The Honourable David Paul Landa, LL.B., M.L.C., 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, 1978.

Acting Chancellor

Vice-Chancellor

ANNUAL REPORT 1978
THE UNIVERSITY OF WOLLONGONG

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Vice-Chancellor's Statement

The planning process that began in 1977 with the circulation of my document 'The Role, Functions, and Development of the University' was continued in 1978 as the University considered modes of long-term planning; prepared apparatus for internal review, and began exploring ways of ensuring effective co-operation with neighbouring educational institutions.

An attempt at a synthesis of departmental and Faculty suggestions for future development was followed by the establishment of a Vice-Chancellor's Planning Committee to consider and co-ordinate all such suggestions for innovation and change in aims and objectives. The Committee's final goal is the determination of a firm scale of priorities for the University's teaching, research and 'community' activities. By the close of the year, the work of the Planning Committee, whose membership is representative of all faculties, was well under way. Early in its deliberations, the Committee was pleased to note the Commonwealth Government's decision to return, from the beginning of 1979, to the traditional, as opposed to 'rolling', triennial funding of higher education for recurrent grants other than equipment. Even though the State's Grants (Tertiary Education Assistance) Act, 1978 did not reflect this change, the Commonwealth action made long-term planning a more practical activity.

During 1978 some reorganisation of the University's administration took place. The post of full-time Deputy Vice-Chancellor evolved from and replaced the functions of the two former part-time Deputy Vice-Chancellorships. In general, the Deputy Vice-Chancellor has assumed most of my own delegations and is directly responsible to me. He is involved in the implementation of policies, particularly those relating to finance, staffing and student areas. One intended effect of this arrangement was to allow me to concentrate more fully on the planning task and on the representation of this University, and university education in general, in government and community concerns.

A Development and Planning Office has been established and charged with co-ordinating departmental and divisional submissions to the Tertiary Education Commission and to other government departments and agencies whose work has a bearing on the university. As well, the Development and Planning Office has responsibility for the university's information and public relations activities.

The further cultivation of links with the Wollongong Institute of Education and the local Technical and Further Education authorities has led to the formation of a number of joint working parties concerned with the rationalisation of facilities and expertise in the teaching of certain courses. Two members of the university's academic staff serve on the Council of the Institute of Education and the Institute's Director served on the University's Council during that year.
During 1978, members of the University attracted a range of substantial research grants, and the University as a whole increased its level of student enrolment. Recognition of our place among Australia's institutions of higher learning continues to grow, as evidenced by the increasing number of enquiries about our activities, and by requests from outside bodies for the specialist services of our staff members. After only four full years of autonomy, the University of Wollongong has progressed far in achieving both consolidation of its work and a high standard of performance.

The Council

Throughout 1978 the Council remained actively involved in academic developments, and in the provision of student and staff services throughout the University.

At its August meeting the Council resolved to bestow upon Professor Austin Keane the title of Emeritus Professor. Professor Keane, retired Chairman of the Department of Mathematics, is the first person in the University to have been honoured in this way by the Council.

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

<table>
<thead>
<tr>
<th>Ex Officio</th>
<th>The Hon. Justice R.M. Hope, Chancellor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emeritus Professor L.M. Birt, Vice-Chancellor</td>
</tr>
<tr>
<td>Elected by the Legislative Council</td>
<td>The Hon. Mr. P.F. Watkins</td>
</tr>
<tr>
<td>Elected by the Legislative Assembly</td>
<td>The Hon. L.B. Kelly</td>
</tr>
<tr>
<td>Appointed by the Governor on the nomination of the Minister for Education</td>
<td>Mr. C. Denley</td>
</tr>
<tr>
<td></td>
<td>Mr. B.S. Gillett</td>
</tr>
<tr>
<td></td>
<td>Sir Richard Kirby</td>
</tr>
<tr>
<td></td>
<td>(Vacancy)</td>
</tr>
<tr>
<td>Elected by the Students of the University</td>
<td>Mr. M. Robinson</td>
</tr>
<tr>
<td>Elected by Convocation</td>
<td>Ms. R.T. Slater</td>
</tr>
<tr>
<td>Elected by the Full-time Academic Staff of the University</td>
<td>Dr. E. Beale</td>
</tr>
<tr>
<td></td>
<td>Mr. J. Dombroski</td>
</tr>
<tr>
<td>Elected by the Full-time General Staff of the University</td>
<td>Associate Professor J.S. Hagan</td>
</tr>
<tr>
<td></td>
<td>Professor A.D. Brown</td>
</tr>
<tr>
<td></td>
<td>Professor J.L.C. Chipman</td>
</tr>
<tr>
<td></td>
<td>Professor R.B. Leal</td>
</tr>
<tr>
<td>Elected by the Members of Council</td>
<td>Ms. E.A. Hilton</td>
</tr>
<tr>
<td></td>
<td>Dr. E.A. Kernohan</td>
</tr>
<tr>
<td></td>
<td>Mr. J.R. Lysaght</td>
</tr>
<tr>
<td></td>
<td>Dr. P. Mowbray</td>
</tr>
</tbody>
</table>
A round of elections was conducted during the year and in addition there were a number of other changes:

Resignations and Retirements -

- Professor F. Fenner
- Professor S.C. Hill
- Mr. C.J. Lambert
- Dr. D.E. Parry
- Mr. W.G. Petersen

Appointments -

- Mr. W. Pike
- Professor B.H. Smith
- Mr. L. Tobin
- Mr. M.F. Willis
- Professor M.G.A. Wilson
- Sir Richard Kirby
- Professor R.B. Leal
- Dr. P. Mowbray
- Mr. P.F. Watkins

The Academic Senate

The University's academic development continued to be guided by the Academic Senate, the supreme academic advisory body to the Council of the University. The Academic Senate met twelve times during 1978, and addressed itself to a wide range of issues affecting staff and students. Notable items on Senate's 1978 agenda were formulation of responses to the Commonwealth Government's decisions to tax post-graduate awards, and to place tighter restrictions on study leave entitlements.

Academic Activities

Although, as in 1977, some departmental programmes were hindered by problems related to space and equipment shortages, some relief is anticipated following the decision of the Tertiary Education Commission, in its 1979-81 report, to recommend approval for the construction of the University's planned Social Sciences II Building.

During 1978 the University's Council approved the division of the Department of Mathematics, from the beginning of 1979, into two separate departments, i.e., the Department of Mathematics and the Department of Computing Science. This action will bring to twenty-one the number of academic departments within the University. Council has also approved the introduction in 1979 of a separate Bachelor of Mathematics degree.

Final arrangements have been made for the teaching of the interdisciplinary Diploma in Intercultural (Migrant) Education course, to be taught under the "umbrella" of the University's Centre for Multicultural Studies. The aim of the course is to provide background knowledge for those involved in the teaching and counselling of migrants. Teaching of this two-year part-time course will begin in 1979, and an initial enrolment of 20 students is envisaged.
Dr. R.D. Johnston of the School of Liberal Studies in Science at the University of Manchester was appointed in 1978 as the University's first Professor of History and Philosophy of Science. When Dr. Johnston takes up his appointment in August, 1979 all of the Chairs in the University for which provision has been made will have been filled.

A list of the 1978 publications of members of the University's staff is included later in this Report. One particularly successful publication has been Associate Professor Colm Kiernan's Calwell: A Personal and Political Biography, launched in February at the Adelaide Festival of the Arts.

The University is proud to record the election in May, 1978, of Professor Bert. Halpern, Chairman of the Department of Chemistry, as a Fellow of the Australian Academy of Science.

On Friday, 12th May the University's third Graduation Day was held, the ceremonies taking place in the University Union Hall. At the morning ceremony 163 degrees in Arts and Commerce were awarded, while the afternoon ceremony saw 133 students graduate in Engineering, Metallurgy and Science. The University recognised the work of one of Australia's leading citizens, Sir Ian McLennan, when it conferred upon him the honorary degree of Doctor of Science. His citation, read by Professor B.H. Smith of the University's Department of Electrical Engineering, stressed Sir Ian's outstanding contribution to Australian industry over a period of almost half a century.

University Day, the anniversary of the first meeting of the Chancellor's Council, was celebrated on Friday, 11th August. The day's activities centred on the theme of "Engineering and Science - the University and the Community". A School's Day was held on 25th August. Four hundred students in Year 12 of their schooling visited the University and heard lectures given by various members of the academic staff.

Enrolments

The academic year 1978 saw the continuation of concern over the number of later-year students who failed to re-enrol at the University.

However, enrolments as at 30th April, 1978 reflected an overall increase in student numbers. Enrolments totalled 2,753, 249 more than in 1977, and 66 more than had been the anticipated level for 1977. The number of new enrolments reached 1,975.

Building Programme and General Site Development

Despite the continued increase in the number of students and staff in 1978, no major buildings were authorised. This put increased pressure on the allocation for minor new works, and the first priority was given to alterations to existing buildings to better use them for the larger numbers and new functions.

The grant of $218,000 was used as follows:
1. Minor alterations to existing buildings $36,489  
2. Extension to the Central Computer Room $12,670  
3. Animal House & Glass House for Biology $31,821  
4. Engineering Laboratory Extensions $52,889  
5. Storm Water Drainage and construction of service road $84,131

$218,000

In addition, the University carried out alterations to the Union Building costing $170,000 and landscaping works, including provision of paths and lighting for the Central Square costing $100,000 from non-government grants. These works were completed in 1979.

Co-operation with the neighbouring Institute of Education was extremely close and effective. The Animal House and Glass House were sited on land which formerly was part of the Institute site, but with the agreement of the Councils of both institutions, was made available for University use; in turn, the University assisted in moving the Institute athletics track and extending the area of playing fields used by the Institute for physical education training.

In addition, a Drama Workshop providing some 140m² of covered space was erected across the common boundary and was jointly funded by both institutions. Agreement was also reached to site an Indoor Sports Hall, to be built with funds provided by the University Sports Association, augmented by the University, across the common boundary, and to enable the Institute to use it in accordance with an agreed schedule for physical education instruction. This project is planned for construction in 1979.

In mid 1978, the University Council authorised the detail design of part of the Stage 2 extension of our Social Science Building, which is our highest priority major new building, in anticipation that some funds for this project would be provided for 1979. This decision was a wise one, which enabled tenders to be called in December 1978 and the builder to be on site in January 1979. This action is expected to provide some relief to problems of accommodation which are expected to become acute by first session, 1980.

Conclusion

From January, 1975 to January, 1978, the Wollongong campus experienced its first three years - the space of a traditional triennial period - as a university. Those years were marked, and sometimes marred, by external economic circumstances which meant severe limitations on funding. Despite those difficulties, the staff and students of the University were able to witness early aspirations and activities coalescing to form a distinctive Wollongong "community" of research, scholarship and teaching. In 1978, we were faced both with considerable uncertainty about external economic factors, and with the need to plan our future development from the base which we had established. The action taken during this year has directed us towards, firstly, the definition of the University's aims and objectives and, secondly, their translation into major goals which we hope to pursue, with some necessary adaptation along the way, towards realisation.
UNIVERSITY FACILITIES AND SERVICES
THE UNIVERSITY LIBRARY

Library Management

Following a reappraisal of Library management, particularly committee structure, membership of the Library Committee of the Academic Senate was revised. At the same time, there was establishment of a new committee entitled the Library Advisory Committee, directly responsible to the Vice-Chancellor. The new committee met for the first time at the end of May, and one of its principal tasks was consideration of a Library Planning Report for the period 1979 to 1982. Many of the implications of this Report are still under attention.

The Library Administrative Officer, first appointed in November 1977, completed his first full year. It is appropriate to comment that this new appointment freed the University Librarian from much of the detail involved in Library expenditure and in staffing matters.

Activities of Library Departments

Library productivity improved in all areas and it is particularly pleasing to report that, for the second year in succession, over 20,000 volumes of monographs and serials were added to the collection, bringing the total held at the end of the year to over 153,000 volumes. In addition, there were 3,585 physical pieces added to the Non-Book collection.

To highlight specific areas of Library activity, the Acquisitions Department administered commitment of amounts of $289,980 and $221,000 respectively from Recurrent funds and an Earmarked Grant for costs of monographs, serials and binding. In addition, the continual processing of donations was accelerated in October, almost 2,000 items being accessioned. All such material is available on demand through the temporary record in the card catalogue.

In the Cataloguing Department, apart from maintaining the previous year's cataloguing output, cooperation continued with Macquarie University in automation of Library cataloguing, leading to a restatement of the level of agreement in June. Receipt of machine readable cataloguing data (MARC) improved significantly, assisting cataloguing output. Progress towards the production of current cataloguing on microfiche reached an almost complete stage by the end of the year and no more catalogue cards were produced by computer after September. Related to this development was the start made on the retrospective cataloguing programme in July. It is envisaged that in three years the whole catalogue will be on microfiche, copies of which will be available in academic Departments of the University.
Reader Services work statistics continued previous trends with a 27.2% increase in circulation of monographs and serials, an 18.9% increase in use of the Reserve Collection, whilst interlibrary lending generally rose over 14%. The first full year's operation of the Tattle-Tape electronic security system confirmed its effectiveness as a deterrent against illegal "borrowing".

Archival activity reached ten years of operation in 1978, although the Archives Unit itself did not formally commence until 1973 and only in 1976 were an Archives Office and user contact established on campus. The Archives is the only repository of its kind in the Illawarra and nearby regions and, even within a restrained collection policy, 1978 holdings of historical material totalled some 500 shelf metres. In addition, there are approximately 300 metres of University and related records. Unfortunately, potential accommodation problems arose and, at the end of 1979, relocation of the Archives Repository must be faced. The attendant problems are being considered currently by the Library Advisory Committee with a mind to a review of future functions and needs, especially given the substantial growth potential and community importance.

Overseas Contacts

During the year, three members of the staff were able to spend some time overseas in various circumstances. The Senior Librarian in Acquisitions effected useful contacts in England, particularly in relation to the second-hand and rare book market. The Technical Services Librarian spent some time in the Eastern United States investigating Library network developments and other aspects of library automation. Finally, the Archivist made very useful contacts in Canada and the United States in relation to archives provision and management, with some emphasis on records operations and thematic schemes such as ethnic and labour material.

Associated Activities

Involvement with outside bodies, associated with the provision of libraries and information services, continued. The University Librarian, the Acquisitions Librarian, the Chief Cataloguer, and some other staff from time to time, were involved in regular contacts with the Australian Advisory Council on Bibliographical Services, both the national and state bodies. The University Librarian attended meetings of the Committee of Australian University Librarians and also coordinated preparation of annual Australian University Library statistics with the assistance of the Library Administrative Officer. The University Librarian also continued as Convenor of the Illawarra Regional Librarians Cooperation Committee.
Usage

Of types of users, the following were found to be a progressive increase on previous years:

- Students .......................... 12.5%
- Research Students .................. 24.5%
- Academic Staff ...................... 12.4%
- Administrative Staff ................. 11.9%
- External Users ...................... 11.6%
- Computer Centre .................... 19.9%
  (Operations and Programming Support)

As with previous years most of the work of the research students and academic staff is processed in unattended hours. Of all users of the system the Science and Engineering Faculties account for 46.9%, whilst day time demand usage exceeded 50% in relation to day batch and night time demand and batch. The throughput breakdown is shown in the pie charts attached.

Project WOLFE

The software package named WOLFE (Wollongong Front End) has been developed by the University Computer Centre to operate on the Interdates 8/16E and 7/16 to act as "front ends" to the Univac 1106. Its development now complete and a stable system achieved, WOLFE offers a diversity of functions to accommodate data input and interactive programming applications. The University Administration and Library systems use the WOLFE features extensively, and in addition, the system serves as a front end to several student terminals on campus.

External Users

Four external users - Wollongong City Council, Huntley Colliery, Local Government Employees Medical and Hospital Benefits Club and the Health Commission have terminals connected by Telecom line to the Univac 1106. A dial-up line also exists which can service the Wollongong Institute of Education and the Goulburn College of Advanced Education. Local schools, Wollongong and Shellharbour Libraries, Telecom and other infrequent users utilize the batch services which the Computer Centre provides. Using WOLFE software on their own Interdata mini computers, interfaced with the Univac 1106, the Wollongong City Council is the major external user of the Computer Centre facilities.
Additional Staff and Equipment

The Computer Centre has extended its staff establishment to a total of eleven full-time personnel, two part-time card punch operators and six Computer trainees.

The staff additions comprise a Social Science Programmer, Consultant Programmer, Research Programmer and an Operations Supervisor. Satisfying an increasing demand by the non-technical faculties to effectively process data on the computer, the Social Science Programmer was appointed. These departments have been greatly aided by this office in the utilisation of statistics packages and in their access to computer usage of facilities. Similarly, students and staff alike are better able to solve their computing problems by having access to the expertise of a Consultant Programmer, who, in addition to these duties, has been responsible in part for the development of the graphics packages. Again, user departments have been better serviced by the appointment of a Research Programmer, available, to more efficiently structure and undertake the development of their particular projects. Because of increasing pressures in the Operations areas, the need was felt to appoint an Operations Supervisor to complement the work done in the Computer Room and Operations Support areas.

Since the commercial applications in the computer installations require experienced programmers, the Trainee Scheme was conceived with the dual aims of contributing to fill that void and providing school leavers with an opportunity for training in the field. The Computer Trainee Scheme has thus far reaped two successful graduates and another six are at various stages of progression through the course. Each three months a new vacancy is created and a new trainee is started. The trainees terminate their course after a two year period. During that time the trainees provide a transient work force through Operations, Computer Centre programming to users of the system, external to the Computer Centre.

In order to provide students and staff with better access to the Univac 1106, the number of terminals around the campus has been increased substantially. Ballistics printers have been installed with the 5 terminal cluster in the Library, and with those in Engineering. Teletypes have been gradually replaced with the VDU's providing a more versatile interface between user and system.

Two new disk drives with associated micro processor controller were acquired gaining an extra six hundred and twenty million characters storage capability, an effective increase of 150% over prior mass storage limits. As an added dividend this feature has minimised files being dynamically unloaded, and runs being adversely affected, such that better response times in demand mode and greater throughput have been achieved.

A plotter capable of producing 10" and 30" plots has been acquired and a Digitizer, the latest enhancement, further services the users of the graphics packages developed by the University.
THE UNION

All students and staff of the University and the Union are members of the Union. The affairs of the Union are controlled by the Board of Management and in day to day matters, by the Secretary-Manager. There are thirteen full-time staff employed servicing the Union and Sports Association. In addition, part-time and casual staff are employed in the shop, catering and cleaning sections.

The Union provides services to its membership including food and liquor services, shop, recreational rooms and organised activities such as workshops and concerts.

There are twelve clubs affiliated to the Union which cover a wide range of activities: Camera Club, Debating Society, Drama Society, Film Group, French Club, Geological Society, Geographical Society, Historical Society, Il Circolo Italiano, Metallurgical Society, Musical Society and Parents' Club.

At the end of 1978 Bar/Bistro extensions were completed and available for use in February 1979. As well as providing a larger capacity to both areas, air conditioning was installed along with completely new furnishings. These extensions have coincided with the substantial growth in the Union's operations over the past twelve months. Union facilities are being utilised to near capacity during the year, facilitating a flourishing operation.

THE SPORTS ASSOCIATION

In 1978 there were twenty constituent clubs of the Sports Association, which members can join and in which they can participate. These clubs cover most sporting activities as shown in the list below:

- Australian National Football
- Badminton
- Basketball
- Cricket
- Hang Glide
- Hockey (Men's)
- Hockey (Women's)
- Judo
- Motor Cycle
- Outdoors
- Rugby Union
- Sailing
- Ski
- Soccer
- Squash
- Surf Riders
- Table Tennis
- Tae Kwon Do
- Tennis
- Volleyball

The clubs compete in local competitions as well as annual intervarsities at universities throughout Australia.

The Sports Association aims to provide physical recreational facilities for individuals and groups. It provides financial support to its constituent clubs to cover the association fees, playing equipment, facility hire and intervarsity subsidies, as well as general sporting fields and association equipment.
The general facilities available are a sports pavilion (with licensed bar), four squash courts (two of which were completed at the end of 1978), a sauna bath and varied sporting fields which are continually being improved upon. It is hoped that by the beginning of 1980 the indoor centre will be completed adjacent to the sports pavilion: this will provide for basketball, table tennis, volleyball, badminton and various indoor sporting activities.

THE COUNSELLING CENTRE

In 1978 311 persons were seen individually by the two Counsellors, involving 974 interviews. There has been a successful continuation of group programmes (which cater for large numbers of people) offering developmental and preventative services and a new emphasis on life planning workshops. The Counselling Centre continued its involvement, with student co-operation, in both Enrolment and Orientation. The Counselling Centre has also successfully sponsored two training workshops for professionals.

The Counselling Centre Secretary continued to co-ordinate both a Student Accommodation and Student Employment Service and both services were well utilised.

The Medical Service, operating out of the Counselling Centre and serviced on an hourly basis by interested general practitioners, continued to be well patronised. There were 455 visits to the Service, 73 of which consulted the Family Planning Clinic.
<table>
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<tr>
<th>DESIGNATION</th>
<th>MALES</th>
<th>FEMALES</th>
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<tbody>
<tr>
<td><strong>Academic Activities</strong></td>
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<tr>
<td>Teaching-and-research staff</td>
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<td></td>
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</tr>
<tr>
<td>Professor</td>
<td>20</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Associate Professor, reader</td>
<td>16</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>36</td>
<td>3</td>
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<tr>
<td>Lecturer</td>
<td>55</td>
<td>12</td>
<td>67</td>
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<tr>
<td>Senior demonstrator, Senior tutor</td>
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<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Demonstrator, tutor, teaching fellow</td>
<td>9</td>
<td>8</td>
<td>17</td>
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<td><strong>TOTAL</strong></td>
<td>144</td>
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<td><strong>Research only Staff</strong></td>
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<tr>
<td>Professor</td>
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<tr>
<td>Professorial Fellow, Reader, Senior Fellow</td>
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<tr>
<td>Fellow, Senior Research Fellow, Research Fellow</td>
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<td>-</td>
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<td>Junior Research Staff</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>Non-academic Administrative Staff</strong></td>
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<tr>
<td>Supporting Academic Activities</td>
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<td>Technical Staff</td>
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<td>Technical Officer</td>
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<tr>
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<td>59</td>
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<td><strong>TOTAL</strong></td>
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<td>Clerk, Typist, etc.</td>
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<td><strong>TOTAL STAFF</strong></td>
<td>315</td>
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<p>| Teaching-and-research Staff               |       |         |       |
| Academic Activities                      |       |         |       |
| Faculty of General Studies               |       |         |       |
| Faculty of Humanities                    | 4     | 2       | 4     |
| Faculty of Engineering                   | 4     | 7       | 10    |
| Faculty of Mathematics                   | 2     | 2       | 4     |
| Faculty of Science                       | 4     | 3       | 12    |
| Faculty of Social Sciences               | 6     | 2       | 9     |
| <strong>TOTAL TEACHING-AND-RESEARCH</strong>          | 20    | 16      | 36    |</p>
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<tr>
<th>Research only Staff</th>
<th>Professor</th>
<th>Professioal Fellow, Reader</th>
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<th>Senior Research Fellow</th>
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### Enrolments to 30th April, 1978

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**TOTAL ENROLMENTS AT THE UNIVERSITY**

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Less secondary enrolments

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**NETT ENROLMENTS**

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# APPOINTMENTS, RESIGNATIONS AND PROMOTIONS

## APPOINTMENTS

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<tr>
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<tr>
<td>Mrs. A.L. Arnold</td>
<td>Lecturer</td>
<td>Psychology</td>
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<tr>
<td>Dr. A. Basu</td>
<td>Tutor</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>Mr. L.J. Splitter</td>
<td>Lecturer</td>
<td>Philosophy</td>
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<tr>
<td>Dr. G.E. Sherington</td>
<td>Lecturer</td>
<td>Education</td>
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<tr>
<td>Dr. O.D. Donald</td>
<td>Lecturer</td>
<td>Geography</td>
</tr>
<tr>
<td>Mrs. M. Campbell</td>
<td>Lecturer</td>
<td>History and Philosophy</td>
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<tr>
<td>Dr. F.J. Paoloni</td>
<td>Lecturer</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Miss S. Keilich</td>
<td>Tutor</td>
<td>Accountancy</td>
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<tr>
<td>Dr. J.C. Forge</td>
<td>Lecturer</td>
<td>History and Philosophy</td>
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<tr>
<td>Mr. M.B. Scott</td>
<td>Lecturer</td>
<td>English</td>
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<tr>
<td>Dr. F.S. Mirri</td>
<td>Lecturer</td>
<td>European Languages</td>
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<tr>
<td>Miss A.J.B. Mackie</td>
<td>Lecturer</td>
<td>European Languages</td>
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<tr>
<td>Dr. D.S. Hawley</td>
<td>Lecturer</td>
<td>English</td>
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<tr>
<td>Dr. J.M. Wieland</td>
<td>Lecturer</td>
<td>Accountancy</td>
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<tr>
<td>Mrs. P.R. MacKay</td>
<td>Lecturer</td>
<td>Sociology</td>
</tr>
<tr>
<td>Ms. P.A. Brewer</td>
<td>Lecturer</td>
<td>Biology</td>
</tr>
<tr>
<td>Miss C.M. McWaide</td>
<td>Lecturer</td>
<td>History</td>
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<tr>
<td>Dr. H.J. Spencer</td>
<td>Lecturer</td>
<td>European Languages</td>
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<tr>
<td>Mr. I.M. Britain</td>
<td>Tutor</td>
<td>Computing Science</td>
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<tr>
<td>Mr. H.A.L. Jeanjean</td>
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<tr>
<td>Dr. T.A. Bailey</td>
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## RESIGNATIONS

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<thead>
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<tr>
<td>Mr. P.G. Abotomey</td>
<td>Lecturer</td>
<td>English</td>
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<tr>
<td>Miss S. Keilich</td>
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<td>Accountancy</td>
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<td>Mrs. L.M. Crossley</td>
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<tr>
<td>Dr. F.S. Mirri</td>
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<td>Dr. R.H. Bradbury</td>
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<td>Dr. J.A. Bradshaw</td>
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<td>European Languages</td>
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<tr>
<td>Dr. R. Rudzats</td>
<td>Lecturer</td>
<td>Chemistry</td>
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<tr>
<td>Professor A. Keane</td>
<td>Professor</td>
<td>Mathematics</td>
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<tr>
<td>Miss D. Dromard</td>
<td>Tutor</td>
<td>European Languages</td>
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<tr>
<td>Mrs. P.A. Schafer</td>
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<td>Computing Science</td>
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<tr>
<td>Mr. H.A.L. Jeanjean</td>
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<td>European Languages</td>
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<td>Mr. I. Britain</td>
<td>Tutor</td>
<td>History</td>
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<tr>
<td>Mr. M. Atkinson</td>
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<td>Dr. H. Beran</td>
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<td>Dr. P.G. Burton</td>
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<tr>
<td>Dr. K.J. Duff</td>
<td>Physics</td>
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<td>Dr. Y.C. Loo</td>
<td>Civil Engineering</td>
<td>Senior Lecturer</td>
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<tr>
<td>Dr. G.M. Mockler</td>
<td>Chemistry</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 12th May, 1978.

BACHELOR OF ARTS

Leonore Robyn Armour
Michael Charles Askew
Gregory Kenneth Atfield
Allen Richard Barlow
Patricia Barnaba
Colin William Barnes
Garry Lyle Brabham
Paul Jeffrey Brightwell
Cheryl Ann Brown
Philip Francis Brown
Pauline Ann Bull
John Frederick Bywater
Anne Kathryn Elizabeth Chapman
Janette Maree Chapman
Susan Louise Chapman
Janet Rosemary Clark
David Graeme Cowie
Rosemary Cullen
Graham Wallace Dal Santo
Joseph Lenehan Davis
Christine Mary Dixon
Debra Ann Donaldson
Janette Elaine Everest
Ian Douglas Ferguson
Giovanna Forte
Roland William Foster
Anne Leonie Francis
Kerry Elizabeth Goonan
Robyn Leigh Gordon
Katrina Marie Griffiths
James Hall
Michael John Halls
Kerry Ann Mary Hampson
Dianne Harrod
Dianne Haye
Darryl Robert Henniker
Ian Joseph Hester
Judith Mary Hicks
Jill Hiddlestone
Dawn Catherine Huntley
Anthony Vincent Johnson, B.Sc. N.S.W.
Annette Francis Jones
Roy Kampen
Patricia Ann Kelly
Michelle Anne Kent
Carol Diane Kiernan

Peter John Knott
Helena Anna Kowalczyk
Jennifer Anne Lanyon
Inga Lazzarotto
Jennifer Elizabeth MacDonald
Judith Kathleen MacRae
James Dempsey Manion
Margaret Robyn Marsh
Peter Miklos Martyn
Roxanne Edith Maynes
Terence William McKibbin
Jean Nancy McLeod
Glynis Brenda Melville-Jones
Nancie Cawley Melvin
Lex Stephen Metcalfe
Joanne Miles
Rosemary Ferguson Webb Montgomery
Helen Frances Moon
Valerie Moon
Maxine Morphett
Karin Carol Neil
Margaret Mary Therese O'Connell
Brian Gerard O'Neill
Mark Andrew Peacock
Narissa Lynne Phelps
Sandra Joy Phillips
Keith William Phipps
Victoria Ruth Potter
Paul Stephen Quinn
Gary Lisle Raftery
Shashi Kala Ravinder
Beverley Anne Ring
John Roach
Bruce Graeme Robinson
Gillian Frances Rogers
Rosalyn Elizabeth Ryall
Janet Elizabeth Sampson
Ralph Vernon Saxton
Sharon Schiavo
Denise Margaret Schultz
David Ross Shield
Robert David Silberman
Jacqueline Carmel Sloan
Carla Gai Smith
Douglas Charles Smith
Kerry Ellen Smith
Irene Louise Stein
Kerry Stratton
UNIVERSITY OF WOLLONGONG GRADUATES (Cont'd)

BACHELOR OF ARTS (Cont'd.)

William Summerside
Phillip John Syer
Janice Violet Taafe
Margaret Joan Thomas
Rosemarie Timar
Kevin James Tucker
Timothy Paul Turnbull
Ana Maria Tych

BACHELOR OF COMMERCE

Maxwell James Branch
Ian Kendall Briggs
June Clotilda Carvalho
Johnny Sergio Costabile
Russell Edward Day
Theresa Mary Day
Sandra Joy Eccles (With Merit)
Harry Luke Erven
Deborah Gai Harrell
Michael George Harvey (With Merit)
Lewis Raymond Hawke (With Merit)
Peter Hobden
Keith Reginald Spencer
Geoffrey Michael Jakeman
Wolfgang Kullik (With Merit)
David John Lear, B.Sc. N.S.W.
Steven Jeffrey Liebeskind
Varongthip Lulitanond
Lya Mariann Manera

BACHELOR OF ARTS - HONOURS

Angela Therese Beckett (Honours Class I & University Medal)
Terence Aubrey Bunn MB BS Syd. -- (Honours Class II, Division 1)
Desmond Arthur Jamieson (Honours Class II, Division 1)
Waldemar Jurkiewicz B.A. A.N.U., Dip Ed Syd Teach. Coll. -- (Honours Class I)
Elizabeth Maria Keenan (Honours Class II, Division 1)
Leanne Kerr (Honours Class I)
Irene Mavis Lucchitti (Honours Class II, Division 1)
UNIVERSITY OF WOLLONGONG GRADUATES (Cont'd)

BACHELOR OF ARTS - HONOURS (Cont'd)

Marie-Louise Mares B.A. Ph.D. Purkyne (Czech) -- Honours Class II, Division 1)
Kathryn Faye Merrett B.A. Dip. Ed. N.S.W. -- (Honours Class II, Division 2)
John David Morris (Honours Class II, Division 1)
Nicola Jane Ronan (Honours Class I)
Lois Helen Sparkes (Honours Class II, Division 1)
Kerry William Withers (Honours Class II, Division 1)

BACHELOR OF COMMERCE - HONOURS

Gregory John Cunningham (Honours Class I)

MASTER OF SCIENCE

Ann Rua MacKenzie Young, B.Sc. Syd
Thesis: "The Distribution, Characteristics and Stability of Debris - Mantled Slopes in Northern Wollongong"

BACHELOR OF ENGINEERING

CIVIL ENGINEERING

Boon Huat Aw
Mark Anthony Bell
Max Emil Boenisch
Gregory William Butler
Robert Spencer Hanepen
Richard John Hapgood
Kenneth George Holzapfel

Nicholas Thomas Hutten
Neil William McKinlay
Gary Francis Murphy
Edward Metodia Spasich
Jonathan Peter Thompson
Richard Alex Wachniewski
Victor McAuley Watts

ELECTRICAL ENGINEERING

John Thomas Reay

MARKETWich ENGINEERING

Scott McElroy

GEOPHYSICAL ENGINEERING

Scott McElroy

BACHELOR OF SCIENCE (ENGINEERING)

CIVIL ENGINEERING

William Michael Young (With Merit)
UNIVERSITY OF WOLLONGONG GRADUATES (Cont'd)

BACHELOR OF SCIENCE (ENGINEERING) (Cont'd)

ELECTRICAL ENGINEERING

John Charles Beckwith (With Merit)
Warwick Lindsay Best
Peter John Costigan (With Merit)
Robin Clive Downie (With Merit)
Milenko Ivan Gracanin

MECHANICAL ENGINEERING

Kevin John McCulloch
Brian Leslie Wiese

Wallace Roy Hammonds
Kenneth Ross Jessop
Theodore Kontopoulos (With Merit)
Giuseppe Mario Rostirolla
Martin Sullivan
Colin Clive Terlich

MECHANICAL ENGINEERING

Ian Graham Woods

BACHELOR OF METALLURGY

Con Steve Augoustou
David Errol Borger
Sidney William Brown
David John Christian
Kerrie Anne Christian
Warren Geoffrey Crouch
Alan Kingsbury Church
Roger Fermino
Philip David Hancox

Robert Jordan
Christopher Ronald Killmore
Gregory Knight
Graham Edward Kohler
Kevin John Marston
Stephen John Omrod
John Edwin Pink
Nickolas Harold Tambakis
Neil David Thomson (Posthumous)

BACHELOR OF SCIENCE

Barry David Anderson
Ian Ronald Bain
Martin Richard Gordon Barkl
Dawn Narrell Bartlett
Geoffrey Brian Bates
Carl Mitchell Brial
Theresa Brown
Robert John Bykerk
Lesley Anne Bynon
Leonie Ann Campbell
Peter Alexander Cowan
Jillian Craig Cruickshank
Stephen Gary Davies
Robert Harry Foott
Peter Denis Hall
Gary Francis Herbert
Susan Hannah Hickey
Rhonda Anne Holland
Brian James Ireland
David John Lowrie

Benon Ludwig Mende
Lesley Ann Munro
Richard Michael Nau
Bernadette Ellen Norris
Noel William Parkhill
Deborah Margaret Parsons
Jindrich Raus
Gavino Sechi
Bruce James Sinclair
Linda Stambul
Rosalind Kay Struthers
Ross Ramsay Sutherland
Ross Ian Tanswell
Nicholas Theodosiadis
Kole Trajcevski
Zafirios Dimitrios Voulalas
Cheryl Ann Wadwell
Nigel Garry Watler
Derek Landsey Webb
Brian Weir
UNIVERSITY OF WOLLONGONG GRADUATES (Cont'd)

BACHELOR OF SCIENCE (Cont'd)

Don Chris Malegan  
Neil Robertson Marott  
Bettina Martire  
David Harish Mayadas, B.A.  
Ian Ross McDonald  
Dinah McKune  

Gunter Alfons Wett  
Susan Pamela Wilcock  
Andrew George Wilson  
Alan Leslie Wolfe  
Anton Yuswak

BACHELOR OF ENGINEERING - HONOURS

CIVIL ENGINEERING

Mark Barraclough (Honours Class I)  
Alexander Nicholas Chalk (Honours Class II, Division 1)  
Ronald Nicholas De Rooy (Honours Class II, Division 1)  
Lau Sooi-Hoe (Honours Class II, Division 2)  
Robert Leslie Mulligan (Honours Class II, Division 1)  
Richard Paul Werakso (Honours Class II, Division 2)

ELECTRICAL ENGINEERING

Phung Bao Toan (Honours Class I and University Medal)

MECHANICAL ENGINEERING

John Rudolf Bout (Honours Class II, Division 2)  
Graham John Dorman (Honours Class III)  
John Thomas Green (Honours Class II, Division 2)  
Leon Ronald James Knight (Honours Class III)  
Quang Hong Lam (Honours Class I)  
Huyen Van Nguyen (Honours Class I)  
Mark Ian Sheldon (Honours Class II, Division 1)  
Charles Peter Swayer (Honours Class II, Division 2)

BACHELOR OF METALLURGY - HONOURS

Peter Barton Burgess (Honours Class III)

BACHELOR OF SCIENCE - HONOURS

Anthony Michael Bolt (Honours Class I)  
Jane Clifton (Honours Class I)  
Robert Anthony Dowdell (Honours Class I and University Medal)  
Dennis John Frost (Honours Class II, Division 1)  
Margaret Joan Hamilton (Honours Class I)  
Peter John Moran (Honours Class II, Division 1)  
Peter Joseph Quinn (Honours Class I and University Medal)
MASTER OF ENGINEERING

Grahame John Edgar, B.E. N.S.W.
Walter Richard Reeves, B.E. N.S.W.
Ambrose Choong Wee Thong, B.E. N.S.W.

MASTER OF SCIENCE

John James Jones, B.A. N.E.
Neil Masters, B.A. York (Can.)
Thesis: "On the Cumulative Human Population of the Earth"
John Allan Land, B.Sc. N.S.W.
Thesis: "Studies Into the Electronic Structure of Transition Metal Complexes".

HONORARY DEGREE

Sir Ian Munro McLennan KBE, CBE, BE Melb., Hon DEng Melb. & N'cle (N.S.W.)

UNIVERSITY OF WOLLONGONG DIPLOMATES

The Diploma in Accountancy was awarded to the following candidates:

Lau Kok Let, BEng N'cle (N.S.W.)
Darryle James Lawson, B.Com N.S.W.
Giuseppe Pellegrino, B.Sc. B.Com. N.S.W.

The Diploma in Education was awarded to the following candidates:

Elizabeth Edith Ashcroft, B.Sc. Q'd.
George Edward Barbaro, B.A. Macq.
Henrique Manuel Leal Barracosa, B.Sc.
Denis Ian Benjamin, B.Sc.
Sally Ann Bezant, B.A. N.S.W.
Murray Richard Blacket, B.A.
Julie Blood, B.Sc. N.S.W.
Jennifer Margaret Bottcher, B.A.
Ivor John Brinson, B.Sc.
Phillip James Chapman, B.Sc.
Colin John Cheetham, B.Com. N.S.W.
Mark Henry Clifford, B.Sc.
Patrick Bede Colby, B.Com

Peter Christopher Langenegger, B.Sc. N.S.W B.Sc. (Hons)
Henry Patrick Lee, B.A. (Hons)
Glyn William Leyshon, B.A.
Achim Franz Linnenlucke, B.Sc.
James Thomas McCready, B.A. N.S.W.
Philip John McKenzie, B.Sc. McG.
Donald Walter Miles, B.Sc. McG.
Pamela Joan Moore, B.A. N.S.W.
Hal Gregory Murray, B.Sc. N.S.W.
Diploma in Education (Cont'd)

Rodney Thomas Crookham, B.Sc.
Joanne Mary Davies, B.A.
Peter Wayne Davies, B.Sc. ANU
Greg Len De Coster, B.Com
David Bain Dorrian, B.Sc.
John William Dowdell, B.Sc.
Ian Earle Dowson, B.Sc. N.S.W.
Raymond Ellis, B.Sc.
Pual Raymond Flower, B.Sc. N.S.W.
Ross David Garrety, B.A. N.S.W.
Rhona Irene George, B.A.
Katherine Keith Gordon-Smith, B.A. N.E.
Colin John Harris, B.A. (Hons)
Judith Anne Harrison, B.A. (Hons)
Marian Dawn Harvey, B.Sc. (Hons)
Karin Helen Hennings, B.A. N.S.W.
Pual David Hobson, B.Sc. N.S.W.
Corinne Hoy, B.A.
Pamela Hughes, B.Sc. Wales
Peter Raymond Hughes, B.Sc.
Michelle Loren Johnson, B.A. Mac.
David Anthony Jolliffe, B.Sc.
Pauline Johanna Langenegger, B.A. Syd.

DOCTOR OF PHILOSOPHY

ELECTRICAL ENGINEERING

Christopher David Cook, B.Sc. B.E. Adel.
Thanh Luong Chon, B.E. M.Eng.Sc. N.S.W.
FACULTY REPORTS

FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

General

Civil Engineering Advisory Committee

During this year there was one meeting of the Civil Engineering Advisory Committee.

Among the matters discussed were:-

1. The establishment of a form and content for professional practice recognition of graduates.

2. The necessity for graduates to have facility with the preparation of technical reports for lay-readers.

3. The establishment of a procedure within the Department to assess all reports including Professional Practice Reports.

The Mining Advisory Committee Meeting met once in 1978. Discussions centred on the provisions of practical experience within the Industry and the determination of acceptable types of experiences and its control.

Considerable emphasis was given to the need to mention a high academic content within the course as well as to provide sufficient practical experience for background.

Student Performance

As in previous years the overall student performance may be considered satisfactory. With the modification of the entry requirements students enter courses with a preparation differing from that of previous years. In particular, Maths in the present H.S.C. format is placed on parity with other subjects. Engineering courses have been established on the assumption that students enter with a competence in Maths higher than is necessary at the present time. Accordingly, there will need to be adjustments in the first year programmes.

Research

Major Topics of Investigation were:

Mathematical Modelling on Hydrologic systems.
Flood Frequency Estimation.
Siltation in a Coastal River.
Use of Granulated Blast Furnace Slag as a Sand Replacement in Concrete.
Fatigue of Ferrocement.
Development of Earthquake Energy Absorbers for Bridge Structures.
Reliability in Geotechnical Stability.
Slope and Landslide Analysis.
Cracking and the Rigidities of Concrete Multicellular Bridges.
Developments and Applications of the Finite Strip Method.
Research in Structures and Solid Mechanics.
Finite Element Technique to Soil Mechanics.
Development of Earthquake Energy Absorbers for Bridge Structures.
Finite Element Packages for Civil Engineering and Mining Engineering Problems.
Dynamic Behaviour of Plate Systems.
Structural Damage to Road Pavements Caused by Large Commercial Vehicles.
Environmental and Safety Problems related to Road Traffic.
Transportation Noise Pollution.
Safety of Young Children on School Journeys.
Systems of Linear Equations.
Analysis of Surge Tanks.
Elastic Analysis of Section Changes in Bending and Direct Stress.

Research Theses

'Testing of Granulated Blast Furnace Slag Concrete-Strength Considerations'
'Non-Linear Analysis of Plate and Box-type Bridges by Special-Purpose Finite Element Method.'
'Cracking of Concrete Multicellular Bridges'.
'The Effect of Recreational Trips on Highway Design Standards'.
'The Effect of Slow Moving Heavy Commercial Vehicles on Road Pavements'.
'A Study of the Relationship Between Mechanical Properties Structure Deformation Behaviour of a Natural Soil'.
'Progressive Failure in Slope Stability Analysis'.

DEPARTMENT OF ELECTRICAL ENGINEERING

Facilities and Equipment

There has been no change in laboratory space available to the Department but the increase in Departmental research activity has made more demands upon that space. Partly in anticipation of antennas to be installed on the roof of Building 8, Room G.13, microwave equipment has been set up in section of Building 8, Room G.11.

The Department acquired a Cromemco System 3 microcomputer and an ACT IV V.D. Unit. These have been housed in Building 8, Room G.13 and are used for both teaching and research in the areas of microprocessor system development.
Equipment maintenance costs continue to rise and this is an added burden on housekeeping funds. For example, a much-used, portable current probe will cost $515.00 to repair. A new instrument would cost around $1,500.

Pass Rates

This year's pass rates were marked by the high pass rate in ELEC 101 Electrical Engineering 1 of 80% in contrast to the 1977 student intake pass rate of 55.10%. As occurred last year there was a very high correlation between the students' performances in the three first year Electrical Engineering subjects and their performances in the Physics, Mathematics and Mechanical Engineering subjects.

Seven students completed the requirements for the B.E. in Electrical Engineering during 1978. Of these seven students, two students gained Honours Class 1, two students gained Honours Class 2, Division 2 and one student gained an Honours Class 3.

Ten students completed the requirements for the B.Sc(Eng.) in Electrical Engineering during 1978 with three gaining passes with Merit.

Research

Major Topics of Investigation were:

Electrostatic Precipitation of Particulate Solids.
Optimal Design for Identification Experiments for Dynamical and Distributed Parameter Systems.
Modelling and Optimisation:
(i) Linear System Identification Using Random Signals.
(ii) Optimisation.
Analysis and Reliability.
Energy Conversion.
Digital Systems: Interfacing Techniques and Microprocessors.
Microwave Antennas and Circuits.

Research Theses

PhD.

Masters
A Computer Controlled Infra-Red Sensing System.
Control of a Coating Mass on a Continuous Hot Dip Galvanising Line.
Fault Identification in Electronic Systems.
Computer Analysis of Large-Scale Non-Linear Networks.
Some Aspects of the Control of a Hot Rolling Mill.
Digital Analysis of Electronic Networks for Reliability Studies.
Electrical Characteristics of a Pilot Scale Electrostatic Precipitator.
Speed Control of a D.C. Machine using a Micro-processor Controlled Thyristor Regulator.
Photographic Measurements of Stratospheric Aerosols.
Modulation of Polyphase Inverters.
Iron Losses in Inverter Fed Induction Machines.

Honours.

Properties of a Particulate Layer.
Stability Analysis of a Proposed Electric Car Drive Unit.
Power Transistor Switching.
Sensitivity Analysis of Reliable Communications Networks.
Stability of Polyphase Induction Motors.
Microcomputer Serial Cassette Interface - Design and Implementation.
The Acoustic Horn - An Introductory Study.

DEPARTMENT OF MECHANICAL ENGINEERING

General

Although development of the Department and its associated research activities continued at a steady rate, progress was restricted somewhat by lack of space.

Additional funding for major plant was appreciated and this needs to be continued at a high level to bring the Department up to a standard equivalent to those of the larger Universities. This applies particularly in relation to the purchase of large items of plant and in the development of the Engineering Workshop.

Equipment

New Equipment

Bulk Solids Handling Laboratory

Crown Pallet Truck
Pressure Transducer
YEW X-Y Recorder

Systems and Computing Laboratory

Tektronix Hard Copy Unit

Environmental Engineering Laboratory

R.A.C. Air Pollution Sampler
Dynamics Laboratory

Endevco Model 2250 Integral Shear Accelerometer X-t Chart Recorder

Fluid Mechanics Laboratory

Multi-tube manometer.

Student Performance

Five students graduated with Master of Engineering.
Nine students graduated in the B.E. course, eight with honours, including two in the first class division and three graduated in the B.Sc(Eng.) course.

The design competition forming part of the subject MECH 122 Design I was conducted again. Ten groups of four students each were given the task of designing a teaching aid to assist primary school children learn their mathematical tables. The Department awarded a number of merit certificates and book prizes and a perpetual trophy to the competition winners.

Research

Major Topics of Investigation were:

Control of Large Scale Systems.


Environmental Engineering.

Dynamics.

Free Surface Waves: Numerical technique developed for the computation of water waves give good agreement with analytical solutions. Transient mode of energy transmission by water waves passing through solids is now being investigated.

Potential Modelling of Flow Separation.

Thermodynamics: The effects of operating parameters on emissions and performance of internal combustion engines when using L.P. gas as a fuel was investigated and the study is continuing.

Research Theses

PhD.

"Flowrate of Simple Bulk Solids from Mass-Flow Bins".
"Control of Large Scale Systems".
"Development of a Numerical Technique for Two-Dimensional Fluid Flow With a Flexible Boundary".

Masters

"An Investigation of some flow promotion techniques for bulk solid bins".
"Dynamics analysis of a paint line".
"Compressible flow through a two-dimensional nozzle".
"The selection and use of sound measuring equipment in industry".
"Analysis and design of Flow velocity head sensors".
"Water re-use in industry".
"A study of two-dimensional heat flow under abnormal boundary conditions".
"Development of a mathematical model of a heat recovery system".
"Transportation of energy".
"Computer aided design of ships propellers".
"Design of diffusers for ocean disposal of industrial wastes".
"Mathematical modelling of engineering systems".
"The application of finite element analysis to problems of multi-dimensional heat conduction with non-linear boundary conditions".
"Factors affecting the recovery of benzene from coke oven gas".

Honours

"Development of Shoebrake for hydraulic turbines".
"Emission control from internal combustion engines".
"The influence of operating parameters on exhaust emissions and performance of a multi-cylinder engine".
"Design of funnel flow bins and expanded flow bins".
"Development of dynamics laboratory motion demonstration apparatuses".
"Design of fast photo-electric photometer".
"Investigation of Francis Turbine vane alignment and overall performance".
"Laboratory determination of the dewatering characteristics of industrial sludges".
"Efficiency tests on a 3-pass dry back, fire tube package boiler".
"A review and comparison of reduction methods applied to multivariable systems".
"Laboratory studies for the prediction of vacuum filter performance".
"Performance test on a centrifugal fan".
"A microprocessor-based control system".
"Performance of a ducted propeller for model aircraft".
"Scale model for an air-conditioning study in the laboratory".
"Installation of an orifice plate and associated equipment for the flow measurement of steam".
"Feeders for mass flow hoppers".
"Computer study of oil flow in a journal bearing".
"Interstitial gas pressures in plane flow bins".

DEPARTMENT OF METALLURGY

General

In contrast to a new enrolment of 37 in 1977, new enrolments in 1978 reverted to the pattern of the past few years with an entry of 24 new students. Although this is quite favourable in comparison with metallurgy departments in Australia as a whole, it, nevertheless, supports the concern expressed in last year's report that there may be a shortage of trained metallurgists in the country in a short time.
For several years the number of new metallurgists graduating in Australia remained surprisingly constant, however, a marked drop occurred in 1977. Although figures for 1978 are not yet available, there is no doubt that there will be a further decline in numbers graduating. It would perhaps be sensible to consider a careful examination of the role of metallurgy departments in this country.

Research

Major Topics of Investigation were:

Properties and Applications of Shape Memory alloys.
Flow and Fracture of Rate Sensitive Copper Alloys.
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.

Research Theses

PhD.
"Structure Development in Eutectic Alloys".
"Effect of Rapid Thermal Cycling on Structure and Properties of Low-Carbon Steels".

Masters

"Mechanical Behaviour of Sheet Metals".
"Electron Microscope Study of Ferrous Alloys"
"Combining Flow Phenomena in Packed Beds"
"Modelling of Metallurgical Processes"
"Fluid Flow in Sinter Beds"
"The Formation of Austenite"
"The Structure and Properties of Metallic Coatings on Steel"
"Structure of Cast Metals"
"The Mechanical Behaviour of Copper Alloys".

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FACULTY OF HUMANITIES
DEPARTMENT OF ENGLISH

General

The most important trend in Departmental life in 1978 was towards increasing community activity in the area of the performing arts, particularly those of music and drama. This is a trend which is expected to continue. At the same time, the traditional and central core of English studies was placed under great stress by the continuing increase in student numbers, which created critical problems of administration, accommodation, teaching method and assessment.

Facilities

The Department acquired its first teaching space, the seminar room ACS 203, at the beginning of the year. The room is now in full use and is to provide housing for the Departmental Library.

During the course of the year, the Department also acquired its first microfilm reader and movie camera.

Lack of office space and teaching areas is still a major impediment to the introduction of proper teaching methods.

Student Performance

Student performance is affected by the increase in part-time tuition, as is the assessment of student performance. The situation may need to be remedied by a lowering of academic expectations and a revision of assessment methods.

Research

Major Topics of Investigation were:

Personal Relationships in Old English Poetry.
Art and Nature in Sixteenth and Seventeenth Century Literature.
The Pathology of Shakespeare's Plays.
The Metaphysical Poets.
Critical Thought in the Seventeenth and Eighteenth Centuries.
John Henry Newman and The Idea of a University
James Joyce
Contemporary Post-Colonial Literatures.
Popular Song Lyrics as a Medium of Communication.
Applications of Computer Technology to Language Research.
Warfare in Old English Poetry.

PhD.

The 'Self Concept' in the Poetry of W. C. Williams, Sylvia Plath and Robert Lowell.
DEPARTMENT OF EUROPEAN LANGUAGES

General

a) Student numbers in the Department continued to rise for 1978. Growing community interest in the learning of foreign languages suggests that this upward trend will persist for the foreseeable future.

b) The rapid expansion of the Department is putting considerable stress on the resources of the Department, especially in the area of staffing and space. Study leave absences threaten to pose particular problems on the offering of courses.

Student Performance

a) Enrolments

Particularly in the Italian section of the Department, enrolments continued to rise. With the development of the Department into honours and post graduate work and the growing community interest in languages student load is expected to continue to rise.

b) Pass Rates

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

c) General comments on student performance

Failure rates tend to be highest among students studying a foreign language for the first time or with an inadequate linguistic background (EURO 103; EURO 153). This is to be
expected since many such students do not fully understand the demands of the courses when they enrol. It is for this reason also that many successful students choose not to pursue their studies past first year level. Despite these problems, the Department's introductory courses in French and Italian must be considered as one of the most popular and successful of its activities.

Research

Major Topics of investigation were:

19th and 20th century novel
Myth in literature
Linguistics applied to the teaching of French as a second language
Intonation analysis
Audio-visual methods in the teaching of French
18th century history of ideas
Indianism in France
20th century novel and civilization
Surrealism, cinema, eroticism
Federico de Roberto
The "Secondo Ottocento"
Italian-American theatre
Methods and materials for teaching Italian at the secondary and tertiary level
French regionalism
20th century Italian literature (Buzzati, Gadda)
Renaissance humanism in Italian
Historiography

DEPARTMENT OF HISTORY

General

The research achievement by members of academic staff in the Department of History was sustained during 1978. Colm Kiernan's biography of Arthur Calwell was launched during Writers' Week at the Festival of Arts, Adelaide, in February, 1978.

A large enrolment in history subjects made for a heavy teaching commitment all round. The availability of money for part-time assistance was very useful. Strong support from the Library was valuable in meeting existing needs as well as in the establishment of a new third-year option in British history.

Student Performance

The pass rate in history in First Year was a little lower than in previous years. The pass rate in 1978 in History 102 was 85.7%, which compared with a pass rate of 87.1% in 1977. The pass rates in later years were consistently high, in five courses being 100% of the students who completed the course.
Major Topics of Investigation were:

The rise and decline of the Liberal Party with particular reference to the personalities and political impacts of Gladstone, Disraeli, Joseph Chamberlain, Ramsay MacDonald, Lloyd George and Winston Churchill.

Arthur Calwell: A Political Biography

French 18th Century intellectual history

A History of the A.C.T.U.

A study of the impact on the community of the Mount 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.

The origins of the modern missionary movement: a documentary study.

British civilian morale and propaganda during the second world war.

A life of A.A. Ioffe.

Translating and editing the four volume 'Zapiskii o Grazhdonskoi Voine' by Antoney-Ovseerky.

Research Theses

Ph.D

"The historian as moralist: Edward Gibbon and The Decline and Fall of the British Empire.

"Aspects of urban growth in Wollongong, 1900-1970"

Masters

"Employment of Women in Australia, 1930-1950".

"Popular religious attitudes in Australia literature in the 1890's."

"A study of theological education in New South Wales".

"The general strike of 1917 in New South Wales)."

"The Edwardine prayer books as instruments of uniformity".

"The development of central political institutions in Papua New Guinea 1951-72".

"A study of the Married Women's Property Act in Australia with particular reference to New South Wales".
1. The Department welcomed the appointment of Dr. R. Johnston as Professor-Designate to take effect from August, 1979. Nevertheless with only three effective members of staff in 1978, resources were strained severely. Although a satisfactory range of subjects was offered, it was fortunate that no Honours students presented themselves and that the Masters students were enrolled in preliminary work at undergraduate level. Even when the Department reaches its establishment of five, it will be difficult to perform satisfactorily when staff are on study or other leave and when, as will be the case from 1979, continuing commitments to Honours and Postgraduate students will have been made.

2. One extremely pleasing feature of the year was that, for the first time, it proved possible to arrange a regular series of Departmental Seminars. For this, great credit should go to the Convener, Dr. J.C. Forge.

Student Performance

Enrolments

Total enrolments were almost identical to those in 1977. Although the Department has few students in relation to some others, the retention rate is good despite the fact that the discipline is less obviously vocational than some.

Pass Rates

Pass rates were satisfactory but do not take account of withdrawals. As usual, the performance of Part-time students at the 100-level is superior to that of Full-time students. It is difficult to determine trends in later years because of the small numbers involved, although it appears that full-time performance improves relative to part-time performance.

Research

Major Topics of Investigation were:

The relationship between epistemology and methodology in nineteenth century philosophy of science.

Structure of Scientific Explanation
Nature of Models in Science
Realism in Science
Role of HPS and Philosophy in science teaching.

Nineteenth Century Theories of Inheritance.
Research Theses

Ph.D.

'An account of explanatory functions of models in physical science'.

DEPARTMENT OF PHILOSOPHY

General

Members of the department took advantage of a number of opportunities to put philosophical issues before a wider public through newspapers and adult education. Professor Chipman, Dr. Beran, and Mrs. Cincotta all contributed columns on philosophical topics to the Sun-Herald. Professor Chipman served as an occasional book reviewer for The Australian, The Weekend Australian, The Canberra Times, and The Illawarra Mercury, and Mr. Beran and Mrs. Cincotta also reviewed books for The Illawarra Mercury.

Mrs. Cincotta lectured regularly for the local W.E.A. on philosophical topics and Professor Chipman took part in a Sydney Philosophy Club school (in conjunction with the W.E.A.) on the philosophy of education.

Facilities

As mentioned in the 1977 Departmental Report the quality of accommodation for the Department of Philosophy, which is housed entirely in an overcrowded temporary building known as 'The Hut', is most unsatisfactory. Staff are unable to use their offices (all of which are well below the Australian norms in size for the relevant levels) during certain times of the day in summer because of the heat. Storage is a desperate problem with part of the Department's own small seminar room now used to store research materials of academic staff members and office files. The Department therefore learned with considerable relief of the T.E.C. recommendation to build Social Sciences II, into which the Department of Philosophy is planned to move in 1981. Meanwhile the problem continues, however I must concede that I cannot think of any way in which any more could be done to alleviate our situation in the short term.

Student Performance

The Department provided for 202 full-time enrolments and 69 part-time enrolments in its subjects. There was little difference in the pass rate of full-time and part-time students. The overall pass rate for full-time students was 78.7% and for part-time students 78.1% making an average for all students of 78.5%. Extremes of pass rate generally occurred in subjects where there were very small enrolments.

It is interesting to note that 6 of the 69 part-time enrolments resulted in High Distinctions, compared with only 5 of the 202
full-time enrolments - a quite dramatic difference in the proportion whose performances were judged sufficient in excellence to merit the award of the highest grade. The rate in respect of the next superior grade of Distinction is about the same for full-timers and part-timers. Of the 202 full-time enrolments 24 resulted in Distinctions (about 12%), which does not differ significantly in rate from the 8 part-time enrolments which resulted in Distinctions. So far as the lowest superior grade is concerned, part-time graduates again performed comparably with full-time candidates. Of the 202 full-time enrolments 50, or slightly less than 25%, resulted in a Credit, while 16 of the 69 part-time enrolments - about the same percentage - resulted in a Credit.

In sum, while the performance of part-time candidates is very comparable with that of full-time candidates at the level of the lower and medium-high passing grades, the number of part-time enrolments resulting in High Distinctions was disproportionately high.

Research

Major Topics of Investigation were:

- The aesthetics of Croce.
- A philosophical basis for a free enterprise society.
- Philosophy of Law.
- Session movements.
- Philosophical assumptions implicit in Australian federalism.
- Responsibility and its relation to the concept of praiseworthiness and blameworthiness and to praise and blame.
- Adequate validity testing procedures for some system of modal predicate logic.
- Theories of meaning for modal language.
- Propensity theory.
- Analysis of all concepts of probability.
- Reference and the Philosophy of language.

Research Theses

Ph.D.

Luigi Pirandello

Masters.

'Kemp Smith's Account of Kant's Transcendental Deduction'.
FACULTY OF MATHEMATICS

DEPARTMENT OF MATHEMATICS

General

Professor A. Keane was awarded the honorary title Emeritus Professor after his retirement, for the work he did for the University.

From 1st January, 1979, the Department of Mathematics splits to form the Department of Mathematics and a new Department of Computing Science.

Facilities and Equipment

Computing Science

4 terminals, 10M byte disk and a 64k byte memory board were added to the Interdata system. ACS-109 was allocated as the undergraduate computing science laboratory. ACS-111 became the computer room-graduate laboratory, with limited access to preserve clean-room conditions to avoid disk failures.

Mathematics

One Tandy Microprocessor.

Student Performance

Honours grades -

1 x I class Honours (medal)
2 x I class Honours
2 x II class Honours Division (i).

Research

Major Topics of Investigation were:

Applied Mathematics:

Preparation of Waves in a Variable Density Region,
Examination of numerical methods for finding the complex zeros of equations of the form $f(z) = z$, where $f(z)$ is a composite function,
Solution of ordinary and partial differential equations in a series of Chebyshev Polynomials,
Stability of laminar flow.

Computing Science

Interactive language SIGMA,
Portability of operating systems.
Decision Sciences

Control Theory: Stochastic control and computational problems,
Jockeying in a Heterogeneous Server System,
New Pattern Matching algorithms,
Queing Theory,
Mathematics in Education,
Population Dynamics,
Mathematics of Athletics.

Pure Mathematics

Analysis and Differential Equations: Mean periodic functions in
several variables, multidimensional integral equations, exponential
polynomials, and functional equations,
Differential equations and Moment sequences: factorisation of
differential operators,
Application of illative combinatory logic.

Research Theses

Ph.D.

Applications of Control Theory to Economic Planning
Numerical Solution of Reactor Kinetics Equations
Time Dependent Net Maternity Functions
Application of Energy Dependent Potentials
Mean Value Properties and Differential Equations
A Problem in Sequential Analysis.
Solution of Sparse Matrix Eigenvalue Problems arising in the
Applications of the Finite Element Method.
A Laboratory for Computing Science.
Some Results in Neighbourhood Lattices.
Some Aspects of Population Dynamics.
Boundary Effects of Shelf Waves.
Application of the Finite Element Method to the Design of Gas Slider
Bearings.

Masters

"Application of Transfinite Numbers and Infinitesimals to Measure
Theory".
"Performance Evaluation of a Portable Operating System".
FACULTY OF SCIENCE

DEPARTMENT OF BIOLOGY

Facilities

The Department of Metallurgy made available to the Biology Department, the laboratory/office complex, G18 in building 1. This room was altered in accordance with the Biology Department's needs, the alteration continued into 1979. An animal house and glass house were constructed near the sports area.

Student Performance

There was evidence, as previously, of a general reluctance to keep abreast of the work during session. This led to some difficulties in biochemical topics, especially those dealing with metabolic pathways, when it was necessary to be familiar with chemical notations which were used frequently during lectures. Performance in practical work was generally good.

Research

Major Topics of Investigation were:

(i) Environmental physiology of marsupials.
(ii) Thyroid function in vertebrates.
(iii) Photosynthesis: regulation and metabolic fluxes in isolated chloroplasts.
(iv) The physiology of microbial response to water stress, embodying:
   (a) the regulation of glycerol production in algae and yeasts;
   (b) the state of water in halophilic bacteria.
(v) Factors affecting the spatial distribution of field crickets.
(vi) The spatial distribution of reef corals and interaction between fish and coral communities.

Research Theses

Ph.D.

The regulation by water availability of glycerol metabolism in yeast.
Factors affecting settling and attachment to solid surfaces of sessile marine organisms.

Masters

The numerical taxonomy of dermatophyte yeasts.
Antibiotic production by marine Chromobacteria.
Honours

$H_2S$ production by Dunaliella.

DEPARTMENT OF CHEMISTRY

General

Professor B. Halpern was elected a Fellow of the Australian Academy in May 1978.

Dr. E. Kokot attended the Sixth National Convention, Surfers Paradise from November 5th to 10th, 1978.

A joint venture with the Varian Instrument Company to develop new methods of clinical analysis was started in February. As a consequence the Varian Company installed at no cost to the University a MAT44 GC/MS system in the department. A mass spectrometry workshop for prospective Varian customers was held in March and four product bulletins based on our work were produced for the Varian Company.

Planning for forthcoming specialist workshops and the first general conference in the fields of Molecular Physics and Quantum Chemistry has progressed well following widespread interest from throughout Australia. Workshops will be held at the University of Wollongong in mid-February 1980, to be followed by the conference at the Science Centre, Sydney. The workshops will be under the auspices of the Co-operative Science and Technology Agreements between Australia and U.S.A. and Australia and West Germany. Sponsorship of a number of professional institutes, government and commercial organizations is expected for the conference. Dr. P.G. Burton is chairman of the planning committees for these meetings.

During his study leave Associate Professor E. Gellert gave a postgraduate course at the Technical University of Instanbul, Instanbul, Turkey, from September 17th to December 3rd 1978, as a Visiting Professor, which was translated into Turkish and published.

Student Performance

Student pass rate in Chemistry units were good with the exception of CHEM.219 "Computer in Science". Most of the students who failed this unit disqualified themselves by not completing the required project work. In addition computer terminals were not available in the first 10 weeks of the course and repeated hardware problems with the UNIVAC System caused further inconvenience to students.

Research

Major Topics of Investigation were:

Development and applications of computer-controlled scientific instruments.
Development and use of computer-based mass spectral data libraries.

Theoretical modelling of ozone and its metastable cyclic conformer.

Intermolecular Forces: the potential energy of the Helium-Helium interaction and quantum mechanical analysis of molecular beam scattering experiments.

Bonding to transition metals: precise theoretical studies.

Quantum Theoretical search for potential high energy chemical lasers.

Application of the generalized finite element method to the vibrational structure of molecules.

Environmental chemistry: Development of new methods for trace analysis and for the chemical treatment of industrial wastewater.

Work on the isolation and structure determination of natural products likely to possess pharmacological activity, and synthesis of new drugs in the area of neoplastic and psychopharmacological activity.

The Application of GC-MS to the diagnosis and study of genetic diseases. Quantitative amino acid analysis by mass spectrometry.

The determination of steric purity of amines and amino acids by gas chromatography and mass spectrometry.

Preparation, spectroscopy and magnetism of polynuclear and polydentate complexes of transition metals.

Synthesis and Investigation of Transition Metal Complexes as models of biologically important sites.

Research Theses

Ph.D.

"The Magnetic and Chemical Behaviour of some Polynuclear Methoxide Complexes of Tervalent Iron with Bidentate Oxygenous 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".

"Stereo specificity of some Enzyme-catalysed Hydrolysis Reactions".

"Voltammetric Analysis of group 5 and 6 trace elements in copper".

"The Use of Stable Isotopes in the in vivo study of Metabolic Disorders".

"Chemical Studies on the use of peroxides for the treatment of Industrial Wastewater".

"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".

"In the area of Synthesis of Drugs".

Masters

"The Application of Ketimine Derivatives to Solid Phase Peptide Synthesis".

"An Investigation of environmental changes resulting from a trial dredging of Illawarra Lake".

"Role of the solvent upon the thermodynamics of acid dissociation of organic acids".

38
"The Preparation of Derivatives of Carboxylic Acid and Phenols suitable for High Pressure Liquid Chromatography".  
"Determination of Serum Trace Metals (Zinc, Iron & Lead) Atomic Absorption Spectroscopy".  
"Indolizidine Derivatives".  
"Investigation of the Incidence of Heavy Metals in Biological Fluids resulting from Occupational Exposure in the Non-metals Industry".  
"Development of a Computerized Magnetic Mass Spectrometer System".  
"Studies in Techniques useful for Molecular Structure Computation".  
"A physico-chemical investigation of the recovery of hydrous tin oxides from electroplating liquors and rinse waters".  
"The Determination of Steric Purity of Asymmetric Compounds by Gas Chromatography and Mass Spectrometry".  

Honours  
"Radiolysis of organic pollutants absorbed at the solid/liquid Interface".  

DEPARTMENT OF GEOLOGY  

General  

The Department continued with a very active programme of teaching and research. The small number of staff (academic and support) and the problems of total available floor area and the unsuitability of many of the rooms for science teaching make teaching and research very difficult. Notwithstanding these difficulties a high standard of teaching has been maintained and members of the Department have continued with research of high world standing as is evidenced by the list of publications and the grants received for further research work.

Facilities and Equipment  

(a) Rooms  

The Department remained short of space. First year laboratory space was a serious problem in relation to the number of enrolments in GEOL 101 and GEOL 102. Postgraduate accommodation continued to be unsatisfactory.

(b) Storage  

Serious problems continued with specimen storage facilities although a second compactus was installed at the east end of G08. Storage for postgraduate students also continued to be a problem with there being in effect no office type space available for the vast majority of part-time postgraduate students and the correct shelving for full-time postgraduates is now 15 months overdue. This makes their work more difficult.
The space situation for part-time students diminishes the amount they are able to contribute to the general life of the University.

(c) Equipment

Blue/U.V. fluorescence facilities were developed during the year. A Magna II electronic typewriter conversion was installed late in the year. This will further aid in the annual updating of documents such as this through its improved edit facilities.

Research

Major Topics of Investigation 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 Pertnjara Group, Amadeus Basin.
- Sediment dispersal patterns and clay mineralogy in Lake Illawarra.
- 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.
- Geochemical and petrographic studies on igneous and sedimentary rocks of the South Coast.
- The Geology of the Bungonia area.

Research Theses

Ph.D.

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

Masters

A study of the post-Permian quartzites of southern New South Wales.
The geology of the Capertee valley.
Magnetism in rocks.
A study of coal rank variation in the south central Sydney basin, New South Wales.
Petrological and Petrophysical Study of Potential Hydrocarbon Storage Reservoirs in Permo-Triassic Sandstone Bodies in the Sydney Basin.
The geology of the Ardrossan dolomite and its development as a refractory in the steel industry.

Honours

The geology of an area north west of Milton.
An analysis of sediments from Wallaga Lake, Bermagui, N.S.W.
The geology of the Brayton district, New South Wales.
A study of the palaeocurrents in the Illawarra Coal Measures, Narrabeen Group and Hawkesbury Sandstone of the Illawarra district, New South Wales.
Aspects of the Petrology of the Rundle Oil Shale, the Narrows, Queensland.

DEPARTMENT OF PHYSICS

General

Dr. Lindsey F. Smith of the Department was invited to present a Review Paper at the Asian-South Pacific Regional Meeting in Astronomy held in Wellington, New Zealand, last December.

It was also gratifying to note the significant increase in enrolment in the General Studies subject offered by the Department, GENE220 and the continuing popularity of PHYS151, the Art of Physics.

The following student received the First Year Staff Prize in Physics for 1978:

Mr. S. D. Munro.

None of the other Staff Prizes were awarded nor was the Australian Institute of Physics (N.S.W. Branch) Prize in Physics awarded for 1978.

Facilities and Equipment

Facilities

The Modern Physics Laboratory was developed extensively in 1978. Also, the Physics Preparation Room in the Pentagon was extensively utilised. The Optics and Spectroscopy laboratories developed on the ground and first floors of the department proved to be very successful.
Equipment

Equipment purchases for the first year laboratories were limited to approximately $1000; most requirements for these laboratories came under the definition of maintenance items. Items of equipment totalling $16,000 were bought for the 200- and 300- level laboratories; $11,500 being expended for the former and $4,500 for the latter. Approximately $10,000 of equipment money were expended on research equipment; the experimental programmes of the astronomy and solid state research absorbing essentially all these funds. The remaining $7,000 of the equipment grant were expended on the departmental workshop and computer facilities, the latter consuming approximately $6,000.

Student Performance

Enrolments

The total EFTS of the department was not significantly different from that of 1977. However, the number of second-year and post-graduate students was larger but, again, not significantly so.

Pass Rates

The subjects for which pass-rates are significant are the two first year subjects PHYS141 and PHYS142. For PHYS141, 96 students were enrolled at the end of the year, 91 of these sat for the final examination and 87 passed, i.e. of those who sat for the final examination, 96% passed. Of the 96 enrolled, 55 were full-time students, while 41 were part-time students. Of the 87 students who passed, 49 were full-time while 38 were part-time, there being a slightly higher percentage of passes for the part-time than for the full-time students. In PHYS142, 153 students were enrolled at the end of the year, 135 of whom sat for the final examination, with 107 passing, i.e. of those who sat for the final examination, 79% passed, a significantly lower percentage than for PHYS141. Of the 107 students who passed, 60 were full-time students, while 47 were part-time. The division of students enrolled in PHYS142 at the end of the year was 94 F/T and 59 P/T. Thus only 64% of the enrolled F/T students passed, while 80% of the P/T students passed. This is a large difference. It is not clear if the 18 students who were enrolled and did not take the final examination were all F/T students or not. If all 18 were F/T students then the pass-rate would be somewhat distorted. A study of the final marks of students in PHYS142 showed that the students who also "take" PHYS141 perform better in PHYS142 than those who do not "take" PHYS141.

General Comments on Student Performance

It was clear that the average student performance in 1978 was worse than that in 1977. This was in particular due to the poor performance of the F/T students in PHYS142.
Research

Major Topics of Investigation were:

Astronomy:
Variable polarisation in close binary stars.

Musical Acoustics:
The effect of low speed (and other variables) on the spectra of violin tones.

Nuclear Physics:
Neutron Capture Mechanisms in the threshold Region
Study of Neutron Capture in Reactor Structural Materials.
The energy Spectrum of Neutrons in a Pulsed Fast Assembly.

Nuclear Fission Research:
The Kinetic Energy of Fission Fragments in \( ^{239}\)Pu (n,f).
Fission Neutron Spectrum Measurements of \( ^{252}\)Cf.

Solid State Physics:
Spectroscopy.

Research Theses

Ph.D.
"The Capture Cross-Section of Different Nuclei in the Kilovolt Region"
"A Study of Short Period Binaries"
"Piezospectroscopy of Neutral Copper and Zinc Impurities in Germanium"
"Neutron Emission from Fission Fragments"
"The Energy Spectrum of Neutrons in a Pulsed Fast Assembly"

Masters
"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 Infra-red Astronomical Objects"
"A Study of Some Infra-red Detectors"
"A Tracking System for the Wollongong University 18 Inch Telescope"
General

It is now over five and a half years from when I first took up teaching at Wollongong and, particularly from the perspective afforded by study leave in 1978 I should like to offer some observations, which appear relevant, to Senate and Council.

The worth of a University department is to be judged on the excellence of its teaching and research. My first priority, particularly following autonomy in 1975, was to establish quickly a reputation for our main teaching "output" - the BCom degree in Accountancy. Commencing with the able assistance of a small initial "band" of teachers this, I believe, has been achieved. External reports confirm that our graduates are highly regarded and sought after. But, faced with a big proportion of marginally qualified students, the cost to the Department has been very high, requiring an inordinate amount of staff time to be spent in academic counselling and remedial work. So far the Honours and Masters programme has not been "pushed", largely because the necessary base of a strong research programme has yet to be firmly established.

Mounting a substantial research programme, or assisting in creating a favourable climate for staff members to pursue their own research has proved much more difficult, particularly in a growing department where staff establishment levels are always "lagged" behind the staff appropriate to a rising EFTS. New staff take time to settle in and "find their feet". Our department is no exception to the generalisation that large departments usually have one or two members not engaged in productive research. Because of the strong demand for well qualified accountants it is not always possible to attract staff of the calibre we would like when new positions become available. Since the skills of existing staff already cover all the core subjects in our field it seems possible and appropriate to defer making "staff" appointments until quality personnel are available. However, our heavy student load required that such positions be manned in the meantime. This provides an opportunity to use visiting staff whose new ideas and approaches may provide a further source of stimulation. The above factors place an imposing burden on leadership in research, and the staff members endeavouring to engage in it. And when it appears that the Department and its staff are to be judged largely on the number of publications then the issue becomes one of real concern.

I have always believed that leadership is provided by action and example - not by preaching and exhortation, requiring an involvement in both undergraduate teaching and research. Yet achievement of this objective is impeded by excessive demands on my time as Departmental Chairman for general University "administration".

In particular, two kinds of excess are particularly frustrating.
First, that overly concerned with a "close system" approach to planning in which external factors are largely ignored. For example, early in 1974 using a simple model I predicted enrolments in the Accountancy Department through to 1978. Those predictions and the actual results are shown hereunder.

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<tbody>
<tr>
<td>Predicted student load</td>
<td>111</td>
<td>140</td>
<td>159</td>
<td>176</td>
<td>195</td>
</tr>
<tr>
<td>Actual</td>
<td>99</td>
<td>149</td>
<td>165</td>
<td>189</td>
<td>201</td>
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</tbody>
</table>

In the event, my model proved not too bad. But that is of little consolation when I recall the many hours of arid, wasted discussion devoted in various committees to planning; they were arid because of the lack of a policy agreement early in the process of the significance of the external environment, or external factors such as student load, which proved to be the determining factor, and one virtually ignored.

Secondly, is the failure of the University to develop smooth and efficient systems in important areas. For example, in spite of numerous reviews, authority and responsibility for examination results remains unclear. Not only do the terms of reference of assessment and examination committees need clarification but also the terms of reference in that regard of Departmental Chairman. Lack of clear rules demonstrating where responsibility resides cause tension and delay, both destructive of good morale and confidence in "the system". Returning from study leave I quickly gained the impression we had regressed, rather than progressed - as might have been expected at this stage in our development. For a small University we spend an inordinate amount of time meeting in committees. Requests to departments for information supplied routinely in the annual report or otherwise, and which should thus be available within the administration, convey the impression of an administration which sees itself existing in its own right on inputs from academic departments, rather than, as a "service function", providing them with the necessary administrative back-up and support.

Recent proposals for "peer reviews" are, in my opinion, a good example of the misdirected energies discussed above. To be handled seriously they require considerable time inputs. The academic community needs to be convinced of the need for them, and of the standing of the "peer review group". Also in the absence of a self evident need for such a review they can be very destructive of morale, itself a fairly delicate flower and one yet to blossom at Wollongong. Pausing at that divide, I can only note that good academic staff will have no difficulty in taking up alternative employment should they so wish.

I have concluded that I cannot participate as fully as I should like in teaching, research and administration - something has to give. And my deliberate decision in these circumstances is not it should be general University administration and not my teaching or
research. Faced with contraction in the tertiary education sector our saving grace may be excellence in teaching and research. Such a reputation must be earned now. The maximum possible amount of our resources must be devoted to these fundamental objectives of research and teaching, requiring a reduction in the proportion of academic staff time, and the level of funds, going into administration. Having reached that decision I feel I should convey it now to Council, the body to whom I am responsible for the teaching and research of the Accountancy Department.

We are a small University, but seem somehow to have failed to realise the benefits of smallness. With a heavy involvement in administration in my early years at Wollongong I, too, must share part of the collective responsibility. But, given the will, can we not take the hard decisions necessary to improve the efficiency and worth of the operations of the University?

Facilities and Equipment

Accounting Laboratory

Carrels were installed and equipment obtained during the year. Together with technical books and reporter services, they have proved to be valuable as teaching aids. We hope in 1979 to see further development and use of the laboratory.

Student Performance

Enrolments

Departmental enrolments continue to rise. As at 30 April 1978 the EFTS was 201 in contrast to 189 a year earlier.

General Comments on Student Performance

Since 1975 we seem to have attracted a bigger proportion than previously of marginally qualified students. The additional factor of travel from Sydney proves too much for many of them, and this is reflected in unsatisfactory pass rates at first, and indeed, later years. It is hoped that the course in "English Expression for Tertiary Students" being run by the Wollongong Technical College will benefit those who need remedial work in English expression. So long as the University is not in a position to require a substantially higher entry standard, the Department just has to live with this situation; unless, of course, the Department were able to operate a first year quota.

Research

Major Topics of Investigation were:

Australian Company Financial Reporting
Extractive industry accounting
Financial accounting theory
Regional studies have been the Economics Department's main area of specialisation since its inception in 1964. During that period, most members of the academic staff, together with many research students, have participated in local research projects.

It is then notable that none of the 1978 publications of Department members, and only two of their conference papers, had direct bearing on the economy of the Illawarra Region.

This situation appears to have arisen out of an academic impasse. In Universities, academic promotion is strongly influenced by publication in refereed journals. Yet, by its nature, much research into local economic problems is insufficiently general to be publishable in economic journals.

It is true that many local economic problems raise issues which are general in their nature. However, exploration of the general problem frequently requires such substantial additional input of research time (above the time required for analysis of the local problem) that such exploration would only be possible if funding were available for research assistance.

Considerable funding has become available for regional economic research during recent years. However, well funded projects (which have invariably been government projects), almost always carry time requirements which can not be met without permanent full-time research assistance. Such contracts have almost invariably been won by commercial research firms - who frequently rely heavily upon the previously published work of the Economics Department.

Faced with this combination of circumstances, Department members have become noticeably less enthusiastic about participation in
regional economic research, and our output in this field has dropped considerably.

During 1979, the Economics Department will consider whether some means may be found which will permit reconciliation of their career interests with the obligations of a regional university.

Facilities and Equipment

Teaching and research in Economics depend increasingly on practical assignments, group work, field work, and workshop-type activity. In spite of the desperate lack of facilities, and because of the keenness and ingenuity of staff members much has been done by the Department in these terms.

However we have not had recognition of our need for workshop space, in which student groups could make use of our primary documentation of industrial and public economic activity; nor of the fact that we generally have three or four research assistants employed on a hourly basis.

The Computer Laboratory planned and constructed for the Department has now (with the full support of all concerned) become the Social Sciences Computer Laboratory and its use is extending. Equipment and software are still inadequate but they are being developed. The services of the programmer, Mr. S. Harrison, have been of great value.

Student Performance

Enrolments have continued to increase, though at a much lower rate than in earlier years. Pass rates and standards have been maintained at a good level. The level of ability of students who proceed to third year level is very high indeed, and their performance in 1978 was excellent. This reflects steady development over the years, and particularly the results of the re-organisation of course structure commenced in 1975 and completed in 1977. The basis for the Honours programme and postgraduate course work and research has thus been consolidated. This is reflected in the annual output of Honours graduates. In 1978 the first Ph.D. (Wollongong) in Economics was awarded to P.J. Wilson for his research on land values as they relate to inner city development and re-development.

Research

Major Topics of Investigation

International Commodity Agreements
Comparative Quit Rates of Men and Women in Australia
Measurement of unemployment in Australia
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
Economics of the Australian Fishing Industry
History of Economic Thought
Economic Aspects of Federal, State and Local Government relationships
Economics of Migration
A regional study of the economics of the tourist business

Research Theses

Ph.D.

The Investment Decision in Changing Industrial Conditions
Impact of Education of Agricultural Productivity in Developing Countries
P.W.S. Andrews and the Unsuccessful Revolution
The Economics of the Australian Fishing Industry
Decentralization in Australia
The Investment Decision in Electricity Generation

Masters

Australian Energy Policy and its Impact on Rural Industry Costs
Towards a General Equilibrium Model for Port Development

DEPARTMENT OF EDUCATION

General

All members of the Department continued their interests in preschools, primary schools, and secondary schools beyond their normal duties and attended conferences in the areas of their interests and related to preservice and inservice teacher education. Professor King maintained an active interest in the Schools Commission in Canberra.

The Department looks forward to relief of present congestion of accommodation when it moves to the new wing of the Social Sciences building. This move will contribute to the accessibility of normal teaching and research facilities hitherto not available to staff or students, such as observation rooms with suitable fittings, programmed instruction materials and an adequate test library. The Department also looks forward to assistance with its staff/student ratio of 1:13.7 (including two notional staff represented in part-time teaching allocations and one short-term appointee).

Student Performance

Enrolments for Master of Arts were 5, for Master of Education 1, and for Ph.D. 5.

In Diploma in Education 78 students enrolled, 73 will receive diplomas.
Students performance was considered to be good.

Research

Major Topics of Investigation were:

- Migrant Education Television Research Project undertaken for the Australian Department of Education to study the effects of Television series directed towards language and culture learning by migrants, begun in 1977, continued through 1978.
- Study of manpower availability of psychologists in Australia was continued on behalf of the Australian Psychological Society and the Australian Hospitals and Health Services Commission, begun in 1977, was concluded in 1978.
- The study into the effects of learning environments on the acquisition by children of literacy, numeracy, and related skills continues to be an on-going study.
- Continuation Classes for immigrants: Research and Evaluation Project, funded by the N.S.W. and Commonwealth Departments of Education, concerns an examination of aspects of the continuation classes conducted in New South Wales and Victoria under the Adult Migrant Education Program. The N.S.W. study is well under way and will continue into 1979.

Intercultural development psychology and education
Compensatory early-childhood education
Career aspirations of secondary and tertiary students
Teacher role perceptions
School-based curriculum development
Construction of models of curriculum development
Instructional design
Economics of education; regional economics and education
Accountability in teacher education
Analysis of curriculum models
Design strategies for instruction
Middle school curriculum development
History of Sydney Church of England Grammar School, including the post-school careers of its former pupils
History of Australian immigration

Research Theses

Ph.D.

Learning Environments in Australia
The School Council and Community Education in N.S.W.: A repertory grid investigation of teacher role perceptions.
Patterns of Decision-making in Australia.
Discrete and Holistic Features within the Structure of Knowledge.

Masters

Teacher Education: Comparative Studies in Australia and the United...
Kingdom.
A Study of Verbal and Operational Performance among Intellectually Handicapped Children.
Implications of the Social Studies Curriculum for deprived children, and the teacher's role.
Health Programs in Schools as a factor in controlling Nutrition and Obesity.
Open Education and Technical Training.
Towards a Model of Teacher Development.

DEPARTMENT OF GEOGRAPHY

General

The need to replace Dr. Robinson for the duration of his secondment to the UN/ESCAP has enabled the Department to undertake a partial rationalisation and restructuring of the teaching program which will, we hope, enable us to offer a more tightly cohering degree course for students electing to major in the human side of the discipline. In this way, it is hoped, graduates will be somewhat better fitted for "markets" beyond the traditional teaching area and if, as a consequence, the fall in enrolments referred to last year can be stemmed or even reversed it will have been worthwhile.

In an effort to overcome some perceived reluctance among school leavers to take Geography at University, but also as a way of meeting our obligations to the regional community, the Department has again run a series of Schools Days for H.S.C. students which, if sheer volume of attendances is any criterion, must be judged as reasonably successful, bringing 450 students to the University and a further 250 to Goulburn for a full day of lectures and discussions. In addition, the first of a proposed series of Studies in Geography was prepared for distribution to High Schools in the hope that the dissemination of such material will prove helpful to both teachers and students at the H.S.C. level.

The Department has continued to attempt to develop closer relationships with individual departments in the Faculty of Science and with the Faculty at large, in the former case through joint and co-operative research projects, several of which have already proved fruitful, and in the latter by increases in the number of subjects now accepted for inclusion in the Science Schedule. In 1979 it is expected this will result in the availability of a full B.Sc. Hons. degree in Geography.

The Department Cartographic Unit has continued to play an important role in facilitating teaching and research activity. The appointment of a technical assistant in 1979 will enable departmental needs in the reprographic areas to be more adequately met. In addition it is hoped that the skills of the unit will be made more generally available to the University community.
Equipment

During the year the Department continued to build up its stock of current and water level recording devices for use in fluvial, lacustrine and near-shore environments. These activities were given further impetus by the acquisition of two boats and an outboard motor, courtesy A.R.G.C., for use on enclosed waters. The supply of mirror stereoscopes for use in air photo interpretation - both for teaching and research - was also increased. In addition the Department funded the purchase of one V.D.U. and contributed to the cost of a line-printer to be housed in the Social Sciences Computer terminal.

Student Performance

Enrolments: Overall the departmental student load was significantly higher than in 1977 (86 v's 68.5) due in part to the revival of first year enrolments but also to larger second year and in particular Honours and postgraduate enrolments (weighted student units).

General: Although pass rates appear to be lower in 1978 than in 1977 this difference is due almost entirely to the different bases of calculation employed. In 1977 rates were calculated in the Department on the basis of students actually enrolled, i.e. attending classes and submitting work for assessment. Figures in column (a) in the table of 1978 results are rates determined by the University's administration on the basis of students officially enrolled, i.e. inclusive of students not attending and failing to withdraw. As the parenthetical figures in column (b) demonstrate, however, when the appropriate correction for 'phantom' students is made no significant differences remain to be explained.

Nevertheless, concern was again expressed throughout the year over the nature of the first year intake, support for which was provided late in the year by an analysis of entry qualifications and the relationship between entry qualifications and performance. Succinctly stated it was clear that the Department was receiving a high, perhaps disproportionately high, fraction of the students from the lower range of the HSC aggregate (approximately 70% - 265) and that among these students only slightly more than 50% were satisfactorily completing their studies in the Department. Among students entering with aggregates of 300 or more, however, the success rate was 100%. Among SAP entrants the performance of category 1 students was generally better than those in other categories, particularly in terms of proportions of students receiving D or HD grades, but there was no systematic variation over the grades of the kind appearing among the HSC entrants.

Clearly this situation requires attention during 1979 and discussions have already been held with a view to reorganizing practical work and, if necessary, modifying the nature of the work load so that students who are obviously having difficulty coping with departmental expectations may become more effective in their studies in Geography.
Once past the first year barrier, however, the situation improves markedly, with the best students performing at very high levels indeed. Nevertheless, the 'tail', especially in 200-level subjects, appears to have lengthened somewhat and thus was reflected within classes in a fairly widespread increasing reluctance to read as required and an apparent reduction in the quality of written work.

Students undertaking the honours year again demonstrated that their work achieves standards fully comparable with those in other universities, with the best attracting considerable praise from external assessors.

Research

Major Topics of Investigation were:

- Fragmentation of Farms in the N.S.W. Wheat Belt.
- Agricultural Productivity in India
- Diffusion of Agricultural Innovation in N.S.W.
- Spatial variations in type of use and use-rate of medical facilities.
- Provision of, and access to, location-specific welfare services in urban areas.
- Processes of Shoreline Erosion of Warilla Beach.
- Quaternary Evolution of the Illawarra Coast.
- Post-glacial modification of coastal barrier and lagoon systems (Killealea Lagoon).
- Prehistory of the Murray Valley (with Victorian State Archaeological Survey.)
- The Canadian Prairies Urban System.
- Demographic and Socio-economic Variation in Rural N.S.W.
- Floodplain Formation in the Illawarra.
- Urbanization of the steep scarp-slope streams in the Illawarra.
- Deposition in tightly-curved meander beds on the Murrumbidgee.
- Flow in meander bends.
- Port modernization in South and Southeast Asia.
- Modelling Port Systems.
- Use of Low-order Health-care Facilities.
- Demographic Change in Non-metropolitan N.S.W.
- Social Deprivation in British Urban Areas.
- Mortality Variations in Time and Space.
- Evolution of Eastern Highlands of N.S.W.
- Environmental Assessment of Coastal Lake Systems.
- Evolution of the Illawarra Coast.

Research Theses

Ph.D.

"Upland Swamps on the Hawkesbury Sandstone Plateaux".

Masters

"Morphostratigraphy of Killealea Lagoon".
"Indo-Fijian Migrant Labour in New Zealand".
Honours

"Distribution and Ecology of Rainforest Vegetation and Fauna in the Illawarra".
"Diurnal Morphologic Variations on a Small Sandy Beach: Coledale, N.S.W.".
"The Diffusion of Sunflower in N.S.W.".
"Landscape Evaluation".
"From Cringila to Mt. Ousley: The Intra-urban Location and Residential Relocation Process of the Italian Community in Wollongong, N.S.W."

DEPARTMENT OF PSYCHOLOGY

General

Professor Clarke was appointed by Senator Carrick, the Federal Minister for Education to membership of the Commonwealth Post-Graduate Course Awards Committee for 1979.

Dr. D. D. Diespecker was appointed Consulting Reader for Psychological Reports, University of Montana, 1978.

Dr. J. L. Morris was appointed as Consultant to the Commonwealth Public Service Board, Canberra, 1978.

Dr. N. L. Adams was appointed a member of the Regional Planning Committee and of the Port and Railway Advisory Committee. He also became chairman of the Wollongong Drug Withdrawal and Motivation Centre Committee.

Facilities

The Resources Committee provided $7,100 for equipment funds for the purchase of equipment. A major effort during 1978 was the consolidation of workshop equipment. Departmental holdings of tapes and films were also considerably extended.

Student Performance

The pass rate improvement in PSYC 101 & 102 achieved in 1977 was maintained in 1978, mainly due to a reorganization of the statistics section of the course.

Research

Major Topics of Investigation were:

Operant conditioning and its applications. Physiological psychology especially the interaction of the alpha and gamma motor systems in man. The role of the psychologist in health care.
Problem solving and communication in industrial organizations. Sources of job satisfaction and dissatisfaction among health employees. Imagery and fantasy as useful techniques in counselling and psychotherapy. A comparison of simultaneous EEG in two subjects, one of whom receives a visual stimulus ("paranormal perception"). Research into psychopathology in the Wollongong area. Selection procedures in the civil service of Australia and the United States of America. Feminism and psychology - life span development.

Research Theses

Ph.D.

Ideology and Sexuality.
Attitudes of Australian men and women toward the traditional, cultural sex role stereotypes.

Masters

Punishment and locus of control.
The effect of a residential programme on self esteem and social attitudes of school avoiders.
A investigation of job satisfaction and management roles in the health commission's health services in the Illawarra.

Honours

The evolution of Gestalt Therapy from Gestalt Psychology.
The relationship between states and traits of two personality variables.
Autism: a developmental disorder of multiple aetiology.
An investigation of the efficacy of relaxation therapy in the modification of physiological responses to stress in Type A (coronary prone) and Type B (non-coronary prone) individuals.
Biofeedback mediated behavioural treatment of bronchial asthma.
Intelligence as an adaptive behaviour.
Gambling behaviour.
Crisis intervention.
The nature of consciousness.
The effects of video feedback on the self concept.
The critical period of socialization and its inevitable consequences.
The influence of the stimulus persons attributes on person perception.

DEPARTMENT OF SOCIOLOGY

General

In 1978, in keeping with the principles on which the Department's Development has been planned, a great deal of Departmental effort was spent on integrating the work of Thomas Luckmann into
Departmental research, thus crystallising the Department's contribution to knowledge studies, a core perspective which informs staff member teaching and research. With this base established, appointments were made of three new staff members to develop community-oriented research. This brings the Department to a fully established status at the start of 1979. Internal review of the whole Departmental programme is being conducted in early 1979 when the full complement of the Departmental staff are together for the first time. This will form the basis for future teaching and research strategy of the Department.

At the end of 1978, Professor Hill was appointed as Acting Director of the Centre for Multicultural Studies. The Department's community-oriented research and liaison will be focussed through this Centre from 1979.

Facilities

Space available was barely adequate in 1978. There will be critical shortages of accommodation of both office space, and particularly research and data resource space in 1979.

Student Performance

Student load: Departmental enrolments continued to rise in 1978. As at 30th April, 1978, EFTS for the Department was 119 in contrast with 108 in 1977.

RESEARCH

Major Topics of investigation were:

Impact of science and technology on developing countries.
Application of Kondratiev long-wave theory to the impact of science and technology on development.
Goals in scientific enquiry.
Indian religion and society: the institutionalisation of charisma and religious movements.
Hegemonic control of esoteric knowledge.
The use of dialectics in social theory.
The impact of migrant education television on Australian ethnic communities.

Research Theses

Ph.D.
Science in Society: a comparative perspective of knowledge systems.
Ethnic Cohesion or Kinship Relation.
The Impact of the Motorcar on Society.
Mission Orientation in Science

Masters

Lesbianism and Ideology.
Honours

Migrants and Mental Illness.
A Prescription for a Meaningful Reality: Rugby League.
The Hidden Network Behind Church/State Relations in the Philippines.
Research Interests

Load Distribution in Orthotropic Bridge Decks.
Dynamic Behavioural 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 System 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 Rigidities of 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.
Non-Linear Analysis of Box-Type Structures by Special-purpose Finite Element Techniques.

Refereed Publications


Conference Papers -


Other Publications.


Refereed Publications (Refereed Outside the University)


Refereed Conference Papers -


DEPARTMENT OF ELECTRICAL ENGINEERING

Research Interests

Automatic control.
Plant identification.
Electrostatic precipitation.
Static converters.
Electrical machines.
Computer systems.
Reliability techniques.
Large-scale systems.
Communications.
Computer-aided analysis and design.
Transportation.

Refereed Publications


Conference Publications


DEPARTMENT OF MECHANICAL ENGINEERING

Research Interests

- Determination of flow properties of bulk solids.
- Dynamic analysis and optimization of bulk handling systems.
- Flow of granular materials.
- Design of bins for bulk solids.
- Computer simulation.
- Process modelling and control.
- Random signal analysis and stochastic processes.
- System identification studies.
- Computer aided control system design.
- Multivariable control system theory and design.
- Some applications of solar energy.
- Boiling heat transfer.
- Exhaust emissions from internal combustion engines.
- Propagation of waves in small bore tubes.
- Treatment and disposal of industrial effluents.

Publications

Refereed Publications


Conference Papers


Other Papers


Books


DEPARTMENT OF METALLURGY

Research Interests

Deformation and fracture at elevated temperatures, with particular reference to multiphase materials.
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 recrystallisation.
Studies of flow phenomena in packed beds.
Publications


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FACTOR OF HUMANITIES

DEPARTMENT OF ENGLISH

Research Interests

Old English language and literature.
Middle English language and literature.
Early-Tudor literature.
Elizabethan literature.
Early seventeenth century literature.
The works of James Joyce.

Publications


Peter Abotomey. Class Lecture After a Recent Visit by Judith Wright (October 1976), LIUMO, Vol. 6, No. 1, 1978, 1-5.

DEPARTMENT OF EUROPEAN LANGUAGES

Research Interests

19th and 20th century French 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 "verismo": 19th century realism (Verga, Capuana, De Roberto).
Pedagogical aspects of teaching Italian.

Publications

Italian-American "teatro populare".

Refereed Publications


Conference Papers


DEPARTMENT OF HISTORY

Research Interests

19th and 20th century English social and political History.
French History from 1650.
Russian History from 1825.
Religious History in Australia and Modern Britain.
Industrial, Trade Union and socio-political history of Australia.
Modern South East Asian history.

Publications


J.S. Hagan. "Industrial Relations and the Writing of Australian History" in B. Curthoys and A. Markus Who is the Enemy? (Sydney, 1978)


Conference Papers


Winifred Mitchell. "Women in Mining Communities" August, 1978 (Macquarie University)

Winifred Mitchell. "History of Pre-School Child Care" August, 1978 (Child Care Conference, Wollongong)

Other Publications


DEPARTMENT OF HISTORY AND PHILOSOPHY OF SCIENCE

Research Interests

Early 19th century British philosophy of science.
Women and science.
The history of evolutionary biology.
Social relations of science in the 19th and 20th centuries.
19th and 20th century genetics.

Publications

Refereed Publications


Conference Papers


DEPARTMENT OF PHILOSOPHY

Research Interests

Interpretation and evaluation of Kant's critical philosophy.
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.
Marxism.
Anarchism.
The Liberal theory of the state.
Self-determination and secession ethics.
The concept of privacy and the right to privacy.
Identity and criteria.
Mathematical logic - its history, development and applications.
Probability and its theoretical interpretation.
Induction.
Responsibility, with reference to action, motive and intention.
Issues arising from the Catholic doctrine of double effect.
Contemporary aspects of Thomistic thought.
The ethical evaluation of the life and teachings of Jesus.

Refereed Publications


Conference and Learned Society Proceedings


Literary Journals


'In House' Publications

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.

Refereed Publications.


Conference Papers


Other Papers


University of Wollongong, Department of Mathematics Preprint series:


Laird, P.G. "On an inverse problem in potential theory", No. 5/78.

Laird, P.G. "A reconsideration of the 'three squares' problem", No. 6/78.

Tognetti, K. and Winley, G. "The Logistic as a stochastic population model", No. 8/78.


Research Interests

Microbial Water Relations
Metabolic regulation in response to environmental stress.
Cellular mechanisms of retention of "compatible solutes" at high concentrations.

Photosynthesis
Chloroplast function and energy transfer within the plant cell.

Environmental Animal Physiology
Temperature regulation.
Thyroid function in vertebrates.
Hormones and metabolism.

Ecology
Ecological and behavioural mechanisms regulating spacial and temporal patterns of population distribution.
Theoretical and mathematical ecology.

Publications

Refereed
(Because of wrong information supplied by the publisher, this was cited in last year's report as a 1977 publication).

Margaret Edgley and A.D. Brown. "Responses of Xerotolerant and Non-tolerant Yeasts to Water Stress."


Conference Papers
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 chemic 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.
Development of sensitive new analytical methods for organic nitrogen compounds and nitrogen oxides.
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 (4-300K) Magnetochemistry of First Row Transition Metal Polymeric 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 (4-300K) Magnetochemistry of Polynuclear Transition Metal Complexes.
Structure and Properties of Lanthanide Schiff Base Complexes.


Conference Papers


Monograph: Biogenesis of Natural Products, a series of postgraduate lectures at the Technical University of Istanbul.

DEPARTMENT OF GEOLOGY

Research Interests

The geology of coal measures.
Rock magnetism and related geophysical phenomena.
Textures and petrochemistry of igneous and metamorphic rocks.
Invertebrates of the Early and Middle Palaeozoic of Australia.
Terrestrial and shallow marine sedimentology.
Igneous petrology of the Illawarra district.
Organic geochemistry.
Economic and environmental geology.
Geothermal properties.

Publications


DEPARTMENT OF PHYSICS

Research Interests

Astronomy - Visible and Infrared.
Experimental Nuclear Physics.
Infra-red Detectors.
Musical Acoustics.
Scattering of Light by Solids.
Solid State Spectroscopy of Impurities in Semi-Conductors.
Studies of Electronic Wave Functions in Solids.

Publications


Conference Papers


B.J. Allen and A.R. de L. Musgrove "Non-Statistical Capture Mechanism in $^{139}\text{La}$ and $^{141}\text{Pr}$", *ibid*.


In addition, Dr. L.F. Smith attended a symposium on "Results from the Anglo Australian Telescope", Canaberra, March 17th, 1978 and the International Astronomical Union Colloquium No. 46 on "Variable Stars" held at the University of Waikato, Hamilton, New Zealand, 28th November - 1st December, 1978.
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.
Interfirm comparisons.
International accounting.
Learning curve.
Small business management.
Statements on accounting standards by professional bodies, and other means of improving accounting practice.
Taxation.
The use of computers in accounting, auditing and business decision-making.
Trade practices and consumer protection.

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


J. Guest, Income Inequality and Economic Growth in Underdeveloped Countries: An Econometric Analysis. Seventh Conference of Economists, Sydney, Macquarie University, August 28 to September 1, 1978.


D. Lewis, Recent Extensions of the Hecksher-Ohlin Theory of Trade. Seventh Conference of Economists, Sydney, Macquarie University, August 28 to September 1, 1978.

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**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 programmes 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**


P.R. de Lacey and A. Barlow. *Continuation at Illawarra high schools*, University of Wollongong, Mimeo. (Wollongong 1978)


DEPARTMENT OF GEOGRAPHY

Research Interests

Transport systems analysis.
Agricultural geography.
Coastal geomorphology.
Fluvial geomorphology.
Urban studies.
Biogeography.
Population Studies.
Regional development and planning.
South-east Asian studies.

Publications


Conference Papers


Other Publications


R. Robinson (ed.) Port Development for Unit Loads and Containerization, Hong Kong, 1976. UN/ESCAP Port Development Series No. 1, (Bangkok, 1978)


DEPARTMENT OF PSYCHOLOGY

Research Interests

Accidents in industry - psychological and physical factors.
Achievement motivation.
Action research and organizational development in industry and
other organizations.
Attitudes.
Autonomic components of the orienting reaction.
Classical and instrumental autonomic conditioning.
Decision and risk taking.
Disadvantaged children.
Gestalt therapy.
Human learning.
Intensive groups.
Personnel - selection and placement.
Prediction of academic success.
Psychophysiology of the autonomic nervous system.
Sex roles.
Social psychology of industry.
Student guidance and counselling services.
Time perception.

Publications

Linda L. Viney & A.M. Clarke. Effects of modelling and instruction
on problem solving by school children with different expectations

K.C. Hayes & A.M. Clarke. Learning effects in human muscular
responses to proprioceptive stimuli. *Physiology and Behaviour*,
1978, 21, 57-63.

D.D. Diespecker (Ed.) *Annual Directory of Small Groups in Australia*,

D.D. Diespecker. Looking out is really looking in. *Small Groups

D.D. Diespecker. Consciousness as a subject for study in
Australian Universities. *Psychological Forum in Australian

K.C. Hayes & A.M. Clarke. Facilitation of late reflexes in humans
during the preparatory period of voluntary movement. *Brain Research*,
1978, 153, 176-182.

DEPARTMENT OF SOCIOLOGY

Research Interests

Knowledge and Theory.
The sociology of knowledge.
The development of "interpretive" sociological theory and research.
The dialectic in social theory.
The cultural location of Eastern and Western knowledge systems.
Sociology of Science
Development of an "interpretive" sociology of science.
Mission-orientation.
Professional socialisation.
Research communication and production.
The Impact of science and technology on industry and society.
Science, technology and developing countries.

Social process
Self concept development and socialisation theory.
Interaction and small group behaviour.
Sociology of conflict.

Social Phenomena
Sociology of organizations.
Professions - established vs. marginal.
Consumer behaviour.
Sociology of migration, migrant integration and education.
Military sociology.
Religion, ideology and belief systems.

Publications


Conference Papers
S.C. Hill. UNESCO Conference (Asian Region) on the Human Implications of Technological Change: opening keynote address, "The Technology Trap". (October)


The Students' Representative Council participated in bringing the activities of the Australian Union of Students onto campus with visits of various officers of the Union and with talks on current issues relevant to students, such as compulsory student unionism.

Once again the S.R.C. attempted to activate students into standing for the various positions on the governing bodies of the University. Although many positions were filled the S.R.C. found that many students were not acquainted with the system whereby they could have a say in their educational environment.

The Women's Collective, a committee co-ordinated by the S.R.C. Women's Officer, had a very active year. Their meetings were held often and each meeting held at lunchtime was repeated at night to give the opportunity for part-time students to become involved. Their most successful campaign was the Wollongong initiated "Free Judith Mitchell Campaign".

The S.R.C. suffered from internal bickering over the affiliation of a club whose activities have been a tradition at the University of Wollongong for many years. The club, the Magnanimous Society (Mag. Soc.) believed in practical answers to questions raised at meetings. For example, they participated in weekly clean-ups of the area around the Union and held some very successful social functions. Because of the clashes with certain S.R.C. members this club decided to dissolve itself later in the year.

The S.R.C. had problems controlling finance during 1978, possibly attributable to the discontinuity caused by the change in the position of Hon. Treasurer half-way through the year.

Throughout 1978, meetings between the S.R.C. executive and "Central Administrative Officers" occurred monthly. These meetings provided valuable and constructive communication between students and administration. Fortunately, this important and essential link shall continue throughout 1979.
<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
<th>Funding Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Institute of Nuclear Science and Engineering</td>
<td>Removal of Soluble Organic Compounds from Aqueous Effluents by Radiation Induced Co-polymetisation with Polyelectrolytes</td>
<td>$500</td>
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<tr>
<td>Australian Accounting Research Foundation</td>
<td>Aspects of Financial Reporting Practice of Australian Companies</td>
<td>$3,020</td>
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<td>Australian Education Research &amp; Development Committee</td>
<td>Precis - Its Applicability for the Subject Catalogue in an Academic Library</td>
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<td>Australian Road Research Board</td>
<td>Computer Design of Prestressed Concrete Box Girders</td>
<td>$32</td>
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<td>Board of Adult Education</td>
<td>Bourke Pre School</td>
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<td>Bulk Solids Handling</td>
<td>Mechanical Engineering</td>
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<td>Bulli Hospital Research</td>
<td>Psychology</td>
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<tr>
<td>Department of Aboriginal Affairs</td>
<td>Bourke Pre-School</td>
<td>$24,505</td>
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<td>Department of Education (Australian)</td>
<td>An Evaluation of Part-Time English Courses for Adult Education</td>
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<td>Electric Vehicles Research</td>
<td>Electrical Engineering</td>
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<td>Electric Research Board Grants</td>
<td>Control of Large Scale Systems</td>
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<td>Environmental Research Donations</td>
<td>Geology</td>
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<td>Geology Fuel Research</td>
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<td>Geology &amp; Petrophysics Research</td>
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<td>Learning Environmental Research</td>
<td>Education</td>
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<td>J. L. Morris Research Fund</td>
<td>Psychology</td>
<td>$434</td>
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<td>Mumbulla Shire</td>
<td>Environment Impact Study - Wallaga Lake</td>
<td>$7,000</td>
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<td>National Health &amp; Musical Research Council</td>
<td>Application of GC - MS and Related Techniques to the Study of Inborn Errors of Metabolism</td>
<td>$22,063</td>
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<td>Source of Funding</td>
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<td>National Health &amp; Medical Research Council</td>
<td>The Influence of the Thyroid Hormones on Membrane Lipids - 1978</td>
<td>$500</td>
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<td>New South Wales Ministry of Education</td>
<td>Compilation of the History of the A. C. T. U.</td>
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<td>Office of Child Care</td>
<td>Bourke Pre-School</td>
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<td>Oceanographic Research</td>
<td>Mathematics</td>
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<td>Sundry Donations for Research</td>
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<td>Sundry Donations for Research</td>
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<td>Utah Foundation</td>
<td>Siltation in Coastal Rivers of New South Wales</td>
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<td>Utah Foundation</td>
<td>Use of Peroxide in Waste Water Treatment</td>
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<td>Water Research Foundation of Australia</td>
<td>Study of Leachate at the Russell Vale Waste Disposal Depot</td>
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<td>Channel Migration and the Character of Flow through Meander Bends</td>
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<td>Wollongong City Council</td>
<td>Development of Earthquake Energy Absorbers for Bridges</td>
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<td>Water Research Foundation of Australia</td>
<td>High Quality Electronic Structure Computations of Small Molecules and their Interactions</td>
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<td>Australian Research Grants Committee</td>
<td>History of the A.C.T.U.</td>
<td>$5,342</td>
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<tr>
<td>Water Research Foundation of Australia</td>
<td>Metabolite Fluxes Across Chloroplast Envelope Membrane</td>
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<td>Photosynthesis and Osmoregulation in Marine Algae Isolation and Study of Chloroplasts from Dunaliella</td>
<td>$5,793</td>
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Special Purpose Funds (Cont'd.)

Rapid and Quantitative Amino Acid Analysis by Direct Mass Spectrometry $12,787

Solid State Spectroscopy Electronic and Vibrational Spectra of Solids $10,799

Spatial Patterns in Corals $1,000

Thermodynamic Studies of Solute Retention by Microorganisms $7,255

SPECIAL PURPOSE FUNDS - OTHER

Library Appeal Fund $10

Wollongong University Appeal Fund $216

DONATIONS FOR SCHOLARSHIPS, BURSARIES, PRIZES, ETC.

Ampol Award for Graduate Students $4,000

Mathematics Prize Fund $1,252

A.J. & J. Waters Geology Prize $1,508

Wollongong University Prize Fund $216

Corporate Affairs Commission $50

John Lysaght Prize $30

N.S.W. Dept. of Education $32

Physics Dept. Staff Prizes $30

S.W. Daniels Prize $40

Australian Institute of Mining & Metallurgy $50

Australian Institute of Metals $40

Australian Federation of University Women $50

Marjorie Brown Prize $30

Australian Psychology Society $100

Australian Society of Accountants $150
FINANCIAL STATEMENT

FINANCES

A brief summary of the accounts of the University for 1978 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 1978 grant to the University as recommended by the Universities Commission and accepted by the Government was $8,950,000. With supplementation this was increased to $9,915,000.

SPECIAL RESEARCH GRANT

The 1978 grant to the University as recommended by the Universities Commission and accepted by the Government was $60,000. With supplementation this was increased to $66,000.

EQUIPMENT GRANT

The 1978 grant to the University as recommended by the Universities Commission and accepted by the Government was $605,000. With supplementation this has been increased to $687,000.

BUILDING PROJECT GRANTS (INCLUDING MINOR AND SITE WORKS)

The 1978 grant to the University as recommended by the Universities Commission and accepted by the Government was $218,000.
## RECURRENT FUNDS
### 1978 RECURRENT INCOME AND EXPENDITURE

<table>
<thead>
<tr>
<th>1977 COM- PARISONS</th>
<th>SOURCE OF INCOME</th>
<th>AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,781,000</td>
<td>Australian Government Grants</td>
<td>9,915,000</td>
<td>99.76</td>
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<tr>
<td>91,893</td>
<td>Other General Income</td>
<td>24,061</td>
<td>0.24</td>
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<td>9,939,061</td>
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<table>
<thead>
<tr>
<th>1977 COM- PARISONS</th>
<th>EXPENDITURE HEADINGS</th>
<th>AMOUNT</th>
<th>%</th>
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<tbody>
<tr>
<td>7,201,930</td>
<td>Salaries and Staff Changes</td>
<td>8,348,305</td>
<td>83.43</td>
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<tr>
<td>1,256,981</td>
<td>Maintenance Expenses</td>
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<td>467,275</td>
<td>Furniture &amp; Library Books</td>
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<td>10,006,694</td>
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## AGGREGATE FUNDS

During 1978 income received from all sources totalled $11,895,823 while aggregate expenditure amounted to $11,638,164.

Aggregate income was received from the following sources:

<table>
<thead>
<tr>
<th>1977 COM- PARISONS</th>
<th>SOURCE OF INCOME</th>
<th>AMOUNT</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>8,781,000</td>
<td>Australian Government Grant</td>
<td>9,915,000</td>
<td>-</td>
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<tr>
<td>463,048</td>
<td>Recurrent</td>
<td>218,000</td>
<td>-</td>
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<tr>
<td>781,000</td>
<td>Building Projects</td>
<td>687,000</td>
<td>-</td>
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<tr>
<td>57,000</td>
<td>Equipment</td>
<td>66,000</td>
<td>-</td>
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<tr>
<td></td>
<td>Special Research</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>10,886,000</td>
<td>91.51</td>
</tr>
<tr>
<td>1977 COMPARISONS</td>
<td>SOURCE OF INCOME</td>
<td>AMOUNT</td>
<td>$</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------</td>
<td>--------</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Special Purpose Funds</td>
<td></td>
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<tr>
<td></td>
<td>Research</td>
<td>251,781</td>
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<td></td>
<td>Scholarships, Prizes, etc.</td>
<td>8,045</td>
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<td></td>
<td>Other</td>
<td>725,936</td>
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<td></td>
<td></td>
<td>985,762</td>
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<td></td>
<td>Other General Income</td>
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<tr>
<td></td>
<td>Recurrent</td>
<td>24,061</td>
<td>0.20</td>
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<tr>
<td></td>
<td></td>
<td>11,895,823</td>
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<table>
<thead>
<tr>
<th>1977 COMPARISONS</th>
<th>EXPENDITURE HEADINGS</th>
<th>AMOUNT</th>
<th>%</th>
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<tbody>
<tr>
<td></td>
<td>Salaries and Staff Charges</td>
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<tr>
<td></td>
<td>Recurrent</td>
<td>8,348,305</td>
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<tr>
<td></td>
<td>Special Research</td>
<td>51,319</td>
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<tr>
<td></td>
<td>Special Purpose - Research</td>
<td>179,628</td>
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<tr>
<td></td>
<td>Special Purposes - Other</td>
<td>60,225</td>
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<tr>
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<td>8,639,477</td>
<td>74.23</td>
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<table>
<thead>
<tr>
<th>1977 COMPARISONS</th>
<th>EXPENDITURE HEADINGS</th>
<th>AMOUNT</th>
<th>$</th>
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<tbody>
<tr>
<td></td>
<td>New Buildings (Including Sites)</td>
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<td></td>
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<tr>
<td></td>
<td>Grants for Building Projects, etc., Under States Grants (Universities) Acts</td>
<td>218,000</td>
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<tr>
<td></td>
<td>Special Purposes - Other</td>
<td>151,618</td>
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<td></td>
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<td>369,618</td>
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<tr>
<td>1977 COM-PARISONS</td>
<td>EXPENDITURE HEADINGS</td>
<td>AMOUNT</td>
<td>%</td>
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<td>----------------------</td>
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<tr>
<td>1,256,981</td>
<td>Maintenance</td>
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<td>21,779</td>
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<td>83,988</td>
<td>Special Purposes - Research</td>
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<td>1,385,732</td>
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<td>1,583,495</td>
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<td>Equipment, Furniture &amp; Library Books</td>
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<td>467,275</td>
<td>Recurrent</td>
<td>311,680</td>
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<tr>
<td>2,901</td>
<td>Special Research</td>
<td>167</td>
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<tr>
<td>964,053</td>
<td>Grants for Equipment</td>
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<tr>
<td>22,224</td>
<td>Special Purposes - Research</td>
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<td>63,423</td>
<td>Special Purposes - Other</td>
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<td>1,045,574</td>
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<tr>
<td>10,952,533</td>
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<td>11,638,164</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>
<td>160,918 DR</td>
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<tr>
<td>Grants for Equipment Under State Grants (Universities Assistance) Act 1976</td>
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<tr>
<td>Grants for Equipment Under States Grant (Tertiary Education Assistance) Act 1977</td>
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<td>Special Purpose Funds (Scholarships, Bursaries, Prizes, etc.)</td>
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<tr>
<td>Special Purpose Funds (Other Purposes)</td>
<td>1,030,583</td>
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<tr>
<td>Australian Research Grants Committee Projects</td>
<td>4,226</td>
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<tr>
<td>Sundry Suspense Accounts</td>
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<tr>
<td></td>
<td><strong>$1,260,595</strong></td>
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