activities throughout the year concentrated on the following topics:

- Regional economic development.
- Input-Output Analysis applied to (a) the Illawarra Region and (b) Fiji.
- Public services for the disposal of pollutants - a regional study.
- Economics of the building industry.
- Change in property values affecting inner-city development and redevelopment.
- Economics of the Australian Fishing Industry.
- History of Economic Thought.
- Economic Aspects of Federal, State and Local Government relationships.

The research theses being undertaken within the Department were:

**Doctor of Philosophy**

- Economic Implications of Particular Systems of Financing Local Government Expenditure in Urban Areas.
- Impact of Education on Agricultural Productivity in Developing Countries.
Department of Education

General

Education III (300-level) was offered for the first time. Unfortunately, because of lack of staff, Education II subjects had to be abandoned for 1976 in order to allow students who had completed these subjects in 1975 to pursue the 300-level subject. Until a more satisfactory staffing position is achieved it appears likely that the undergraduate Education subjects will continue to be offered in alternate years.

Seminars for graduate students were introduced in order to enable mutually supportive contacts among thesis students and between higher degree students and staff.

The format of the Diploma in Education programme was changed in several ways. In particular, the orientation of the programme was directed much more to school-based activities. Method lecturers were drawn from the schools for the first time and many of these lecturers were able to conduct groups in situ with the assistance of school students. The teaching practice component of the programme was also adjusted so that supervising teachers and coordinators could take a more direct role in evaluation and assessment. One consequence of these changes, made on educational grounds, was that the University could conduct its own programme without drawing on assistance from the Wollongong Institute of Education.

A system of field days was also introduced, in which students were enabled, over a period of five weeks in each session, to assimilate comfortably into schools in which their teaching practice was to occur. Seminars conducted between school staff and our students were designed to ensure that the matching of students with supervising teachers and with particular classes of children was optimised.

Finally, the Health Education component of the Diploma programme was expanded; a development made possible through the close cooperation of the N.S.W. Health Commission.

Research

Research activities throughout the year were concerned with the following topics of investigation:

Work Preparation Centre Project, commenced by Professor King in Victoria in 1975 in collaboration with Dr. S.C. Sykes, and concerned with the efficacy of Work Preparation Centres in the training of minimal mental retardates. This project is funded by the Australian Department of Social Security ($50,000 per annum).

Migrant Education Television Research Project, undertaken for the Australian Department of Education ($50,000 per annum) to study the effects of television series directed towards language and culture learning by migrants. This project is now proceeding with Professor S.C. Hill, Department of Sociology as co-director with Professor King.

A study of manpower availability of psychologists in Australia was also undertaken for the Australian Psychological Society and the Australian Hospitals and Health Services Commission ($7,000). Mr. C.R. Horne (Sociology) is collaborating with Professor King in this study.

A study on the effects of various learning environments on the acquisition by children of literacy, numeracy and related skills was commenced in 1976, funded by this University ($1,850). Late in 1976 the University decided to fund this project more fully (approximately $9,000).
A study on intermediate and long range effects of compensatory pre-schooling was continued in 1976. This project, which commenced in January 1975 and funded by E.R.D.C., will continue into 1977.

A study on characteristics and school programmes of rural children on the south coast of N.S.W. commenced in 1974 and is still in progress. This project ($4,500) is being carried out by Dr. P.R. de Lacey in association with Associate Professor J.S. Hagan, Department of History.

Project enrichment of childhood preschool, Bourke, N.S.W.:

A project concerning disadvantaged children in the Bourke area was commenced some years ago and continued through 1976. This study, involving children from low socio-economic circumstances and Aboriginal children, is being undertaken by Dr. de Lacey in collaboration with the University of New South Wales and is funded by the Department of Aboriginal Affairs (approximately $40,000).

A survey of special characteristics of pre-school high school pupils.

An intercultural survey of classificatory and language performance of children from several Asian and Pacific countries, in association with the East-West Centre, Honolulu.

In a general study of curriculum development, Dr. Fielding and Dr. Cavanagh have almost completed an analysis of preservice teacher education programmes of the end-on type. When published, the work will follow up on work already completed by Dr. Fielding (accepted for Vestes, 1977).

Research theses being undertaken within the Department during the year were:

**Doctor of Philosophy**

Toward a structural epistemology of a discipline.

**Master of Arts**

Comparisons of Models of Teacher Education in Australia and the United Kingdom.

The Place of Creative Activities in Education.

A Study of Verbal and Operational Performance among Intellectually Handicapped Children.

The School Council and Community Education in N.S.W.: A Repertory Grid Investigation of Teacher Role Perceptions.

Ethical Problems of the Integrated Curriculum.

Implications of the Social Studies Curriculum for Deprived Children, and the Teacher Role.

Social Influences on the Cognitive Development of Children from Different Ethnic Groups.

The Planning of Tertiary Education in Australia for the 1980's Incorporating an Examination of University Entrance and Enrolment Policies and Practices.

Assessment of Experiential Learning of Metallurgy Technicians and the Implications for Future Curriculum Development.

**Department of Geography**

**Facilities and Equipment**

After a long period of anticipation, the Department finally moved into new quarters in the new Social Sciences Building, thus all members came together under the one roof for the first time since the Department's inception several years before.

As a result of the relocation, the cartographic unit had to be re-established. Despite early problems the new Physical Geography Laboratory was the centre of a heavy programme of physical and chemical analyses conducted as a part of the Departmental Research programme and its use in undergraduate teaching was expanded considerably. With the growing popularity of courses in Physical Geography in both the Arts and Science degree programmes this usage will expand significantly and is likely to pose problems in the next year or so.
Student Performance

The fall out rate among first year students continued to disturb. This year the loss has reached near epidemic proportions and clearly required some more careful screening of new entrants. An analysis of entry levels in relation to performance for first year students in this Department will be undertaken as soon as possible. Among the advanced students performance levels are gratifyingly high, however, although, given the very intensive teaching they receive, this is perhaps no more than should be expected. What remains to be determined is whether their performance after graduation is considered to be on par with that of graduates from other bigger Universities where greater independence is likely to be required by them simply because of the generally higher level of impersonality and is encouraged by their greater competitiveness.

Research

A major research project, undertaken in collaboration with other Departments and completed during the year, was the Lake Illawarra Environmental Assessment Project.

Research theses undertaken within the Department were:

Doctor of Philosophy

Shopping Behaviour in Suburban Wollongong.

Master of Science

Slope Stability in the Illawarra

Bachelor of Arts (Honours)

The Windang Barrier System.
Voting Behaviour at the 1974 Local Government Elections, City of Wollongong.
The Meander Pattern of Macquarie Rivulet.

Department of Psychology

General

In 1975 first year subjects comprised six individual sections taken over the full year. In 1976, these sections were grouped under the titles "Psychology 1A" and "Psychology 1B" and offered as two separate subjects offered in the First Session and the Second Session respectively.

The second year course remained unchanged.

In 1975, third year subjects were divided into a "standard" section offered in the first session and an "advanced" section of the same subject in the second session. The advanced sections were discontinued in 1976 and more subjects were offered in their place, e.g. "Psychological Issues", "Psychology and Abnormality", "Individual Differences", and "Industrial Psychology" were added.

For the first time all subjects were allocated a credit point rating which was integrated into a university-wide scheme for the award of degrees based on credit points.

Facilities and Equipment

In March 1976, the Department moved into new accommodation in the recently erected Social Sciences Building and occupied a large part of the second floor. The facilities comprise: offices, laboratories, seminar rooms, one way vision suites, research cubicles and workshop.

In general there remains a pressing need for sufficient funds to purchase the apparatus necessary for teaching and experimentation in psycho-physiology.
Major topics of investigation during the year were:

Modification of the phasic stretch reflex latency and amplitude by long-loop influences during the preparation for voluntary movement (Research conducted by Professor A.M. Clarke with Dr. K.C. Hayes at The University of Waterloo, Canada).

An examination of the effects of a modified extinction in operant conditioning (Research conducted by Professor A.M. Clarke with Professor R. Banks at The University of Waterloo, Canada).

Experimental investigation of the relationship between variables in the Atkinson-McClelland formulation of the determinants of achievement drive. In particular, the relation between incentive and subjective probability of success is of interest.

The use of audio visual cassettes in presenting modules of counselling interviews. The scripting is constant and the counselees are varied between capsules. The variation occurs in age/ethnicity/background/sex of the client. The capsules are presented to counsellors who vary in the same characteristics. The device is to be used as a vehicle for teaching counsellors and for making counsellors aware of otherwise unperceived biases.

The development of a pictorial vocational interest inventory for use with low ability readers and for the lower levels of secondary school where reading ability and motivation is inappropriate for existing techniques.

Humanistic psychology: particularly humanistic education and new methods of experiential teaching.

The measurement of change in intensive groups.

Action research into changing management styles in response to increasing social pressure for more worker participation in management.

Industrial safety and accident prevention, with emphasis on reporting and information processing systems.

Personal space - awareness of and judgements about an individual's need for personal space.

The study of social attitudes.

Sex differences.

Time perception.

Ideology and psychology.

Psychology in China.

The behavioural control of obesity.

The processing of ambiguous sentences.

The effects of punishment on human behaviour.

The ongoing research theses were:

**Doctor of Philosophy**

Attitudes of Australian men and women towards the traditional, cultural sex-role stereotypes.

**Master of Arts**

Punishment and the locus of control.

*Master's Qualifying (completed in 1976)*

Mothers' perception of emotionally disturbed children.

*Bachelor of Arts (Honours) (completed in 1976)*

An investigation of personal space: The relationship between sex differences and some personality variables on perceived frontal space (Empirical project).
The Department of Sociology

General

In 1976 the Department of Sociology moved into its second year of teaching, and so introduced new courses at a 200 level. Consistent with the Department's philosophy of integrated development of courses from 100 to 400 levels, the first Session of the pass course was a core course involving no options, and comprising theory and methodology streams. Three options were introduced in the theory stream of second Session: these were entitled, 'Ideology and Belief Systems'; 'Time, Work and Leisure'; and 'The Sociology of Small Groups'. The 'Sociology of Small Groups' option was not offered in 1976, but will be introduced in 1977. The Department regards these three areas of enquiry to be bases on which the more diffuse pattern of third year courses will be built during 1977. In addition to these pass courses, a 200 level course at an advanced level was introduced, 'Foundations of Sociological Thought': the purpose of this course is to deepen the student's scholastic background in the most central areas of sociological theory, and is intended as the first in a series of advanced level courses at 200, 300 and 400 levels which will continue this deeper development of sociological competence of continuing students.

The Department regards its initial commitment is to the development of a high-quality teaching School and, into this framework, the subsequent integration of research activities. In line with this commitment the Department has introduced a number of innovations in teaching techniques such as:

- Continuous assessment rather than formal examinations.
- Open Seminars.
- Excursions (e.g., the Departmental staff organised and helped support the attendance of 16 students (primarily from SOC100 and 200 levels) at the annual conference of the Sociological Association of Australia and New Zealand held in Melbourne).

Facilities and Equipment

Facilities available to the Department comprise only office space and a store. A seminar room designed to Departmental specifications (primarily by expanding its planned length) was made available through timetabling; it was developed for use as a communications room to some extent, but with no control over its general security or use, the Department could not use the room as fully intended.

Equipment purchased during the year was primarily for the purposes of developing our audio and audio-visual recording resources. Equipment purchased was as follows:

- Akai GXC39 Tape recorder
- 2 x Akai SW30 Speakers
- 2 x Akai ADM80 Microphones
- Tape recorder AV.3620.CE
- Receiver Monitor CVM.110
- Sony Video Camera AVC.3450
- Tripod VTC.20.A
- RF Unit RFU51A

Research

The overall plan for the Department's development required concentration in 1975 on origination of a teaching programme, and in 1976, the development of a research base - integrated as far as possible with current teaching - from which subsequent Departmental research programmes could emanate. Thus the research activities of the Department started in 1976 to formalise along the
lines planned by the Department for its long-term development. At centre is a distinctive theoretical theme shared by Departmental members - from a variety of perspectives: concerning the development of a bridge between empiricism and phenomenology through a theory of action and social meaning. This basic epistemological position was formalised into a well received paper presented by Horne and Hill at the SAANZ Conference; D'Alton contributed a methodological paper on one component of the method we propose - on deviant case analysis of historic material. The approach also underlay a subsequent interpretation of current empirical data presented for publication by Hill, as well as a commissioned Research Report to the N.S.W. Council of Science and Technology by Hill and Jagtenberg. In keeping with the Department's commitment to integrate effective teaching with research activities, research work done in this area in 1976 is presently being built into SOC300 level courses to be run in 1977.

The other main line of research the Department is developing attempts to integrate the specialised competences of staff into research of use to both the local Wollongong and wider Australia scene. Mr. Horne acted as methodology consultant and author of the WUSC Subject Catalogue - a study completed with library staff of the University of Wollongong. Mr. Horne has also been directing commissioned research (with Professor King of the Department of Education) into the training and employment of psychologists in Australia. Professor Hill is co-directing (with Professor King) a major research project funded by the Australian Department of Education, into the effectiveness of migrant education television in Australia. In addition, as cited above, Professor Hill was commissioned by the N.S.W. Science Council to research and present a report (with Mr. Jagtenberg, Ph.D student) on improving the productivity of scientists in Australia. This report will be published as a monograph by the New South Wales Government in 1977. Dr. D'Alton has continued his specialised research on sociology of conflict and the military, presented a research paper on this to the 1976 SAANZ Conference and has subsequently been invited to a central conference on military studies, to deliver the keynote address.

Furthermore, from mid-November, 1975 until mid-January, 1976, Professor Hill was invited to the University of Sussex (UK) to complete a 6-year research project, which Professor Hill was assisting to direct on the impact of science and technology on underdevelopment, the research phase of this study having been completed in Thailand. Although analysis was completed while present in England, some additional work was required during the year to finish writing up the research for publication.

In addition, Professor Hill completed an article on the impact of technology on contemporary Australian society, which was invited for inclusion in a book edited by Godfrey Gardner entitled, 'Technology Versus People'.
RESEARCH INTERESTS AND PUBLICATIONS

FACULTY OF ENGINEERING

Department of Civil Engineering

Research Interests

Load Distribution in Orthotropic Bridge Decks.
Dynamic Behaviour of Elastic Plate Systems.
Road Materials Research - Skid Resistance.
The C.C.T.V. Camera as a Research Tool.
Stress Analysis Using Holography.
The Analysis of Stress Distribution Produced at Abrupt Changes in Section.
The Investigation of Curvature Produced in Plates with Edge Loading Using Moire Fringe Techniques.
The Analysis of Whole Stress Fields under Impact Conditions.
Experimental Analysis of Structures.
The Development of High speed Photographic Techniques.
Identification of Systems Dynamic Characteristics by Cross Correlation Analysis.
Stability of Natural Slopes.
Finite Element Applications in Geomechanics.
Soil Anisotropy.
Temperature Wave Method Applied to Determining Fracture Toughness.
Hydrology of the Storm Rainfall-Runoff Process.
Mathematical Modelling of a Hydrologic System.
A Computerised System for the Design of Prestressed Multispan Box Girder Bridges.
Cracking and the Longitudinal Rigidities of Reinforced Concrete Multicellular Bridge Decks.
The Use of Granulated Slag in Concrete.
The Use of Granulated Slag in Asphaltic Surfacing.
Transport requirements in the Municipality of Shellharbour.
Preparation of Noise Level Maps.
Planning and Design of Buildings for Comfort.

Publications


Conference Papers


Department of Electrical Engineering

Research Interests

Electrostatic Precipitation of Particulate Solids.
System Identification.
Static Converters for Variable Speed Drives.
Electrical Machines.
Optimisation Techniques.
Reliability Techniques.
Large Scale Systems Analysis.
Computer-aided Analysis and Design.
Communications.
Process Modelling and Control.
Computers as Control System Elements.
Transportation.
Utilization of Solar Energy.

Publications


Conference Papers


Higher Degree Theses

Doctor of Philosophy


Department of Mechanical Engineering

Research Interests

Control of Large Scale Systems.
Design of Bulk Solid Storage Systems.
Environmental Engineering.
Naval Hydrodynamics.

Publications


Conference Papers


Higher Degree Theses

Master of Engineering Science (U.N.S.W.)

Department of Metallurgy

Research Interests

- Deformation and Fracture at Elevated Temperatures, with Particular Reference to Multiphase Melolinos.
- Solidification of Metals.
- High Temperature Calorimetry.
- Development of Precision Testing Equipment for Studies of Metal Deformation in Uniaxial and Biaxial Tension.
- Analysis and Structural Interpretation of Plastic Behaviour in Metals.
- Studies of Transformations in Various Alloys having the Property that Shape Deformation by Loading at Some Appropriate Temperature is Recovered by Heating at Some Higher Temperature (Shape Memory Alloys).
- Metallographic Studies of Alloys of Commercial Importance.
- Studies of the Structures developed in Metals by Recrystallisation, with Particular Reference to Rapid Recrystalisation.
- Studies of Flow Phenomena in Packed Beds.

Publications


FACULTY OF HUMANITIES

Department of English

Research Interests

- Old English Poetry.
- Personal Relationships in Old English Poetry.
- Early-Tudor Poetry in Manuscript.
- Art and Nature in Sixteenth and Seventeenth Century Literature.
- The Traditional Popular Ballad.
- Attitudes to Nature in Australian Fiction.
- The Poetry of Sylvia Plath.
- The Metaphysicals.
- The Restoration.
- Critical Thought in the 17th and 18th Centuries.
- Popular Song Lyrics as a Medium of Communication.
- James Joyce.

Publications


Conference Papers


Department of European Languages

Research Interests

- 19th and 20th century novel and theatre.
- Literature, painting and film in 20th century France.
- The "Nouveau Roman".
- Linguistics applied to the teaching of French as a second language.
- Intonation analysis.
- Audio-visual methods in the teaching of French.
- Italian literature of the late 19th century.
- Methods and materials for teaching Italian at the secondary and tertiary level.
- Italian-American folk theatre of the early 1900's.

Publications


Department of History

Research Interests

**General**

European History from 1650.
British History from 1500.
Any Area of Australian History.
Modern South East Asian History.

**Specific**

The decline of the Liberal Party with special reference to the impact of Disraeli, Gladstone, Joseph Chamberlain, Lloyd George, Winston Churchill and Ramsay MacDonald.
David Low in Australia: A Bibliography.
Modern Colonial History: Special current interest Malaysia/Indonesia.
A Biography of Archbishop Daniel Mannix.
A History of the A.C.T.U.
A life of A.A. Ioffe.
Translating and editing the four volume "Zapiskii o Grazhdonskoi Voine" by Antonev-Ovseerky.
A study of the impact on the community of the Mt. Kembla mine disaster of 1902 and the growth of a legend about the disaster.
The St. Andrews University Missionary Association 1923-8: a study of the origins and nature of missionary zeal.

Publications


Higher Degree Theses

**Doctor of Philosophy**

T. Cutler, "The History of the Australian Meat Industry Employees' Union".

K. Davies, "Sectarianism and the Development of Elementary Education in N.S.W. 1788-1918".
Department of History and Philosophy of Science

Research Interest

Early 19th Century British Philosophy of Science.
Women's Studies.
Embryology and Evolution 19th Century.
Social Relation of Science in 19th and 20th Centuries.
19th and 20th Century Genetics.

Publications


Higher Degree Theses

Doctor of Philosophy


Department of Philosophy

Research Interests

Interpretation and Evaluation of Kant's Critical Philosophy.
Social and Political Aspects of Privacy.
Philosophical Logic, with Special Reference to Existence and Truth.
Legal and Political Obligation and its Basis.
Aesthetics of Benedetto Croce.
Private Enterprise-Based Social Philosophy.
Philosophy of Mind.

Publications

Conference Paper

Department of Mathematics

Research Interests

Numerical analysis.
Matrix analysis.
Oceanography.
Nuclear reactor theory.
Computer science.
Statistical decision theory.
Probability.
Operations research.
Functional analysis.
Measure theory.
Abstract algebra.
Logic.
Set theory.
Topology.
Continuum mechanics.
Non-linear partial differential equations.

Publications

FACULTY OF SCIENCE

Department of Biology

Research Interests

Community Ecology.
Microbial Water Relations.
Behavioural Ecology.
Environmental Animal Physiology.
Photosynthesis.

Publications


Department of Chemistry

Research Interests

Information Retrieval from Computer-Based Libraries of Mass Spectral and Other Data.
Applications of Computer Controlled Mass Spectrometers to Analytical Problems.
Investigation of the Role of Ozone and its Metastable Cyclic Conformer in Atmospheric Phenomena.
Quantum Theoretical Search for Potential High Energy Chemical Lasers.
Prediction of the Electronic Structure and Properties of Transition Metal Complexes in Crystalline and Biological Environments.
Spectroscopic Investigation of Simple Transition Metal Complexes in Crystals at Cryogenic Temperatures.
Use of Peroxides for Wastewater Treatment.
Development of Computerised Feed Forward Control Systems for Cyanide, Sulphide, Phenols and Other Contaminants.
Surface Chemistry of Iron Oxides.
Isolation and Structure Elucidation of Alkaloids from a New Guinean Plant.
Synthetic Modification of Tylocrebrine, an Antileukaemia Agent.
Synthetic Approaches to Brain-Active Drugs.
Trace Analysis Especially Related to Electrochemical Techniques.
Solvent Effects in Acid-Base Studies.
Thermodynamics of Non-Reacting Systems involving High Temperature Calorimetry.
The Application of Chemical Ionization Mass Spectrometry to the Analysis of Biological Fluids.
The Determination of Absolute Configuration of Asymmetric Molecules by Gas Chromatography and Mass Spectrometry.
The Sequencing of Tryptic Peptides by Cathepsin “C” and Mass Spectrometry.
Absorption Studies on Supported Metal Catalyst Systems.
Exchange Reactions on Heterogeneous Catalysts.
Detector Systems Based on Specificity of Heterogeneous Catalysed Reactions.
Variable Temperature (4-300°K) Magnetoochemistry of First Row Transition Metal Polynuclear Complexes.
Structure and Properties of Oxygen Carrying Transition Metal Complexes.
Structure and Properties of Transition Metal Complexes of Polydentate Schiff Base Ligands.
A Study of the Infrared Spectra of Transition Metal Complexes using the Metal Isotope Substitution Method.
Variable Temperature (4-300°K) Magnetoochemistry of Polynuclear Transition Metal Complexes.
Structure and Properties of Lanthanide Schiff Base Complexes.

Publications


Department of Geology

Research Interests

The Geology of Coal Measures.
Rock Magnetism and Related Geophysical Phenomena.
Textures of Igneous and Metamorphic Rocks.
Invertebrates of the Early and Middle Palaeozoic of Australasia.
Terrestrial and Shallow Marine Sedimentology.
Igneous Petrology of the Illawarra District.
Organic Geochemistry.
Economic and Environmental Geology.

Publications


Conference Paper


Special Report

Department of Physics

Research Interests

Solid State Physics.
Spectroscopy.
Astronomy.
Theoretical Physics.
Nuclear Physics.
Musical Acoustics.

Publications


Conference Papers


FACULTY OF SOCIAL SCIENCES

Department of Accountancy

Research Interests

Accounting Theory Construction and Verification.
Administrative Law.
Analysis of Australian Company Financial Reporting Practices.
Behavioural Aspects of Management Information Systems.
Business Finance.
Business Objectives.
Capital and Profit Concepts, including Cost and Value Concepts, and their Measurement.
Capital Expenditure Decision-making.
Constitutional Law.
External Reporting in the Extractive Industries.
History and Development of Accounting Thought.
International Accounting.
Learning Curve.
Statements on Accounting Standards by Professional Bodies and other Means of Improving Accounting Practice.
Taxation.

Publications


Department of Economics

Research Interests

Industrial Economics.
Urban and Regional Studies.
Economic Development.
Economics of Migration.
Labour Economics.
Monetary Economics.
Natural Resource Economics.
International Economics.

Publications


Conference Papers


Department of Education

Research Interests

Classificatory ability in Australian children.
Cognitive development of minority groups.
Convergent, divergent and operational thinking among white and Aboriginal children.
Curriculum studies and development.
Effects of mass media on children.
Enrichment programs for disadvantaged preschoolers.
Schooling and social class.
Socialization of children, migrants and minority groups.
Educational administration.
Organizational behaviour.
Open education.
Work preparation of the mildly mentally retarded.
Migrant education through the media.

Publications


Department of Geography

Research Interests

Geography of Transport Systems.
Agricultural Geography.
Coastal Geomorphology.
Fluvial Geomorphology.
Urban Studies.
Biogeography.
Population Studies.
Regional Development and Planning.
Publications


Conference Papers


Special Report


Department of Psychology

Research Interests

Accidents in Industry - Psychological and Physical Factors.
Achievement Motivation.
Attitudes.
Autonomic Components of the Orienting Reaction.
Bisensory Learning including Vibrotactile Learning.
Classical and Instrumental Autonomic Conditioning.
Decision and Risk Taking.
Deviant and Criminal Behaviour.
Disadvantaged Children.
Human Learning.
Personnel - Selection and Placement.
Prediction of Academic Success.
Psychophysiology of the Autonomic Nervous System.
Social Psychology of Industry.
Student Guidance and Counselling Services.
Time Perception.

Publications


Conference Papers


Department of Sociology

Research Interests

- Self-Concept.
- Socialization.
- Small Group Theory.
- Sociology of Science.
- Impact of Science and Technology on Society.
- Science, Technology and Developing Countries.
- Social Dynamics of Ecology Movement and Response.
- Professionalism.
- Sociology of Organizations.
- Military Sociology.

Publications

Conference Papers


STUDENT ACTIVITIES

The Students' Representative Council

In 1976, the Students' Representative Council continued to promote wider student participation in University and community affairs. As well as an increase in Clubs and Societies affiliated with the S.R.C., there was an increase in services and in representative and social activities.

Major Ongoing Activities

During the year a campaign was waged protesting Federal Government cuts in education spending. A significant representation of students confronted Commonwealth Minister for Education, Senator J.L. Carrick, when he visited the campus and a student boycott of classes was successfully held nationally on September 30th.

Student representation within University government was one means used to accentuate the problems of course content, workloads and tertiary teaching methods. The provision of health benefits, travel schemes and insurance at student rates was also a major objective in 1976.

New Developments

New developments were concentrated in the areas of welfare and social services such as short-term loans at no interest; the implementation of the bicycle-rental scheme; support for on-campus child-care facilities and the development of the Alternate Media Resource Unit.

Major changes in the S.R.C. Constitution enabled significant activists to concentrate on Education, Environment and Women's Rights. The S.R.C. was actively involved in national education campaigns; local environment protection in the Illawarra; financial assistance to community women's refuge centres, and maintaining pressure on campus against sexism.

Facilities

With the development of the Union building the S.R.C. acquired two more adjoining offices on the ground floor stage 1. Consideration of and planning for more economic use of space and resources began.
### GRANTS AND DONATIONS

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
<th>Principal Investigator</th>
<th>Grant Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated Pulp and Paper Mills Limited</td>
<td>Development of Spark Perforation Unit for Cigarette Tissue, <em>Department of Electrical Engineering</em></td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Australian Accounting Research Foundation</td>
<td>Aspects of Financial Reporting Practice of Australian Companies, <em>Department of Accountancy</em></td>
<td></td>
<td>$6,000</td>
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<tr>
<td>Australian Education Research and Development Committee</td>
<td>Intermediate and long Range Effects of Compensatory Pre-Schooling Education, <em>Department of Education</em></td>
<td></td>
<td>$418</td>
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<tr>
<td></td>
<td>- 1975</td>
<td></td>
<td>$10,661</td>
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<tr>
<td></td>
<td>- 1976</td>
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<td>$16,765</td>
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<td></td>
<td>Precis - Its Applicability for the Subject Catalogue in an Academic Library - 1976</td>
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<tr>
<td>Australian Hospitals and Health Services Committee</td>
<td>Grant for Survey of Psychological Manpower in Australia, <em>Department of Education</em></td>
<td></td>
<td>$4,750</td>
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<tr>
<td>Australian Road Research Board</td>
<td>Computer Design of Prestressed Concrete Box Girders, <em>Department of Civil Engineering</em></td>
<td></td>
<td>$500</td>
</tr>
<tr>
<td>Unisearch Limited</td>
<td>Bulk Solids Handling, <em>Department of Mechanical Engineering</em></td>
<td></td>
<td>$932</td>
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<tr>
<td>Commonwealth Scientific and Industrial Research Organisation Grants</td>
<td>C. Lill, <em>Department of Mathematics</em></td>
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<td>$450</td>
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<td>Department of Decentralization and Development</td>
<td>Printing Costs Regional Data Handbook, <em>Department of Economics</em></td>
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<td>$1,560</td>
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<tr>
<td>Department of Education</td>
<td>Evaluation of Effectiveness of the Migrant Education Television Programme, <em>Department of Education</em></td>
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<td>$24,000</td>
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<tr>
<td>Electricity Commission of New South Wales Grant</td>
<td>Electrostatic Precipitation, <em>Department of Electrical Engineering</em></td>
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<td>$3,500</td>
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<tr>
<td>Electrical Research Board Grants</td>
<td>Optimisation of Distribution Systems, <em>Department of Electrical Engineering</em></td>
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<td>$1,500</td>
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<tr>
<td>Environmental Research Donations</td>
<td><em>Department of Geography</em></td>
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<td>$1,236</td>
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<td>Laport Australia Limited</td>
<td>Use of Peroxide in Waste Water Treatment, <em>Department of Chemistry</em></td>
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<td>$1,000</td>
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<tr>
<td>National Health and Medical Research Council</td>
<td>Application of GC-MS and Related Techniques to the Study of Inborn Errors of Metabolism, <em>Department of Chemistry</em></td>
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<td>$9,965</td>
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<tr>
<td>Source of Funding</td>
<td>Sensitive Topic</td>
<td>Department</td>
<td>Amount</td>
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<td>-------------------</td>
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<td>------------</td>
<td>--------</td>
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<tr>
<td>National Health and Medical Research Council (Cont)</td>
<td>Development of GLS/MS Techniques for Diagnosis</td>
<td>Department of Chemistry</td>
<td>$18,282</td>
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<tr>
<td>Oceanographic Research</td>
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<td>Department of Mathematics</td>
<td>$500</td>
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<tr>
<td>Organisational Development and Job Satisfaction</td>
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<td>Department of Psychology</td>
<td>$1,400</td>
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<tr>
<td>Special Research</td>
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<td>Department of Biology</td>
<td>$80</td>
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<tr>
<td>Sundry Donations for Research</td>
<td></td>
<td>Department of Accountancy</td>
<td>$90</td>
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<td></td>
<td></td>
<td>Department of Chemistry</td>
<td>$500</td>
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<tr>
<td></td>
<td></td>
<td>Department of Electrical Engineering</td>
<td>$2,723</td>
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<tr>
<td></td>
<td></td>
<td>Department of Mathematics</td>
<td>$312</td>
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<td>Department of Sociology</td>
<td>$200</td>
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<tr>
<td>Vice-Chancellor's Special Research</td>
<td>Detoxification and Clarification of Industrial Effluents</td>
<td>Department of Mechanical Engineering</td>
<td>$750</td>
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<td></td>
<td>Water and Natural Slope Instability</td>
<td>Department of Civil Engineering</td>
<td>$1,500</td>
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<td></td>
<td>Siltation in Coastal Rivers of New South Wales</td>
<td>Department of Mechanical Engineering</td>
<td>$4,000</td>
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<td></td>
<td>Use of Peroxide in Waste Water Treatment</td>
<td>Department of Chemistry</td>
<td>$2,500</td>
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<tr>
<td>Wollongong City Council</td>
<td>Study of Leachate at the Russell Vale Disposal Depot</td>
<td>Department of Chemistry</td>
<td>$10,000</td>
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<tr>
<td>Australian Research Grants Committee</td>
<td>A.A. Calwell - A political Biography 1914-1973</td>
<td>Department of History</td>
<td>$4,919</td>
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<td></td>
<td>Clarification and Detoxification of Effluent Water from Steel Industry</td>
<td>Department of Chemistry</td>
<td>$1,246</td>
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<td></td>
<td>Influence of the Chemical Environment on the Bonding Spectra and Reactivity of Molecules in Condensed Media</td>
<td>Department of Chemistry</td>
<td>$1,226</td>
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<td>Investigations Concerning Natural Slope Stability</td>
<td>Department of Civil Engineering</td>
<td>$2,499</td>
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<td></td>
<td>Metabolite Fluxes Across Chloroplast Envelope Membranes and the Regulation of Photosynthesis Phosphate Translocation in Pea Chloroplasts</td>
<td>Department of Biology</td>
<td>$1,484</td>
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<td>Project Description</td>
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<tr>
<td>Screening Metabolic Disorders by Gas Liquids Chromatography and Mass Spectrometry</td>
<td>Department of Chemistry</td>
<td>$9,061</td>
<td></td>
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<tr>
<td>Sedimentological Investigation of the Pternjara Group Amadeus Basin</td>
<td>Department of Geology</td>
<td>$600</td>
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<tr>
<td>Solid State Spectroscopy Electronic and Vibrational Spectra and Solids</td>
<td>Department of Physics</td>
<td>$10,768</td>
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<tr>
<td>Thermodynamic Studies of Solute Retention by Micro Organisms</td>
<td>Department of Biology</td>
<td>$457</td>
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<tr>
<td>Wave Analysis for the East Australian Coast</td>
<td>Department of Mathematics</td>
<td>$1,120</td>
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</table>

**Special Purpose Funds - Other**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>Australian Council of Trade Unions</td>
<td>History of the A.C.T.U., Department of History</td>
<td>$5,345</td>
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<tr>
<td>Australian Institute of Management</td>
<td>Donation for Books</td>
<td>$800</td>
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<tr>
<td>Illawarra Branch</td>
<td></td>
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<tr>
<td>Australian Institute of Management</td>
<td>Autonomy Donation for Improvement of Managerial Techniques</td>
<td>$800</td>
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<td></td>
<td></td>
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<tr>
<td>Donations to Geology</td>
<td></td>
<td>$1,027</td>
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<td>Donations to Geography</td>
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<td>$92</td>
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<tr>
<td>Donations to Psychology</td>
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<td>$140</td>
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<tr>
<td>Library Appeal Fund</td>
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<td>$21</td>
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<tr>
<td>Wollongong University Appeal Fund</td>
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<td>$215</td>
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</table>
Donations for Scholarships, Bursaries, Prizes, Etc.

Ampol Award for Graduate Students

Mathematics Prize Fund

Wollongong University Prize Fund

Blue Circle Cement Limited

Lysaghts

Metallurgy Society

Australian Fertilizers

Australian Iron and Steel

Institute of Engineers

Institute of Mining and Metals

Gina Savage

Marjorie Brown

Corporate Affairs

Australian Society of Accountants

$2,500

$67

$25

$30

$100

$20

$30

$75

$140

$30

$20

$50

$150
FINANCIAL STATEMENT

Finances

A brief summary of the accounts of the University for 1976 is set out below.

Since the 1st January, 1974, Australian Government Grants to Universities have been subject to supplementation based on various indices. This has had the following effect on the various grants to this University.

Recurrent Funds

The 1976 grant to the University as recommended by the Universities Commission and accepted by the Government was $6,160,000. With supplementation this has been increased to $7,114,000.

Special Research Grant

The 1976 grant to the University as recommended by the Universities Commission and accepted by the Government was $45,000. With supplementation this was increased to $52,000.

Equipment Grant

The 1976 grant to the University as recommended by the Universities Commission and accepted by the Government was $570,000. With supplementation this has been increased to $648,000.

Building Project Grants

The 1976 grant to the University as recommended by the Universities Commission and accepted by the Government was $46,500.
## RECURRENT FUNDS

### 1976 Recurrent Income and Expenditure

<table>
<thead>
<tr>
<th>1975 COMPARISONS</th>
<th>SOURCE OF INCOME</th>
<th>AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,526,000</td>
<td>Australian Governments Grants</td>
<td>7,114,000</td>
<td>99.32</td>
</tr>
<tr>
<td>42,548</td>
<td>Other General Income</td>
<td>48,041</td>
<td>.68</td>
</tr>
<tr>
<td>5,568,548</td>
<td></td>
<td>7,162,041</td>
<td>100.00</td>
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### 1975 COMPARISONS

<table>
<thead>
<tr>
<th>EXPENDITURE HEADINGS</th>
<th>AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and Staff Changes</td>
<td>5,968,889</td>
<td>86.28</td>
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<tr>
<td>Maintenance Expenses</td>
<td>789,095</td>
<td>11.40</td>
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<td>Furniture &amp; Library Books</td>
<td>159,457</td>
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<tr>
<td></td>
<td>6,917,441</td>
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</table>

## AGGREGATE FUNDS

During 1976 income received from all sources totalled $9,267,221 while aggregate expenditure amounted to $8,950,754.

Aggregate income was received from the following sources:--

<table>
<thead>
<tr>
<th>1975 COMPARISONS</th>
<th>SOURCE OF INCOME</th>
<th>AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Government Grants</td>
<td>Building Projects</td>
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<tr>
<td>429,601</td>
<td>Equipment</td>
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<td></td>
</tr>
<tr>
<td>36,324</td>
<td>Special Research</td>
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<tr>
<td>465,926</td>
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<td>24,527</td>
<td>.26</td>
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### Australian Government Grant

<table>
<thead>
<tr>
<th>1975 COMPARISONS</th>
<th>AMOUNT</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Recurrent</td>
<td>7,114,000</td>
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<tr>
<td>Building Projects</td>
<td>645,550</td>
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<tr>
<td>Equipment</td>
<td>650,000</td>
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<tr>
<td>Special Research</td>
<td>52,000</td>
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<tr>
<td>9,417,446</td>
<td>8,461,550</td>
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<tr>
<td>1975 COMPARISONS</td>
<td>SOURCE OF INCOME</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td><strong>Special Purpose Funds</strong></td>
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<td></td>
<td><strong>Research</strong></td>
<td>175,604</td>
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<td></td>
<td><strong>Scholarships, Prizes, etc;</strong></td>
<td>3,477</td>
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<tr>
<td></td>
<td><strong>Other</strong></td>
<td>554,022</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td>733,103</td>
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<tr>
<td></td>
<td><strong>Other General Income</strong></td>
<td>48,041</td>
</tr>
<tr>
<td>10,356,819</td>
<td><strong>Total Income</strong></td>
<td>9,267,221</td>
</tr>
<tr>
<td>1975 COMPARISONS</td>
<td>EXPENDITURE HEADINGS</td>
<td>AMOUNT</td>
</tr>
<tr>
<td></td>
<td><strong>Salaries and Staff Changes</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Recurrent</strong></td>
<td>5,968,889</td>
</tr>
<tr>
<td></td>
<td><strong>Special Research</strong></td>
<td>31,478</td>
</tr>
<tr>
<td></td>
<td><strong>Special Purpose - Research</strong></td>
<td>55,477</td>
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<tr>
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<td><strong>Special Purposes - Other</strong></td>
<td>26,286</td>
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<tr>
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<td><strong>Total</strong></td>
<td>6,082,130</td>
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<tr>
<td></td>
<td><strong>New Buildings (Including Sites)</strong></td>
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<tr>
<td></td>
<td><strong>Grants for Building Projects etc.,</strong></td>
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<tr>
<td></td>
<td><strong>Under States Grants (Universities) Acts</strong></td>
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<tr>
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<td><strong>Special Purposes - Other</strong></td>
<td>80,924</td>
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<td><strong>Total</strong></td>
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<tr>
<td></td>
<td><strong>Maintenance</strong></td>
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<tr>
<td></td>
<td><strong>Recurrent</strong></td>
<td>789,095</td>
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<tr>
<td></td>
<td><strong>Special Research</strong></td>
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<td><strong>Special Purposes - Research</strong></td>
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<td><strong>Special Purposes - Other</strong></td>
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<td><strong>Total</strong></td>
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<tr>
<td></td>
<td><strong>Equipment, Furniture &amp; Library Books</strong></td>
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<tr>
<td></td>
<td><strong>Recurrent</strong></td>
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<td><strong>Grants for Equipment</strong></td>
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<td><strong>Special Purposes - Research</strong></td>
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<td><strong>Special Purposes - Other</strong></td>
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<td><strong>Total</strong></td>
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<tr>
<td>10,469,750</td>
<td><strong>Total Expenditure</strong></td>
<td>8,950,754</td>
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## AGGREGATE FUND BALANCES

<table>
<thead>
<tr>
<th>SOURCE OF FUNDS</th>
<th>AMOUNT</th>
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<tbody>
<tr>
<td>Recurrent Funds</td>
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<tr>
<td>Special Research Grants Under the States Grants (Universities) Act 1976</td>
<td>20,289</td>
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<td>Grants for Equipment Under States Grants (Universities) Act 1976</td>
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<td>Grants for Building Projects Under the States Grants (Universities) Act 1972-75</td>
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<td>Grants for Minor Works and Site Works and Services Under the States Grants (Universities) Act 1976</td>
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<td>Special Purpose Funds (Research)</td>
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<tr>
<td>Special Purpose Funds (Scholarships, Bursaries, Prizes, etc.)</td>
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<tr>
<td>Special Purpose Funds (Other Purposes)</td>
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<td>Australian Research Grants Committee Projects</td>
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<tr>
<td>Sundry Suspense Accounts</td>
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<td>Sundry Creditors</td>
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**$1,399,154**