

THE UNIVERSITY OF WOLLONGONG



ANNUAL REPORT 1989

THE UNIVERSITY OF WOLLONGONG



Arms of the University

The principal elements incorporated in the arms of the University are the blue of the sea, the gold of the sand and the red of the Illawarra flame tree. The open book often used for educational institutions is also included.

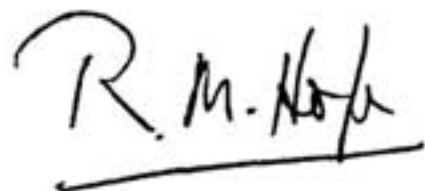
The blazon is: Azure an open book proper bound gold on a chief wavy of three cinquefoils gules

ANNUAL REPORT 1989

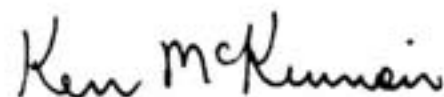
The Honourable Dr Terry A. Metherell, MP, Minister for Education

Dear Minister

In accordance with section 10(i) of the Annual Reports (Statutory Bodies) Act, 1984, and Section 34 of the Public Finance and Audit Act, 1983, the Council of the University has the honour to present to you, for tabling to the Parliament, the *Annual Report* of the proceedings of the University for the period 1 January to 31 December 1989.

A handwritten signature in black ink that reads "R. M. Hoff". The signature is written in a cursive style and is underlined with a single horizontal stroke.

Chancellor

A handwritten signature in black ink that reads "Ken McKinnin". The signature is written in a cursive style.

Vice-Chancellor and Principal

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In 1988 the Federal Government changed the gridlines for higher education in Australia. The New South Wales State Government supported the changes, which dispensed with the binary Universities and Colleges of Advanced Education system and introduced the "Unified National System". As a result of its forward planning and the many new initiatives introduced since 1981, the University of Wollongong was not significantly affected by the changes. Indeed, it proved to be well placed as an independent and self-confident member of the new system.

The University did not have to expend its energies, as most other institutions did, in negotiating the paths of imposed amalgamations.

Instead, the vigorous momentum of academic development could be maintained. The agenda involved the reorganisation of departments, including the establishment of three Faculties; the filling of seven new Chairs and two Deans' positions; major technology and research contracts; capital and minor works on campus and at Campus East; and the consolidation of staffing and student policies and practices sufficiently attractive to have been used since as models elsewhere.

The School of Health Sciences and the Department of Psychology were joined and reorganised to form a Faculty of Health and Behavioural Sciences. The Faculty, an innovative development in Australian universities, promotes a fully integrated study of the person as a biophysical being. Its potential is exciting and has already led to initiatives in interdisciplinary research work. Moreover, a formal agreement was signed between the Faculty and the Illawarra Area Health Service (with the full support of the New South Wales Minister for Health): it allows for conjoint staff appointments and the cooperative use of facilities. The Faculty is moving towards offering a broader array of postgraduate courses and developing other programs for health professionals. A Graduate Diploma in General Practice for medical practitioners was approved for introduction in 1990, the forerunner of other such graduate programs within the Faculty's Graduate School.

Another new faculty capitalises on developments in communications technology. The Faculty of Informatics, approved in December 1989, will bring together the Departments of Computer Science, Electrical and Computer Engineering, and Mathematics together with the Program in Information Technology. The new Faculty will help the University to maximise its recognised strengths in telecommunications and computing. During the year, Northern Telecom (a Canadian international company) contracted to establish the Nortel Research and Development Centre on campus and Telecom (Australia) initiated a network software centre on campus. These are significant developments.

A good pointer to the buoyancy of the academic community was the endorsement during the year of the establishment of a Faculty of Law in 1990. An Advisory Committee of eminent legal experts proposed a Faculty which would provide accredited legal courses for barristers and solicitors; it would be distinguished by a strongly clinical approach to legal training and by concentration, particularly at the Graduate level, on three areas of specialisation—Industrial Law, Natural Resources and Mining Law and Court Practice and Administration. Planning for Law has been a nice example of the University's capacity to take advantage of the deregulation of the tertiary system; its network of contacts and its earlier preparation and laying of foundations allowed it to implement its planning quickly. The concept of specialist Graduate Schools within the Faculties was approved in April, and first realised through establishment of a Graduate

School of Journalism. Like other Wollongong developments, the Journalism proposal linked the base of specialised knowledge and research skills within the University with the region's capacity to provide a diverse environment for research and practical experience.

The academic initiatives of 1989 have opened exciting paths for development; they have also offered Wollongong students more options for study and research, further enhanced by continuing strong growth in both undergraduate and post-graduate numbers.

A special welcome feature of the increasingly diverse and interesting social composition of the student body was the presence of greater numbers of international students. Ten per cent of the student body came from overseas: among them were 400 subsidised by the Australian government; 300 full-fee paying and 20 American students were the vanguard of an increasing number from this source.

The introduction of an agreed Code of Practice for Teaching within the University was a further boost for good communication between staff and students as well as an endorsement of the maintenance of high standards of teaching performance. It was complemented by the approval of a general Code of Conduct for staff embraced in Staff Discipline Regulations.

Much valued and constructive contributions of the Academic Staff Unions on campus have facilitated the emergence of policies in the best interests of the whole University community. As a consequence, the University has been able to lead the field in staff evaluation and development programs for both academic and general staff. Attraction and retention of staff in key areas emerged strongly in 1989 as challenging issues for universities. The balancing trick will be to retain variety and equity over a range of disciplines while ensuring that highly competitive areas are staffed by appropriately qualified people. The strains on budgeting engendered by salary loadings and pressures for individually set salaries have been particularly difficult to cope with during the year and the omens for 1990 are for greater rather than less pressure. A general salary rise for academics is needed to overcome the current non-competitive salary structure.

During the year the Faculty structure and administration worked positively to support teaching and research activities and to facilitate development, especially the advent of the new Faculties. General staff enthusiasm and a complementary sense of achievement have been high.

The senior executive staff was restructured to reflect the demands of high levels of activity in academic and development areas. The review of the senior executive followed the retirement of Professor Peter Rousch, Deputy Vice-Chancellor and Director of the former Wollongong Institute of Education. Professor Rousch's efforts as Director during the amalgamation period were essential to its success and he played a key role in leading the University to its present stage of development.

Construction of a federally funded multi-purpose building began in 1989



The Vice-Chancellor, Professor Ken McKinnon, left, and the Chancellor, Mr Justice Hope AC CMG

and is expected to be ready for the first occupants at the end of 1990. It will relieve the strain on accommodation only briefly so great is the pressure from prospective users. The University itself funded, from borrowing and other sources, essential expansion of student accommodation places and Stage II of the Illawarra Technology Centre (ITC). The latter, urgently required by the success and growth of the University's technology transfer activities, was already fully booked by the end of the year and tenders had to be called for ITC Stage III.

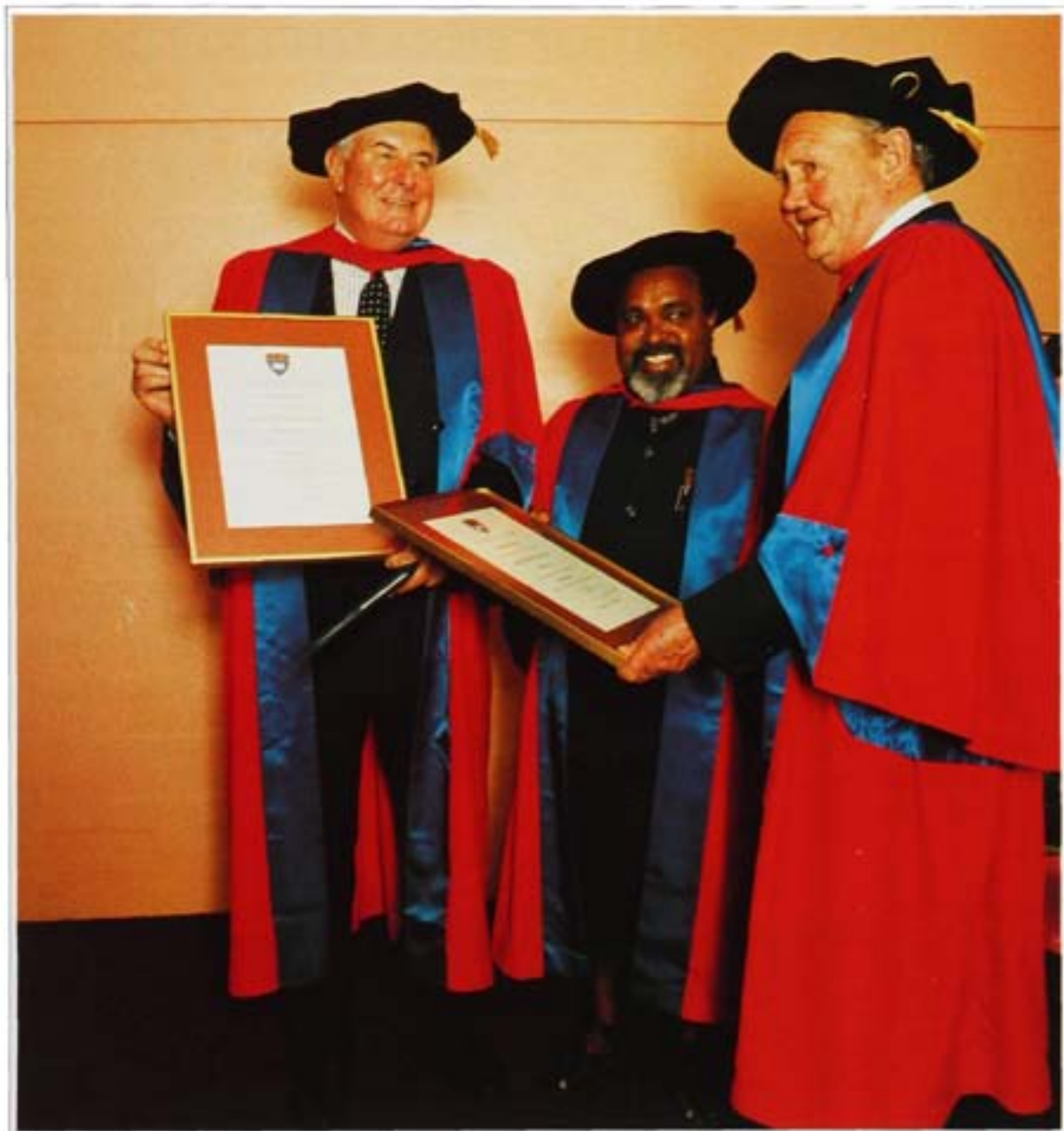
An important project during the year was the establishment of an interactive Science Centre at Campus East. Converted from a Nissen-hut complex and equipped from various sources (including the Brisbane Expo), the Science Centre is the happy result of the great dedication and resourcefulness of Physics Lecturer Glen Moore, combined with support from the Faculty and volunteer assistance. The Centre is doing much to provide the community with a better understanding of science. Already it is achieving popularity rivalling the nationally supported Centre. It is particularly successful with its young visitors who feel comfortable with the wide range of challenging activities and the low-scale facilities. The Centre is fortunate to have the active support of BHP and other Wollongong enterprises.

Relationships between the University and Government were mixed in tone during 1989. Wollongong, together with other universities, fought to retain wider representation on its Governing Council than that originally proposed in the State Government's unilateral amendment of all NSW University Acts. The University view prevailed to the extent that two more places were allowed on Council, including one student member and provision for a member coopted by Council. Most importantly, the Council retained its right to appoint a Chancellor from outside its own ranks: an essential provision, especially with a reduced Council, to ensure that the Chairman of the Council and leader of the University community is chosen from an eminent and varied field. Nevertheless the restricted numbers within the company directors' model favoured by the State government have unduly limited the range of input into Council decision making.

To the University's and the community's major disappointment, the NSW Government reneged on the terms of an original agreement to provide a level of funding for the Wollongong Conservatorium of Music. In 1989 the Government grant was reduced to \$30,000 making the operation practically untenable for the University other than by an unreasonable further increase in subsidy from its own funds. Unfortunately the State government arguments lost sight of earlier promises and of the cultural and educational needs of a large city and the University's role in identifying and meeting these needs. At the time of reporting, negotiations were unfinished, with some prospects that the government might soften its stand.

The year finished on a high note. On December 8 the University held a graduation ceremony to confer postgraduate degrees and three honorary Doctorates. Degrees of Doctor of Letters were conferred on the Rt Hon Sir John Gorton, the Rt Hon Michael Somare and the Hon Gough Whitlam for their contributions to the cultural, educational and political independence of their nations. The former Vice-Chancellor of the University of Papua New Guinea, Professor Ken Inglis, commented in a commemorative article for the occasion:

"At a time of such ferment, every public event in a university takes on a



The three prime ministers who were honoured by the University by the award of Honorary Doctorates are seen here after the ceremony. They are, from the left, the Hon Gough Whitlam, the Rt Hon Michael Somare and the Rt Hon Sir John Gorton

symbolic importance; and in offering honorary degrees to Sir John Gorton, Gough Whitlam and Michael Somare The University of Wollongong is making an affirmation about higher education and nationhood. Honouring a Prime Minister is not unusual. Honouring two Prime Ministers on the one occasion is as far as I know unprecedented. Honouring three Prime Ministers is a gesture of breathtaking inspiration."

This is a good summary point for the year. The University has sought to approach all its planning and development with similar flair. It has been a year of satisfying developments.

Professor K.R. McKinnon, March 1990

GOVERNMENT OF THE UNIVERSITY

Principal Officers

Visitor

His Excellency the Governor of New South Wales

Chancellor

The Honourable Mr. Justice Robert Marsden Hope, AC, CMG, LLB *Syd.*

Deputy Chancellor

Brian Somerville Gillett, BA DipEd *Syd.*, DLitt

Vice-Chancellor and Principal

Professor Kenneth Richard McKinnon, A.U.A. *Adel.*, BA BEd *Q'ld.*, EdD *Harv.*, FACE

Deputy Vice-Chancellor

Professor Ian W. Chubb, MSc DPhil *Oxf.*

Vice-Principal (Administration)

Kenneth B. Baumber, BSc *St. And.*

Vice-Principal (Development)

James W. Langridge, BBus *NSWTT*
DipTertiaryEd, *NE*, MACS.

Pro Vice-Chancellor

Professor J. Lauchlan C. Chipman, MA LLB *Melb.*, BPhil, DPhil *Oxf.*, DipTertiaryEd *NE*.

The University Council*

Elected by the Legislative Council

The Honourable Edward Phillip Pickering, MLC, BSc (Chem. Eng.) *NSW* (from 26 May 1988)

Elected by the Legislative Assembly

The Honourable Christopher John Downey, M.L.A., BA DipEd *Syd.* (from 21 June 1988)

Ministerial Nominees

Brian Somerville Gillett, BA DipEd *Syd.*, DLitt (6 December 1988 to 31 December 1989)

University Council

From left, front row: Dr Winifred Mitchell, Professor Ron King, Dr Brian Gillett (Deputy Chancellor), Mr Justice Robert Hope, AC, CMG (Chancellor), Professor Ken McKinnon (Vice-Chancellor), Mr Rod Oxley, Mr Ron Griffiths, Mr Keith Phipps; back row: Mrs Lynn Woodley (minute secretary), Dr Max Lowrey, Mrs Susan Chapman, Dr John Panter, Professor Lauchlan Chipman (Pro Vice-Chancellor), Mr Tony Kent, Dr Arthur Smith, Mr Ron Parker, Mr Jim Langridge, Mr Gary Ryan, Professor Ian Chubb (Deputy Vice-Chancellor), Mr Ken Baumber (Vice-Principal (Administration)), Ms Felicity McGregor, Dr Ted Booth, Mr Michael Arrighi, Professor Stephen Castles. Professors Chipman and Chubb and Mr Langridge are not members of the Council but may be asked to sit in to answer questions in their areas of interest



Susan Louise Chapman, Dip Health Admin
Mitchell, BA (6 December 1988 to 31 December
1989)

Jeremy Kitson Ellis, MA *Oxf.* (6 December
1988 to 6 December 1991; resigned 12 Septem-
ber 1989)

Albert Coulston Evans, A.M. (6 December
1988 to 31 December 1989)

Ronald Griffiths (6 December 1988 to
6 December 1990)

Harold Hanson, DipLaw (S.A.B.) *Syd.* (6 Dec-
ember 1988 to 31 December 1989)

Ronald William James, BA MB, BS *Syd.*, DGO
Dublin, FRCOG, FRACOG (6 December 1988
to 31 December 1989)

Roderick John Oxley, BBus, AssDip Local
Govt Admin., *Mitchell*, C.P.A., F.A.I.M. (6 Dec-
ember 1988 to 31 December 1989)

Ex Officio

The Chancellor: The Honourable Mr Justice
Robert Marsden Hope, AC, CMG, LLB *Syd.*
The Vice-Chancellor and Principal: Professor
Kenneth Richard McKinnon, A.U.A. *Adel.*, BA
BEd *Q'ld.*, EdD *Harv.*, F.A.C.E.

Elected by the Students of the University

Daniel Morrissey, BA (21 November 1987 to
31 December 1989)

Monique Danielle Licardy (21 November 1988
to 31 December 1989)

Paul L. Manning, BEd *Syd.* (21 November
1987 to 31 December 1989)

Elected by Convocation

Michael Arrighi, BA Hons. (21 November
1988 to 31 December 1989)

Keith W. Phipps, BA DipEd MACE
(21 November 1987 to 31 December 1989)

Winifred Joyce Mitchell, MA N.E., PhD NSW
(21 November 1988 to 31 December 1989)

Gary R. Ryan, BCom M.Mgt (21 November
1986 to 31 December 1989)

Elected by the full-time Academic Staff of the University

Two Professorial Members

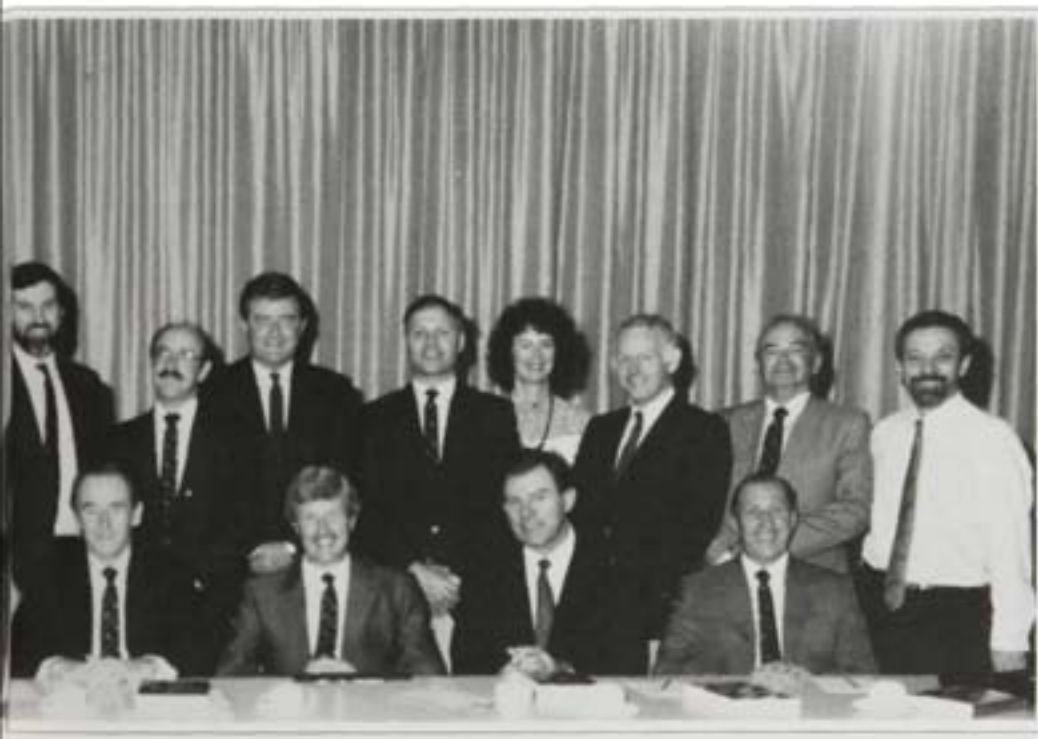
Stephen Castles, Vor-Diploma Soc., *Fran Am
Main*, MA, DPhil *Sus* (21 November 1988 to
31 December 1989)

Ronald C. King, BCom BEd *Melb*, PhD
Monash, FAPsS (21 November 1988 to
31 December 1989)

Two Academic Staff Members other than Professors

Maxwell J. Lowrey, MEN.S.W. PhD, ASTC,
MIEAust, MACS (21 November 1988 to
31 December 1989)

John J. Panter, BA *Adel*, PhD NSW
(21 November 1986 to 31 December 1989)





P.C. Arnold



B. Baader



H. Beran



P.D. Bolton

Two Members elected by the Institute Academic Staff

Edward O. Booth, BEc DipEd, MEd, Syd., Ed.D Hawaii (21 November 1987 to 31 December 1989)

Arthur Smith, MA Stan, PhD, Ohio (21 November 1988 to 31 December 1989)

Elected by the full-time General Staff of the University

Felicity McGregor, BA DipLib NSWALAA (9 December 1988 to 31 December 1989)

Ronald B. Parker, BA (21 November 1987 to 31 December 1989)

Anthony Kent (21 November 1988 to 31 December 1989)

Secretary to Council

Mr Kenneth Baumber, Vice-Principal (Administration)

THE ACADEMIC SENATE

Chairman of Senate

Professor Ronald C. King

Ex Officio Members

The Honourable Justice Robert M. Hope, AC, CMG, Chancellor

Professor Kenneth R. McKinnon, Vice-Chancellor and Principal

Professor Ian W. Chubb, Deputy Vice-Chancellor

Mr Kenneth E. Baumber, Vice-Principal (Administration)

Professor J. Lauchlan Chipman, Pro Vice-Chancellor

Mr John Shipp, University Librarian

Heads of Departments

Professor Michael J.R. Gaffikin, Department of Accountancy

Professor Helen M. Garnett, Department of Biology

Professor Leon Kane-Maguire, Department of Chemistry

Professor Lewis C. Schmidt, Department of Civil & Mining Engineering

Associate Professor Gregory Doherty, Department of Computing Science

Professor Dudley A.S. Jackson, Department of Economics

Professor Hugh S. Bradlow, Department of Electrical & Computer Engineering

Associate Professor James M. Wieland, Department of English

H.S. Bradlow



M. Bunder



G.D. Calvert



R.G. Castle





S. Castles



T. Chandra



C.E. Ezean



J.E. Falk

Professor Murray G.A. Wilson, Department of Geography

Professor Alan C. Cook, Department of Geology

Professor Edward P. Wolfers, Department of History & Politics

Associate Professor Graham K. Winley, Department of Information Systems

Professor Brian Moloney, Department of Languages

Professor Helen Gamble, Department of Legal Studies

Professor Julian F. Lowe, Department of Management

Professor David Griffiths, Department of Mathematics

Professor Peter Arnold, Department of Mechanical Engineering

Professor William J. Plumbridge, Department of Materials Engineering

Dr Harry Beran, Department of Philosophy

Professor Peter Fisher, Department of Physics

Professor William J. Lovegrove, Department of Psychology

Associate Professor James E. Falk, Department of Science & Technology Studies

Professor Stephen C. Hill, Department of Sociology



P. Fisher



H. Garnett



D.A. Griffiths



J.M. Hagan

C.D. Cook

G. Doherty



S.C. Hill



M. Hough



N. Kennon



R.C. King



N. Kyle



R. McC. Lilley



W.J. Lovegrove



J. Mangan

Deans of Faculties

Professor James S. Hagan, Faculty of Arts
 Associate Professor John C. Steinke, Faculty of Commerce
 Professor Russell D. Linke, Faculty of Education
 Associate Professor Noel F. Kennon, Faculty of Engineering
 Associate Professor Christine E. Ewan, Faculty of Health and Behavioural Sciences
 Associate Professor Martin Bunder, Acting, Faculty of Mathematical Sciences
 Associate Professor Peter D. Bolton, Faculty of Science



A.G. Morris



L.B. Pickering

Dean of Students

Professor Murray G.A. Wilson

Heads of Schools

Professor G. Dennis Calvert, School of Health Sciences
 Professor Barry Conyngham, School of Creative Arts
 Professor Carla Fasano, School of Policy & Technology Studies
 Professor Ronald C. King, School of Learning Studies

J. Pincombe



W. Plumbridge



E. Richards



L.C. Schmidt



Heads of Centres

Professor Stephen Castles, Centre for Multi-cultural Studies

Professor Ron Johnston, Centre for Technology & Social Change

Professors

Professor Günter Arndt, Department of Mechanical Engineering

Professor Chris D. Cook, Department of Electrical & Computer Engineering

Professor Ken Gannicott, School of Policy & Technology Studies

Professor James M. Hill, Department of Mathematics

Professor Michael Hough, Department of Management

Professor Raghu Singh, Department of Mechanical Engineering

Professor Sandra C. Speedy, School of Health Sciences

Academic Staff Elected by and from the Members of each Faculty

Dr Evelleen Richards (Faculty of Arts)

Mr Robert G. Castle (Faculty of Commerce)

Dr Noelene Kyle (Faculty of Education)

Dr Tara Chandra (Faculty of Engineering)

Mrs Jan Pincombe (Faculty of Health & Behavioural Sciences)

Dr A. Grahame Morris (Faculty of Mathematical Sciences)

Associate Professor Ross McC. Lilley (Faculty of Science)

Student Members

Ms B. Baader

Mr S.I. Mawbey

Mr D.J. Morrissey

Mr L.B. Pickering

Mr A.C. Soper

Secretary to Senate

Mr Peter Wood, Assistant Secretary,
Academic Services Branch

* During 1989 the New South Wales State Government amended the Acts of Incorporation of all New South Wales universities. The new University of Wollongong Act was passed by the New South Wales Parliament on 13 October 1989 and will come into effect on 1 January 1990. The University Council, as constituted in 1989, will cease to hold office on 31 December 1989 and a new Council, reduced in number, will take office on 1 January 1990. Mr Justice Hope will continue to hold the office of Chancellor in the new Council.



P. Shepherd



R.N. Singh



A.C. Soper



S.C. Speedy



J.M. Wieland



G.K. Winley

E.P. Wolfers



P.G. Wood



ADMINISTRATION



*Professor Ian Chubb
Deputy Vice-Chancellor*



*Mr Ken Baumber
Vice-Principal (Administration)*



*Mr Jim Langridge
Vice-Principal (Development)*

During 1989, significant changes were made to the Executive Management structure of the University. The Deputy Vice-Chancellor (Services and Development), Professor Peter Rousch, who formerly held the position of Director of the Wollongong Institute of Education before its amalgamation with the University in 1982, retired in July. After his retirement the Executive was restructured in the following way.

The position of Chief Executive was renamed "Vice-Chancellor and Principal". It is now supported by a single Deputy Vice-Chancellor and a Pro Vice-Chancellor on academic matters, and by two Vice-Principals on administrative and developmental matters. This replaces the previous arrangement of two Deputy Vice-Chancellors, a University Secretary and a Deputy University Secretary / Business Manager.

This restructuring, shown diagrammatically on page 19, reflects the current directions and priorities of the University and will ensure



*Professor Lauchlan Chipman
Pro Vice-Chancellor*

that it continues to meet the new challenges and initiatives in a time of rapid change in higher education.

The Vice-Principal (Administration) now has the responsibility substantially for all the Central Administration activities of the University. Reporting to him are:

- *Academic Services Branch* responsible for secretariat support, research administration, postgraduate student matters and ceremonial matters (e.g. Graduation);

- *Buildings and Grounds* responsible for physical planning, design and construction of buildings, site services and maintenance;
- *Financial Services* responsible for budgetary and accounting services, business and office services, the Printery and campus security;
- *Personnel Services* responsible for academic and general staffing matters, including recruitment,

salaries, industrial relations, staff training and development;

- *Planning and Marketing* responsible for planning and statistics, marketing, media liaison, publications and schools liaison;
- *Student Services* responsible for undergraduate student matters, student counselling, Careers and Appointments and accommodation;
- *Administration Data Processing Unit* responsible for computer support of the Administration activities;

The Vice-Principal (Development) has a particular responsibility for the business, international and financial affairs of the University, including a continuing overview of budgetary strategies. The International Office, which is responsible for the promotion of the University overseas and the recruitment of international students, reports directly to the Vice-Principal (Development).

Some of the major activities impacting on the Administration during 1989 were:

- the enactment of a new University of Wollongong Act by the New South Wales Parliament during 1989, effective from 1 January, 1990. The most significant change for the University in the new Act is a reduction in the size of the Council from 29 members to 18. Reduction in the num-

ber of Ministerial appointees (from eight to four), academic staff (six to three), general staff (three to one) and students (also three to one) were specified in the Act;

- the introduction of Freedom of Information legislation by the New South Wales Government (see page 59 of this report);
- the introduction of major new Regulations on staff discipline for academic staff and Campus Access and Order Regulations to control the movement of people and vehicles on campus;
- the introduction of the Higher Education Contribution Scheme (HECS) by the Federal Government from the beginning of 1989 requiring major changes to administrative procedures and practices relating to student enrolment;
- a major review of the administrative support positions in academic Departments to address the significantly changing role of the traditional secretary to a broader administrative level. This has resulted in a revised classification system which provides greater opportunity by permitting promotion on the basis of personal skills and experience in combination with work value;
- changes to the University's faculty structure to accommodate new directions and emphases. Three new faculties were

Retired Professor Peter Rousch (left), now a Professor Emeritus of the University, is seen here after having formally declared open Heritage Week 1989. Also in the picture are Ms Carol Speechly and Dr Arthur Smith



created in 1989 - one of these, Law, is a new Faculty set up to prepare for the first intake of Law students in 1991; the other two, Health & Behavioural Sciences and Informatics, are rearrangements of existing units in the University and reflect the growth and development of the course offerings in these areas;

- * a significant program of capital development, including the commencement of construction of a \$10 million general purpose academic building, a 50 metre swimming pool, and the provision of an additional 300 student residential places;
- * substantially increased and targetted promotion and marketing of the University, including enhanced media coverage, range and quality of publications and schools liaison;

The year was also a successful in the international arena. The International Office provided a focus within the University for the activities associated with marketing the full-fee overseas program and other international activities. University representatives continued the program of visits to countries within the South-East Asia Pacific region for the purpose of recruiting students and establishing links with other institutions. As a result, over 250 students were enrolled in Autumn Session in both undergraduate and post-graduate courses in each of the six Faculties. The largest proportion of students were enrolled in the Faculty of Commerce. A mid-

year intake resulted in a further 50 students being enrolled in a range of courses. The number of commencing students in 1990 is expected to increase to around 300.

Formal links were established with Tunghai University in Taiwan and Chulalongkorn University in Thailand and discussions are under way with several institutions in the United States of America. The US program was expanded considerably during 1989 and staff from the International Office attended the annual National Association of Foreign Student Advisers Conference in Minneapolis-St Paul in late May. The number of Study Abroad students is expected to increase during 1990 as a result of the promotional work conducted during 1989. A successful orientation program was conducted on behalf of Cornell University for their students who commenced study for one session as a number of east coast institutions, including the University of Wollongong in July.

The International Office continued to explore potential new markets in the Asia-Pacific region, especially in the light of the significant changes to the Australian Government policy on overseas students during 1989.

In summary, 1989 was another busy and productive year for the University's Administration. Much has been achieved, both in support of day-by-day activities and in assisting the changing face of the Institution. 1990 promises to be equally challenging and rewarding.

CHARTER

The University of Wollongong was established and incorporated by an Act of the New South Wales Parliament: 'The University of Wollongong Act, 1972' and commenced on 1 January 1975. An amending Act, 'The University of Wollongong (Advanced Education) Amendment Act, 1982' led to the amalgamation of the former Wollongong Institute of Education with the University.

The aims of the University are contained in Section 10(i) of the Act, which states that the University shall, within the limits of its resources:

- (a) provide at Wollongong or elsewhere educational facilities at university standard and advanced education courses for any persons enrolled therein;
- (b) disseminate and increase knowledge and promote scholarship;
- (c) confer and award degrees and diplomas; and
- (d) have particular regard to the need for educational facilities of university standard and for advanced education courses in the Illawarra region.

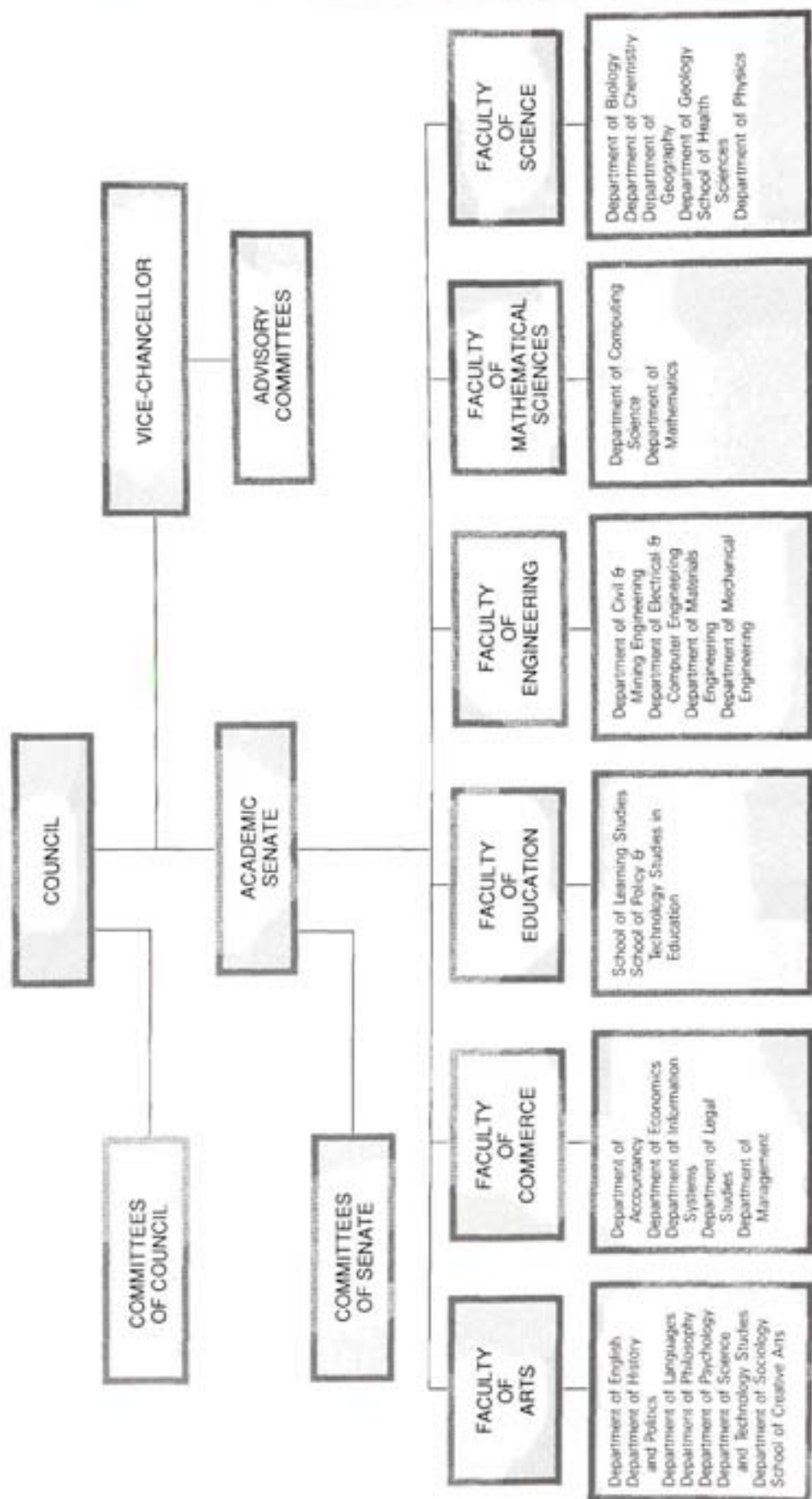
The University is governed by the Council, consisting of ex-officio members (the Chancellor, the Vice-Chancellor and the Director of the Institute), eight Ministerial nominees, two members elected by Parliament, three members elected by students, nine members elected by academic and general staff and four members elected by the Convocation. There is one major Committee of Council, the Administrative Committee.

The major academic body providing advice to Council on academic matters is the Academic Senate.

MISSION STATEMENT

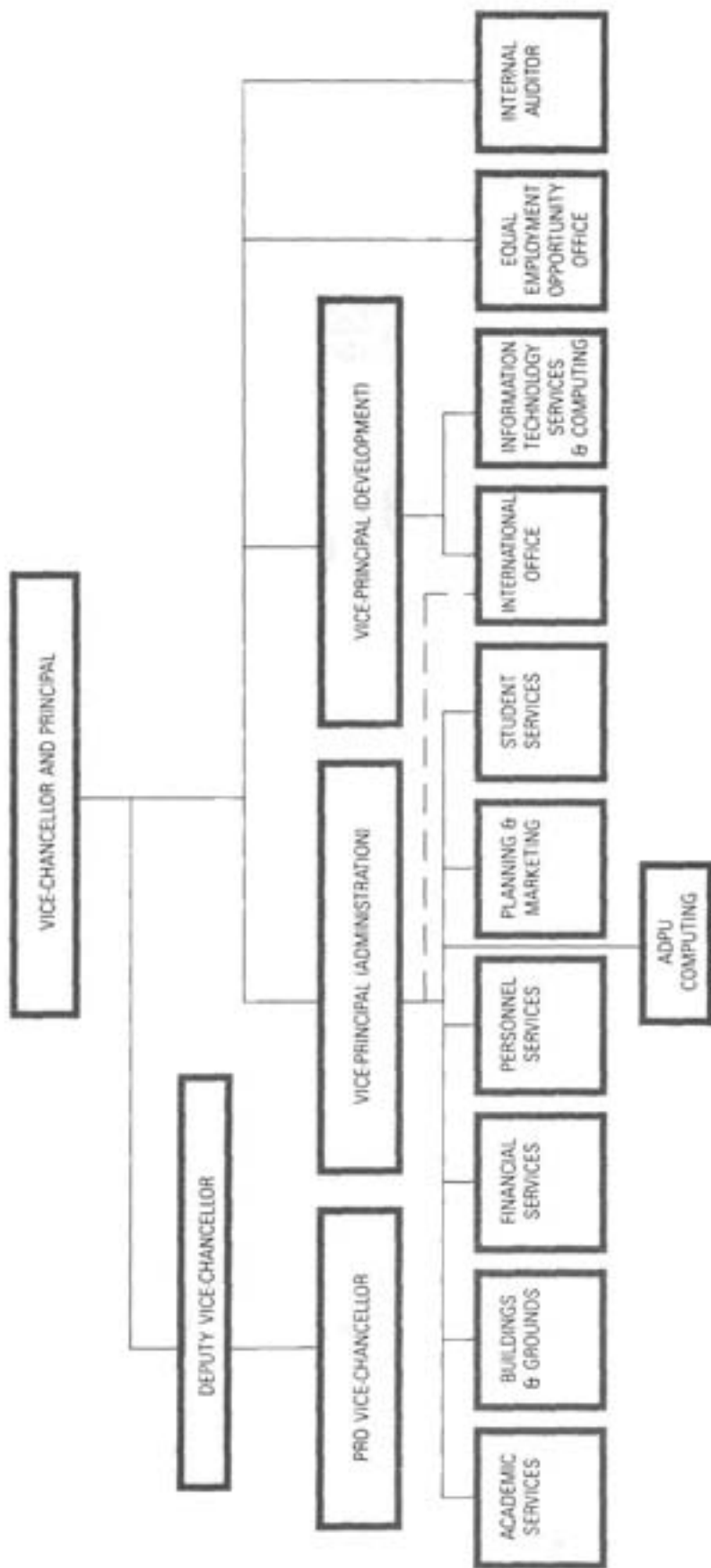
1. The prime objective of The University of Wollongong is to be strong in both the traditional and new disciplines at both undergraduate and postgraduate levels so as to produce graduates and research outcomes of international distinction and in areas of national importance.
2. The University especially emphasises in its courses and research activities the comprehension, critical evaluation, and application of science and new technologies to industry, commerce and society.
3. The University is committed to increasing excellence through the attraction of increasingly well-qualified students from both within Australia and from overseas. Specific objectives designed to ensure this academic excellence include strong student advice and support arrangements, stringent progress requirements and constant updating of curricula content.
4. The University recognises its special responsibility to the educational needs of its region's population and aims to meet that obligation through arrangements which encourage greater participation in higher education.
5. A broad general education combined with appropriate specific or professional skills will be provided for all students. Research skills, communication skills, computer literacy, skills in logical exposition and competence in the use of statistical concepts will be expected of all graduates.
6. High standards of teaching and performance and of research activity, both basic and applied, are encouraged and maintained through staff development, evaluation and guidance programs.

ACADEMIC GOVERNANCE OF THE UNIVERSITY



- NOTES: (1) A new Faculty—the Faculty of Informatics—will amalgamate the Faculty of Mathematical Sciences and the Department of Electrical and Computer Engineering from the beginning of 1990.
- (2) At the end of 1989 the structure of the Faculty of Law was still to be determined. The Faculty will, however, include the staff of the Department of Legal Studies and will become operational from the beginning of 1990.
- (3) The Faculty of Health and Behavioural Sciences, consisting of the School of Health Sciences and the Department of Psychology, was established during 1989. It will be fully operational in 1990.

ADMINISTRATION OF THE UNIVERSITY



Reports from Faculties

Academic Activities

Faculty of Arts

The Faculty of Arts shares the aims of other Arts faculties in universities throughout the world: to develop the study of the Arts disciplines in their own right by promoting coherent courses of study; and by maintaining research opportunities for staff. It believes that one is essential to the other, and that without their nexus, teaching loses its vigour. Staff who are themselves involved in inquiry and creativity are best able to excite enthusiasm for critical thought and stimulate the power to imagine among their students.

The range of courses the Faculty offers is rather wider than those commonly offered by faculties of

equivalent size. It provides courses in the humanities, the social sciences, and in the creative arts: from long-established subjects such as philosophy, history and languages, through psychology and sociology, to painting, ceramics, theatre and music.

Successful study of these subjects in approved sequences at undergraduate level leads to one of the three Bachelor's degrees administered by the Faculty: the Bachelor of Arts, the Bachelor of Creative Arts and the Bachelor of Information Technology and Communication.

At postgraduate level, the Faculty offers a range of Masters degrees by coursework and by thesis, a Doctorate of Creative Arts involving presentation and thesis and a Doctorate of Philosophy by thesis only. It is also possible to take a one-year postgraduate Diploma of Arts, specialising in one or more of the disciplines within the Faculty.

All these courses teach the skills of thinking and communication which are common to all scholarly inquiry and discourse, and their application, in a humane social context. All are concerned with theory; it is difficult to distinguish between them very clearly in terms of their practicality. Theoretical knowledge is eminently practical in the sense that those who know how to apply it have the means to adopt their knowledge to changing circumstances. Those who do not are destined to operate with knowledge that is obsolescent.

Professor Brian Moloney became Head of the Department of Languages at the beginning of the year. He has a Master of Arts and Doctor of Philosophy degrees from Cambridge University. His most recent appointment was as Head of the Italian Department and subsequently as Chairman of the School of Modern Languages and Cultures at the University of Hull. Professor Moloney has published extensively and for a time edited 'Italian Studies'





Similarly, those who operate their skills without an appreciation of their cultural inheritance, or an awareness of the possible social consequences of their actions, make at best a dubious contribution to the present and the future. The Faculty tries to ensure that its own students do better, and it looks forward to being able to help students in other faculties place their skills in cultural and social perspectives.

In the past few years, the Faculty has increasingly concentrated its resources on the study of technological change and its social effects. The context of this study has so far been mainly Australian but in the past year or so the Faculty has developed research projects and courses of study concerned with Australia's northern neighbours.

In 1988, the Faculty set itself some specific tasks to further this trend, and fulfilled some of them in 1989.

The Department of History and Politics offered a Master of Arts in International Relations, designed for middle-level administrators in Papua-New Guinea and the developing countries to our north; 14 students began their studies during the year.

The Department of English built on the achievements of its New Literatures Research Centre (which

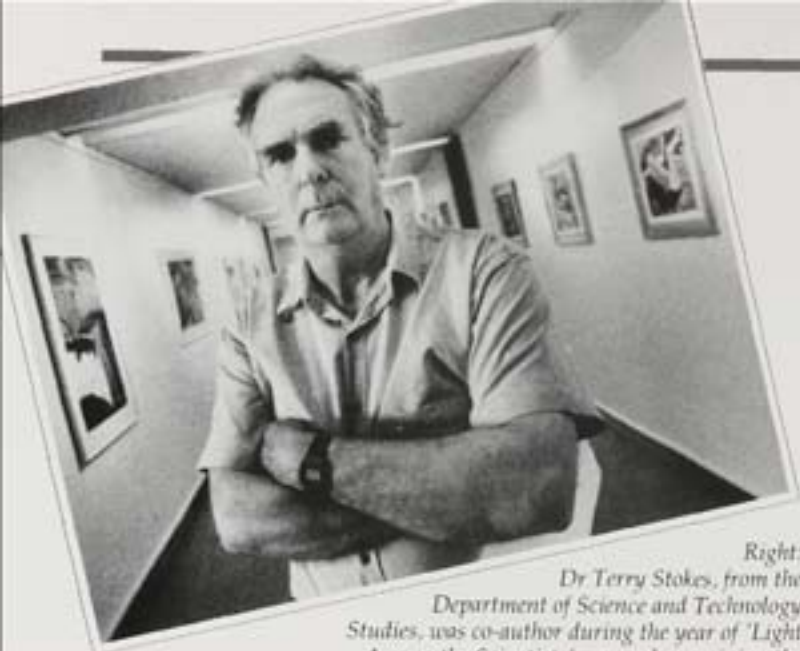
is concerned with the 'new English' literatures of emerging nations from Papua New Guinea to Malaysia) by offering a Master of Arts by coursework, which will enable students from Australia and overseas to undertake a range of studies in Post-colonial Literatures. The Department of Languages has begun to offer Bahasa Indonesia and Bahasa Malaysia as a regular first year subject, and (depending on funding) will develop it to a major study.

Other departments offered new courses of a more general kind which also allow a concentration on the problems of countries to our

A Department of Languages class in session. During the year the Department began to teach Bahasa Indonesia and Bahasa Malaysia as a regular first-year subject

The Faculty of Arts offers a wide range of courses in the humanities, the social sciences, ranging from traditional subjects such as philosophy, history and languages to psychology and sociology, to painting, theatre and music and ceramics





Above: John Eveleigh described the exhibition of his paintings, Heroic Materialism and the Natural Order, as being concerned with an aesthetic response to industry and landscape

Right: Dr Terry Stokes, from the Department of Science and Technology Studies, was co-author during the year of 'Light Among the Scientists' - a work examining the Walter and Eliza Hall Institute for Medical Research



north. The Department of Science and Technology Studies, in conjunction with the Centre for Technology and Social Change, in 1989 offered the Master of Policy (Technology Policy), a course which is concerned with the study of Technological Policy. Several departments have combined in revising the subjects in the less specifically-focused Master of Policy (Social Policy) degree. Professor Stephen Hill, Chairman of the Department sponsoring the latter degree, became Foundation Chairman of the United Nations Science and Technology Policy Asian Network (STEPAN).

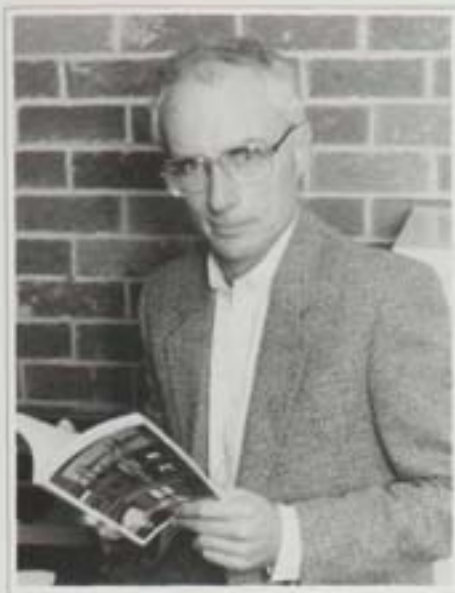
These developments have helped the Faculty fulfil its aim of applying theoretical knowledge to practical ends. It broke new ground by entering the field of co-operative education. Its new fourth year subjects in the B. Info. Tech. degree provide for an extended period in which students will work for an

employer, and use that experience in furthering their studies.

In developing its Master of Arts degree in Journalism, the Faculty planned a course of studies which will allow the Foundation Professor to provide for a concentration of practical work in planned conjunction with employers. The same interest in producing

The Department of History and Politics offered a Master of Arts in International Relations designed for middle-level administrators from the developing countries to the north. This picture shows career diplomats from Indonesia and Papua New Guinea together with four students undertaking other programs





Left: Another Writer in Residence at the Department of English was the outstanding Australian author and novelist, Alex Buzo, whose work ranges across prose to poetry to theatre to radio

graduates of truly professional skill extends to the School of Creative Arts, which opened a new 100 seat experimental theatre in August, and soon afterwards used it for two major productions.

The new courses are signs of the Faculty's progress in the teaching and research directions it has set

itself. In teaching them, it will continue to bear in mind that it is teaching skills, as well as passing on subject matter. It hopes graduates will continue to show both theoretical and practical skills, and possess that humane knowledge that will allow them to increase the value of their own lives, and the lives of those around them.

Above: John Scott, a new lecturer in poetry and prose fiction in the School of Creative Arts, took up where Ron Pretty left off for six months sabbatical in England



Faculty of Commerce

Professor Helen Gamble gave up her position as Chairman of the New South Wales Law Reform Commission to establish a Department of Legal Studies at Wollongong University. She is the Faculty's first woman professor



Backward glance to University Day in May, when Associate Professor John Steinke, of the Department of Economics, and Dean of the Faculty, was presented with an award marking his 25 years of distinguished service at the University. With him is the Chancellor, Mr Justice Hope AC, CMG



Strong demand was again expressed for courses in the Faculty of Commerce at both undergraduate and postgraduate level. As in 1988, it was necessary to place limitations on enrolments in the Bachelor's degree, making the Faculty's HSC entry aggregate the highest for any of the major degrees offered at the University.

Availability of Commerce subjects to students in other faculties was also necessarily restricted, as were transfers from students enrolled in other degrees. Applications to transfer into the Bachelor of Commerce greatly exceeded the number accepted, but a significant number of students successfully met the stringent requirements.

The Associate Diploma in Computer Applications likewise continued to enjoy a high demand, despite the existence of a separate specialisation in Business Systems Analysis within the Commerce degree. This demonstrates convincingly a perceived need by employers for computer expertise from staff members.

All Faculty courses attracted an increasing number of international students, thus indicating the growing reputation of Wollongong University overseas, as well as in Australia.

The Department of Legal Studies became autonomous, after the prestigious appointment of Professor Helen Gamble, the Faculty's first woman professor. Legal Studies is now developing its course offerings to encompass a

variety of educational and vocational needs. A Graduate Diploma in Law was approved, to be offered in 1990.

Research activity thrived during the year, with open seminars a regular feature in all departments. Faculty has also succeeded in attracting from overseas a number of visiting fellows, who collaborate with staff members on common research developments. Although these fellows are not invited to teach on a regular basis, they offer occasional seminars which are of direct, as well as indirect, benefit to students in their department.

Perhaps as a response to staff commitment to research, student numbers in research degrees are growing. This is particularly true of the Master of Commerce in the areas of accountancy and economics, where numbers have traditionally been quite small. The Faculty presently has almost 40 domestic students enrolled in higher degrees by research or with an appreciable research component. Eight of these enrolments are at PhD level.

The Faculty's MBA course remains a drawcard both for graduates



Professor Michael Gaffikin, head of the Department of Accountancy

working in local industry and international students. Provision of management training to graduates in other disciplines is obviously most appropriately provided at a stage where they clearly recognise the need for such knowledge in their workplace and are therefore willing to make the considerable commitment of time and energy required to gain that qualification.



A lecture on Management in progress. The lecturer is Dr Muayyad Jabri

Faculty of Education

A significant development for the Faculty in 1989 was the arrival of two new Professors of Education. Professor Ken Gannicott was appointed to the School of Policy and Technology Studies in Education, while Professor Russell Linke, appointed to the School of Learning Studies, also took his place as Dean of the Faculty. As a result of seven retirements the Faculty also underwent numerous staff changes during the year. It is anticipated that the Faculty will experience a similar number of retirements in 1990.

The number of students enrolling in postgraduate studies in the Faculty continued to increase, with the Master of Education experiencing a particularly dramatic growth in enrolments from seven in 1988, to 51 in 1989.

Reorganisation of the course in 1988 proved to be so popular that students completing the Master of Studies in Education, who also satisfied requirements for the award

of Master of Education, almost without exception elected to graduate under the Master of Education title.

During the year the number of international full-fee-paying students applying for entry into Faculty postgraduate courses at the Ph.D., Masters (Honours) and Pass Masters level, continued to increase.

The Graduate Diploma in Educational Studies (Computers in Education) was reviewed during 1989, with particular emphasis on the structure of the course for the purpose of incorporating recent developments in the educational applications of computers. As a result, a new schedule of subjects was approved by Council, for implementation in 1990.

The Faculty has advertised the phasing out of its external teacher education courses. Final intakes for all courses will occur in 1990. It is expected that the last of these students will graduate at the end of 1994. Thus, from 1991, teachers

Two new professors of Education took up their duties during the year. On the left is Professor Russell Linke, Dean of the Faculty. With him is Professor Ken Gannicott, who is at the School of Policy and Technology Studies





Associate Professor Brian Cambourne, front row left, has gained an international reputation for his work on studies in literacy and for leading the way in more effective teaching and learning. Members of his research team are, front row, Kerry Lyon, Fiona McKay and Jan Turbill and, back row, Peter Keeble, Sue Curtis, Bob Colevin and Bevan Ferguson

seeking an upgrading of a two-year Teacher's Certificate to three-year Diploma of Teaching, or a three-year Diploma of Teaching to four-year Bachelor of Education Degree, will be able to do so only through participation in the Faculty's on-campus academic program.

The Bachelor of Education (Secondary) Science, which began in 1988, doubled its intake in 1989 with students in the course continuing to achieve a pleasing success rate.

In 1989 a select number of students enrolled in the fourth year of the Bachelor of Education (Primary). Competition for places in the course is high and because of this and the number of suitably qualified applicants it is anticipated that approximately 48 students will enrol in the course in 1990.

In its first year of operation, the number of students undertaking the Bachelor of Education (Honours) course was six, comprising five students from the Bachelor of Education (Primary) and one from the Bachelor of Education (Secondary) English/History.

The Graduate Diploma in Education continued to draw far more applicants than could be

accepted. The number of applicants for entry into mathematics and science methods is, however, disappointingly low. Similarly, the Faculty's undergraduate courses, the Bachelor of Education programs, attracted far more students than could be accommodated in all areas except in mathematics education and science education.

During the year the Faculty was visited by the Panel from the Discipline Review of Teacher Education in Mathematics and Science. In addition, the Faculty prepared a detailed submission in response to the Panel's request for information about the Faculty's courses in the mathematics and science education areas.

In second session, the Faculty formed a Teacher Education Review Committee to undertake a review of all the Faculty's teacher education programs, taking into consideration current, and future, teacher education needs and trends. The committee, which included representation from all course areas in the Faculty, and was open to any staff member interested in contributing to the review, met for the first time in September to discuss a timeline and terms of reference.

Faculty of Engineering



Professor Günter Arndt took up his appointment as Foundation Professor of Manufacturing Engineering in mid-year. He is Australia's first Professor of Manufacturing Engineering

The first Dean of the Faculty of Engineering, Professor Brian Smith, retired at the end of 1988, and pending appointment of a successor Associate Professor Noel Kennon was appointed Dean for an interim period from January 1. The Sub-Dean of Faculty, Dr Max Lowrey, whose term of office expired in mid-year, was reappointed for an additional period of 12 months.

Three professorial appointments were finalised during the year. Professor Christopher Cook took up appointment as Professor of Electrical Engineering in February. Professor Günter Arndt took up appointment as Foundation Professor of Manufacturing Engineering in the middle of the year. And Professor Raghu Singh was appointed to the Giant Resources Chair of Mining Engineering. It was expected that Professor Singh would take up his duties early in 1990.

Additional academic appointments were made in all departments but perhaps the most significant was the arrival of Dr Golshah Naghdy in Electrical and Computer Engineering as the second woman member of academic staff in the Faculty.

The Faculty continued to promote engineering for females by organising the annual Women in Engineering careers night, which was particularly successful. There was an attendance of over 80. As a result of efforts such as this, female participation in engineering is increasing and in two departments is particularly pleasing. Seven of the 17 new students in Materials Engineering in 1989 were women while in Electrical and Computer Engineering ten of the 25 female students were in first year. Additionally during the year, five women in Electrical and Computer Engineering were completing requirements for the degree of Bachelor of Engineering.

Recruitment effort substantially increased with the establishment of a Faculty-based Schools Liaison Committee to organise promotional material, visits to high schools and participation in careers functions. The first steps towards serious participation in international recruiting were taken with the submission, to the Engineering Board in Singapore, of applications for accreditation of Wollongong engineering courses. Faculty is in the process of establishing an International Liaison Committee to assist and advise the Dean in the development of strategies for attracting overseas students to study engineering at this University.

Three research centres became functional during the year. A Key Centre for Mines was established as



a joint enterprise between the Department of Civil and Mining Engineering, the Department of Geology and the School of Mines at the University of New South Wales.

A Centre for Materials and Surface Engineering associated with the Department of Materials Engineering was launched in August and a Key Centre for Advanced Manufacturing and Industrial Automation, associated with the Department of Mechanical Engineering, began operation. Through the auspices of the Key Centre for Advanced Manufacturing and Industrial Automation, the most advanced Flexible Manufacturing System in Australia has been set up within the Illawarra Technology Centre.

As part of the overall plan of the University for the rationalisation of research activity, seven research programs were established within the Faculty. These are Water



Above: Students in the Faculty have access to equipment that is among the best available anywhere. This student is working with one of the most modern of transmission electron microscopes

Professor Charles Gerrard is Professor for Mines in the Key Centre for Mines, operated by the Departments of Geology and Civil and Mining Engineering and the University of New South Wales

Engineering and Geomechanics, and Structural Engineering and Construction, in Civil and Mining Engineering; Advanced Telecommunications, and Industrial Automation in Electrical and



At what has become an annual Women in Engineering Information evening in June, bursaries were presented to four women. They are, back row, Selina Logan (by the Department of Civil and Mining Engineering) and Nicole Moroz (Mechanical Engineering), and in the foreground, Monika Motor (Electrical and Computer Engineering) and Brontwyn Gifford (Materials Engineering)

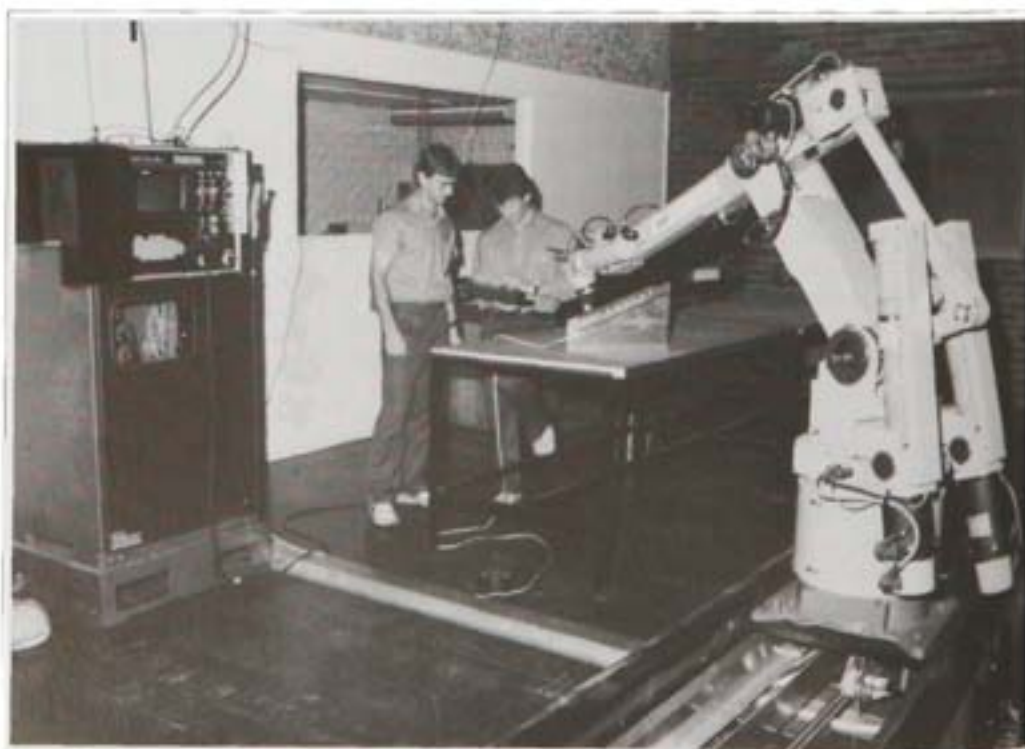
Computer Engineering; Advanced Materials and Surface Engineering in Materials Engineering; and Advanced Manufacturing Technology, and Bulk Materials Handling and Physical Processing in Mechanical Engineering.

Faculty research continued to be supported with funds from various sources, including substantial new grants gained through the BHP organisation for studies of road bases and pavement surfacing, through NERDDC for development of methods for accurately characterising stockpiles of coal and through GIRD for work on ceramic coatings and on improvement of welding of high strength low alloy steel.

Several significant changes were made to the teaching programs of the departments. Both Materials Engineering and Mechanical Engineering modified their undergraduate courses to about 192 credit points, in line with the other faculties; Civil and Mining Engineering obtained approval to fast-track the combined degrees of Civil Engineering/Commerce and Civil/Mining Engineering; and in collaboration with the University of Technology, Electrical and Computer Engineering established a Masters Degree in Telecommunications.

To assist and guide further

Students at work with a GMF S-100 robot. The robot is used in Manufacturing Engineering to teach the science of programming



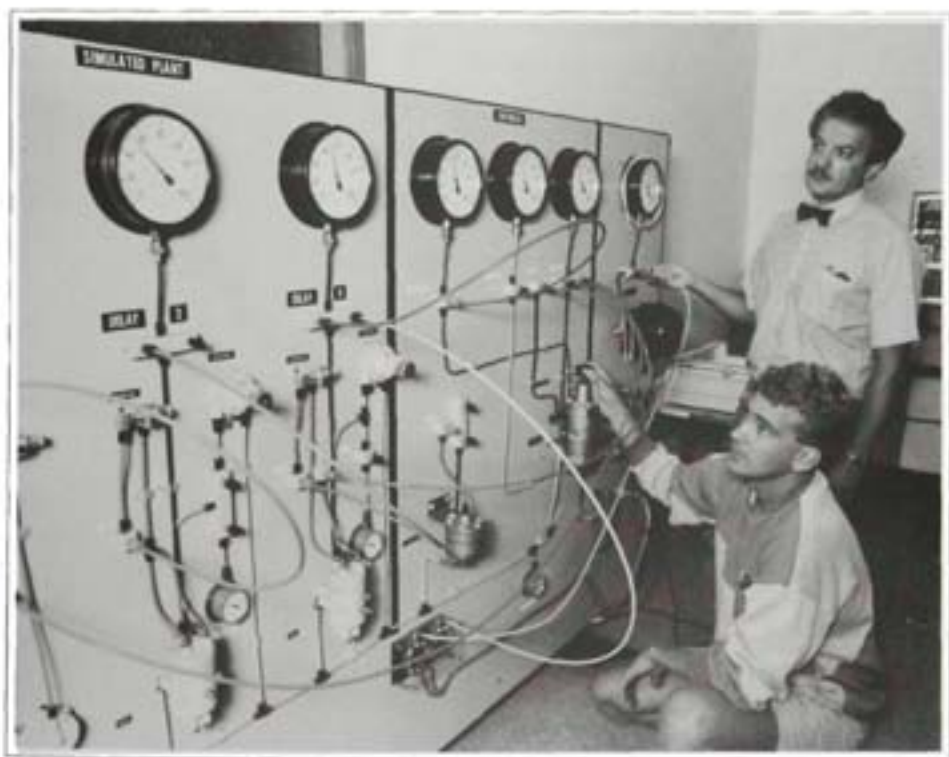


One of the highlights of the Mechanical Engineering students' year is the annual Creative Design Competition. The winners on this occasion, seen here with their 'Pool Access for the Disabled Hoist', are, from the left, Alan Towers, David Scott, Mr John Hobson, headmaster of Para Meadows School, Dr Bob Wheavay, of the Department of Mechanical Engineering and organiser of the competition, Peter Cable and Sandro Lucchini. The design is to be refined and a hoist manufactured by BHP for presentation to the physically disabled pupils of Para Meadows School

development of the Faculty, particularly in the climate of the new faculty structure of the University to be introduced in 1990, a Faculty Visiting Committee was established. A significant step in this move was the setting up, earlier in the year, of a Visiting Committee for the Department of Electrical and Computer Engineering to complement existing Committees

for Civil Engineering, Materials Engineering and Mining Engineering.

It is anticipated that the Faculty Visiting Committee will be a significant factor in planning and implementing the activities and ventures which will see important changes in the operation of the Faculty over the next few years.



Dr John Montagner and a student, Graham Caldwell, in the Department of Mechanical Engineering. This pneumatic process simulator parallels the operation of a small process plant, including feedback control. Students investigate the closed-loop response of the plant subjected to a process disturbance using a variety of controller settings

Faculty of Mathematical Sciences

Undergraduate student numbers increased by ten per cent over 1988 figures and this rate of growth is expected to be maintained over the next few years.

New teaching developments included the introduction of Modula-2 into first year to replace Pascal, and the introduction of a first-year course on computer systems and a second-year database subject. Software tools developed by Dr Maciaszek and his group for dataflow diagrams and entity relationship modelling were introduced into the software engineering, database, and business data processing subjects.

The postgraduate coursework offerings were consolidated around the departmental research themes of knowledge-based systems, database design and robotics.

Software projects this year include robot simulation and vision, image

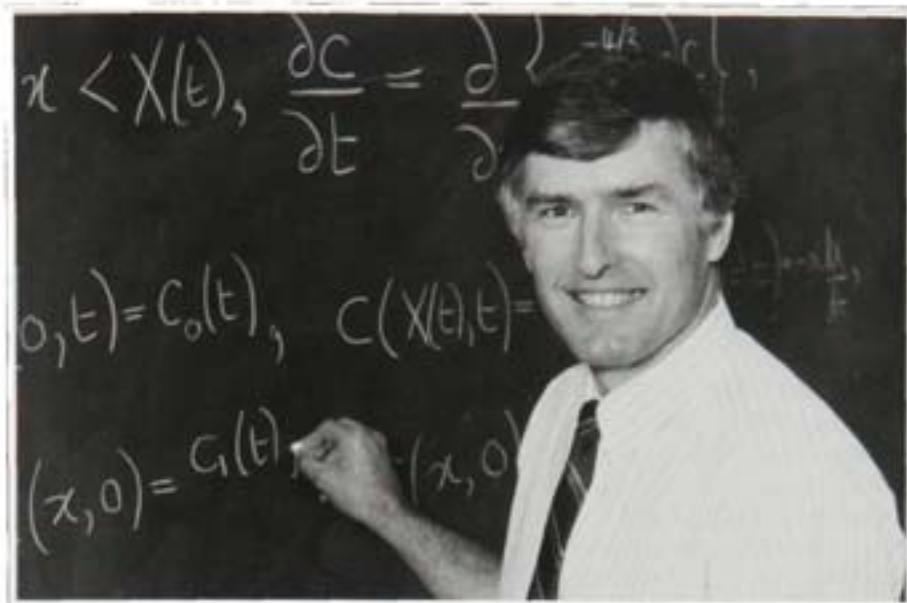
processing, a networked with player game, a CASE tool, backgammon, seat reservation systems, and library information retrieval, running on a number of Unix machines and Apple Macs.

Computing Science support staff are also heavily involved in the development of the campus computing environment, lending support in the areas of networking, Unix operating system installation and management, and the Apple consortium management. This contribution has developed because of the increasing convergence of technologies used by Computing Science and the rest of the academic activities on campus.

During 1989, significant changes took place in first-year teaching of Mathematics. Two 6 credit point sessional subjects (Foundations of Mathematics, and Data Analysis and Mathematical Modelling) replaced the previous 12 credit point annual

Eminent mathematician, Professor John Blake piles hands with a group of his past and present students and post-doctoral appointees at the farewell conference held in his honour in June to mark his departure. He left to become Head of the School of Mathematics at the University of Birmingham, England





Outstanding academic achievement by Professor Jim Hill in the Department of Mathematics was recognised by the award of a University Chair – known as a Personal Chair at some universities. Professor Hill has a formidable record in various areas of applied mathematics

subject, Mathematics 1B. Both subjects are intended primarily for students majoring in Mathematics. The first is designed to give students a rigorous foundation in those concepts that are basic to any study of Mathematics or Theoretical Computing Science.

The second emphasises the integrated use of analysis, graphics, computation and report writing in solving problems in Applied Mathematics and Statistics. A spreadsheet package has been developed in the department by Dr Chris Coleman for use in this and other courses.

The month of July saw three changes in the staff of the Department of Mathematics. Professor John Blake, who had been Dean of the Faculty of Mathematical Sciences or Head of the Department of Mathematics for nine years, left to head the Department of Mathematics at the University of Birmingham. Dr Brian Jefferies moved to Macquarie University and after a two-year absence broadening his experience in the Victorian Department of Agriculture, Dr Ken Russell returned to teaching. He has also taken on the role of Director of Statistical Consulting.

During the first half of 1989, Dr Ross Sparks ably filled this role in an interim capacity. The consulting service in statistics and mathematics is partly funded by the Board of Research and Postgraduate Studies and is available to all members of the University Research community. The consulting service has also extended its external links, particularly in the Illawarra.

Professor Reinfelds in 1989 moved to New Mexico State University, Las Cruces, as head of department there, after 15 years in Computing Science at Wollongong. Dr Korczak left the Department at Christmas for a professorial position at Louis Pasteur University in Strasbourg.

Dr Gorton arrived from Sheffield with a recent PhD in the application of transputers to the modelling of semiconductor devices. His teaching includes a new course in parallel computing for our graduate students.

Dr Hille remained at ETH Zurich for another year. In exchange, he arranged the visit of Dr Teufel, who is teaching compilers, and Ms Schmidt who is a teaching fellow. The department had two professorial positions and two lecturer positions advertised.

Faculty of Science

On July 26 the Federal Minister for Science, Small Business and Customs, Mr Barry Jones, opened the first stage of the Faculty's interactive Science Centre. The Centre's aim is to stimulate interest in science by students and the general public by providing 'hands-on' experience of science and technology and, in addition to demonstrate, in an exciting way, not only the basic principles of science but to provide also a showplace for new developments in technology and the innovative use of this technology by industry. More than 50 local and national industrial firms have sponsored exhibits in the Centre and during its first eight weeks of operation it welcomed more than 3000 visitors. For a full description of the Science Centre please turn to page 50.

During the second half of the year the Faculty underwent considerable reorganisation. The School of Health Sciences was detached from

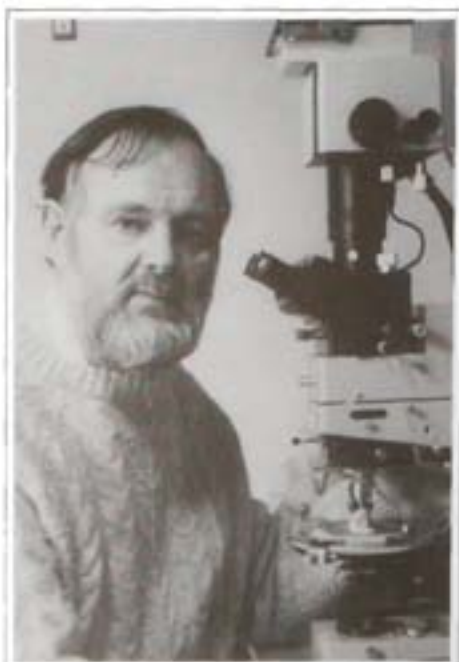
the Science Faculty to form, from 1 January 1990, together with the Department of Psychology, a new Faculty of Health and Behavioural Sciences.

This split is regarded by both faculties as the natural outcome of the growth and maturation of the School of Health Sciences. Arising from the formation of the new Faculty, the University on 11 August 1989 signed an agreement with the Illawarra Area Health Service for the operation of joint courses in Public and Community Health, Nursing and related sciences. With this and the inevitable growth in high-interest courses in this area, the new Faculty is destined in future years to play a major role in The University of Wollongong's activities.

In 1989 the Department of Physics moved more strongly into the futuristic area of quantum well physics. This is the branch of solid state physics in which new techniques for fabricating materials permit atomic layers of several substances to be deposited alternately in a controlled manner. The layered semi-conductor structures made in this way can be tailored to match not only the needs of device physicists but also those of researchers in materials science. This ability to produce 'custom-made' structures is causing a revolution in semi-conductor physics. Both theoretical and experimental research programs are in progress at The University of Wollongong, the experimental work involving the use of lasers and high field superconducting magnets to test, study and model the new materials.

During 1989 an increasingly important part of the Department of Geography's energies was channelled into research and teaching activities relating to the

Head of the Department of Geology, Professor Alan Cook was made a Fellow of the Australian Academy of Technological Sciences and Engineering. The award was made in recognition of his pioneering work in the source of natural gas and petroleum in sedimentary rock





Students at work in one of the laboratories in the Department of Biology

possible impact of climatic change on the future environment of Australia, in particular upon the Greenhouse Effect, and the question of whether the heating of the earth will cause sea levels to rise, inundating low-lying coastal areas and overwhelming many of the world's small island nations.

In the past year, for example, Dr Colin Woodroffe was invited to assist the government of the Maldiv Islands (Department of the Environment) — and supported in this task by the Australian International Development Assistance Bureau (AIDAB) — by compiling a report on the possible implications of the Greenhouse Effect on their national territory — a scattering of coral atolls in the Indian Ocean, most of them lying only a few metres above sea level. Somewhat surprisingly, his X-ray analysis of annual growth bands in coral heads suggests that there is little evidence to support the view that global warming has already begun to affect sea levels significantly.

Taking a different tack, based on extremely detailed analyses of the available international data on sea level changes, Dr E.A. Bryant has also concluded that there is, as yet, no evidence to support the view of generally rising sea levels. During the course of 1989 Dr Bryant has been an invited participant in several major conferences on the Greenhouse Effect, including those sponsored by CSIRO and more recently by Macquarie University.

A third approach to the problem is being taken by Associate Professor G.C. Nanson and his co-workers who are attempting to unravel the pattern of long-term trends in Australian climate and water regimes over the last 300,000 years in order to place possible future changes in the context of the range of natural changes from our recent geological past. Work recently completed suggests, in fact, that the level of natural variation is such that it might be difficult to ascribe future changes to other than natural causes.

Employing a different approach to basically the same problem is Dr David Griffith of the Department of Chemistry who has carried out pioneering studies in the development of new methods of detecting and measuring small amounts of gases in the atmosphere using matrix isolation techniques in infrared spectrometry.

Dr Griffith was awarded a Fulbright Fellowship and is currently working at the Center for Atmospheric Research at Boulder, Colorado, on the chemical analysis of plumes from burning forests. These will complement the studies he has already carried out in Australia and Europe on the contribution bush fires make to the global atmospheric pollution problem. It is also worth noting that Dr Griffith is the fourth member of the academic staff of the Department of Chemistry to be awarded one of the highly prestigious Fulbright Fellowships, a remarkable achievement for a department having only 13 staff.



At the Postgraduate Research Students' Open Day at the end of September Yang Yan (a student from China) explains her project - Strength and Stability of Masonry Arches - to John Shaw

RESEARCH

Second edition of the *Research Report*, produced by the Academic Services Branch within the University, was published this year once again to coincide with the postgraduate research students' Open Day towards the end of September. A major change from last year's issue is that research themes are grouped by program (in the 1987-88 edition they were grouped by faculty). Other research (that is to say, not included in programs) is dealt with in a related section.

The programs described in the *Research Report* are listed on the facing page.

Not reported in the *Research Report* - because of restrictions on space - was the work of the University's research centres, several of which operate under the aegis of the Illawarra Technology Corporation Limited (ITC).

Set up by the University, ITC is located on campus and is guided by the University Council. Flowing from ITC are three groupings: National Engineering Information Systems Pty Ltd, the Automation and Engineering Applications Centre and ITC Uniadvice Ltd, the research/consulting arm of the University.

ITC Uniadvice Ltd

Much of the research and development work being undertaken at The University of Wollongong is directly relevant to industrial and government interests in Australia and overseas. Uniadvice is the consulting company for the University: on commercial lines, Uniadvice aims to link the needs of the community with the academic skills and research facilities of the University.

Research undertaken in Centres described below may have been generated through funded private-enterprise channels or through government-sponsored research, which in turn may be the result of pure research grants or of a project with commercial applications.

In the past both local and overseas interests have been joint participants in research projects and Uniadvice, with its inbuilt capacity to respond as a private-enterprise operation to clients' interests, is poised to negotiate relevant R & D programs.

Uniadvice offers a blend of experience and expertise, and represents a source of

The programs described in the Research Report

*Water Engineering and Geomechanics
In Pursuit of Intelligent Materials
Exercise, Strain and Fitness
Engineering and Industrial Mathematics
Quaternary Research
Social and Psychological Health
Electronic and Vibrational Properties and Solids
Computing Science
Fossil Fuels
Advanced Manufacturing Technology
Management Strategy and Organisational Change
Studies in Performing Arts
Industrial Automation
Advanced Telecommunications
Literature and the Colonial Legacy
Accountability and Financial Reporting
Applied Cognitive Studies
Bioactive Molecules
Biological Macromolecules
Advanced Materials
Educational Policy
Science and Technology Policy
The Life Sciences in the Social Context
Nature and Dynamics of Science and Technology
Information Technology in its Social Context
Labour Market Analysis
Structural Engineering and Construction
Equity in Education
Geological Evolution of the Tasmanides
Bulk Materials and Physical Processing
Australian Flora and Fauna*

knowledge covering an extraordinarily wide range of skills from both scientific engineering and the social disciplines. This is normally provided via consulting, contract research and development assignments as well as through further educational activities.

Uniadvice's objective is to focus on areas where it has a sustainable competitive advantage in the provision of these services and to develop and facilitate the process of technology transfer to industry and the economy in general.

The Intellectual Property Division of Uniadvice ensures that the complex and important issues surrounding intellectual property are effectively managed.

The main business of the division is to protect any intellectual property that is developed at the University – whether by copyright, registered design, patent or trade marking. The extent of the protection depends upon the commercial value of the intellectual property.

Uniadvice is in the process of obtaining Registered Research Agency status which enables companies registered with the Industry Research and Development Board a deduction of 150 per cent of expenditure on eligible research and development activities against assessable income.

The research centres operating under the aegis of Uniadvice are the

Automation and Engineering Applications Centre
Centre for Advanced Materials and Surface Engineering (CAMSE)
Centre for Applied Biological Research
Bulk Materials Handling
Centre for Information Technology Research
Microwave and Materials Research Institute which embraces
Centre for Advance Materials and Surface Engineering
Microwave Applications Research Centre
Centre for Technology and Social Change
Centre for Transport Policy Analysis

Research Centres operating independently are

Centre for Advanced Manufacturing and Industrial Automation (CAMIA)
Key Centre for Mines
Mining Research Centre
Centre for Multicultural Studies
New Literatures Research Centre

Automation and Engineering Applications Centre Ltd

Automation and Engineering Applications Centre Ltd (AEAC) designs, manufactures and installs manufacturing systems to improve the productivity, efficiency and quality of manufactured goods. AEAC has designed and built robotic systems including arc welding and assembly robots as well as specialised automation equipment designed by AEAC's staff for specific customer



Roger Tindall – a technician in the AEAC – works on the development and design of robotic systems and assembly robots

applications. Modern manufacturing technology is characterised by its multi-disciplinary nature: in other words, it is now necessary to incorporate mechanical, electrical and computer engineering into industrial automation projects. Nearly all of the AEAC's work involves computer-controlled machinery with substantial hardware (robots, pneumatic and electric activators, software content and so on).

A highlight of the year was the design and commissioning of a major automation system to load automatically nine items on to trays. The system involves nine interacting computer-controlled machines linked by a conveyor. These computers are networked to a central console which allows an operator to monitor the status and performance of every machine. All the mechanical, electrical and computer design and much of the manufacturing for this system was carried out by AEAC engineers.

The year also saw the formation of the Australian Training School for Advanced Manufacturing (ATSAM). ATSAM provides training to operators, tradespersons and managers in modern manufacturing techniques by means of two-day and three-day courses. This training is aimed at people already in the workforce so that, without leaving work, they can readily take a series of integrated courses at ATSAM to produce a nationally accredited qualification such as a Certificate or Advanced Certificate. Such training complements multiskilling and reskilling requirements of national award restructuring, and is conducted with close cooperation of unions and management.

ATSAM has received a grant from the Education and Training Foundation to assist in this work, and has already conducted a series of courses ranging from computer literacy, industrial computers and pneumatics for operators to robotics, management information systems and manufacturing resource planning for senior managers.

Centre for Applied Biological Research

The Centre for Applied Biological Research undertakes specific microbial analyses as well as short- and long-term research contracts in several areas of applied science.

Professional testing undertaken for the detection and enumeration of specific organisms, including *Legionella* sp. and other micro organisms, which are common pollutants in buildings, industrial effluents, water bodies and disturbed environments form a significant activity. The Centre has also been involved, in collaboration with UK and US companies, in the evaluation of new techniques with potential for the rapid detection of *Legionella* sp. in environmental samples. This has established the University internationally as one of the few laboratories at which environmental evaluation of new methods for *Legionella* sp. detection can be undertaken reliably, and is leading to further research and development projects which will involve graduate student participation.

Another major research activity in 1989 was to determine the efficiency of instrumentation and/or chemicals designed to control micro-organisms, algae and protozoa in specified environments. These include water quality in circulating water systems, air quality from air conditioning and air treatment systems, sludge, industrial run-offs and human health care products. The efficiency of ozone as a disinfecting agent for commercial water treatment is a major research focus. Further biological processes (in conjunction with chemical and engineering processes as appropriate) are being evaluated as a means of treating some industrial wastes.

Other activities included determining the effect of packaging on the microbiological quality of milk as well as ascertaining the role of micro-organisms in a variety of unusual corrosion problems.



At the opening of the Centre for Advanced Materials and Surface Engineering, the Director Mr Bill Wodrow is at the right. A widely experienced engineer, he has worked for Rolls Royce and has his own consultancy business. With him are Professor Howard Worner, CBE (at left), and Professor Tom Bell from the University of Birmingham (UK)

Centre for Advanced Materials and Surface Engineering

Wollongong University's Centre for Advanced Materials and Surface Engineering (CAMSE) was officially launched on September 6. Activities of the new Centre incorporate those of the former Centre for Materials and have been expanded to include Surface Engineering Technology.

The Centre acts as a consultancy service to industry on materials related topics such as failure analysis, materials selection and materials assessment and testing, carrying out research and development in the area of new materials, with emphasis on product development and continuing educational training for industry.

The aim of the Centre is to forge strong links with industry through collaborative research and development and offset partnerships. Currently, the Centre is pursuing the

acquisition of equipment for a Plasma Nitriding and Physical Vapour Deposition (PVD) duplex treatment plant to permit prototype component development and characterisation for technology transfers to industry.

The plasma nitriding (a clean process with no effluent) is capable of replacing the more conventional and environmentally damaging processes currently used for surface treatments of metallic substrates.

The Centre has received funding support from the Department of Business and Consumer Affairs and the NSW Education Training Foundation to conduct a market survey of processes and components and a training course in surface engineering technology.

It is anticipated that the Centre will soon be co-ordinating a national consortium (consisting of government, industry, research agencies and academics) in surface engineering which will serve as a focus for new developments in surface technology.

Other projects being pursued by the Centre include low-cost ceramic coatings and a program in advanced materials development testing for aircraft engines, in conjunction with other overseas agencies.

Bulk Materials Handling

Bulk Materials Handling provides a focus for the contract research, development and consulting activities in bulk solids handling associated with the Department of Mechanical Engineering. It also facilitates and promotes technology transfer and interaction with industry. In particular, the Centre interacts with organisations involved in the bulk handling of solids – and with their consultants, contractors and equipment suppliers.

Director of the Centre is Professor P.C. Arnold; consultants are Dr A.G. McLean, Dr P.W. Wypych and Mr O.C. Kennedy; full-time staff are I. Frew, Technical Officer, and I. McColm, Laboratory Assistant.

Dr Brian Moore resigned as a lecturer in the Department of Mechanical Engineering and as a consultant to ITC Bulk Materials Handling in May 1989 to take a senior mechanical engineering position with the large consulting firm, Gutteridge Haskins and Davey, which is keen to establish a closer relationship with ITC Bulk Materials Handling. This is something that is currently being investigated.

ITC Bulk Materials Handling during 1989 shared the Bulk Materials Handling Laboratory with the Bulk Materials Handling Research Group of the Department of Mechanical Engineering. The area comprises 540 m² of laboratory space plus outside and rooftop pneumatic conveying pipelines. And since the activity of the group is experimentally based, space ran out during the year. As this report is written, the laboratory is being extended to provide an additional 200 m² of high-headroom, heavy laboratory space. The extension is being funded jointly by the Centre and the University. Construction by year's end was almost complete.

Research and development is a vital part of the activities of ITC Bulk Materials Handling. Work thus continued on the NERDDP Projects concerned with the long distance pneumatic conveying of flyash and related products, and on the development of design strategies for loading and unloading belt conveyor systems. A further \$22,130 has been requested from the AERB for 1990 for the project, Optimal Design of Stepped Pipelines for the Long Distance Pneumatic Conveying of Fly Ash and other Related Products.

Professor Peter Arnold visited the USA in May and presented papers at the 6th International Symposium on Freight Pipelines at Columbia, Missouri, and at the 15th Powder and Bulk Solids Conference, also in May, at Chicago, Illinois. He also visited Fuller International at Bethlehem, Pennsylvania, and Jenike and Johansson, Inc. at San Luis Obispo, California.

All consultants presented papers at the Third International Conference on Bulk Materials Storage, Handling and Transportation held at Newcastle (NSW) in June. A total of eight papers from Wollongong were presented.

A three-day short course on the Design and Operation of Pneumatic Conveying Systems was held at Wollongong on July 3 and 4. Lecturers included Professor Alan Reed (see below) and Mr Roger Barnes from Thames Polytechnic, London, Professor Alan Roberts, Assoc. Prof. John Chambers and Mr Owen Scott from The University of Newcastle, Mr Bill Ure, Managing Director, Bulk Materials Handling Pty Ltd, Sydney, as well as Peter Arnold and Peter Wypych from Wollongong. Fifty-five delegates attended the course. A great deal of positive feedback, as well as inquiries for consultancy work, resulted.

Professor Alan Reed is Professor of Bulk Solids Handling Technology and Director of the Wolfson Centre for Bulk Solids Handling Technology at Thames Polytechnic. He spent a month as a Visiting Research Fellow in the Department of Mechanical Engineering at Wollongong and he took part in the Newcastle Conference and collaborated with Peter Wypych on aspects of the pneumatic conveying research program. Professor Reed also contributed to the Pneumatic Conveying short course and to a further two consultancy projects for ITC Bulk Materials Handling.

The Bulk Handling Research Groups of the the Universities of Newcastle and Wollongong have made a number of important contributions to the knowledge in several areas of the bulk materials handling and transportation field. The groups have gained the respect of a number of Australian industries and have contributed significantly to many industrial projects. They enjoy an international reputation for their work; Australia, in general, and Newcastle and Wollongong, in particular, lead the world in several aspects of bulk solids research.

Since the viability of the bulk materials handling research has been firmly established



Another University initiative takes shape. Here at the 'launching' of the Centre for Information Technology is the Board of Management: from left are Mr Ian Carter, Director of Uniadvise, Professor Hugh Bradlow, Head of Electrical and Computer Engineering, Mr Robert Somervaille, Chairman of the Centre (and current chairman of the ABC and British Aerospace Australia), Professor Ken McKinnon, Mr Ken Douglas, former NSW State Manager of Telecom, and Mr Ian Reinecke of the University's Information Technology and Communication Program

and in view of the importance of this work to Australian industry, it is believed that the establishment of a Institute of Bulk Materials Handling Research, linking Newcastle and Wollongong, would contribute to the enhancement of Australia's industrial development. Such an Institute would be unique in Australia and would have world-wide recognition. A detailed proposal for the Institute is currently with both universities.

Centre for Information Technology Research

The Centre for Information Technology Research was established in April to conduct three main activities: technical research and development, regulatory and policy research, and training in telecommunications management. These activities are seen as inter-related and some projects involve all three elements.

After its establishment the Centre embarked on a program of technical research for OTC Limited in packet communications networks and for Telecom Australia in the regulation of

mobile cellular telephony. It also began a series of telecommunications management-education programs for Telecom Country Division.

CITR has played a leading role in the attraction of R&D laboratories to the Illawarra Technology Centre on The University of Wollongong campus. Telecom Australia during 1989 agreed to establish a software development laboratory employing more than 20 professional researchers. And Northern Telecom agreed to establish its telecommunications R&D centre for the Asia Pacific region on campus, in a facility that by 1992 will employ 60 researchers.

The Centre will be designing research proposals in conjunction with Telecom Australia and Northern Telecom in both technical and policy areas. In the technical area, the Centre will focus particular attention on fast packet switching and in the policy area on the regulatory aspects of broadband capacity in the local loop.

A joint venture to implement a trial network in the Illawarra to test telecommunications services and products will provide the testbed for much of CITR's research in the future.



The University's research into the applications of microwave energy have led (and are leading) to many new and unexpected byways. At the research centre here is a pilot plant (one tonne/day) for the microwave smelting of tin from concentrate

The Microwave Applications Research Centre

By 1989 in its third year of operation, the Microwave Applications Research Centre has established itself with a successful research record. Practical applications are already in operation. This was evident at the First Australian Symposium on Microwave Power Applications which was hosted by the Centre at the University over three days in February. The symposium proved to be a highlight of the 1989 program.

The use of microwaves to sterilise sewage sludge was proved during mid-year trials on a pilot plant at Shellharbour Water Board sewage treatment plant. The process was developed in conjunction with Industrial Microwave Applications Pty Ltd and the Water Board. It confirmed the results of the earlier laboratory trials in that the microwave heating of sludge under pressure results in speedy controllable sterilisation. As a result, a commercial plant built by IMA was purchased by the Water Board.

The major single project being undertaken by MARC concerned the use of microwaves in pyrometallurgy. In the process under development, composite mixtures of metallic

ores and carbonaceous materials are heated under microwaves to red heat prior to final smelting.

The microwave process has proved to be a highly efficient source of heat and, because of its ability to react with some materials more than others, the way is open for new metal production processes. Microwaves can selectively heat materials and can selectively drive certain reactions.

This research project on precursor treatment of minerals is being undertaken under a Federal Government GIRD grant. Several other minerals projects and others involving tailings or byproducts from other processes are being undertaken for private industry, including Muswellbrook Energy and Minerals Pty Ltd and BHP.

The need to design and develop equipment for specific research projects has resulted in a variety of new microwave applicators, sensors and control devices. Where applicable, these have been patented and they have considerable potential for industry in their own right.

Some of the equipment concerned involves travelling-wave applicators for continuous smelting systems, a rotary kiln for uniform product heating, a new way of sensing temperature using fibre optics and a continuously variable microwave power supply.

The Microwave Applications Research Centre investigates many applications of microwave energy and provides Australian industry with access to the latest microwave processing systems. Research is backed by the combined experience and talents of specialists in the disciplines of Electrical and Mechanical Engineering, Metallurgy, Chemistry, Biology, Physics, and Computer Sciences.

The industrial application of microwave energy has attracted world-wide interest in recent years. Research has traditionally centred on applications to domestic and industrial cooking. It is now recognised, however, that microwave energy has the potential to change radically the established heating and processing methods of many industries.

Research projects have identified important opportunities for companies involved in drying, ceramics, chemistry, biology and metallurgy. High-temperature pyrometallurgical projects form a unique and important feature of the Centre's work.

The Centre was initially involved with drying. It now has wide experience in a range of products including nuts, grains, cereals, timber, fruits, industrial dyes, pastes, stockfeed, coal, minerals and ceramics.

Microwave drying provides fast and efficient removal of the final percentages of moisture, something which is often very difficult and costly with conventional methods.

The heating of materials to recover oil from shale and rare-earth processing represents a significant proportion of work being done by the Centre.

Microwave and Materials Research Institute

The Microwave and Materials Research Institute comprises two research centres dedicated to industrial application.

These are

The Microwave Applications Research Centre

The Centre for Advanced Materials and Surface Engineering

There are some 20 members on the full-time staff of the Institute who also call on the part-time assistance of experts, particularly those on the University staff.

With its members having training and experience in a variety of scientific fields, predominantly the engineering areas of metallurgy, materials, mechanical, electrical, control and chemical, the Institute's special strength lies in its ability to take a multidiscipline approach to research and development.

The Centre for Technology and Social Change

The process of innovation is undergoing major changes. Science is entering a steady state, required to operate within a more or less fixed envelope of resources within which change must occur. Technology has become the major determinant of world patterns of trade and investment and in many industries the level of investment in intellectual capital, through R&D and knowledge acquisition, exceeds that in physical capital. Moreover, the social technologies of management and organisation are as important to the effective management and direction of technology in the 'new knowledge' age as are the 'hard' generic technologies of information technology, biotechnology and new materials.

In these circumstances, the need and demand for improved methods for the management of science and technology have also grown quite sharply. Companies need to understand the dynamics of technology formation, and the

*Program Director, Technology and
Human Resources in TASC, is Ms
Barbara Lepani*



ways in which their businesses might be transformed. Research organisations need to focus and manage their resources to produce the knowledge and technology so critical to international competitiveness. Governments need to understand how technology contributes to economic growth and social improvement, and the extent to which policy can be developed to influence these relationships.

TASC's Technology Strategy Program focuses on the analysis and development of industry and technology policy. Australia's situation in the 1980s is unique among OECD nations. The combination of shallow industrial structure, low level of international competitiveness, distance from markets and the non-coherent nature of the national innovation system present very great challenges. The profound lack of internationalisation in manufacturing industries has four major consequences:

- inappropriate industrial structure;
- lack of dynamic inter-sectoral and inter-firm links;
- independent evolution of the science and technology infrastructure;
- declining terms of trade.

Studies of these problems in more than 500 firms and of means to overcome them have provided detailed analyses of internationalisation, technology strategy, linkages between public sector R&D and industry, and higher value added processing.

The **Research Policy Program** focuses on the consequences of the dramatic increase in the level of competitiveness in the production and exploitation of knowledge. A range of bibliometric, econometric, patent analysis and other techniques have been developed to provide a professional analytical capability on which to base effective priority setting, research evaluation and foresight exercises. These have been applied to the evaluation of the international standing of a range of fields including astronomy, acoustics and marine science, and to the development of performance indicators for universities, to the identification of technological priorities, to the evaluation of research organisations and to the development of an effective research classification scheme.

The **Technology and Human Resource Program** has focused on the industrial relations, training and work organisation

appropriate to the introduction of new technologies. Particular emphasis has been placed on the soft technologies which can develop an organisational culture of innovation, manage systemic learning and develop enterprise skills.

Workshops build on TASC's ability to locate the problems of managing change within the framework of the new technology-led business environment and are delivered on Social Architecture of the Workplace, Innovation and Creativity and Research Leadership.

Centre for Transport Policy Analysis

The Centre for Transport Policy Analysis was established in January 1986 with the appointment of a Director (Dr Ross Robinson) and a guarantee by The University of Wollongong to underwrite the Centre for a period of three years.

By the end of 1989, almost four years on, the Centre had achieved a gross income of over \$1 million; it had a staff of eight including project staff, six on The University of Wollongong campus and two project staff in Canberra, with 13 Senior Research Associates on Australian or overseas University campuses; and it had completed projects for State and Federal governments and government agencies, for one Royal Commission, for the United Nations in Bangkok and for the World Bank in Washington.

A large part of the Centre's funds has come from research projects carried out on an *ad hoc* consulting basis. These have been spread across government, industry and international agency interests and many, if not most, have dealt with extremely sensitive policy issues which have required independent and high-level professional judgement.

Internationally, the Centre has completed two major projects for the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in Bangkok – one involved a review of maritime developments in Asia and the Pacific in the late 1980 and the other a sophisticated and complex computer simulation model of existing international liner shipping networks and services in Asia,



Dr Ross Robinson (middle), Director of the Centre for Transport Policy Analysis, makes a point as a panellist at the Asian Sea Transport Conference in Taipei

the Far East and the Pacific. The model is an integral element in ESCAP's Regional maritime Development Strategy to assist developing member countries with their port and shipping policies.

At the Request of the World Bank in Washington, the Centre recently completed a detailed evaluation of the impact of deregulation measures in Indonesia's maritime sector. This study is regarded by the Bank as a significant input to its development program for Indonesia and by the Indonesian Government as a basis for policy evaluation and further policy making.

In 1989 the Centre, among other projects, completed an important study of the valuation of port assets for a major industry association; developed a computer model of Bass Strait shipping in co-operation with the Tasmanian Government; assisted the Port of Fremantle Authority with the development of its strategic plan; and advised another major Australian port on its pricing policies.

In past months too, the Centre provided a major study for the Inter-state Commission in the development of its Waterfront Strategy for the Federal government; it completed research into Australian flag shipping costs, port charges and port administration in NSW;

and it provided a major policy paper on the trading of international aviation rights for the government of Western Australia.

In addition to relatively short-term, special-purpose consulting projects, the Centre in 1989 was working on three, three-year research projects. These longer-term arrangements – one on the cost penalties paid by rural exports through Australian ports, a second on Australia's domestic freight movements and the third on Australian flag competitiveness and national maritime policy – call for in-depth analysis of particular, complex and difficult issues and should result in insights and concepts which will provide a much better basis for transport policy making in Australia.

For 1990 the Centre expects to meet some of the demand – from students in Korea, China, Papua New Guinea and Taiwan as well as Australian students for postgraduate (particularly MA and PhD) programs in transport. It is likely, too, that in 1990 the Centre will promote a number of offshore training seminars for port and maritime managers. Centre personnel also continued to accept invitations to present papers at international forums – in 1989, at Taipei and Yokohama, and in February 1990 at Singapore.

OTHER RESEARCH CENTRES



Lecturers in CAMIA – Dr Yixin Yao (left) and Dr Elias Soares are seen here with a manufacturing welding robot and turning lathe

Centre for Advanced Manufacturing and Industrial Automation (CAMIA)

Centre for Advanced Manufacturing and Industrial Automation (CAMIA) the federally funded Key Centres for Teaching and Research established in 1988. Its mission is to develop facilities for – and hence offer support to – local industry in advanced manufacturing technology and management, including industrial automation. It does this in three distinct strands by:

Training (education at undergraduate and postgraduate levels and dissemination of knowledge to industry at a professional level)

Research and Development (fundamental and applied research into AMTM: Advanced Manufacturing Technology and Management)

Application (problem solving / consulting for industry).

First priority has so far been the establishment of necessary and appropriate facilities.

CAMIA has therefore pooled resources with other university departments / units and at the close of the year was building up a computer-integrated Flexible Manufacturing System (FMS) and laboratory comprising CNC machines, industrial robots, automated guided vehicles (AGV) and on-line metrology equipment, capable of welding, machining, assembly and quality control monitoring. This R & D facility is forecast to become the most comprehensive demonstration FMS in Australasia.

Under the direction of Professor Günter Arndt (appointed director on 1 January 1989 and also Australia's first Professor of Manufacturing Engineering) the first year of operation of CAMIA has seen the development and running of 13 professional courses on topics ranging from Total Quality Management to Industrial Robot Applications, to Manufacturing with Lasers; a successful 'AMT' Research Program at this University (ref. University of Wollongong *Research Report 88-89*), resulting in 37 publications this year and comprising 13 academics; and the establishment of many industry contacts in preparation for joint problem solving / consulting projects.

Despite gloomy industry prognostications for Australia, the future of CAMIA, and its effect on Australian manufacturing industry, looks bright. A record number of papers has been received for 'ICME 90' (Aust International Conference on Manufacturing Engineering) organised by CAMIA / Mechanical Engineering at Wollongong, and many projects undertaken are supported by external grants.

CAMIA is firmly committed to the improvement of Australian manufacturing to world-competitive standards and will increasingly explore new means of interaction and co-operation with manufacturing industry in Australia and the Pacific region.

Centre for Studies in Literacy

During 1989 the Centre for Studies in Literacy continued to fulfil its brief of conducting research, assisting in the teaching of post-graduate students, and designing and delivering professional development and in-service courses for schools and private enterprise. In 1989, two of its members, Ms J Turbill and Dr B Cambourne, completed two major commissioned projects. The Secondary Literacy In-service Course ('SLIC'), a Project of National Significance, was published by the Curriculum Development Centre. And seven 'theory into practice' articles for teachers of Aboriginal literacy were completed for the NSW Department of Education.

In late 1989 a joint venture between the Centre, New York State Department of Education, and the University was formed to train SLIC facilitators who will run the program in USA. A second agreement to fund the development and piloting of the professional development program for the USA market has also been drawn up and funded, and Turbill and Cambourne will be engaged in designing and trialing this program in 1990.

The Centre was also awarded a 'Healthy Cities Award of Excellence' for its work in promoting 'Excellence in English Teaching' in the local educational region.

The research program for which this award was made has attracted overseas interest and Centre staff, (Turbill and Cambourne) and local teachers have been invited to run a symposium at the IRA conference in Atlanta Georgia in May 1990.

Key Centre for Mines

The Key Centre for Mines began full-time operation at the beginning of 1989 as a joint venture between the universities of Wollongong and New South Wales. Seed funding was provided by the Department of Employment Education and Training as part of the Key Centre Program, aimed at achieving better links between universities and key sectors in the economy.

In close consultation with the minerals

industries, the Key Centre is providing a range of educational and research services on a 'demand-driven' basis. These include:

- *Short Courses and Seminars*
These are typically of one to five days duration, and, in all cases, an appropriate blend is sought of industry and university involvement in course leadership.
Examples 1989: Subsidence Due to Underground Coal Mining, Geotechnical Considerations in Mine Design, Longwall Operators, Computers in Mining, Blasting - Application and Safe use of Commercial Blasting
- *Award Courses*
The Key centre is currently finalising a Master of Mining degree which is aimed at improving graduate education for personnel in the minerals sector. To this end instruction will take place both at the university and at specific mine sites around Australia.
- *Contract Research*
The Key Centre is actively engaged in contract research consultancies and market study projects and current clients include BHP Engineering.
- *International*
A high profile role is taken by the Key Centre in promoting educational and research services overseas and particularly in the emerging nations of the Asian region. Representatives from international mining corporations have attended special training programs at the University and Key Centre staff are involved in consulting projects throughout the region.

The Director of the Key Centre for Mines is Professor Charles Gerrard. In this capacity he provides a crucial link to industry and coordinates the marketing functions of the departments involved. He is assisted by an Associate Director at this University and an Associate Director of international activities located at the University of New South Wales.

The Key Centre is assisted by an Advisory Council, chaired by Mr Reg Fraser of Pasminco Mining, and comprising senior industry and academic leaders. Its role is to provide direction and guidance; it is conscious always of the need to listen and react to minerals-sector requirements.

The Centre was opened on December 5 by the Minister for Primary Industries and Energy, Mr John Kerin MP.

Mining Research Centre

The activity of the Mining Research Centre for 1989 continued with the Rapid Face Bolting Project (RFBP), the mine emergency expert system, and work on the behaviour of mine explosions.

The test rig for the RFBP tests proved to be most successful in evaluating the performance of alternative drill bits and alternative grouting techniques. The traditional method of chemical grout introduction about the bolt was abandoned after several weeks; a compactive fixing system, into which an inorganic grout can be introduced, allows substantial pull-out strengths to be achieved. Investigations also continue on the assessment of suitable economic materials for the drill bit.

A prototype test on a proposed Rapid Face Bolting System was carried out in a local colliery, and further work will be needed to refine the total drilling system.

The mine emergency expert system, *Emergency Control Advisory System* (ECAS), was further developed by the Australian Coal Industry Research Laboratories (ACIRL). The contribution by the MRC to the project is the furnishing of data and expert advice to provide the knowledge base for the computer-based system. Demonstrations of the work completed have evoked favourable responses from the coal mining industry. The project should be completed in 1990.

A computer model is being developed for the analysis of methane fires and their propagation throughout a coal mine as the flame front is fed coal dust dislodged by the preceding shock wave. The model created is coded for solution using parallel computer processing techniques on a computer utilising transputers.

Coloured graphical displays of the results are being developed, and initial results were ready for study at the end of the year.

The Centre for Multicultural Studies

Intensive public debates on immigration and multiculturalism caused considerable demand for the research expertise of the Centre for Multicultural Studies in 1988-89. After the release of the Report of the Committee to Advise on Australia's Immigration Policies (for which the CMS had done considerable consultancy work) in June 1988, there was a reorientation of policies in the area, and CMS researchers played a major part in policy discussion, through participation in media debates and government consultative bodies.

The publication of the book *Mistaken Identity: Multiculturalism and the Demise of Nationalism in Australia*, by four CMS staff aroused considerable attention. Policy-orientated research for bodies like the Office of Multicultural Affairs and the Department of Immigration, Local Government and Ethnic Affairs included projects on recognition of overseas qualifications, ethnic small business, migrant women, and the economies of multicultural education. The Centre sought to obtain research funding from international sources, and was successful in gaining a grant from the OECD for case studies on linguistic pluralism in Australian schools. Funding from the Agnelli Foundation, Turin, was secured for a major study of the contribution of Italians to Australian society and culture.

Teaching remained a major focus of the Centre's work. Two MA (Hons) were successfully completed in 1988. The Centre now has two PhD students and two MA (Hons) students. CMS staff teach undergraduate courses in the Faculty of Education and in Sociology, and participate in the MA (Pass) programs of Sociology and Social Policy.

In addition to externally-funded research projects, CMS staff are working on several academic books to meet the growing need for teaching materials in the multicultural area. Other work in progress includes research on racial violence and on community relations in Australia and overseas. The Centre is also planning a BA Major in Multicultural Studies, in co-operation with the Department of Languages and Sociology, and the Faculty of Education.

New Literatures Research Centre

The New Literatures Research Centre had a successful year in 1989, in the areas of research and publication and in the fostering of scholarship in the New Literatures. During the year, the Centre hosted the visits of several distinguished academics and writers, including Professor Eddie Baugh, Professor of English at the University of the West Indies and DEET Visiting Professorial Fellow in Australia; Professor Edwin Thumboo, Professor of English, Dean of the Faculty of Arts and Social Sciences, National University of Singapore; and Ms Eva Ranaweera, Sri Lankan poet, novelist and playwright, who worked with Dr Laleen Jayamanne on the film adaptation of one of her novels.

Several members of the Centre visited universities overseas: Dr Sharrad accepted a visiting Lectureship at the East-West Centre, University of Hawaii, Mr Scott spent a session at the University of Stirling, in Scotland, and Dr Cranny-Francis visited the Philippines in the course of her current research.

One feature of the Centre's activities was its involvement with the Commonwealth Writers' Prize, organised by Mr Bill McGaw as Chairman of SPACLALS (the South Pacific Association for Commonwealth Literature and Language Study).

The Centre had also been responsible during the year for the publication of two issues of the SPACLALS journal, SPAN, edited by Bill McGaw, as well as two issues of *New Literatures Review*, edited by Dr Paul Sharrad (Wollongong) and Associate Professor Bill Ashcroft (UNSW). Other publications in a list too long to cite in full, included two books by Dr Cranny-Francis and one of which she was co-editor, a collection (in press) of the proceedings of the Olga Masters Conference, including a chapter by Associate Professor Jones, 16 articles, numerous reviews and conference papers. The Centre has been asked to play a role in the compilation of a Companion to Commonwealth Literature, a million-word resource to be edited by Professor Ken Goodwin of The University of Queensland.

A successful seminar series linked the Centre's activities through the year. Papers were presented by the Centre's visiting scholars and writers, members of the Centre



Among the distinguished academics and writers hosted by the New Literatures Research Centre was Professor Edwin Thumboo

and postgraduate students. The seminars ran parallel to the English Department's Postgraduate series, providing a healthy balance of research areas and a broad focus for discussion.

During the year, Centre members presented papers at most of the major conferences in the field. In December/January 1989-90, Associate Professor Jones presented a paper in Washington - at the MLA (Modern Language Association) of which she is Secretary. The Centre had a large representation at the 1989 ASAL (Association for the Study of Australian Literature) Conference in July, where Ms Sharon Clarke presented a paper, and Associate Professor Wieland chaired a session.

Associate Professor Wieland gave a paper on his research to the 1989 Symposium on Literature in the Asia-Pacific Region, a select seminar at the University of Singapore. In August, Associate Professor Jones, Mr McGaw and Mr Stone presented papers at the ACLALS (Association for Commonwealth Literature and Language Study) Silver Jubilee Conference in Kent, at the University of Canterbury.

Dr Cranny-Francis attended two Finnish conferences: The Tenth Annual Summer School on Linguistics, and the 16th Annual Systemic Conference, at which she presented a paper. Mr Scott addressed the Centre for Commonwealth Studies at the University of Stirling. And Dr Jayamanne attended and presented a paper at the August conference of the International Centre for Ethnic Studies.

YEAR OF INNOVATION

Per ardua ad astra

When the triumphant Brisbane Expo 88 took its final curtain call, the majority of those valuable exhibits, many of them unique, were destined to return from whence they came, there to be mothballed and lost from public view, perhaps forever. But as was recounted in the *Annual Report for 1988*, academics

at The University of Wollongong saw things differently. Working on the theory that few exhibitors would have a use for their marvels once the show was over, physics lecturer Glen Moore and a group of other dedicated and enterprising colleagues offered to dismantle them, and provide transport to Wollongong.

Stage 1 of the University's Science Centre at Campus East was opened in July by Mr Barry Jones, Federal Minister for Science



Thus it was that on 26 July 1989 the dream cherished by those same academics was realised when the Federal Minister for Science, Mr Barry Jones, declared it reality when he formally opened stage 1 of the University's Science Centre

This is not 'just another science show' and there is much more to the Science Centre than the sprinkling of Expo exhibits. Nor is it a baby sister to Sydney's Powerhouse Museum or to Canberra's National Science and Technology Centre. Canberra's exhibits demonstrate the theory of science. Sydney's demonstrate its history. Wollongong's focuses on the application of science to industry and to everyday life.

The Centre's 60 or so exhibits are continually being augmented and improved upon, thanks to the willing co-operation of sponsors whose immediate return is a mere wall plate, but who recognise the plate's undeniable spin-off in terms of customers, users and future staff. This is another example *par excellence* of University-community interaction.

Crowded with excited school children every afternoon, the Centre a few weeks after its opening had become a living part of the community – which is exactly what it had always been planned to be.



At the opening ceremony: to achieve that July landmark Mr Glen Moore of the Department of Physics and a team of volunteer workers invested some 3000 man hours on the project

To some school children when they arrive at the Centre, science is more or less a closed book. When they leave the book is open and the children have become aware that it is packed with exciting pictures.

The Centre has to pay its way, so that every child has to pay \$2 admission. For this they get 90 minutes or so of hands-on entertainment. Much better than going to the movies, they say.

Glen Moore and the Illawarra Planetarium Society of which he is president, worked tirelessly with the Faculty of Science and other volunteers to create the Centre, giving more than 3000 man-hours to the job since early in 1988. Within the Faculty, the Department of Physics has provided the largest portion of the resources contributed, notably augmented by a \$30,000 Challenge Grant made available by the Vice-Chancellor.

As these words are being written (in late October 1989) the Science Centre is still at an interim stage. The next stage will see it expand to the vacant end of its building at Campus East, with exhibits which will involve other faculties and

other industries of local importance. Then will come the planetarium, which was at the heart of the original concept. *Per ardua ad astra!*

University and Health Service partnership

The University of Wollongong and the Illawarra Health Service during 1989 established a partnership to develop what promises to be 'an invaluable relationship' for the region.

That was how Mr Peter Collins, Deputy Leader of the Parliamentary Liberal Party and State Minister for Health, put it in his speech at the signing ceremony in the University Council Room on Friday August 11.

Mr Collins said: '...The signing of the agreement between the Illawarra Health Service and the University of Wollongong will put in place an invaluable relationship between health services and the Illawarra's tertiary institutions.

The University and the Area Health Service will be working together to

develop teaching and research programs. These will be directed at a range of health services, with particular emphasis on preventative strategies.

'The agreement will also assist with recruitment of health professionals.

'Over the next five years the University of Wollongong will develop a number of postgraduate medical programs, the first of which will be a postgraduate Diploma in General Practice, to become available in 1990.

'Such programs will assist clinical staff to keep abreast of developments in service delivery and technology.'

The Minister went on to say that the Greiner government was committed to the Illawarra and that enhanced funding of \$4.1m had been allocated for 1989-90, representing a real growth of three per cent. He commended the Area Health Service and the University on their vision

and commitment to the future of health services in the region. In order to achieve the goals set, the University is reorganising its health and medicine courses within a Faculty of Health Sciences.

Features of the partnership, which will distinguish it from health training and delivery services based on traditional Schools of Medicine, are

- emphasis on disease prevention and health promotion
- strong focus on primary care
- commitment to the role of curative, preventative and support services
- strong co-operation between local government, industry and the community
- affiliation of area-based services.

From the germination of such medical seeds, the people of the Illawarra cannot but benefit in years ahead from new levels of health care.

Maintenance to Manufacture

Halls of residence furniture (and lecture theatre and office furniture) bear a hallmark of quality of design, materials and workmanship



There would appear to be no limit to the range of skills provided by the Buildings and Grounds Maintenance Section in the University. As an example, the section in 1976 began making furniture in a modest way, in a workshop located in a corner of one of its buildings.

Gradually the demand for its furniture grew. In response to this it stepped up its activity in the area. It was then encouraged to branch out into a production-style joinery, making furniture suitable for campus needs. By the beginning of 1989, there was a superbly equipped workshop at Campus East and the unit was producing office-type furniture as good as any, both in terms of design and manufacture.

The Maintenance Section had found that it was able to produce personalised furniture, designed for a specific area and use, at an



This corner of the furniture-making workshop gives clear evidence of the professional nature of the tooling

acceptable cost. In some cases, items were manufactured and supplied in a shorter time than would have been needed by an outside company.

The range of furniture produced includes desks for professors, general staff and students, workstations, conference room tables and cupboard furniture, bookshelves, glass-fronted noticeboards, pinboards, whiteboards, video trolleys, display and advertising stands, indoor garden boxes and settings, ergonomic furniture, computer furniture, pigeonhole units and essay boxes, personal locker units, filing units, drawer units, lollipop lights around the campus, floor-to-ceiling cupboard and shelving units, material-covered room dividers.

Specialised items of furniture are being designed and manufactured using eight trades including 25 permanent staff and 11 casual tradesmen and unskilled workers within the section.

Helping the Unemployed

A Centre to train and retrain long-term unemployed in the computer, electronics and communication industries was formally opened on campus in February. Designated the Illawarra Information Technology Centre (ITeC), it was opened by Mr Peter Duncan, MP. In addition to its training and retraining goals, ITeC intends to provide open-access services and business incubation services. It is now, in fact, a part of the national Network of Information Technology Centres.

Initial major sponsor of the project was the Wollongong City Council. A board of directors was established by Dr Ken King of the Illawarra Technology Centre from a dozen local or locally represented organisations. Manager is Mrs Robyn Steele, and Chairman of the Board of Management is Professor Michael Hough from the Faculty of Commerce.

ACADEMIC AND ALLIED SERVICES

Dean of Students

The introduction of procedures designed to reduce the need for students to lodge formal appeals against academic administrative decisions referred to in an earlier report continued to be effective in 1989. Unfortunately, however, a significant portion of the Dean of Students' activity continues to be related to such matters. While most issues during the year were capable of resolution by discussion and negotiation with the student and the academic unit concerned, not all could be managed in this way. Of continuing concern is the clear impression created by some of the cases brought to the Dean's attention that there is still some distance to go to ensure that in all academic units, practices and procedures relating to the teaching and assessing of students are uniformly fair and beyond reasonable criticism. With the need to implement the Freedom of Information Act now upon the University, still closer attention to the development of appropriate academic procedures will be necessary. For this reason the suggestion that the University prepare and distribute to students and staff a manual of appropriate practices relating to the teaching, assessment, and supervision of students (to parallel the Management Handbook) has been taken up by the University for 1990.

Feedback from the Deans of the several faculties also indicates that the early warning system for identifying students at academic risk is proving effective in reducing the level of Show Cause cases.

During 1989 further attention has been given to the development of a Code of Ethics referred to in the 1988 Report. As a result of discussions with staff and students it is probable that a final draft will be available for discussion early in 1990.

In 1989 the Dean also played a more formal role in the Orientation Week ceremonies and became more widely involved in matters relating to student welfare, including the assumption of the Chair of the Management Committee of one of the University's Halls of Residence.

As in previous years a significant amount of the Dean's time was taken up in providing advice to individuals, both staff and students. For the first time this included providing general academic advice, including that on course and subject selection, to a small number of international students *who believed they were appropriately enrolled*. The need for faculties with large numbers of such students to ensure that the availability of experienced advisors in the Faculty is effectively communicated to their international students is now obvious.

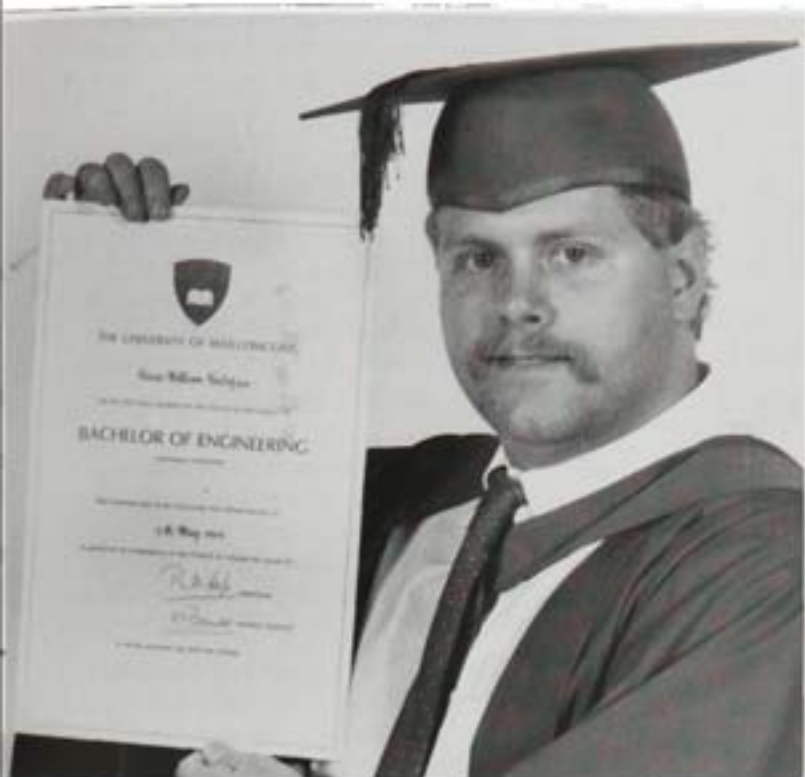
Aboriginal Education Unit

Throughout 1989 the Aboriginal Education Unit (AEU) continued to function primarily as an Aboriginal student support and study facility. Increasingly staff of the Unit have been active in schools and communities, informing potential Aboriginal students about opportunities for study at The University of Wollongong.

Close contact has been maintained with South Coast Aboriginal community organisations, and evidence suggests that Aboriginal people are becoming more knowledgeable about modes of entry and participation at the tertiary level.

Staff of the AEU were awarded the 1989 Ethel Hayton Memorial Trophy for community service and contributions, in general, to development of Aboriginal education awareness in the region.

The AEU Orientation and Alternative Admissions Program, established in 1984, continued to attract and prepare Aboriginal and Torres Strait Islander students for University study. Mutually beneficial links are in the process of being established between this program and services offered by the Learning Assistance Centre and University Gateway Project. An integrated model of Aboriginal student support services and study facilities was considered for introduction in 1990.



To Brian Roelofsen goes the distinction of being the first Aborigine to graduate in Mechanical Engineering from The University of Wollongong



A proud moment for the Aboriginal Education Unit came on University Day—August May 8, which marked the University's 27th birthday—when the Aboriginal Education Unit was awarded the Ethel Hayton Award for its notable contribution to community activity. Here with the trophy is the AEU's Carol Speechley

Aboriginal tertiary education programs already operating at the University began to produce a more diverse range of results at graduation points. While the initial thrust of Aboriginal participation in degree courses was in teacher education, patterns of enrolment and completion have now spread across a wider range of faculties.

During the year, seven Aboriginal students graduated. Other degrees awarded were *Bachelor of Engineering*, one; *Bachelor of Arts*, one; *Bachelor of Education*, three; *Diploma in Applied Science (Nursing)*, two. There has been a steady increase in the number of Aboriginal graduates each year since the AEU began operation in 1985.

New initiatives for Aboriginal participation in higher education courses were prepared in the Health Science, Legal Studies and Commerce areas. Aboriginal Studies elective subjects were established in the Faculty of Education, and prospectives were developed in other disciplinary areas.

AEU resources appeared to be serving the interests and needs of an expanding cross-section of non-Aboriginal students and staff. Critical mass may have been reached for introducing an inter-disciplinary major in Aboriginal Studies. Certainly there is an expanded degree of interest in research and inquiry in the Aboriginal education and studies field.

Provision of culturally relevant Aboriginal student support and study services will remain the prime function of the AEU in the foreseeable future. Yet, as this brief summary indicates, opportunity exists now for further integrated expansion into other related areas. In particular, it seems feasible to promote consolidation of initiatives already under way in teaching, research and development, in general, and of Aboriginal tertiary education programs in particular.

Computer Services

Development of the campus area network continued in 1989 to be the major activity of the Department. By the month of October some 18 local area networks – both Macintosh-based and IBM Compatible PCs – were connected to the backbone, as well as eight host computers.

The optical fibre backbone has been extended to a further five buildings; their occupants will be connected by mid 1990.

The University's policy in developing the network is to make it accessible to all members of staff and to promote it as a vital – if not the main – information medium, for both on- and off-campus communications. Several initiatives are being taken to encourage all staff – not only the computer cognoscenti – to use the facilities. These facilities include: provision of user-friendly

software packages – for both the Macintosh and PC – which simplify network access and electronic mail. Various options are currently under review; promotion of the facilities available on the network, eg, E-Mail around campus, library catalogue enquiries via the Unisys 2200, student record and departmental finance inquiries via the IBMS/38, news and off-campus and overseas E-Mail via the Sequent UNIX computer and ACSnet; regular workshops in their use; regular meetings of the network users to exchange experience and ideas.

After nine years of continuous service – during which its capacity was enhanced several-fold – the old (Unisys) Sperry 1100 was finally switched off in July. A final scramble transferred the remaining academic and administrative applications to PCs, UNIX boxes or the IBMS/38.

The Library PALS software was transferred to the Unisys 2200 early in the year. Except for a small amount of MAPPER work, PALS became the sole application running on the 2200.

The University's Computer Literacy Policy requires all students first enrolling after 1 January 1989 to be 'computer literate' before graduating. Most student degree courses already include enough computing to meet the policy requirement. For the other students, a basic level of literacy is defined – and special courses were developed to bring the students up to the required level. These courses are based on word processing on personal



As outlined above, University policy requires that all students must be computer literate before graduating. For students enrolled in other than computing courses, a specific level of literacy is defined—and met by means of special programs

computers or Macintoshes and accessing the on-line Library Catalogue.

Plans are currently being developed in co-operation with academic departments to introduce sufficient computing content into more credit courses and thus accelerate the program.

Conservatorium of Music

For the 22nd meeting of the Conservatorium Interim Board of Management, Professor Lauchlan Chipman, Pro Vice-Chancellor of the University, was elected Chairman after the retirement of Professor Peter Rousch.

Professor Chipman reported to the Board on the reduction in NSW government funding for the Conservatorium. The board sought to identify procedures addressing such adversity, while noting that the reduction was calculated by the government to provide a more equitable method of distributing funds to country music centres.

Subsequent information provided by government authorities supporting the reduced funding proposed a streamlining of Conservatorium efficiency, and producing statistical information for comparison.

University evaluation of this information produced the contrary view that the Conservatorium was, in fact, efficiently run. Further clarification on the comparative status of the Wollongong Conservatorium with Country Music Centres served to support the view that, unlike any of the existing music centres, while not claiming to be an international institution, the Conservatorium was nevertheless able to indicate that since its inception it had been operating at an international level.

As this report is being prepared the University is hopeful of a re-appraisal of the funding situation. In the meantime an optimistic spirit prevails.

University Printer — New Manager



The University Printery is an active element in campus communication, producing some 14 million 'impressions' annually. Mr Ed Hyde, who had been in charge for 13 years, retired in 1989. He is succeeded by Mr Glenn Brissett (above) a printer who has had wide experience in the field

Equal Employment Opportunity Unit

The year under review was the fourth of the EEO program at the University: 1989 was particularly busy, with a number of changes occurring within the Unit.

From July the University was subject to the requirements of the NSW Freedom of Information Act, 1989. The EEO Co-ordinator was designated FOI Co-ordinator for the University, and while this meant an increase in workload for the Unit, it was a complementary focus to the equal-opportunity function.

The Academic Women's Co-ordinating Committee continued to function throughout the year. The percentage of academic women at the University is still low at 21.2 per cent. However, several women have been appointed to senior positions including two at professorial level, and several in non-traditional faculties such as engineering and



In the University of Wollongong, a Freedom of Information unit has been set up alongside the Equal Opportunity Unit, both under the control of Dr Peg MacLeod (middle) seen here with Margaret Newton and David Roden at an AITEA seminar held in July

commerce. Members of the Academic Women's Co-ordinating Committee conferred with female Muslim students during the year to discuss issues of mutual interest. The talks are resulting in a greater understanding of cross-cultural issues.

The Disability Committee was also active throughout the year, and continued to raise awareness of the general University community to the needs of the disabled. Buildings and Grounds has contributed greatly to improved access, and the University administration has provided extra funds for the purchase of items of equipment to assist disabled people. An application was made under the 1989 Higher Education Equity Program for funds to initiate a pilot program in the schools and TAFE Colleges to attract more students with disability to the University.

These initiatives have meant the EEO Unit is becoming involved in student matters to a greater extent than previously. In addition to the issues mentioned, the Unit co-ordinated the development of an AIDS policy which covers both staff and students. The policy

was endorsed by Council at its October meeting, and was implemented by means of an education program for staff and students.

Staff training and development programs were continued during the year. Selection Techniques programs were in the greatest demand — the most popular were the Personal Effectiveness and Career Development Workshops. Staff from all parts of the University community took advantage of the courses. Feedback indicated that the courses were considered successful.

Freedom of Information Office

Administration of the NSW Freedom of Information Act, 1989, has been delegated to the Equal Employment Opportunity Co-ordinator and the FOI office is located in the EEO Unit.

In essence, the Act requires the University to provide:

to the public, reasonable access to information about the University's policies and activities; to individuals, reasonable access to information the University holds about them; and, to individuals, a reasonable opportunity to ensure that records held about them are not incomplete, incorrect, out of date, or misleading.

The stated intention of the legislation is to ensure *openness, accountability and responsibility* in all public areas.

The University has an 'affirmative obligation' to assist in implementing the intent of the Act, beyond simple compliance with the various mandatory requirements.

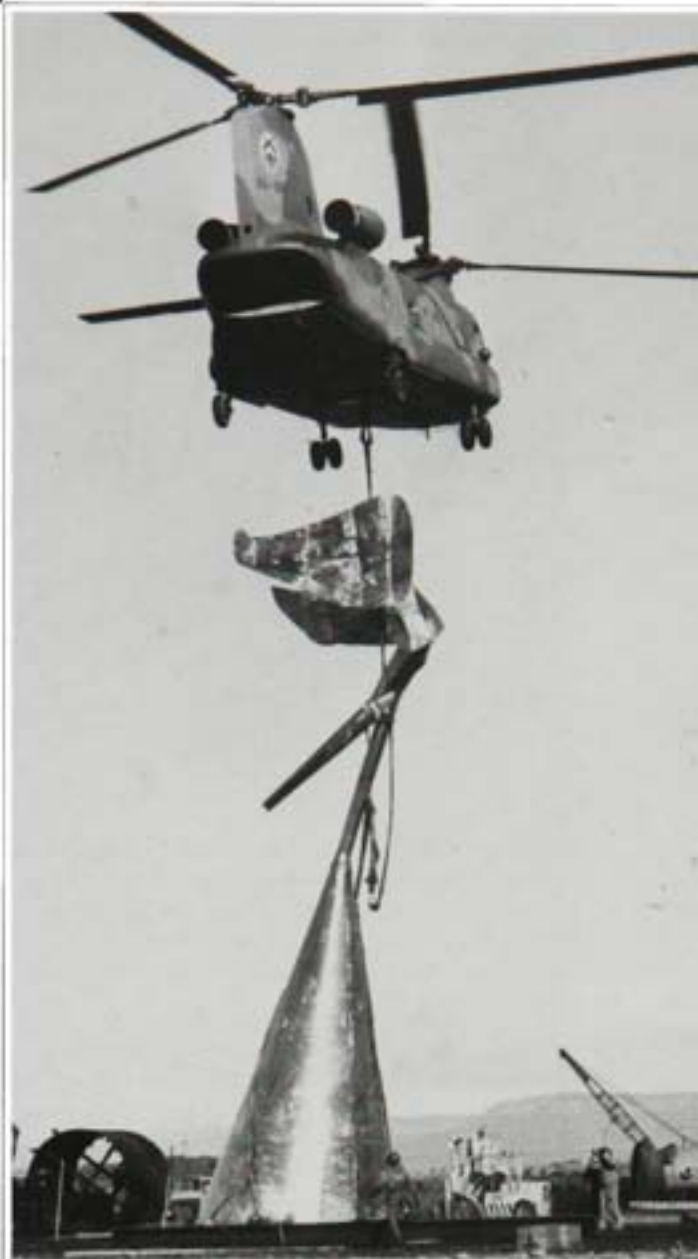
With this in mind, the University of Wollongong Council, at its meeting on June 9, expressed support for the intent of the Act and endorsed the concept of Freedom of Information as University policy, adopting these recommendations:

that, for purposes of the Act, 'the University' comprise any officer of the University and any part of the University that exists or operates by virtue of, or subject to, the authority of Council.

that for purposes of the Act, a document is the University's if it is a document: to which the University has an immediate right of access; that is in the possession, or under the control of a person in that person's capacity as an officer of the University; or if it has been created by an officer of the University in the normal course of that person's duties for the purposes of the person as an officer of the University;

that, so far as is practicable, the University should look to means of making available information that will obviate the necessity for formal applications to be made in accordance with the Act;

that the appropriate officers of the University be requested to maintain regular consultation with their counterparts in other NSW universities with a view to achieving consistency of approach in the implementation of the Act.



A Chinook helicopter of the RAAF takes the weight of the monument to commemorate Lawrence Hargrave, pioneer of flight. The concept (and much of the funding) came from the Friends of the University. The giant steel structure was designed by Bert Flugelman and built by Transfields

The Friends of The University of Wollongong Ltd

The Friends' organisation in March moved from the house it had occupied in Northfields Avenue since 1987 to a central location within the Administration's Planning and Marketing Branch. This move followed extensive discussions about the



Friends Executive Officer (since June) is Ms Juliet Richardson

structure and organisation of the Friends, which in turn resulted in some rationalisation of the organisation's activities. Its four standing committees were reduced to two: the Community Involvement Committee and the Graduates Group.

While the Friends remains a separate company, the intention of its physical relocation within the Planning and Marketing Branch was to enable the organisation to work more effectively with the University administration in achieving its aims. The new location proved immediately beneficial in many ways.

A new Executive Officer, Juliet Richardson, was appointed in June, in the wake of the departure of the previous incumbent, Giles Pickford, for a position at the Australian National University.

As in previous years, the Friends' Executive Officer played a key role in the organisation of the University Open Day, which attracted more visitors, probably, than ever before.

The combination of clear skies and a focus on the environment ensured that departmental and other displays were enjoyed by visitors of all ages.

A questionnaire completed by several hundred visitors (who were hoping to win a personal computer) provided valuable

feedback and underlined the fact that Open Day is an important exercise in terms of community relations.

The Lawrence Hargrave sculpture on the theme of flight — a Bicentennial Project of the Friends — was lowered into place at the foot of Mount Keira by an RAAF Chinook helicopter in May. The sculpture stands 14 metres in height and had over 100 tonnes of concrete poured into it during its installation. It is certainly one of the largest, and possibly is the largest, public sculpture in a rural setting in the southern hemisphere.

When Ethel Hayton MBE died in 1988 the Friends undertook to create a lasting tribute to her memory. This is being achieved by the establishment of the Ethel Hayton Memorial Fellowship in Religious, Spiritual and Contemplative Studies at the University. By early November several thousand dollars had already been raised towards this Fellowship, which will enable scholars of national and international repute to spend a semester at The University of Wollongong.

A further tribute was achieved by the naming of the Ethel Hayton Walk, in the heart of the city which runs between Crown and Burelli Streets near the Performing Arts Centre, an area much frequented by Ethel Hayton for much of her life.

The Michael Birt Library

The development of services was a major aspect of the 1989 Library strategic plan. Activities included the extension of existing, and the introduction of new, services and the further development of staff resources. Planning continued to ensure that the best advantage can be taken of new information technologies as a means of satisfying the increasing demand for services which are accompanying the growth of the University.

The most important and far-reaching changes in 1989 were in staffing. Appointments were made to a number of key senior positions including Deputy University Librarian, Information Services Librarian, Reference Librarian and Senior Cataloguer. Staff development programs continued to be recognised and supported as a primary means of providing high quality services. At the



University Librarian is Mr John Shipp

beginning of the year, seminars were held to heighten awareness of the relationship between staff attitudes and the image of the Library.

The appointment of a Government Publications Librarian enabled the re-assessment of the way in which government documents are processed and used. This coincided with major changes in government policy which advocated the extension of charges for government publications. In the past, the Library has received most

Commonwealth and NSW government publications through a free-issue scheme. While this scheme will continue, more publications will have to be purchased. Others, such as parliamentary papers, will be issued free but the Library will have to pay binding charges. This will have a significant effect on the Library budget.

To counter these trends, more emphasis will be given to ensuring that government publications are incorporated quickly into the Library's collection and that they can be accessed easily through the catalogue. Reader education programs will be provided in 1990 to heighten the awareness of the value of government information and to facilitate access.

Reader education was given new impetus in 1989 by the development of a computer-based



Throughout the year much emphasis was placed on improving the quality of the library environment and its collections

guide to the Library. In association with the Department of Information Systems, the Library developed programs designed to introduce students to the catalogue and to the layout of the main Library building. The programs were available on personal computers located in the Library and quickly became popular with students who preferred self-paced learning. Their use eased the demand for Library tours and permitted a more effective use of staff time. Development of the programs, including Apple Macintosh versions, will be introduced in 1990.

The book vote was augmented by an increase in recurrent funds and by an allocation from student-fee income. These additions, and careful monitoring of the book vote, enabled the acquisition of new serial titles and the maintenance of existing subscriptions.

The most significant initiative was the purchase of ten data bases on compact disc. These permitted the Library to offer a level and quality of services not available at many of the larger university libraries.

Extensive opportunities were offered to academic staff and postgraduate students to acquaint them with the data bases. By the end of the year, access by undergraduates was encouraged and planning began to incorporate data base searching as part of the requirements of several courses.

Introduction of the compact disc data bases highlighted the changing skills which Library staff and readers will need if they are to access information effectively. The University's policy requiring staff and students to become computer literate will be further justified as more information is available only through computer interfaces.

Throughout the year, attention was given to improving the quality of the Library environment and its collections. Items from the University's art collection were displayed throughout the building. Most notable were two sculptures by Bert Flugelman which were placed in the Special Collections area.

Donations of books were received from a number of sources, including the Swiss Government. Sadly, a long-term benefactor of the Library, Edgar Beale, died during the year. Among the items donated by Mr Beale was an extensive collection of legal materials.

While every effort is made to ensure that collections grow at a pace consistent with the development of the University, the Library is small when compared with those of many Australian universities. However, the provision of services of the highest possible quality is regarded as being as important as the acquisition of books.

Increasingly, attention is being given to the use of technologies which will enable members of the University to access information in ways which are appropriate and cost-effective. During the 1990s, the Library will continue to develop innovative approaches to the provision of information services.

Wollongong English Language Centre

Operating under the umbrella of Uniadvice, within the Illawarra Technology Corporation, the Wollongong English Language Centre (WELC) is a registered ELICOS centre as determined by the Australian Government. It is self-supporting and operates on a commercial basis without subsidy. Its primary function is to offer short-term English language courses to international students whose aim is to learn to speak, read and write English, or improve their already existing English capabilities.

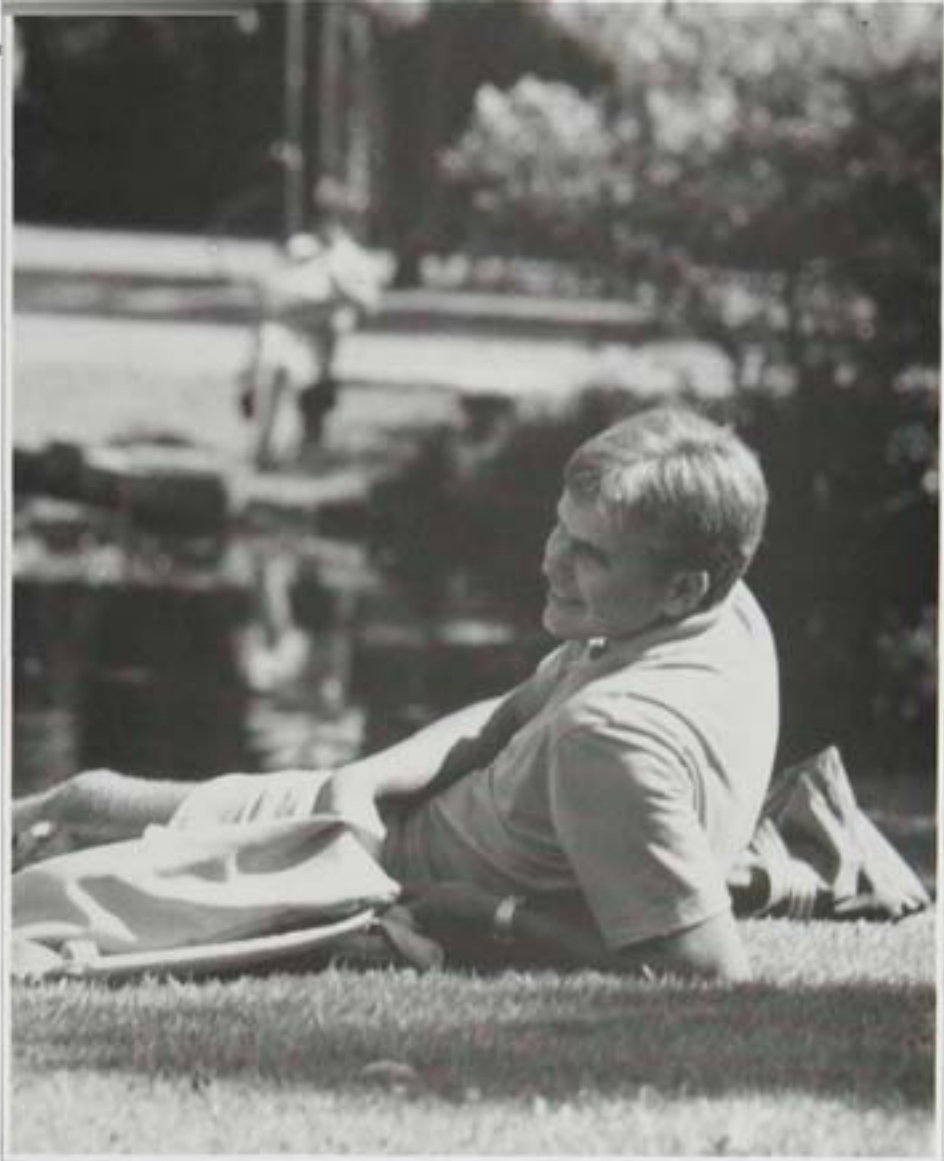
The Centre's clients include students who intend pursuing academic courses at tertiary institutions, including The University of Wollongong; students whose aim is to become competent in the English language for their own interest; and those whose aim is to improve their prospects of employment and promotion in industry in their own countries. Enrolments have included students from Indonesia, Taiwan, Hong Kong, Thailand, Korea, Japan, Brazil, France and Italy.

The Centre was formed in 1989, and at the end of the year had an enrolment of approximately 200 students. Although teaching accommodation has been a difficulty, it is anticipated that the Centre will move into new self-contained accommodation in March 1990 when, it is anticipated, stage 2 of the Technology Centre facility will be completed on the campus of the University.

In addition to providing an appropriate learning environment under suitably qualified teachers, the Centre supports students through counselling and accommodation placement. In this regard it liaises with the University of Wollongong.

Centre for Teaching Development

Changes to academic conditions of appointment require that student surveys of the teaching of all members of the academic staff must be conducted every two years. This requirement led to a dramatic increase in the workload of the Centre during 1989. Fortunately, because compulsory evaluations of teaching were already required



Close by the Library is the University duckpond, and a pleasant lawn – a favourite leisure/study rendezvous for students

of staff seeking promotion or a continuing appointment, procedures were already established and the program proceeded efficiently.

The number of student surveys completed over the past few years is at the point where it will be possible shortly to discover systemic strengths and weaknesses in teaching at the University. Analysis of the surveys will begin in 1990.

During the year the Staff Development Coordinating Committee recommended a rationalisation of all staff development services. The recommendation was accepted in October with the result that, at the end of 1989, the Centre for Teaching Development will be replaced by a Centre for Staff Development with responsibility for planning

and conducting staff development programs for both academic and general staff.

For the last few months of the year, professional staff in the Centre, together with colleagues who will be members of the new organisation in 1990, were involved in planning the programs and procedures to be adopted. The Centre for Staff Development is only the second such unit in Australian universities so that there was little prior experience upon which to draw.

Routine activities of the Centre, discussed in earlier *Annual Reports*, continued during the year.

A program of upgrading the audio-visual facilities in lecture theatres was put in train. It will be maintained during 1990.

STUDENT SERVICES

Accommodation

Halls of Residence

During 1989 The University of Wollongong continued to operate its two collegiate-style Halls of Residence, *International House* and *Weerona*, as a single administrative unit. This lean administrative arrangement has helped to keep student costs down, and the Halls of Residence continue to provide the most cost-efficient residential accommodation to students of any Australian university hall or college.

Rates for 1989 were \$95 a week for a single room, serviced weekly, with 19 meals provided; shared rooms at *Weerona* provided the same services for \$78 per week.

The Halls are financially self-supporting, with full occupancy during the academic year.

Since 1987 the collegiate Halls have directed themselves to the improvement of academic services to residents and the development of a more collegiate style. As a result the number of resident tutors in the Hall in 1989 had increased, along with the number of formal and informal academic tutorials held in Hall. Both Halls are well equipped with a number of computers and printers. The availability of these services was highly appreciated by residents.

The development of collegiate spirit was fostered by a week-long academically focused orientation program, monthly formal dinners with academic guests invited and hosted by the residents,

Student accommodation at Kooloobong is modern and comfortable, the rooms bright and airy





The campus at The University of Wollongong is a perfect example of what a university campus should be – relaxing and with meticulously tended lawns and gardens

commencement and valedictory dinners with awards recognising academic and sporting achievement and service to the House and community, the creation of a number of student jobs and scholarships. Student response to these changes was very positive and morale among residents was high, with virtually no discipline problems.

Non-collegiate accommodation

Three residential complexes – Campus East, Kooloobong and Gundi – are non-collegiate. The University also provides an information/assistance service for off-campus (private) accommodation. The off campus system handles between 800 and 1000 offers of housing annually. New and visiting University staff are assisted with short-term accommodation. This year saw 35 staff/visitors stay in staff housing, while a further 20 were assisted into housing in the private sector.

Campus East houses 91 students and is located in Fairy Meadow. It has a central dining room and full board is provided. The occupation fee for 1989 was \$90 a week.

Kooloobong was established in 1985 and houses 100 senior students. The townhouse style accommodation is located on the main campus. Residents cater and clean for themselves. The occupation fee for 1989 was \$70 a week.

Gundi first leased in February 1988 and accommodates 39 students also in townhouse-style residences. This complex is situated in Wollongong, close to the beach and city centre. Residents clean and cater for themselves. The occupation fee for 1989 was \$70 a week.

Counselling Service

The primary function of the Service is to provide counselling for personal problems caused by stresses associated with being a university student or staff member, and difficulties occurring in people's personal lives. An overseas student advisor is also employed to assist international students with adjustment and welfare problems. During 1989, 945 people sought counselling in a total of 1,986 interviews.

The service also aimed, by providing a range of personal development programs, to prevent problems from occurring. Workshops were provided for stress management and assertiveness and self-confidence building. An introduction-to-university program is offered to new students at the beginning of each year. The program helps students adjust to the demands of a university environment. It also assists in developing a sense of belonging with the University.

The program is organised in small groups which are led by a senior student. This format establishes a mentoring system, which enables new students to utilise the experience of others already familiar with the learning system and the resources available.

During 1989, in order to increase the proportion of the first-year intake participating in the program, it was expanded to accommodate 1,182 students.

Interventions were also undertaken to develop resources within the University community. The Counselling Service is set up as a resource centre where students may link up with others with similar concerns and experiences.

Meetings were held with academic departments in order to assist teaching staff with advising and counselling students with academic problems. In order to develop a

sense of community within the University, networks were established for postgraduate students, women in engineering, mature-age students and overseas students. The Counselling Service continued to co-ordinate the provision of services and equipment for students with disabilities.

Recreation and Sports Association

The year 1989 was one of consolidation for the Recreation and Sports Association. The major development — the swimming pool — was held up for almost six months due to the wet weather, but it had its first trial fill in October.

On the positive side, the level of activity in the Centre skyrocketed, with all programs filling quickly and casual use of every facility showing strong demand.

The year was also the one in which the outside community made much greater use of the facilities. As an attempt to break down the mystique of the University and to encourage interaction at all levels, the Recreation and Sports Association provided facilities for large organisations, such as the volleyball and netball associations, for district-wide competitions, not to mention the Academy of Sport and smaller groups such as the disabled, martial arts and others.

It was perceived that community use in 1989 had reached saturation.

Club sport and performance at Australian universities championships was very good, with top efforts in soccer, rugby league and union, netball, golf and cricket. Promotion of club sport was greatly improved by the employment of a clubs officer. The severe restrictions in weekend sport, especially hockey, led to renewed calls for artificial playing surfaces on campus.

Over all, 1989 was a year of full programs, high levels of facility use



and consolidation for facility development in 1990/91, which will include the swimming pool, artificial hockey surface and running track.

Students' Association

The Students' Association throughout 1989 continued to provide efficient and effective student services. The Association recognises its primary role to provide material services to its members. And as a part of this recognition the Association in 1989 provided three new services, all of which play an important role in student welfare.

The first is concerned with the law. The Association provides free professional legal advice to all students. This service is provided by Denley, Gargett and Baird, one of the most reputable of legal firms in Wollongong.

Second of the trio comes in conjunction with the University's Student Learning Assistance Centre.

The Students' Association runs a student tutor service for those having difficulties with academic related problems. The service is a valuable resource to the University and is welcomed by the student body. It is already providing excellent results.

The third service is the Student Discount Booklet. For this the Students' Association approached businesses in the Wollongong region for their inclusion in the discount booklet, which provides students with discounts ranging from five per cent to 30 per cent. The booklet has served to foster a warm relationship between the Students' Association and local businesses as well as providing an avenue for the development for closer ties between the students of the University and the Wollongong community.

The services added further depth to the extensive and vital list provided by the Association.

Student Learning Assistance Centre

From February, the University opened the doors on a new learning concept in Australian education. The LAC at Wollongong is a one-stop shop where all the learning support needs of students, undergraduate and postgraduate alike, are provided free of charge.

The Centre has access to what is believed to be the only computer-based diagnostic/prescriptive study-skills instrument in the world.

A student can, within 20 minutes of entry to the Centre, receive a computer printout that identifies strengths and potential problems in

The University's Recreation and Sports Association encourages virtually every sport there is. The Recreation Centre caters for volleyball and netball associations, for the Academy of Sport and for small groups in many categories

16 areas important to learning. The program also prints recommendations in students' problem areas and recommends resources available at the Centre.

Teaching at the Centre is wide in scope. Help is provided on an individual and small-group basis in study skills; essay writing; oral communication and English usage. The Students' Association has provided funding that allows free tuition on a one-to-one basis, or in small groups in any subject. Students recommended by department heads are used as tutors. The latest innovation at the LAC is Supplementary Instruction. Subjects that are high risk have been identified. Postgraduate students sit in on the main lecture and impact with lecturers about the expected outcomes. During the week, two sessions are held in the LAC where students enrolled in the 'subjects at risk' may attend and receive supplementary instruction.

During the year, the University has provided generous funding that has allowed the purchase of equipment, materials and books (including dictionaries for each discipline subject) together with funding for teaching. All this adds up to a 'one stop shop' for students where they can learn the skills that allow them to learn more effectively, and with greater ease and confidence.

Tutor students and they will return again and again... Teach the students study skills and they become independent learners for life.

University Union

In recent years the Union has set itself the goal of providing the University with an inviting, friendly and relaxed community centre. The outcome in 1989 was that the Union showed considerable initiative and resources in providing, from a limited base, services and facilities of a high standard.

The Union's catering operations were consistently used by both staff

and students, many of whom used the facilities to relax and meet friends and colleagues away from the rigours of academia. The standard of catering offered was such that many organisations sought Union facilities and/or catering services for their conferences and seminars.

Refurbishing of the Bistro and Lounge Bar, in the weeks of the opening of University Tavern, provided what a visiting American food service expert described as 'the finest restaurant on any campus in the world'.

Diversification of Union catering operations necessitated considerable staff structural changes; and staff responded magnificently to the challenges.

Union activities continued to provide opportunities for staff and students to meet, relax and enjoy traditional forms of entertainment and to explore avenues that are not normally available.

Involvement in Union activities and clubs and societies offers rare leadership and involvement opportunities. Many business, community and political leaders have honed their skills in University Union activities and societies.

The Child Care Centre attracted a large Commonwealth grant to expand from 50 to 60 places and to implement a 20 place Family Day Care Scheme administered by the Centre.

Conference, seminar and meeting rooms provided free to University groups are fully utilised by a broad cross-section of the campus community. Union facilities were also used for examinations and other official University purposes.

Union Arcade services, including pharmacy, medical, dental and optometrical services, hairdresser, travel agent, mini market, bank and credit union, provided valuable services to the University community.

COUNCIL 1989

ATTENDANCES

	Possible	Attended	Apology/ Leave		Possible	Attended	Apology/ Leave
Ex Officio				Mr P.L. Manning	6	4	2
The Hon. Mr Justice				Mr D. Morrissey	6	5	0
R.M. Hope	6	5	1				
Professor K.R. McKinnon	6	6		Elected by Convocation			
Professor P.D. Rousch	4	4		Mr M. Arrighi	6	6	
				Mr K.W. Phipps	6	5	1
Elected by NSW Legislative Council				Dr W.J. Mitchell	6	6	
The Hon. Mr E.P.				Mr G.R. Ryan	6	5	1
Pickering, MLC	6	4	2				
				Elected by the Full-time Academic Staff of the University			
Elected by NSW Legislative Assembly				<i>Professorial Members</i>			
Mr C.J. Downy, MLA	6	2	4	Professor S. Castles	6	3	1
				Professor R.C. King	6	6	
Ministerial Nominees				<i>Academic Staff other than Professors</i>			
Dr B.S. Gillett	6	6		Dr M.J. Lowrey	6	6	
Ms S.L. Chapman	6	5	1	Dr J.R. Panter	6	5	1
Mr J.K. Ellis	4	3	1				
Mr A.C. Evans	6	2	4	<i>Elected by Institute Academic Staff</i>			
Mr R. Griffiths	6	2	3	Dr E.O. Booth	6	6	
Mr H. Hanson	6	4	2	Dr A. Smith	6	6	
Dr R.W. James	6	3	3				
Mr R.J. Oxley	6	5	1	<i>Elected by the Full-time General Staff of the University</i>			
				Mr A. Kent	6	5	1
Elected by the Students of the University				Ms F. McGregor	6	6	
Ms M.D. Licardy	6	5	0	Mr R. Parker	6	6	

BUILDINGS AND SITE DEVELOPMENTS

In June, construction started on the Commonwealth Government-funded General-purpose Academic Building. The project cost is \$8.7m (June 1988 prices) and completion is expected in February 1991. Total usable floor area will be approximately 3,900 sq m.

The building has been designed for flexibility and to help reduce a critical need for additional academic offices and teaching areas, particularly for the departments of the rapidly growing Faculty of Commerce.

There are three interconnecting structures. Two of them, Blocks A and B, will be of three storeys, virtually identical in design (mirror reversed) and will include some 140 offices, 70-seat lecture room, 12 other general teaching rooms and seven computer laboratories.

The third structure, Block C, will comprise a 400-seat multi-purpose lecture theatre with, in addition, a large stage and backstage facility to be used for theatre performances and work space for the School of Creative Arts.

Overall, the building will be general purpose in character and function and will allow for maximum physical and servicing flexibility to cater for a wide range of potential users and

the need to incorporate future communications and teaching technologies.

At its own cost, the University had advanced the planning and design of the building, so that construction could be started soon after the 1989 Commonwealth Government grant became available.

In addition to funding the General-purpose Academic Building, the Commonwealth Government in 1989 also provided \$1m towards the \$2.8m extension to the Weerona student residential complex. The extension (Stage 2) provides an additional 100 places.

Other major projects which were undertaken during the year and funded by the University include:

- Stage 2 extension to the Illawarra Technology Centre Building. Work on the building extension, at a cost of \$4.2m, began in April 1989. The building provides much-needed additional space for the technologically advanced activities being nurtured by the Technology Centre. The project is funded from University funds and from a loan raised specifically for this purpose.
- Stage 3 extension to the Kooloobong student-accommodation complex. This

Work on Stage 3 – the extension to the Kooloobong student accommodation complex provides for a further 100 places





Architectural 'rendering' of the proposed General Science Building – see column 2, below. 'Rendering courtesy of the University's architects, Graham, Bell and Bowman

\$2.5m project provides an additional 100 student places in the self-catering unit-style Kooloobong complex on the main campus. This project is funded from a loan raised for the purpose.

- An additional 130 student accommodation places were also provided at Campus East (former Commonwealth migrant hostel). The additional places were provided by altering and refurbishing two blocks of existing units which were included in the purchase of the total property but which had, until 1989, continued to be used by the Illawarra Housing Trust for community housing. The refurbishment / alterations cost of \$600,000 was met from University funds.
- A 50-metre swimming pool for both educational and recreational purposes has been constructed adjacent to the University Recreation Centre. The pool will be extensively used by the Faculty of Education for physical education, and by the Sports Science and Human Movement sections of the School of Health and Behavioural Sciences. The total cost of approximately \$800,000 is being met jointly

by the University and its Recreation and Sports Association.

- An Animal House giving larger and improved facilities was provided for the Department of Biology at a cost of approximately \$300,000, of which \$150,000 was provided by way of the Commonwealth Government Minor Works grant for 1989. The balance will be provided from the 1990 Minor Works Program.
- The Animal House was provided by making extensive alterations to an existing building.

During 1989, the University also planned and designed a new General Science Building in anticipation of some Commonwealth funds becoming available in 1990. This will allow construction to begin as soon as additional funds become available. The total cost of the project is estimated to be \$5.8m (December 1989 prices).

During the year the University also advanced the planning of other essential buildings in anticipation of funds becoming available in the future.

Summary of Commonwealth Government Grants

Major Projects

General Purpose Academic Building (Bld. 40)
- total project cost (\$8.7m) - 1989 Grant \$2.5m

Additional student accommodation -
Weerona Stage 2 (\$2.8m) - Commonwealth Contribution

\$1.0m

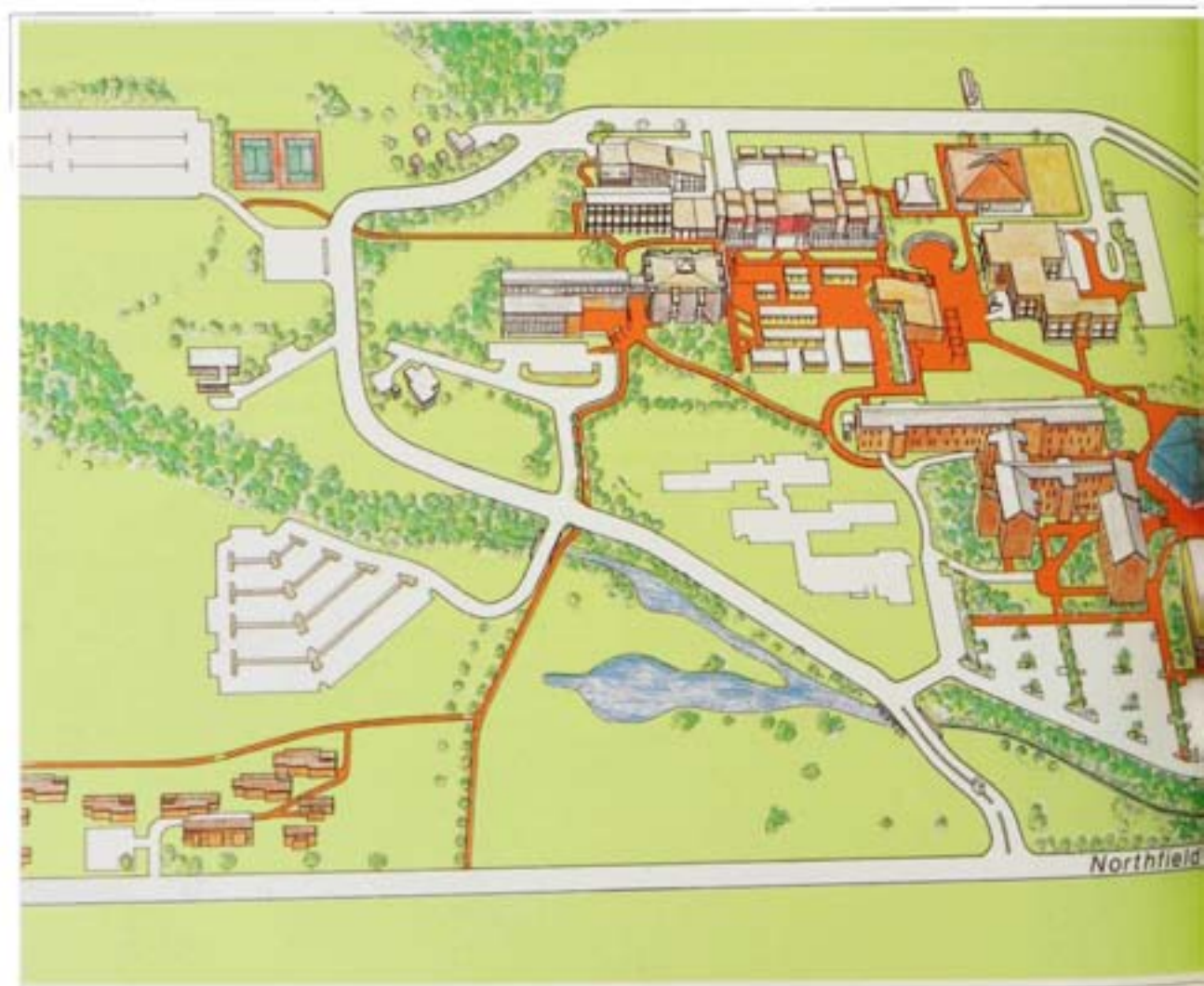
\$3.5m

Minor Building and Site Development Projects

Alterations and refurbishment in
Building 6 to provide larger and
improved Animal House facility \$150,000

Alterations and refurbishment of
Building 5 to provide additional
teaching areas 150,000

Extension to Building 6 to provide additional laboratory space for Department of Mechanical Engineering (Total Cost \$150,000)	75,000
Relocation of high voltage electrical power lines in association with General Purpose Academic Building	50,000
Site works (in Precinct G) in association with General Purpose Academic Building	30,500
Site works in association with Kooloobong Stage 3 Student Accommodation Project	4,000
Additional external lighting on main campus	20,500
Building alterations (Building 103) to provide additional space for academic use	9,000
Alterations in Library to provide space for Learning Assistance Centre	11,000
Painting of buildings at Campus East	27,000
Total	<u>\$527,000</u>



University Land

Main Campus

Northfields Avenue, Gwynneville
(Wollongong)

Lot 1 in Deposited Plan, 113094

Area: 82.04 ha

Land use: University buildings, education
and research activities

All land is essential to the University's
operations.

Land value (VG) \$2,466,000

International House

Hindmarsh Avenue, Gwynneville
(Wollongong)

Lot 41 in DP546239 Vol 11543 Fol. 188

Lot 42 in DP546239 Vol 11543 Fol. 189

Lot 1 in DP546474 Vol 11619 Fol. 167

Lot 13 in DP585083 Vol 13585 Fol. 56

Area: Approximately 1.2 ha

Land use: Students' residential college
Land is essential to the University's
operations

Land value (VG) \$110,000.

Mt Keira Observatory

Mt Keira / Picton Road (Permissive
occupancy)

Area: 1.027 ha

Land use: University Observatory / Telescope
building

Land is essential to the University's
operations

Land value (VG) \$4,000

Residence for Vice-Chancellor

2 Parrish Avenue, Mt Ousley

Lot 17 DP24098

Area: 0.2023 ha

Land use: Vice-Chancellor's Residence



Residence required under terms of appointment
Land value (VG) \$60,000.

Other Off-campus Property

Lot 1 Porter Street, Gwynneville
(Wollongong)
Certificate of Title Reg. Book No. Vol 4945
Fol 128

Area: 882m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$26,000.

49 Northfields Avenue, Gwynneville
(Wollongong)

Lot 6 DP36218 Vol 13318 Fol. 14
Area: 525m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$31,000.

51 Northfields Avenue, Gwynneville
(Wollongong)

Lot 5 DP36218 Vol 18720 Fol. 37
Area: 548 m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$31,000.

53 Northfields Avenue, Gwynneville
(Wollongong)

Lot 4 DP36218 Vol 11029 Fol. 17
Area: 545m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$31,000.

55 Northfields Avenue, Gwynneville
(Wollongong)

Lot 3 DP36218 Vol 13318 Fol. 13
Area: 575m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$31,000.

18 Madoline Street, Gwynneville
(Wollongong)

Lot 14 DP36215 Vol 13330 Fol. 166
Area: 668m²
Land use: Building accommodation for University education/research activities
Land is essential to the University's operations
Land value (VG) \$31,000.

Weerona (Hall of Residence)
12 Macquarie Street, Wollongong

Part Lot B
DP160926
Conveyance Book 1875
Number: 753 (residue)
Area: 1.171ha
Land use: Student residential accommodation
Land use is essential to the University's operations
Land value (VG) \$500,000.

Fairy Meadow Facility (Campus East)
Cowper Street, Fairy Meadow

Lot 1
DP719865, Parish of Woonona
County of Camden
Folio Identified 1/719865
Area: Approx. 12.02ha
Land use (part): Student residential accommodation
Land is essential to the University's operations
Land value (VG) \$750,000

PUBLICATIONS

The University produces a rich summary of its activities. The most impressive (and arguably the most important) are this publication — the *Annual Report* — and the *Research Report*, both of which fall under the aegis of the Academic Services Branch.

The *Research Report* grew out of *Research Publications*, which was just that, a list of publications without a narrative section describing research activities. The first full-scale *Research Report* appeared in 1988 to coincide with the first research students Open Day. The 1988-89 issue was also published to coincide with a postgraduate students research Open Day last September.

An innovation this year (or rather seven innovations) was a series of gatefold brochures, produced in colour, to provide information for potential postgraduate students on the range and scope of the University's research opportunities. While the first issue of the *Research Report*

dealt with descriptions of research work on a faculty basis, the second gave prominence to research programs and 'other research' — that is to say, to research projects not included in specific programs. Indicative of the wisdom of the second approach, perhaps, is the fact that the first issue ran to 60 pages and the second to 96. In each issue some 20 pages were devoted to research publications on a faculty and departmental basis.

Another addition to the University's publishing activities was a journal produced by the International Office. Entitled *Study Abroad in Australia*, the journal — as the title indicates — was a part of the University's overseas student-attraction program. Despite having only two colours on the outside front cover and no colour on the inside pages, the journal nevertheless had a welcome reception by students and study abroad administrators in the USA.

The most frequent of the University's publications is *Campus News*, a weekly eight-page A4-size news sheet. *Campus News* began as a





chiefly-for-campus publication, as a link between administration and staff and students, a link between department and department. To a lesser extent it was seen, also, as an instrument of public relations. Today it goes beyond the campus boundaries, to the Friends of the University, to other universities, to certain areas of government and the press. It is widely considered to be a prime source of news to those outside campus.

Two other journals are published on a regular basis. *The University of Wollongong Gazette*, which is published four times a year, began seven years ago. It was seen then as a desirable bridge between the University and the community, carrying research reports and news of the University to the outside in a way that *Campus News*, saddled with its columns of domestic business, seminars and forthcoming events, could never do.

The *Gazette* was given a face-lift for 1988, with the front page appearing in full-colour and on two of the inside pages. This use of colour was continued in 1989.

An innovation in 1989 was the incorporation into the *Gazette* of *The University of Wollongong Graduates Gazette*, which had previously appeared twice a year as a separate eight-page journal. The *raison d'être* for the *Gazette* and the *Graduates Gazette* is the keeping open of lines of communication between the University and former students. The *Graduates* pages continued in 1989 to



concentrate on profiles and the doings of graduates, in whatever courses and occupations they have been pursuing since leaving University.

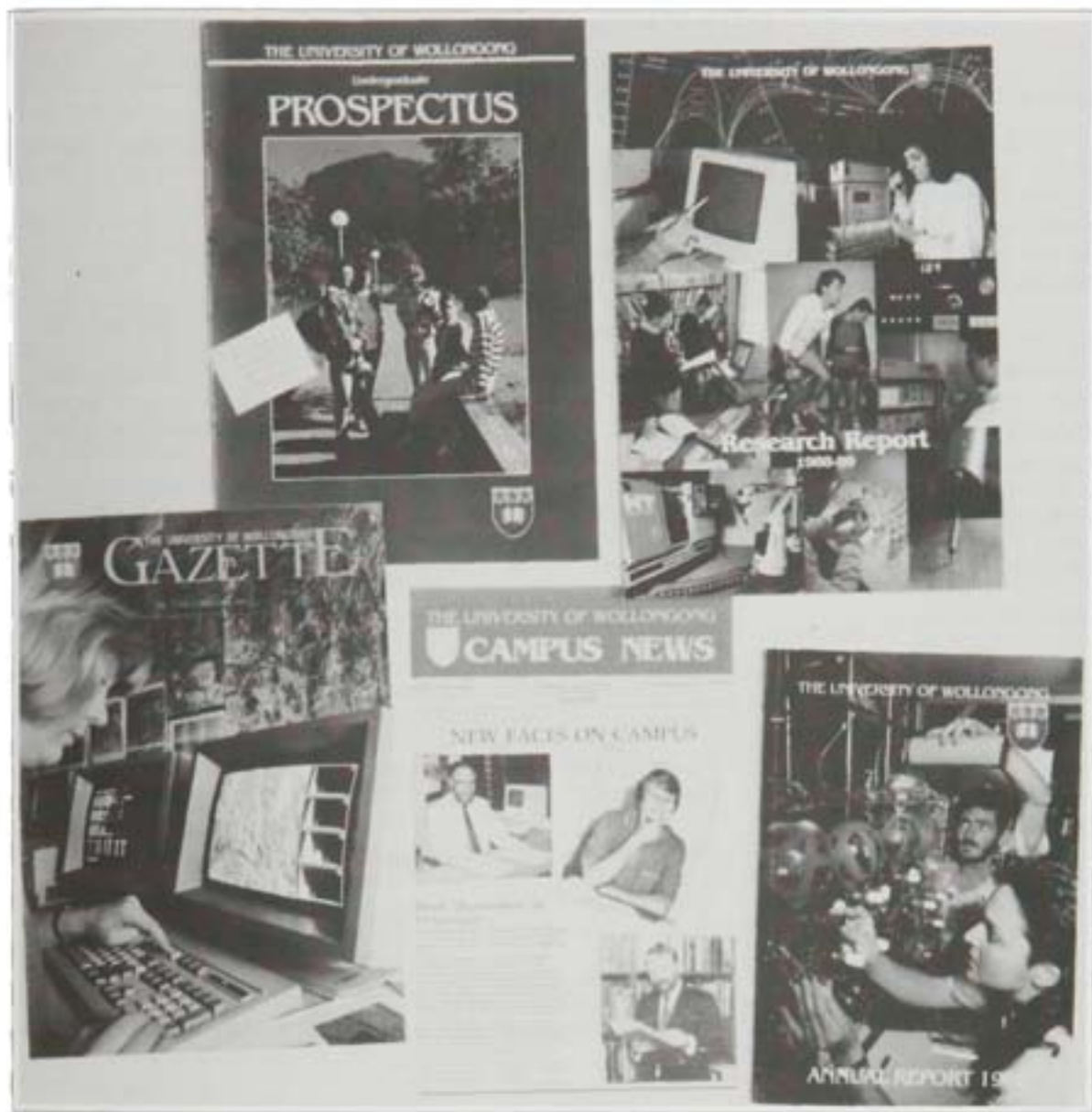
More specific in content, *The University Calendar* is published in four volumes:

Vol. I — legislation volume, contains the University of Wollongong Act and By-law;

Vol. II — Undergraduate Calendar — see below.

Vol. III — Postgraduate Calendar — see below

Vol. IV — Statistics report, statistical information and historical tables.



The *Undergraduate Calendar* is a comprehensive guide to undergraduate-course information. It contains Bachelor Degree, Diploma and Associate Diploma regulations. The handbook also lists schedules of subjects and subject descriptions for all undergraduate courses.

The *Postgraduate Calendar* is a comprehensive guide to postgraduate course information. The publication contains Graduate Degree and Diploma and Associate Diploma regulations. Its also lists schedules of subjects and subject descriptions.

A profusion of promotional publications is produced by the Planning and Marketing Branch. Among them is the *Undergraduate*

Prospectus which provides an introduction to the University for potential undergraduate students. It promotes the high calibre of courses, the setting, atmosphere, facilities and services, and it gives course information and entry requirements.

The *Undergraduate Prospectus* is complemented by a series of brochures providing detailed course information.

In addition to those, there is a comprehensive four-colour map guide to the campus. And promotional brochures are produced for the Science Centre and the Business and Technology Complex at Campus East, and for marketing activities in the USA, Malaysia, Japan and Korea.

PRIZES AWARDED

Name of Prize Winner

Name of Prize

Faculty of Arts

English

Not determined

The Marjory Brown Prize

Psychology

Barbara Nagy

The Australian Psychological Society - Prize in Psychology

Creative Arts

Helen Rivero

Des Davis Prize in Drama

Sue Nicholls

Philip Larkin Prize

History and Politics

Jenifer Anne Jones

The Australian Institute of Political Science Prize

Faculty of Commerce

Accountancy

Arif Shehaab Ali

Australian Society of Accountants Annual Prize (1)

Lai Fun Wong

Australian Society of Accountants Annual Prize (2)

Robyn Williamson

Australian Society of Accountants Annual Prize (3)

Robyn Williamson

Australian Society of Accountants Annual Prize - Best Graduating Student

Robyn Williamson

ATMA Prize for Management - Accountancy

Robyn Williamson

Coopers and Lybrand Prize for Advanced Auditing

Robyn Williamson

NSW Department of Finance Prize

Robyn Williamson

Touche Ross & Co. Chartered Accountants - Prize for Business Finance

Economics

Frances Murphy

The Hilda Kirby Prize

Jenny Jurman

The Industrial Relations Society of NSW Prize

Information Systems

Mike Condon

The Apple Award for Computer Applications

Glen Kerridge

National Safety Council of Australia Prize

Arielle Lam

The Unisys Award for Business Systems Analysis

Peter Davies

The Unisys Award for Graduate Diploma in Business Information Systems

Legal Studies

Lam Kwok Wai Calvin

ATMA Prize for Taxation Law and Practice

Tony Swinton

Butterworths Pty Ltd Law Publishers (four prizes)

Corey Maranesi

Elizabeth Ross

Sonya Cehic

Dominic Calabria

Corporate Affairs Commission Prize for Law of Business Organisations

Management

Terry Sinclair

The AIM Prize for the Graduate Diploma in Management

Jeffrey Brown

The AIM Prize in Management Studies

Bruce Malcolm Cox

The AIM Prize in the Master of Business Administration

Melissa Anne Irvine

Friends Prize for Management Studies

Faculty of Engineering

Engineering

Colin J. Goodger

The Institute of Engineering, (Australia), Award

Civil and Mining Engineering

Craig Mackey

The Australasian Institute of Mining and Metallurgy (Illawarra Branch) Mining Prize

Bradley Elvy

Elizabeth Tague Prize

No suitable candidate

Hot-Dip Galvanising Award

Two suitable candidates only

Joint Coal Board Prizes (three prizes)

Gerald Linde

Craig Mackey

Craig Mackey

The Western Mining Corporation Prizes for Mining Engineers (two prizes)

Bradley Elvy

Electrical and Computer Engineering

Andrew Jan Frikken	A.W. Tyree Transformers Pty Limited Award
Bruce Vincent Walsh	Walsh Institution of Electrical Engineers Award
Colin Edward Coates	Institution of Electrical Engineers, UK Award
David Robert Irvine	Staff Prize for the Fourth Year Electrical Engineering Thesis

Materials Engineering

David John Langley	The Australian Institute of Mining & Metallurgy (Illawarra Branch) Materials Prize
Michael Funcik	BHP Colorbond Materials Prize
Danuta Obuchowski	BHP Steel Slab and Plate Products Division Materials Prize
Alan Giumelli	Blue Circle Southern Cement Limited Maldon Works Materials Prize
Bryan Shedden	Commonwealth Banking Corporation Materials Prize
Caroline Bohlsen	Institute of Metals & Materials Australasia (Wollongong Branch) Materials Prize
	Metal Manufactures Prizes (three prizes)

1. Leonard Woods
2. Danuta Obuchowski and Grant West (shared)
3. Danuta Obuchowski

Mechanical Engineering

Steven Brian Harvey	Sam Marshall Prize for Mechanical Engineering Undergraduate Thesis
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Faculty of Mathematical Sciences

Computing Science

David William Innes	IBM Prize for Excellence in Computing Mathematics
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Mathematics

Paul Ian Morris	The Austin Keane Memorial Prize
Michael John Jennings	The SA Senior Prize
Linda Joy Granziera	Statistical Society of Australia (NSW Branch) Prize - awarded jointly
Paul Christopher Livingstone	

Faculty of Science

Science

Katherine Louise Lamb	The Gina Savage Prize
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Biology

Sharon Epps	The Biology Prize
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Chemistry

Maria Carmen Morales	Bert Halpern Prize in Chemistry
Monica Manthey	The G.W. Daniels Memorial Prize
Susan Melinda Hunt	The Peter Beckmann Memorial Prize

Geology

Gareth Thomas Cooper	The A.J. & I. Waters Prize in Geology - awarded jointly
Jaqui Mifsud	The Australasian Institute of Mining & Metallurgy (Illawarra Branch) Geology Prize
Stuart I. Hankin	B.P. Australia Ltd Coal Geology Prize
	The CRAE Mapping Prize in Geology
	The Evan Phillips Prize in Geology
	The Foundation Prize in Geology
	The Geological Society of Australia (NSW Division) Prize in Geology
	Prospectors Supplies Prize in Geology

Physics

(not awarded in 1989)	The Australian Institute of Physics (NSW Branch) Prize in Physics
Alexander John Gray Beck	Staff Prize in First Year Physics
Joint-Award:	Staff Prize in Second Year Physics
Martin Gerard	
Peter John Maguire	
Not awarded in 1989	Staff Prize in Third Year Physics
Tania Marie Silver	Staff Prize in Honours Year Physics

School of Health Sciences

Desilee Gail Dwyer	Illawarra Award for Nursing Excellence
Jann Haselden	Illawarra Hospital Encouragement Prize for Nursing
Desilee Gail Dwyer	Illawarra Hospital Prize for Nursing

ACADEMIC PROMOTIONS

Name	Promoted to	Academic Unit
Dr N.A.B. Gray	Associate Professor	Computer Science
Dr N.J. Kyle	Associate Professor	Learning Studies
Dr D.L. Mixon	Associate Professor	Psychology
Dr J.A. Schuster	Associate Professor	Science and Technology Studies
Dr R.T. Wheway	Associate Professor	Mechanical Engineering
Dr C.A. Freeth	Senior Lecturer	Physics
Dr M. Garson	Senior Lecturer	Chemistry
Mr R. Handley	Senior Lecturer	Legal Studies
Miss Y.B. Kerr	Senior Lecturer	Policy & Technology Studies
Dr M. Magdy	Senior Lecturer	Electrical & Computer Engineering
Dr A.G. Morris	Senior Lecturer	Mathematics
Dr D.T. O'Brien	Senior Lecturer	Economics
Dr F. Prokop	Senior Lecturer	Mathematics
Dr A.N. Schultz	Senior Lecturer	Creative Arts
Dr M. Sivakumar	Senior Lecturer	Civil and Mining Engineering
Dr A.D. Wells	Senior Lecturer	History & Politics
Dr M.J. Wilson	Senior Lecturer	Learning Studies

STUDY AND OVERSEAS CONFERENCE LEAVE IN EXCESS OF TWO WEEKS

Faculty/Unit	Member	Principal Location
FACULTY OF ARTS		
Creative Arts	Ms E. Jeneid Mr R. Pretty	USA, Japan USA/UK
English	Mr D. Davis A. Prof D. Jones	USA/UK USA, UK
History & Politics	Dr B. Kiernan	Asia/Europe
Information Technology	Dr I. Reinecke Dr B.N. McCarthy Dr D. Hawley	Europe UK, USA USA, France
Psychology	Dr G. Huon Prof W. Lovegrove	UK, Europe UK
Sociology	Ms R. Albury Mr M. Donaldson	Aust. Aust.
Science & Technology Studies	Dr T. Stokes Dr R. Badham	USA/UK UK
Centre for Multicultural Studies	Mr M. Morrissey	South America

Faculty/Unit	Member	Principal Location
FACULTY OF COMMERCE		
Accountancy	Mr W. Funnell	UK, ACT
Economics	Dr J. Thampapillai A. Prof V.H. Tran A. Prof J. Steinke A. Prof R. Markey	Canada, Germany UK, Europe, Thailand UK/USA Europe, Aust.
Legal Studies	Mr K. Hale	UK, Europe
Management	Ms M. Craig-Lees Mr R. Cleary Prof J. Lowe	Europe, USA USA UK

FACULTY OF EDUCATION

Learning Studies	Mr P. Geekie Dr N. Kyle	Thailand/London UK, Aust.
Policy & Technology Studies	Dr B. Watkin Mr N. Hall	USA, Canada USA

FACULTY OF ENGINEERING

Civil & Mining Engineering	Prof L.C. Schmidt A. Prof R. Chowdhury Dr R. Kohoutek	Vic/USA /Europe Aust. USA
Electrical & Computer Engineering	A. Prof F. Paoloni Dr J. Chicharo	USA PNG, USA
Materials Engineering	Dr G. Delamore	Canada/UK
Mechanical Engineering	Dr L.Y. Shue Dr I. Jawahir	Europe USA

FACULTY OF MATHEMATICAL SCIENCES

Computing Science	Dr L. Maciaszek Dr P. McKerrow	USA, Canada, France UK
Mathematics	Dr G. Williams Dr P. Laird Dr C. Coleman Dr T. Horner	USA Canada/Japan UK/Aust. UK/Aust.

FACULTY OF SCIENCE

Biology	Dr R.J. Whelan A. Prof A.J. Hulbert Dr E.J. Steele	UK, USA Spain/UK/Europe USA/Europe
Chemistry	A. Prof P. Burton Dr D. Griffith	USA/Japan/Europe USA
Geography	A. Prof R.W. Young A. Prof G. Nanson	USA/Europe Europe/Aust.
Geology	Dr P. Carr A. Prof B. Jones	USA Europe, Aust.
Health Sciences	Mr A. Monaem Ms I. Stein	Queensland UK
Physics	Dr W. Zealey	UK, Aust.

GRANTS AND DONATIONS

Australian Research Council Grants

Faculty of Arts

History

Prof J.S. Hagan and Dr K. Turner
A History of the Australian Labour
Party (NSW) \$8,000

Dr S. Piggin
Australian Evangelicalism - a
Bicentennial History \$17,000

Languages

Dr G. Ianziti
Humanist Awareness of the
Contemporary as an Autonomous
Dimension of Historiographical
Representation (in 15th
century Italy) \$7,000

Centre for Multicultural Studies

Prof S. Castles, Dr K.D. Gibson
and Dr J.H. Collins
The Apparent Growth of Self-
Employment: Migrants and the
Economic Restructuring of
Sydney \$30,000

Ms M. Kalantzis and Dr W.W. Cope
Cultural Pluralism and School
Achievement: Affective and Cognitive
Outcomes to Four Junior Secondary
Social Science Curricula \$8,685

Psychology

Dr D. Badcock and
Prof W.J. Lovegrove
Reception Field Model of the
Sustained and Transient Response
Properties of Vision in Normal and
Specifically Disabled Readers \$22,363

Dr S. Kinoshita and Dr S.V. Wayland
Repetition Priming in Amnesia \$13,100

A.Prof L.L. Viney
The Process of Counselling \$18,000

Sociology

Prof S.C. Hill
Historical Analysis of Technology-
Culture Relationships in Australia \$27,000

Science and Technology Studies

Dr R.J. Badham
The Design of Human Centred
Forms of Computer Integrated
Manufacturing (CIM): a Case Study
in the Social Construction and
Implications of Technological Systems \$6,815

Prof J. Falk
Preconditions for the Successful
Development, Transfer and
Application of Expert Systems in
Australia \$9,490

Dr I. Reinecke
Comparative Cost Efficiency and
Equity of Electronic Data Systems
and Printed Media in the
Dissemination of Information
from Government Sources \$13,000

Faculty of Engineering

Civil and Mining Engineering

A.Prof R.N. Chowdhury
Slope Stability and Risk Assessment \$31,299

A.Prof Y.C. Loo
Punching Shear Failure at Corner
and Edge - Columns of Reinforced
Concrete Flat Plates with Spandrel
Beams \$29,319

Materials Engineering

Dr T. Chandra
Study of Recrystallization and
Precipitation in Hot Worked Copper
Containing Microalloyed Steels \$26,000

Dr G. W. Delamore
Crystallisation Kinetics of Metallic
Glasses \$32,000

Prof W.J. Plumbridge
Residual Stress Effects on Fatigue
Crack Growth in Structural Steels \$35,918

Mechanical Engineering

Dr I.S. Jawahir Development of a Knowledge-Based System for Chip Control Automated Manufacture	\$16,350
Dr A.K. Tieu Superlaminar Flow in Hydrodynamic Thrust Bearings	\$33,548

Faculty of Mathematical Sciences**Computing Science**

A.Prof G. Doherty Distribution of Mathematical Software	\$23,000
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Mathematics

Prof J.R. Blake and Dr W.K. Soh Cavitation Bubbles near Compliant Boundaries	\$14,800
Prof J.R. Blake and A.Prof G. Doherty Transient Cavities near Boundaries	\$43,512
Prof J.M. Hill Integral Formulations and Bounds for Heat Diffusion Moving Boundary Problems	\$23,973
Dr N.F. Smyth Internal Hydraulic Jumps and Undular Bores Formed on a Shelf Break	\$27,147

Faculty of Science**Biology**

Dr D.J. Ayre Factors Determining the Genetic Structure of Populations of the Sea Anemone <i>Acintia Tenobrosa</i>	\$34,606
A.Prof A.J. Hulbert Studies of the Evolution of Mammalian Endothermy	\$35,895
A.Prof R.McC. Lilley The Molecular Biology and Osmo- regulation of the Marine Alga <i>Dunaliella</i>	\$18,000
Dr H.J. Spencer Radiotelemetric Determination of Distribution, Colony Sites and Feeding Range of the Grey-Headed Fruit Bat - <i>Pteropus Poliocephalus</i>	\$32,500

Dr R.J. Whelan Competition Among Plants for Pollination	\$27,439
Dr R.J. Whelan and Dr D.J. Ayre Genetic Consequences of Plasticity of Mating Systems in the Proteaceae	\$35,969

Chemistry

Dr P.T. Crisp and Ms M. Guilhaus Improved Methods for the Analysis of Anionic Surfactants in Natural and Waste Waters	\$18,000
Dr M.J. Garson Chemistry and Biochemistry of Marine Invertebrates from the Illawarra Region	\$30,000
Dr M.J. Garson and Dr P.T. Murphy Production of Bioactive Metabolites by Marine Sponges - In Vitro and In Vivo Studies	\$34,819
Dr D. W. Griffith The Role of Fire in Atmospheric Chemistry, and the Application of FTIR Spectroscopy to Atmospheric Trace Gas Analysis	\$23,500
Prof L. Kane-Maguire Kinetics and Mechanisms of Metal Carbonyl Cluster Reactions	\$28,000
Prof L. Kane-Maguire, Dr S.G. Pyne and Dr J. Carver Organometallic Complexes as Reagents in Peptide Synthesis and Modification, and Asymmetric Synthesis	\$40,000
Dr S.G. Pyne Asymmetric Synthesis of Chiral Alkaloids from Chiral β -Amino Sulfoxides	\$20,000
Dr G.G. Wallace Development and Application of New Electrosynthesised Polymers	\$14,000
Geography Dr E.A. Bryant, A.Prof R.W. Young and Dr C.D. Woodroffe Thermoluminescence and Uranium- Thorium Dating of Last Interglacial Coastal Landforms Along the New South Wales Coastline	\$12,000
Dr C.L. Ferguson, Dr C.L., Dr R. Henderson and Dr E. Leitch Tectonostratigraphic Terrane Analysis of the Craigilee-Yarrol Province, Northern New England, Orogen	\$5,000

A.Prof G.C. Nanson,
A.Prof R.W. Young and Dr D.M. Price
Quaternary Studies of Stream
Development in Central and
Eastern Australia \$15,000

Dr C. D. Woodroffe and
Dr R.F. McLean
Sea-level Change, Geomorphology
and Late Quaternary Development of
Cocos (Keeling) Islands: Darwin's
Atoll \$25,000

Geology

Dr P.F. Carr, Dr C.L. Fergusson and
A.Prof B.G. Jones
Relationship between Plutonism,
Volcanism and Tectonics in the
Southern Wollondilly Tract,
Eastern Lachland Fold Belt \$10,500

A.Prof B.G. Jones, A.Prof
G.C. Nanson and A.Prof R.W. Young
The Gilbert Fandelta – an Integrated
Sedimentological, Geomorphical and
Chronological Study of a Tropical
Monsoon River System \$11,500

Physics

Dr K.S. Cheng
Pulsars: Timing and High Energy
Radiation Emission \$6,000

Prof P. Fisher, Dr C.A. Freeth,
Dr R.A. Lewis, Dr P.E. Simmonds,
Dr A.D. Martin
Electronic and Vibrational Spectra of
Solids \$65,000

Dr W.J. Zealey and Dr G.K. Moore
Digitisation and Image Analysis of
Astronomical Images \$20,071

Centres

Centre for Transport and Policy Analysis

Dr R. Robinson and Dr K. Trace
Australian Flag Competitiveness and
National Maritime Policy: An Analysis
of its Cost Impacts on Container and
Bulk Minerals Exports \$32,796

National Energy Research Development and Demonstration Council

Faculty of Engineering

Materials Engineering

A.Prof N. Standish
The Bulk Density of (Export) Coal \$275,329

National Health and Medical Research Council Grants

Faculty of Arts

Psychology

Dr G. Huon and Dr M. Wootton
Cognitive and Nutritional Factors in
Bulimia Nervosa \$21,324

Biology

Prof L.W. Chubb
Peptides, Neuropeptides and
Neuro-Transmission \$109,044

Prof H.M. Garnett
Interaction of Human Cyto-
megalavirus with Peripheral Blood
Monocytes \$44,468

Prof H.M. Garnett
Characterisation of Cytomegalovirus
Induced Plasma Membrane
Glycoproteins \$43,369

A.Prof A.J. Hulbert
The Role of the Thyroid in the Early
Physiological Development of
Mammals \$44,188

Dr E.J. Steele and Dr P.D. Cooper
Studies on the Potential of Gamma
Insulin as an Adjuvant in Mice \$28,136

Dr E.J. Steele and Dr G.W. Both
Mechanism of Somatic Hyper-
mutation in Antibody Variable
Region Genes in Mice \$41,659

Chemistry

Dr R.J. Truscott
Mechanism of Senile Nuclear
Cataract in Man \$28,245

Health Sciences

Prof G.D. Calvert and Dr D.R. Turner
Characterisation of Human Lipid
Transfer Protein \$41,579

A.Prof C. Ewan
Job Characteristics and Risk Factors
for Heart Disease \$34,752

**CSIRO/University of Wollongong
Collaborative Scheme**
Faculty of Engineering**Mechanical Engineering**

Dr W.K. Soh and Dr K. Hourigan
The Effect of Secondary Flow
Separation on the Shedding of
Vorticity \$5,000

Faculty of Mathematical Sciences**Mathematics**

Prof D. Griffiths and Dr G. Brown
Development of Statistical Tools for
Control Charting Under Non-
standard Conditions \$6,800

Faculty of Science**Chemistry**

Dr P.T. Crisp and Dr J.D. Saxby
Flash Oxidation of Sulphur-Rich Coals,
Oilshales and Recent Sediments \$5,500

A.Prof J. Ellis and Dr K. Bowmer
Odorous Algal Metabolites in Surface
Waters \$6,000

Dr D.W. Griffith, Dr P. Cheney and
Dr D. Williams
Atmospheric Emissions of Bushfire
Smoke \$9,400

Dr G.G. Wallace and Dr D.G. Laing
Development of a Biosensor for
Caffeine \$10,000

Geology

Dr P. Carr and Dr G. Carr
A Comparison of U-Pb, Rb-Sr and
Nd-Sm Isotopic Systematics of
Silurian to Carboniferous Gold
and Base Metal Mineralization in
the Eastern Lachlan Fold Belt \$6,800

Dr B.E. Chenhall, A.Prof B.G. Jones
and Dr G. Batley
The Environmental Significance of
Industrial Metal Pollutants in the
Sediment and Biota of Estuarine
Lagoonal Systems on the NSW
Coast \$7,500

Dr A.C. Hutton and Dr D.H. French
Mineralogy Geochemistry and
Organic Petrography of Australian
Tertiary Oil Shales \$3,000

Other Research Grants**Faculty of Arts****Centre for Multicultural Studies**

*Health Services Research and Development
Grants - Commonwealth Dept of Health*

Ms C. Alcorso, Dr C. Cooper and
Prof S. Castles
Drug and Alcohol Intervention in a
Multiethnic Society \$57,947

Giovanni Agnelli Foundation

Prof S.C. Castles
Euro-Australians Project \$119,733

*Dept of Immigration Local Government
and Ethnic Affairs*

Prof S.C. Castles and Ms C. Mitchell
Overseas Qualification Study \$64,936

*Dept of Immigration Local Government
and Ethnic Affairs*

Prof S. Castles
Adult Migrant Education Programme
Services \$19,918

Office of Multicultural Affairs

Prof S.C. Castles
Community Relations Strategy \$19,036

Office of Multicultural Affairs

Ms M. Kalantzis and Dr W. Cope
Economics of Multicultural Education
Stage 2 \$5,267

NSW Department of Education

Ms M. Kalantzis and Dr W.W. Cope
D.S.P. Parent Participation Project \$26,329

*Dept of Immigration Local Government
and Ethnic Affairs*

Ms M. Kalantzis
Education and Cultural and Linguistic
Pluralism Project No 6 \$37,897

Psychology*Commonwealth AIDS Research Grants*Ms L. Crooks
Montreal Conference Funds \$2,500*Research Foundation Australia*Prof W.J. Lovegrove
Effect of Spatial Filtering on Reading
Comprehension \$1,650*Commonwealth AIDS Research Grants*A. Prof L.L. Viney, Dr R. Henry and
Dr B.M. Walker
The Psychosocial Needs of HIV-
Infected People and their Carers \$56,268*Department of Community Services
and Health*Mr J. Wragg
Drug and Alcohol Evaluation
Handbook \$2,000*NSW Department of Health*Mr J. Wragg
Evaluation of South Eastern Region's
Child Development \$3,000*Commonwealth Department of Health*Mr J. Wragg and A. Prof L.L. Viney
Longitudinal Drug Education/
Prevention Study in NSW \$16,395**Faculty of Commerce****Economics***CTEC Evaluations and Investigations
Program*A. Prof D.E. Lewis
Credit Transfers Between TAFE and
Higher Education - a Pilot Study \$18,200*ACIAR*Dr D. O'Brien
Rural Employment and Income in
Indonesia \$67,714**Faculty of Education***Department of Education
Employment and Training*A. Prof B. Cambourne
Remix and Editing of Final Cut of
the Secondary Literacy Inservice
Course Video \$8,000*NSW Department of Education*A. Prof B. Cambourne
Aboriginal Education Unit and
Disadvantaged Schools Programme \$10,807*Commonwealth Special Education
Program 1989*Ms A. Elliott
Using Computer-based Learning Activities
with Hall, N. Developmentally Delayed
Children in Preschool Classrooms \$4,000*NSW State Cancer Council*Mr M. Hatton
An Evaluation of the Document -
Cancer Education a Resource for
Science Teachers \$16,500*BHP Steel*Dr N.J. Kyle
Encouraging Young Women into Non-
traditional Employment Training and
Higher Education in the Illawarra \$15,000*Women's Research and Employment
Initiatives Program*Dr N.J. Kyle and Dr J.M. Jones
Encouraging Female Entry into
Traineeships in Non-traditional
Employment in the Illawarra \$3,737**Faculty of Engineering****Civil and Mining Engineering***Bellambi Coal Company Pty Ltd*Dr N.I. Aziz
Dust Suppression in Mines \$500*Water Research Advisory Council
Fellowship*Ms M.C. Bufill
Methods for Predicting the Effects of
Urbanisation on Water Quantity and
Quality \$32,127*Bunge Industrial Steels Pty Ltd*Dr R. Kohoutek
Serviceability of Semi-rigid Joints \$3,000*BHP Steel International*Dr D.G. Montgomery
Steel Slag Research Project \$4,000*Kembla Coal and Coke Joint Coal
Board; et al*Prof L.C. Schmidt
Rapid Face Bolting Project \$42,520*Electrical and Computer Engineering
Australian Telecommunications and
Electronics Research Board*Prof H. Bradlow, Dr R.F. Hille and
Dr S. Ghahreman
Integration of Conversational Voice
Communications into Local and Wide
Area Computer Networks \$6,000

Electrical Research Board

Dr K.J. McLean, Dr M.A. Magdy and
Dr D. Platt
A New Approach to Adaptively Tune a
PSS for Generators Subject to Large
Changes in System Configurations \$9,000

*Australian Telecommunications and
Electronics Research Board*
A.Prof T.S. Ng and Dr J. Chicaro
Performance Analysis of Multiple
Beam and Optimum Combining
Space Diversity Arrays In Digital
Mobile Base Stations \$6,000

*Australian Telecommunications and
Electronics Research Board*
A.Prof T.S. Ng, A.Prof F. Paoloni and
Prof H.S. Bradlow
Video Transmission Rate Reduction
by Hybrid and Interpolative Coding
Techniques \$6,000

Electrical Research Board
A.Prof T.S. Ng
To Develop a Knowledge Acquisition
System for Expert Construction for
Alarm Processing in a Power System
Control Centre \$10,000

*Australian Telecommunications and
Electronics Research Board*
A.Prof F.J. Paoloni
A Pipeline Two-dimensional Fourier
Transform Processor \$2,000

*Australian Institute of Nuclear
Science and Engineering*
A.Prof F.J. Paoloni
An Investigation of the Electrical
Characteristics of a Vacuum ARC
Centrifuge \$3,700

Materials Engineering

Generic Technology Grant
Prof D. P. Dunne
Development of High-productivity
Welding Processes and Procedures
for Joining Structural Steels of
Australian Manufacture \$120,000

BHP/Bunge Industrial Steels Pty Ltd
Prof D.P. Dunne
The Structure and Properties of Haz of
Welded HSL 80 Plate Steels \$4,000

National Teaching Company Scheme
Prof W.J. Plumbridge
Variability in Magnesia Particulates \$16,875

Mechanical Engineering

Electrical Research Board
Prof P.C. Arnold and Prof P.W. Wypych
Optimal Design of Stepped Pipelines
for the Long-distance Conveying of
Fly Ash and Other Related Products \$38,795

Electrical Research Board
Dr A.K. Tieu
A Numerical and Experimental
Investigation into the Oil Whirl
Characteristics of Hydrodynamic
Journal-related Products \$32,000

Faculty of Science**Biology**

*Murray-Darling Freshwater Research
Centre*
Dr D. Ayre and Ms J. Chaplin
Reproduction and Dispersal of the
Freshwater Ostracod *Candocypris
Novaezealandio* in the Illawarra and
Murray-Darling Regions of NSW \$8,213

Clive and Vera Ramaciotti Foundation
Prof H.M. Garnett
Cell Sorter for Biomedical Research in
Particular to Study the Interactions of
Human Cytomegalovirus with Blood
Leukocytes \$20,000

*Government Employees Assistance to
Medical Research Fund*
Dr E.J. Steele
Genetic Fingerprinting of the Progeny
of Hyperimmunized Mice \$32,500

Clive and Vera Ramaciotti Foundation
Dr E.J. Steele
Molecular Screening for Restriction
Fragment Length Polymorphisms in
Antibody Variable DNA Sequences
in Progeny of Immune Males \$35,768

Clive and Vera Ramaciotti Foundation
Dr G. Sullivan-Tailyour
Identification of the Surface Molecules
Mediating Attachment and Penetration
of Human Cytomegalovirus \$25,000

*Metropolitan Water Sewerage and
Drainage Board*
Dr R. Whelan and Mr S. Bellgard
The Impact of Soil Disturbance on
Mycorrhizal Fungi and its Relationship
with the Post-Disturbance Recolonisation
of Adry Sclerophyllous Hawkesbury
Sandstone Heath O'Hares
Catchment Area \$2,000

Chemistry		<i>Smithsonian Institute</i>	
<i>BHP/UNIWOL Joint Research Proposal</i>		Dr C. Woodroffe	
Dr P.T. Crisp and Dr P.J. Kirton		Mapping of Central Belize Barrier	
The Chemical Characterisation of		Reef from Satellite Imagery	\$US5,000
Coke Oven Emissions			\$8,120
<i>Max Planck Institute</i>		Health Sciences	
Dr D. Griffith		<i>Government Employees Assistance to</i>	
Field Measurements of Bushfire		<i>Medical Research Fund</i>	
Chemistry		Prof G.D. Calvert	
		Uptake of Lipid from Lipoproteins	
		by Hepatic Cells	\$30,000
<i>Clive and Vera Ramaciotti Foundation</i>		<i>Australian Coaching Council</i>	
Prof L. Kane-Maguire and Dr J. Carver		Dr K. Chad	
NMR Structural Studies on Bioactive		Relationship Between Physical	
Molecules Involved In Disease Onset		Requirements and Physiological	
and Control		Responses in Netball	\$12,500
<i>Australian Institute of Nuclear</i>		<i>BHP Steel, Slab and Plate</i>	
<i>Science and Engineering</i>		<i>Products Division</i>	
Dr S.G. Pyne		Mr O. Curtis	
Redox Potentials of Free Radicals		The Rehabilitation Programs Quality	
Involved in Protein Modification		Control Research Project	\$32,000
			\$400
<i>Industry Technology and Commerce</i>		<i>Australian Coaching Council</i>	
<i>Co-operative Research Support</i>		Mr H. Fuller	
Dr R. Truscott		The Design and Development of	
Cataract Formation in Man		Adapted Fishing Tackle Prototypes	
		Suitably Modified for Disabled	
		Fishers	\$13,000
<i>ACIAR</i>		<i>Australian Rugby Football Union</i>	
Dr R. Truscott		Dr P. D. Milburn	
Breeding and Quality Analysis of		Investigation into the Biomechanics	
Rapeseed for China		of Rugby Scrummaging	\$4,066
		<i>Victorian Nursing Council</i>	
<i>Australian Institute of Nuclear</i>		Ms J. Pincombe	
<i>Science and Engineering</i>		Pre-Natal Needs of Islamic Women	\$5,914
Dr G.G. Wallace			
The Use of Ion Implantation Techniques		Physics	
to Produce New Chemical Sensors		<i>Australian Institute of Nuclear</i>	
		<i>Science and Engineering</i>	
		Dr J.N. Mathur	
<i>Urban Water Association</i>		Calculation of the Energy Spectrum of	
Dr G.G. Wallace		Neutrons Released in Fission Using a	
Development of a Chloramine		Cascade Evaporation Model (CEM)	\$400
Sensor			\$20,000
		Centres	
Geography		Centre for Work and Labour	
<i>Australian Institute of Nuclear Science</i>		Market Studies	
<i>and Engineering</i>		<i>Dept of Education, Employment</i>	
Dr E. A. Bryant		<i>& Training - Consultancy</i>	
Dating of Rock Platform Formation		A. Prof J. Mangan	
Australian		Office of Labour Market Adjustment	
		Skills Audit Unemployment Study	\$16,250
			\$400
<i>Department of Health</i>			
Dr A. Young			
Pollution Task Force Lead Study -			
Healthy Cities Illawarra			\$27,800
<i>Conservation Commission of NT</i>			
Dr C. Woodroffe			
Geomorphology and Environmental			
Change in the Lower Mary River, NT			\$21,000

Centre for Advanced Manufacturing and Industrial Automation

*Dept of Education, Employment
& Training - Key Centres*
CAMIA (Centre for Advanced
Manufacturing and
Industrial Automation)

\$184,800

Donors and Benefactors

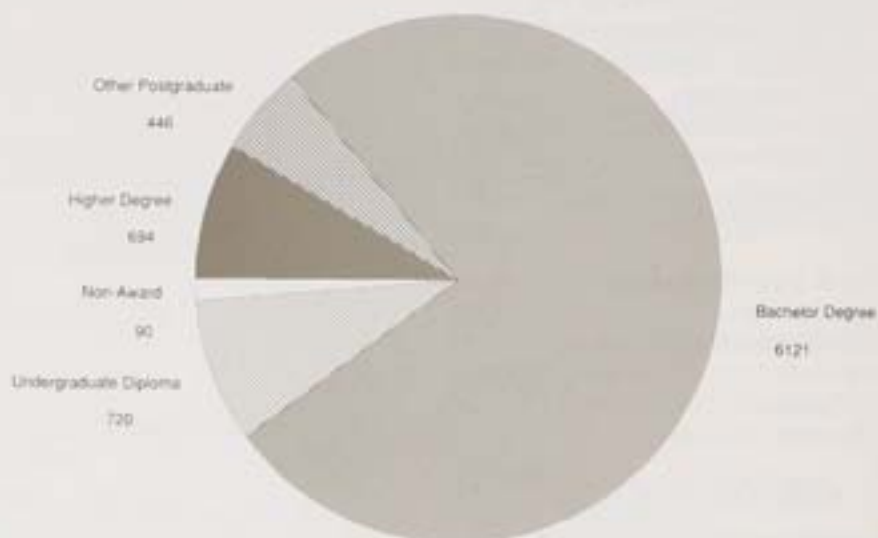
National Bank - Scholarship	\$15,000
MM Metals - Scholarship	\$1,200
BHP Coated Products - Scholarship	\$1,440
Graham Bell & Bowman - Scholarship	\$1,200
Office Supplies - Scholarship	\$1,200
Bevans Real Estate - Scholarship	\$1,200
Kiama Council - Scholarship	\$2,000
IMB Society - Scholarship	\$1,200
Australian Wool Corporation - P.G. Scholarship	\$9,473
Australian Iron & Steel Pty Ltd - BHP/China Scholarship	\$10,700
Illawarra Credit Union - Employment Scholarships	\$7,500
G.A. Jackson - Prize	\$5,000
Professor H. Worner - Howard Worner Prize	\$2,000
M.E. Morrow - Mary Wade Memorial Trust	\$1,000
Mary Wade History - Mary Wade Memorial Trust	\$1,500
IMB Society - IMB Society Scholarship	\$1,200
Australian Wool Corporation - P.G. Scholarship	\$1,283
Coal Corporation of Victoria - P.G. Scholarship	\$8,142
Elizabeth Tague Prize - Uniadvice	\$3,500
Peter Schmidt Memorial Scholarship - Uniadvice	\$13,318
Ethel Hayton Scholarship Fund - Friends of the University of Wollongong Ltd	\$4,347
Illawarra Credit Union - Employment Scholarship	\$2,500
Associated Pulp & Paper Scholarship - APPM	\$7,500
Comalco Research Prize - Comalco Research	\$1,500

1989

STAFF AND STUDENT STATISTICS

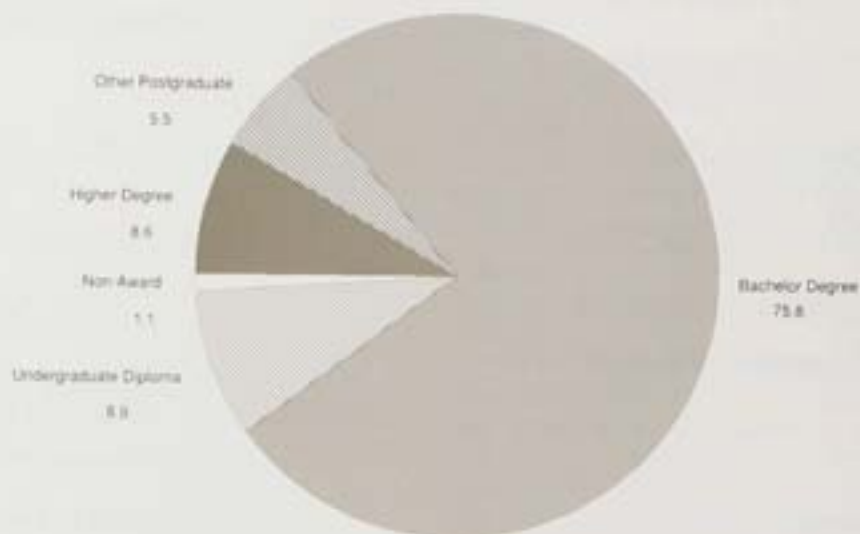
Degrees and Diplomas 1989

Totals

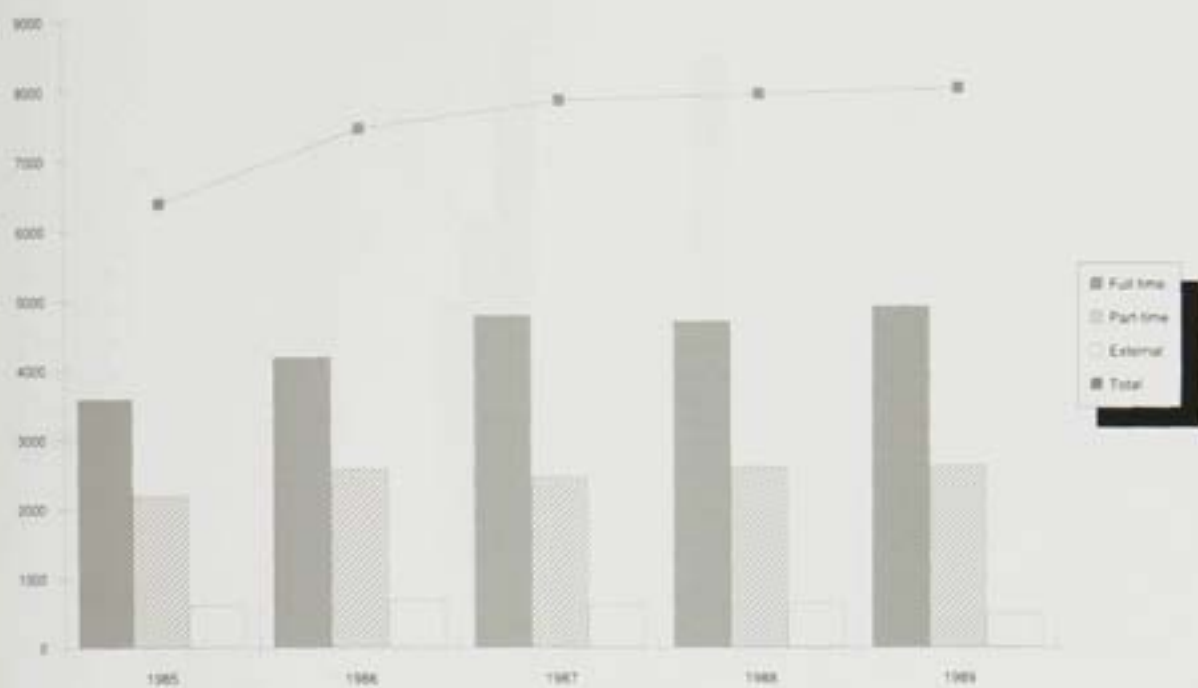


Degrees and Diplomas 1989

Percentages



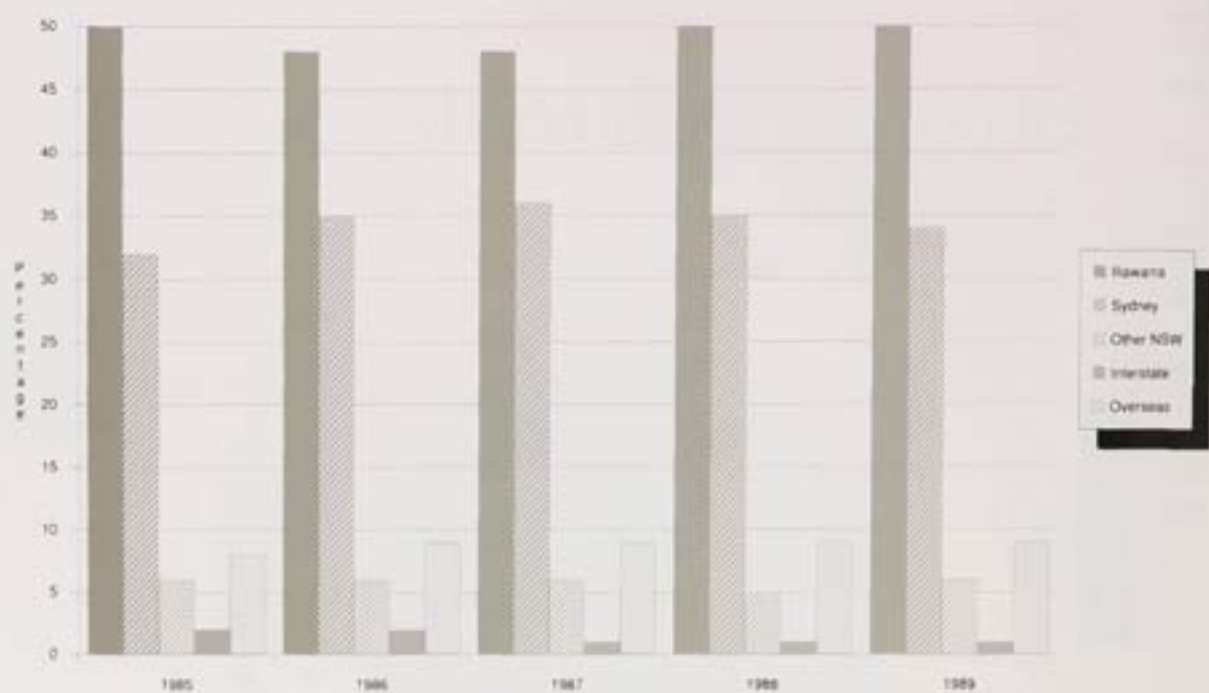
Growth in Student Population



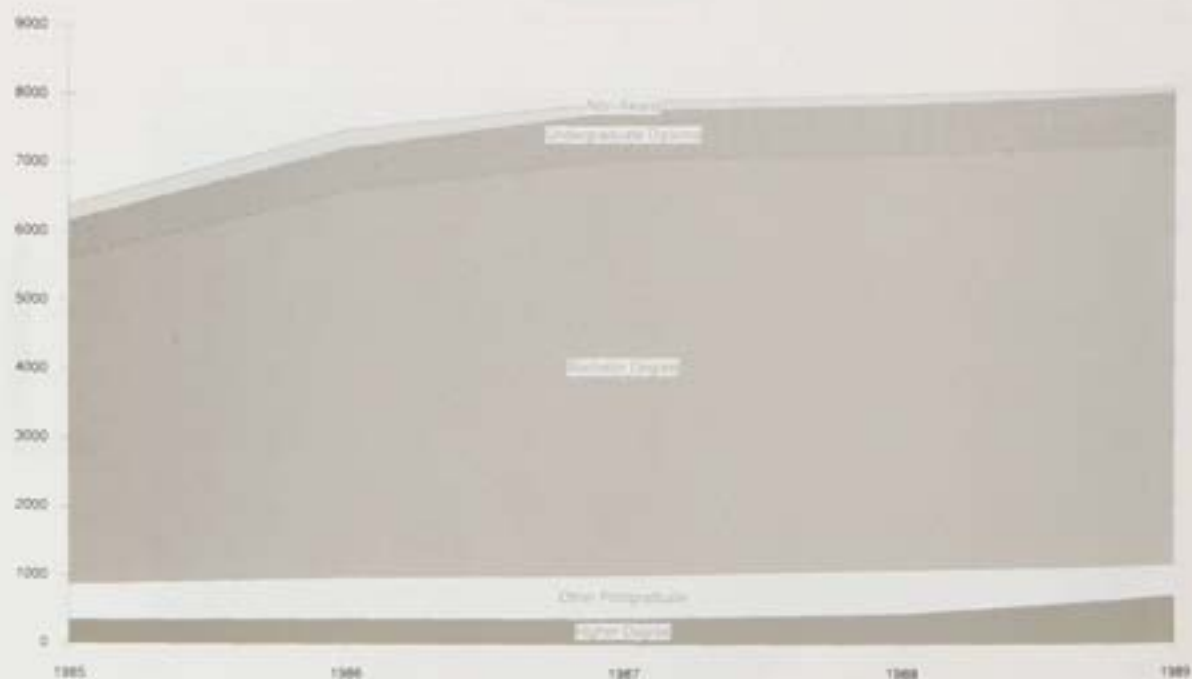
Enrolment by Age



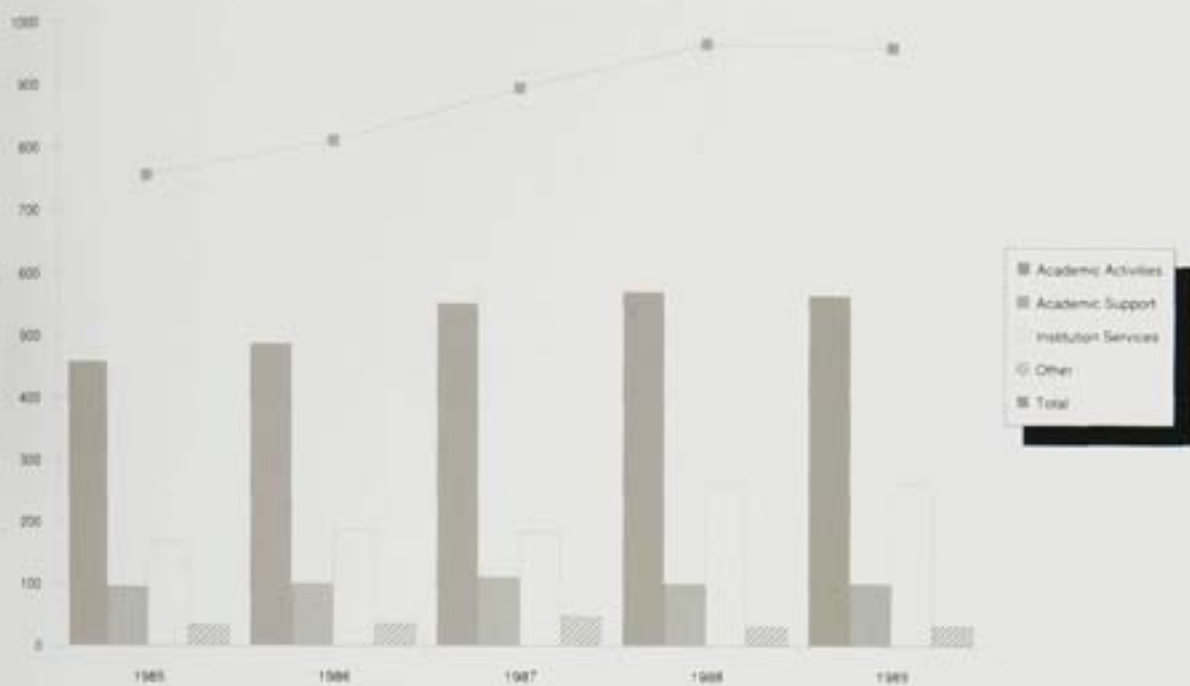
Proportional Enrolment by Region



Enrolment Summary 1985-1989



Full-Time and Fractional Full-Time Staff



Other includes independent operations, student services and public services.

ENROLMENTS IN UNIVERSITY COURSES 1989

By Course Type, Sex and Attendance Mode

Doctor of Philosophy	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Creative Arts	4	4	8	1	3	4	—	—	—	5	7	12
English	4	2	6	1	—	1	—	—	—	5	2	7
History & Politics	3	2	5	4	—	4	—	—	—	7	2	9
Languages	1	—	1	—	—	—	—	—	—	1	—	1
Philosophy	1	—	1	—	—	—	—	—	—	1	—	1
Psychology	—	5	5	3	6	9	—	—	—	3	11	14
Sociology	—	1	1	1	—	1	—	—	—	1	1	2
STS	7	1	8	5	1	6	—	—	—	12	2	14
Faculty of Arts	20	15	35	15	10	25	—	—	—	35	25	60
Accountancy	2	—	2	—	—	—	—	—	—	2	—	2
Economics	3	—	3	—	—	—	—	—	—	3	—	3
Information Systems	—	—	—	2	—	2	—	—	—	2	—	2
Management	2	—	2	4	2	6	—	—	—	6	2	8
Faculty of Commerce	7	—	7	6	2	8	—	—	—	13	2	15
Learning Studies	1	1	2	14	10	24	—	—	—	15	11	26
Policy and Tech. Studies	—	1	1	4	2	6	—	—	—	4	3	7
Faculty of Education	1	2	3	18	12	30	—	—	—	19	14	33
Civil and Mining Engineering	12	4	16	5	—	5	—	—	—	17	4	21
Elect. & Comp. Engineering	6	2	8	5	—	5	—	—	—	11	2	13
Materials Engineering	8	2	10	2	1	3	—	—	—	10	3	13
Mechanical Engineering	6	—	6	2	—	2	—	—	—	8	—	8
Faculty of Engineering	32	8	40	14	1	15	—	—	—	46	9	55
Computing Science	—	—	—	2	—	2	—	—	—	2	—	2
Mathematics	2	1	3	—	—	—	—	—	—	2	1	3
Faculty of Mathematical Sciences	2	1	3	2	—	2	—	—	—	4	1	5
Biology	6	8	14	2	1	3	—	—	—	8	9	17
Chemistry	10	2	12	5	1	6	—	—	—	15	3	18
Geography	3	—	3	3	—	3	—	—	—	6	—	6
Geology	4	1	5	3	1	4	—	—	—	7	2	9
Health Sciences	—	1	1	3	2	5	—	—	—	3	3	6
Physics	5	1	6	2	—	2	—	—	—	7	1	8
Faculty of Science	28	13	41	18	5	23	—	—	—	46	18	64
COURSE TYPE TOTAL	90	39	129	73	30	103	—	—	—	163	69	232

Doctorates	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Creative Arts	5	5	10	6	1	7	—	—	—	11	6	17
Psychology	—	1	1	1	—	1	—	—	—	1	1	2
Faculty of Arts	5	6	11	7	1	8	—	—	—	12	7	19
COURSE TYPE TOTAL	5	6	11	7	1	8	—	—	—	12	7	19

Masters by Research	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Creative Arts	1	1	2	2	—	2	—	—	—	3	1	4
English	1	6	7	1	4	5	—	—	—	2	10	12
History & Politics	—	—	—	3	—	3	—	—	—	3	—	3
Languages	—	—	—	1	—	1	—	—	—	1	—	1
Multicultural Studies	—	—	—	—	2	2	—	—	—	—	2	2
Philosophy	—	—	—	1	1	2	—	—	—	1	1	2
Psychology	1	1	2	3	—	3	—	—	—	4	1	5
Sociology	—	1	1	—	—	—	—	—	—	—	1	1
Faculty of Arts	3	9	12	11	7	18	—	—	—	14	16	30
Accountancy	1	—	1	—	1	1	—	—	—	1	1	2
Economics	—	1	1	1	1	2	—	—	—	1	2	3
Management	2	0	2	1	—	1	—	—	—	3	—	3
Faculty of Commerce	3	1	4	2	2	4	—	—	—	5	3	8
Learning Studies	—	—	—	1	11	12	—	—	—	1	11	12
Policy and Tech. Studies	—	—	—	1	2	3	—	—	—	1	2	3
Faculty of Education	—	—	—	2	13	15	—	—	—	2	13	15
Civil and Mining Engineering	5	—	5	1	—	1	—	—	—	6	—	6
Elect. & Comp. Engineering	4	—	4	2	—	2	—	—	—	6	—	6
Materials Engineering	2	2	4	4	2	6	—	—	—	6	4	10
Mechanical Engineering	3	—	3	1	—	1	—	—	—	4	—	4
Faculty of Engineering	14	2	16	8	2	10	—	—	—	22	4	26
Computing Science	—	1	1	1	—	1	—	—	—	1	1	2
Faculty of Mathematical Sciences	—	1	1	1	—	1	—	—	—	1	1	2
Biology	1	1	2	—	—	—	—	—	—	1	1	2
Geography	1	—	1	1	—	1	—	—	—	2	—	2
Geology	4	—	4	1	—	1	—	—	—	5	—	5
Health Sciences	2	2	4	3	6	9	—	—	—	5	8	13
Faculty of Science	8	3	11	5	6	11	—	—	—	13	9	22
COURSE TYPE TOTAL	28	16	44	29	30	59	—	—	—	57	46	103

Masters by Coursework												
Creative Arts	6	7	13	7	5	12	—	—	—	13	12	25
History and Politics	1	—	1	15	—	15	—	—	—	16	—	16
Languages	—	—	—	—	2	2	—	—	—	—	2	2
Psychology	5	1	4	6	4	10	—	—	—	9	5	14
Sociology	2	1	3	2	2	4	—	—	—	4	3	7
STS	2	1	3	9	1	10	—	—	—	11	2	13
Faculty of Arts	14	10	24	39	14	53	—	—	—	53	24	77
Accountancy	5	—	5	8	2	10	—	—	—	13	2	15
Economics	—	—	—	—	1	1	—	—	—	—	1	1
Management	30	9	39	84	20	104	—	—	—	114	29	143
Faculty of Commerce	35	9	44	92	23	115	—	—	—	127	32	159

Masters by Coursework	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Learning Studies	1	0	1	3	6	9	—	—	—	4	6	10
Policy and Tech. Studies	—	—	—	1	1	2	—	—	—	1	1	2
Faculty	2	1	3	27	18	45	—	—	—	29	19	48
Faculty of Education	3	1	4	31	25	56	—	—	—	34	26	60
Civil and Mining Engineering	1	—	1	4	—	4	—	—	—	5	—	5
Mechanical Engineering	—	—	—	6	—	6	—	—	—	6	—	6
Faculty of Engineering	1	—	1	10	—	10	—	—	—	11	—	11
Computing Science	1	—	1	4	2	6	—	—	—	5	2	7
Mathematics	1	—	1	—	1	1	—	—	—	1	1	2
Faculty of Mathematical Sciences	2	—	2	4	3	7	—	—	—	6	3	9
Chemistry	—	1	1	3	1	4	—	—	—	3	2	5
Geology	7	—	7	3	—	3	—	—	—	10	—	10
Health Sciences	1	—	1	2	6	8	—	—	—	3	6	9
Faculty of Science	8	1	9	8	7	15	—	—	—	16	8	24
COURSE TYPE TOTAL	63	21	84	184	72	256	—	—	—	247	93	340

Masters—Preliminary												
Creative Arts	—	1	1	1	—	1	—	—	—	1	1	2
English	—	1	1	—	—	—	—	—	—	—	1	1
History & Politics	—	1	1	1	—	1	—	—	—	1	1	2
Psychology	1	—	1	4	5	9	—	—	—	5	5	10
Sociology	—	—	—	1	—	1	—	—	—	1	—	1
STS	2	—	2	2	1	3	—	—	—	4	1	5
Faculty of Arts	3	3	6	9	6	15	—	—	—	12	9	21
Accountancy	2	—	2	3	—	3	—	—	—	5	—	5
Economics	6	1	7	—	1	1	—	—	—	6	2	8
Management	1	—	1	3	—	3	—	—	—	4	—	4
Faculty of Commerce	9	1	10	6	1	7	—	—	—	15	2	17
Learning Studies	—	—	—	—	1	1	—	—	—	—	1	1
Policy and Tech. Studies	—	—	—	1	1	2	—	—	—	1	1	2
Faculty	—	—	—	18	20	38	—	—	—	18	20	38
Faculty of Education	—	—	—	19	22	41	—	—	—	19	22	41
Civil and Mining Engineering	1	—	1	1	—	1	—	—	—	2	—	2
Elect. & Comp. Engineering	1	—	1	—	—	—	—	—	—	1	—	1
Materials Engineering	—	—	—	1	1	2	—	—	—	1	1	2
Mechanical Engineering	2	—	2	1	—	1	—	—	—	3	—	3
Faculty of Engineering	4	—	4	3	1	4	—	—	—	7	1	8
Computing Science	—	—	—	4	—	4	—	—	—	4	—	4
Faculty of Mathematical Sciences	—	—	—	4	—	4	—	—	—	4	—	4

Masters—Preliminary	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Biology	—	—	—	2	—	2	—	—	—	2	—	2
Chemistry	1	—	1	—	—	—	—	—	—	1	—	1
Geography	—	—	—	1	1	2	—	—	—	1	1	2
Geology	12	1	13	1	1	2	—	—	—	13	2	15
Health Sciences	7	3	10	3	11	14	—	—	—	10	14	24
Physics	—	1	1	—	—	—	—	—	—	—	1	1
Faculty of Science	20	5	25	7	13	20	—	—	—	27	18	45
COURSE TYPE TOTAL	36	9	45	48	43	91	—	—	—	84	52	136

Postgraduate Diploma												
Languages	—	—	—	2	6	8	—	—	—	2	6	8
Philosophy	—	—	—	2	1	3	—	—	—	2	1	3
Psychology	7	8	15	1	6	7	—	—	—	8	14	22
STS	2	—	2	1	—	1	—	—	—	3	—	3
Faculty of Arts	9	8	17	6	13	19	—	—	—	15	21	36
Accountancy	1	1	2	5	4	9	—	—	—	6	5	11
Economics	—	—	—	—	1	1	—	—	—	—	1	1
Information Systems	4	1	5	12	3	15	—	—	—	16	4	20
Management	9	6	15	44	11	55	—	—	—	53	17	70
Faculty of Commerce	14	8	22	61	19	80	—	—	—	75	27	102
Faculty	18	54	72	13	12	25	10	41	51	41	107	148
Faculty of Education	18	54	72	13	12	25	10	41	51	41	107	148
Computing Science	4	—	4	9	—	9	—	—	—	13	—	13
Mathematics	—	—	—	2	2	4	—	—	—	2	2	4
Faculty of Mathematical Sciences	4	—	4	11	2	13	—	—	—	15	2	17
Geography	—	—	—	1	—	1	—	—	—	1	—	1
Geology	—	—	—	2	—	2	—	—	—	2	—	2
Health Sciences	—	—	—	—	4	4	—	—	—	—	4	4
Faculty of Science	—	—	—	3	4	7	—	—	—	3	4	7
COURSE TYPE TOTAL	45	70	115	94	50	144	10	41	51	149	161	310

Bachelor Degree												
BA	315	495	808	154	269	423	—	—	—	467	764	1231
BA(Hons)	9	22	31	5	16	21	—	—	—	14	38	52
BCA	72	124	196	6	12	18	—	—	—	78	136	214
BInfoTechCom	76	39	115	24	5	29	—	—	—	100	44	144
Faculty of Arts	470	680	1150	189	302	491	—	—	—	659	982	1641
BCom	453	356	809	214	125	339	—	—	—	667	481	1148
BCom(Hons)	2	—	2	1	—	1	—	—	—	3	—	3
Faculty of Commerce	455	356	811	215	125	340	—	—	—	670	481	1151

Bachelor Degree	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
BEd-Phy/HlthEd	79	70	149	5	2	7	—	—	—	84	72	156
BEd-Phy/HlthEd-Conversion	—	—	—	—	—	—	14	11	25	14	11	25
BEd(Primary)	69	258	327	4	20	24	—	—	—	75	278	351
BEd(Primary)-Conversion	—	—	—	—	—	—	74	247	321	74	247	321
BEd(Secondary)-Eng/Hist	29	46	75	4	2	6	—	—	—	35	48	81
BEd(Secondary)-Math	11	16	27	—	1	1	—	—	—	11	17	28
BEd(Secondary)-Science	6	8	14	—	—	—	—	—	—	6	8	14
Faculty of Education	194	398	592	13	25	38	88	258	346	295	681	976
BE-Civil	202	12	214	68	5	71	—	—	—	270	15	285
BE-Civil/Mining	1	—	1	2	—	2	—	—	—	3	—	3
BE-Computer	66	1	67	48	1	49	—	—	—	114	2	116
BE-Electrical	207	13	220	102	9	111	—	—	—	309	22	331
BE-Materials	31	6	37	32	10	42	—	—	—	63	16	79
BE-Mechanical	141	2	143	147	4	151	—	—	—	288	6	294
BE-Mining	20	—	20	12	—	12	—	—	—	32	—	32
BE/BCom	3	—	3	—	—	—	—	—	—	3	—	3
BMath/BE	6	1	7	2	—	2	—	—	—	8	1	9
Faculty of Engineering	677	35	712	413	27	440	—	—	—	1090	62	1152
BMath-Computing	151	36	187	110	29	139	—	—	—	261	65	326
BMath-Mathematics	48	33	81	29	16	45	—	—	—	77	49	126
BMath(Hons)	3	—	3	—	—	—	—	—	—	3	—	3
Faculty of Mathematical Science	202	69	271	139	45	184	—	—	—	341	114	455
BAppSci-Human Movement	55	56	111	9	5	14	—	—	—	64	61	125
BAppSci(Hons)-Human Move.	2	2	4	—	—	—	—	—	—	2	2	4
BEnvSci	41	19	60	14	7	21	—	—	—	55	26	81
BEnvSci(Hons)	—	—	—	—	1	1	—	—	—	—	1	1
BNursing-Conversion	1	15	16	1	19	20	—	—	—	2	34	36
BSc	191	141	332	69	57	126	—	—	—	260	198	458
BSc(Hons)	6	4	10	5	2	7	—	—	—	11	6	17
BSc-Nutrition	—	20	20	1	3	4	—	—	—	1	23	24
Faculty of Science	296	257	553	99	94	193	—	—	—	395	351	746
COURSE TYPE TOTAL	2294	1795	4089	1068	618	1686	88	258	346	3450	2671	6121

Enabling												
BEd(Primary)-Bridging	—	—	—	—	—	—	7	32	39	7	32	39
Faculty of Education	—	—	—	—	—	—	7	32	39	7	32	39
COURSE TYPE TOTAL	—	—	—	—	—	—	7	32	39	7	32	39

Diploma												
DipTeach(Primary)-Conversion	—	—	—	—	—	—	5	59	64	5	59	64
Faculty of Education	—	—	—	—	—	—	5	59	64	5	59	64

Enabling	Full-Time			Part-Time			External			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
DipAppSci(Nursing)	54	241	295	6	21	27	—	—	—	60	262	322
DipAppSci(Nursing)-Conversion	—	6	6	7	50	57	—	—	—	7	56	63
Faculty of Science	54	247	301	13	71	84	—	—	—	67	318	385
COURSE TYPE TOTAL	54	247	301	13	71	84	5	59	64	72	377	449

Associate Diploma												
AssocDipCompApplcns	55	26	81	61	15	76	—	—	—	116	41	157
AssocDipAdmin(CompApplic)	—	—	—	1	2	3	—	—	—	1	2	3
AssocDipAdmin(Industrial)	1	1	2	48	23	71	—	—	—	49	24	73
AssocDipAdmin(SmlBusMgt)	—	—	—	5	2	5	—	—	—	5	2	5
AssocDipAdmin(Waste Control)	—	—	—	1	—	1	—	—	—	1	—	1
Faculty of Commerce	56	27	83	114	42	156	—	—	—	170	69	239
AssocDipSportsSc	15	14	29	2	1	3	—	—	—	17	15	32
Faculty of Science	15	14	29	2	1	3	—	—	—	17	15	32
COURSE TYPE TOTAL	71	41	112	116	43	159	—	—	—	187	84	271

Non-Award												
Non-Award	—	2	2	23	16	39	—	—	—	23	18	41
Non-Award (Exchange)	—	—	—	6	3	9	—	—	—	6	3	9
Non-Award (Study Abroad)	—	—	—	1	—	1	—	—	—	1	—	1
	—	2	2	30	19	49	—	—	—	30	21	51

Total University Enrolments												
	2686	2246	4932	1662	977	2639	110	390	500	4458	3613	8071

Finance Report

The financial statements of the University for the year ended 31st December 1989 prepared in accordance with Section 41B of the Public Finance and Audit Act 1983 and certified by the Auditor General in terms of Section 41C of that Act are shown on the following pages of this report.

The form and content of the statements are largely dictated by requirements of the Public Finance and Audit Act 1983. The University currently receives exemption under the Act thereby allowing the preparation of statements on a modified accrual basis. In line with current general practice within the tertiary education sphere, the University does not capitalize assets and does not charge depreciation in its accounts. All capital items are treated as expenditure in the year in which the expenditure was incurred.

The University has also been exempted from the preparation of consolidated accounts. Consequently the financial statements of the University show the results and transactions for University activities only and do not include the results and transactions of its subsidiary companies. Separate accounts are prepared for each of these subsidiaries and the results are reported by way of a note to the University's accounts.

With the requirement of the NSW State Treasury and the NSW Auditor General to adopt a more commercial approach in the preparation of financial statements, the University is moving towards a full accrual basis of accounting. The accounts of the University's subsidiary companies are already prepared on this basis and it is anticipated the University's accounts will be prepared in this way in 1990.

The combined income and expenditure statement provides details of all funds received and expenditure incurred by the University after eliminating inter fund transfers. Income is reported by source of funds while expenditure is reported by activity after extracting expenditure for provisions which are shown separately. It should be noted that this statement

combines a number of funds which, under granting conditions, can be utilised only for specified expenditure purposes. Annexures A to J provide a breakdown of these special funds.

Total income available to the University and its subsidiaries in 1989 exceeded \$81million, an increase of 21.1per cent over 1988. Of that 65 per cent was received from the Commonwealth and State Governments, and student charges, for general teaching and research activities (refer Figure 1). In 1989 the method of funding operating grants for these recurrent purposes was amended to include Equipment, Research and Minor Works which were previously funded by separate grants. Student charges were also amended. In 1988 the University received funds from the Higher Education Administration Charge which was discontinued in 1989 and replaced by the Higher Education Contribution Scheme. Substantial increases in income were achieved for all sectors of the University in 1989 as shown in Table 1. The most significant increase occurred in International Student Operations and was the result of active marketing, particularly in the Asia-Pacific region. The increase in major building projects reflects the University's success in attracting Federal capital funding for the construction of a general purpose academic building and a contribution towards the cost of additional student accommodation at Weerona.

The increase in interest income was the result of higher earning rates together with an increase in the amount of funds available for investment. The heavy and persistent rain experienced in the first half of 1989 contributed to the latter as construction and capital expenditure were delayed pending an improvement in the weather.

Major building projects commenced during the year in addition to the academic building and Weerona extensions, were extensions to student accommodation at Kooloobong, Stage 2 of the Technology Centre and the swimming pool. The funding of these projects was assisted in varying amounts by the University's own development funds which are derived solely from interest income.

continued overleaf

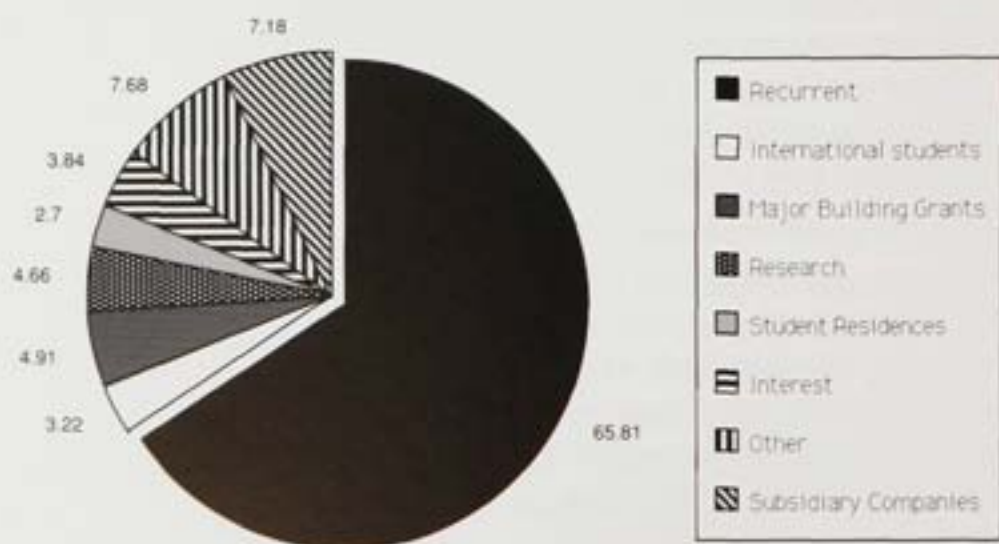
Table 1: Comparison of Income

	1988	1989	% Increase
Recurrent	48,108,439	53,654,698	11.53
International Students	782,108	2,628,091	236.03
Major Building Grants	1,786,389	4,000,000	123.92
Research	3,005,906	3,797,978	26.35
Student residences	1,801,796	2,198,882	22.04
Interest	2,153,819	3,129,125	45.28
Other	4,803,578	6,263,805	30.40
Subsidiary Companies*	4,835,769	5,854,161	21.06

* Financial Year Ending 30th June

Figure 1: Income Received 1989

Per cent



The University of Wollongong

FINANCIAL STATEMENTS

31 DECEMBER 1989

AUDITOR GENERAL'S CERTIFICATE

The accounts of the University of Wollongong for the year ended 31 December 1989 have been audited in accordance with Section 34 of the Public Finance and Audit Act 1983.

In my opinion, the accompanying statement of balances, together with the combined statement of income and expenditure, funds statement and annexures A to K, read in conjunction with the notes thereto, comply with Section 41B of the act and exhibit a true and fair view of the financial position at 31 December 1989, and transactions for the year then ended.



R.K. DUNN FASA CPA
ASSISTANT AUDITOR-GENERAL

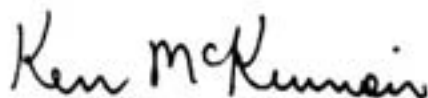
SYDNEY
30 March 1990

STATEMENT BY MEMBERS OF THE COUNCIL

Pursuant to Section 41B(1)(f) of the Public Finance and Audit Act, 1983, and in accordance with a resolution of the members of the Council, we declare on behalf of the Council of The University of Wollongong that, subject to audit requirements, in our opinion:

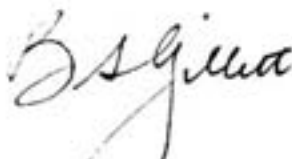
1. The accompanying financial statements exhibit a true and fair view of the financial position of The University of Wollongong as at 31 December 1989 and transactions for the year then ended.
2. The statements have been prepared in accordance with the provisions of the Public Finance and Audit Act, 1983, and the Public Finance and Audit (Statutory Bodies) Regulation, 1985.

Further, we are not aware of any circumstances which would render any particulars included in the financial statements to be misleading or inaccurate.



Vice-Chancellor

2 February 1990



Deputy Chancellor

REVIEW OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 1989

The financial statements of the University for the year ended 31st December 1989 have been prepared in accordance with Section 41B of the Public Finance and Audit Act 1983. The form of the statements is largely dictated by requirements of this Act. The University currently receives certain exemption under the Act thereby allowing:

- i) The preparation of statements on a modified accrual basis. As the University, in line with general practice within the tertiary education sphere, does not capitalize assets and therefore does not charge depreciation in its accounts, all capital items are treated as expenditure in the year in which the expenditure was incurred;
- ii) preparation of separate accounts for the University and each of its subsidiary companies without consolidating the results of the subsidiaries with those of the University. These results are reported by way of a note to the accounts and are reported separately to Council.

The combined income and expenditure statement (page 4) provides details of all funds received and expenditure incurred after eliminating inter fund transfers. Income is reported by source of funds while expenditure is reported by activity after extracting expenditure for provisions which are shown separately. It should be noted that this statement combines a number of funds which, under granting conditions, can only be utilized for specified expenditure purposes. Annexures A to J provide a breakdown of these special funds.

Total income available to the University in 1989 was \$76 million, an increase of 21.1% over 1988. Of that 70% was received from the Commonwealth and State Governments for general teaching and research activities, (1988 76.05%). In 1989 the method of funding operating grants for these recurrent purposes was amended to include Equipment, Research and Minor Works which were previously funded by separate grants. In addition the University received funds from the Higher Education Administration Charge in 1988 which was discontinued in 1989 and replaced by the Higher Education Contribution Scheme. Funds for recurrent purposes should therefore be considered in totality when comparing with 1988 figures, as set out below.

1988		1989
	Commonwealth Government Grant	
39,837,676	- Recurrent	49,238,700
-	- Higher Education Contribution Scheme	1,064,311
572,444	- Superannuation Productivity Supplementation	609,286
2,297,000	- Equipment	-
441,000	- Research	-
505,000	- Minor Works	-
2,030,360	- Higher Education Administration Charge	-
415,491	- Other	438,792
	State Government Grant	
83,000	- Conservatorium of Music	31,241
2,000,468	- Nurse Education	2,286,336
\$48,122,439	Total funds received for recurrent purposes	\$53,668,666

Variance 11.5% increase.

Substantial increases in income were achieved for all sectors of the University as shown by the following table.

Description	1988	1989	Variance Amount	Variance %
Recurrent	48,122,439	53,668,666	5,546,227	11.525
International Students	782,108	2,628,091	1,845,983	236.027
Major Building Projects	1,786,389	4,000,000	2,213,611	123.915
Research	3,055,906	3,847,978	792,072	25.919
Student Residences	1,801,796	2,198,882	397,086	22.038
Interest	2,178,819	3,155,204	976,385	44.813
Other	5,003,578	6,498,036	1,494,458	29.868
Total	62,731,035	75,996,857	13,265,822	

The increase in recurrent funds was the result of funding from the Commonwealth Government for additional student intake during the year in accordance with the educational profiles and the budget submitted to Council in December 1988.

The most significant increase occurred in International Student Operations and was the result of active marketing, particularly in the Asia-Pacific region. The increase in major building projects reflects the University's success in attracting Federal capital funding for the construction of the Commerce Building and a contribution towards the cost of additional student accommodation at Weerona.

Other major building projects commenced during the year were extensions to student accommodation at Kooloobong, Stage 2 of the Technology Centre and the Swimming Pool. Together with the previously mentioned projects, these were assisted in various degrees by University Development Funds.

The increase in interest income is the result of higher earning rates together with an increase in the amount of funds available for investment. The heavy rains experienced in the first half of the year no doubt contributed to the latter as construction and capital expenditure were delayed pending an improvement in the weather.

STATEMENT OF BALANCES (ALL FUNDS) AT 31 DECEMBER 1989

1988 \$		Note	1989 \$
	Current Assets	6	
20,530	Cash		364,260
3,293,094	Receivables		4,245,904
4,899,629	Investments	19	13,560,753
112,340	Inventories	1(d)	80,799
75,546	Other		196,427
<u>8,391,139</u>	TOTAL CURRENT ASSETS		<u>18,448,143</u>
	Non-Current Assets	7	
25,750,503	Receivables		27,687,375
5,999,716	Investments	19	5,549,716
<u>31,750,219</u>	TOTAL NON-CURRENT ASSETS		<u>33,237,091</u>
<u>40,141,358</u>	TOTAL ASSETS		<u>51,685,234</u>
	Current Liabilities	8	
3,578,854	Creditors and borrowings		4,376,439
176,535	Provisions		192,083
-	Special Funds		453,026
1,527,006	Other		9,317,326
<u>5,282,395</u>	TOTAL CURRENT LIABILITIES		<u>14,338,874</u>
	Non-Current Liabilities		
1,167,171	Creditors and borrowings	9	1,042,839
	Provision for Long Service Leave	15(ii)	
	Estimated liability at 31/12/89		5,713,553
	Less amount unprovided		<u>1,842,508</u>
3,538,263			3,871,045
25,069,697	Provision for State Superannuation	15(iii)	26,817,129
	Provision for State Public Service		
586,816	Superannuation	15(iv)	778,292
	Professorial Superannuation		
1,892,635	Scheme	15(i)(b)	1,755,984
<u>32,254,582</u>	TOTAL NON CURRENT LIABILITIES		<u>34,265,289</u>
<u>37,536,977</u>	TOTAL LIABILITIES		<u>48,604,163</u>
<u>\$2,604,381</u>	NET ASSETS		<u>\$3,081,071</u>
	ACCUMULATED FUNDS	Annexure	
511,537 DR	General Recurrent Fund	A	462,480 DR
-	Building Projects Grant	C	370,818
208,762	Equipment Grant	D	-
51,843	Research Grant	E	-
1,289,194	Special Purpose Funds (Research)	F	1,253,726
3,781,107	Other Special Purpose Funds	G	4,736,344
33,683	International Student Operations	H	861,558
2,248,671 DR	Halls of Residence	I	3,678,895 DR
<u>\$2,604,381</u>			<u>\$3,081,071</u>

The Statement of Balances is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

**COMBINED STATEMENT OF INCOME AND EXPENDITURE
FOR THE YEAR ENDED 31 DECEMBER 1989**

1988 \$	Note	1989 \$
Income		
		Commonwealth Government Grants
39,837,676		- Recurrent 22 49,238,700
512,444		- Superannuation Productivity Supplementation 24 609,286
2,297,000		- Equipment -
2,649,401		- Research 2,794,899
505,000		- Minor Building -
1,750,389		- Capital Works 4,000,000
472,651		- Other 417,064
		State Government Grants
83,000		- Conservatorium of Music 31,241
2,000,468		- Nurse Education 2,286,336
36,000		- Nurse Education - Building extensions and alterations -
137,448		- Research 177,795
4,170		- Other 74,024
710,057		Other grants and donations for research 875,284
102,224		Scholarships and Prizes 264,272
4,424,533		Special purpose accounts 5,742,676
782,108		International Student Operations 2,628,091
		Higher Education Contribution Scheme 21 1,064,311
2,030,360		Higher Education Administration Charge 1(f)(ii) -
1,801,796		Student residences 2,198,882
2,178,819		Interest 3,155,204
415,491		Other Income 438,792
<u>62,731,035</u>		<u>Total Income 75,996,857</u>
Expenditure		
		Recurrent
24,486,084		- Academic Activities 26,749,407
4,126,314		- Academic Services 4,723,098
985,102		- Student Services 903,683
11,000,403		- General University Services 12,434,387
632,975		- Public Services 774,456
		Financial Transfers for: 1(f)(iii)
-		- Equipment 2,450,385
-		- Minor Works 691,000
677,986		Nurse Education - Building extensions and alterations -
2,547,827		Equipment grant purchases 208,762
3,348,369		Research 3,930,013
504,999		Minor Building Works -
1,925,155		Major Building Works 2,495,222
417,419		Scholarships and Prizes 511,493
4,354,041		Special Purpose accounts 7,171,222
689,710		Full Fee Courses 1,374,456
2,043,469		Student Residences 2,387,454
-		Student Residences - Building Projects 3,583,494
15,500		Provision for Doubtful Debts 9,500
409,730		Provision for long service leave 464,602
45,000		Provision for major repairs and replacements 35,000
57,988		Provision for Professorial Superannuation scheme 75,375
580,933		Provision for State Superannuation -
2,118,291		Superannuation in-service costs 3,767,926
<u>60,967,295</u>		<u>Total Expenditure 74,740,935</u>
1,763,740		Surplus for year prior to adjustments 1,255,922
606,734		Less interest transferred to provisions 725,767
1,157,006		Surplus 530,155
289		Less prior period adjustment 53,465

continued overleaf

continued from page 107

<u>1,156,717</u>	Increase in Accumulated Funds		<u>476,690</u>
	Add writeback of provision for State Superannuation Fund		-
2,330,681	Less transfer to provision for Long Service Leave		-
<u>2,330,681</u>			<u>-</u>
-			-
<u>1,156,717</u>			<u>476,690</u>
	Add - Deferred Income due from Commonwealth/ State Governments for Superannuation Liability	23	1,938,908
<u>2,182,774</u>			<u>1,938,908</u>
<u>3,339,491</u>			<u>2,415,598</u>
	Less increase in employees' accrued entitlements for Superannuation.		
2,011,780	- State Superannuation	15(iii)	1,747,432
<u>170,994</u>	- State Public Service Superannuation	15(iv)	<u>191,476</u>
<u>2,182,774</u>			<u>1,938,908</u>
<u>1,156,717</u>			<u>476,690</u>
	Prior Period Adjustment:		
	Adjustment in unprovided employees' accrued entitlements for Superannuation		-
<u>386,394</u>			<u>-</u>
<u>386,394</u>			<u>-</u>
	Surplus for year after prior period adjustment		<u>476,690</u>
<u>1,543,111</u>			<u>476,690</u>
	Less - Employees' Accrued Entitlements not provided for.		
	Long Service Leave		
	Amount transferred from Provision for Superannuation		-
2,330,681	Less Increase in amount unprovided	15(ii)	317,416
<u>1,931,807</u>			<u>317,416</u>
<u>398,874</u>	Increase in amount unprovided for year	20	<u>317,416</u>
<u>\$1,144,237</u>	Surplus for year after adjustment to reflect increase in the unfunded liabilities	20	<u>\$159,274</u>

The Combined Statement of Income and Expenditure is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

**STATEMENT OF SOURCES AND APPLICATION OF FUNDS
FOR THE YEAR ENDED 31 DECEMBER 1989**

1988 \$		1989 \$
	Sources of Funds	
	Funds from Operations (A)	
62,752,373	Inflows of funds from Operations	76,037,197
<u>59,858,433</u>	Less Outflows of funds from Operations	<u>71,068,538</u>
2,893,940		4,968,659
2,569,168	Deferred Income	1,938,908
2,330,681	Adjustment for transfer from Provision for Superannuation	-
<u>7,793,789</u>		<u>6,907,567</u>
	Reduction in Assets	
	Current Assets	
5,898,101	Investments	-
66,718	Prepayments	-
-	Sundry Advances	288,475
-	Stock	<u>31,542</u>
<u>5,964,819</u>		<u>320,017</u>
	Non-current Assets	
-	Loans to staff	2,036
-	Investments	<u>450,000</u>
-		452,036
	Increase in Liabilities	
	Current Liabilities	
956,163	Creditors and accrued expenses	1,189,313
150,000	Income received in advance	7,790,320
<u>1,106,163</u>	Unsecured Advance	-
		<u>8,979,633</u>
	Non-current liabilities	
150,000	Unsecured Advance	-
-	Secured Loans	<u>25,668</u>
<u>150,000</u>		25,668
15,014,771	Total sources of funds	<u>16,684,921</u>
	Application of Funds	
	Increase in Assets	
	Current Assets	
1,100	Cash on hand	830
-	Investments	8,671,124
571,668	Debtors	797,634
-	Prepayments	120,881
1,090,130	Accrued Income	453,151
83,676	Sundry Advances	-
30,733	Stock	-
-	Cash at Bank	<u>342,900</u>
<u>1,777,307</u>		<u>10,386,520</u>
	Non-Current Assets	
1,412,206	Investments	-
4,899,849	Amount Owing by Commonwealth/State Governments	1,938,908
14,441	Loans to Staff	-
<u>6,326,496</u>		<u>1,938,908</u>

continued overleaf

	Reduction in Liabilities	
	Current liabilities	
62,503	Bank overdraft	28,611
-	Secured Loans	363,117
5,060,124	Income received in advance	-
<u>5,122,627</u>		<u>391,728</u>
	Non-current liabilities	
225,417	Secured Loans	-
-	Unsecured Advance	150,000
<u>225,417</u>		<u>150,000</u>
712,737	Long Service Leave paid	640,183
777,310	State Superannuation paid	-
53,417	Professorial Superannuation benefits and refund contributions paid	469,771
19,460	Major repairs and replacements paid	19,452
-	Minor Works Paid	527,000
-	Equipment Paid	2,161,359
<u>1,562,924</u>		<u>3,817,765</u>
<u>\$15,014,771</u>	Total Application of Funds	<u>16,684,921</u>
	(A) NOTES: Reconciliation of funds from operations for year.	
2,893,940	Funds from Operations	4,968,659
	Less:	
606,734	Interest received on provisions	725,767
6,333	Employee contributions to Professorial Superannuation	40,340
409,730	Provisions	
45,000	- Long Service Leave	464,602
57,988	- Major Repairs and Replacements	35,000
580,933	- Professorial Superannuation	75,375
15,500	- State Superannuation	-
-	- Doubtful Debts	9,500
-	Financial Transfers for:	
-	- Equipment	2,450,385
15,005	- Minor Works	691,000
<u>1,737,223</u>	Transfer from ANU for LSL	-
<u>\$1,156,717</u>	Increase in accumulated funds	<u>476,690</u>

The statement of Sources and Applications of Funds is to be read in conjunction with the note to and forming part of the accounts on pages 115 to 124.

ANNEXURE C

BUILDING PROJECTS GRANT
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988		1989
\$		\$
	Income	
1,750,389	Commonwealth Government Grant	2,500,000
116,402	Transfer from General Development Fund	366,308
216,076	Transfer from Special Services Account	-
<u>2,082,867</u>		<u>2,866,308</u>
	Expenditure	
75,225	Administrative Building	-
1,240,825	Library Extensions	-
-	Commerce Building	2,495,490
<u>1,316,050</u>		<u>2,495,490</u>
766,817	Surplus for year	370,818
766,817	Accumulated Deficiency at 1 January 1988	-
<u>NIL</u>	Surplus at 31 December 1989	<u>\$370,818</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

ANNEXURE D

SPECIAL EQUIPMENT GRANT
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988		Note	1989
\$			\$
	Income		
2,297,000	Commonwealth Government Grant	1(f)(i)	-
	Expenditure		
1,191,800	New Equipment		179,855
134,513	Replacement Equipment		11,126
1,221,514	Computing		17,781
<u>2,547,827</u>			<u>208,762</u>
250,827	Deficit for Year		208,762
459,589	Accumulated funds at 1 January 1989		208,762
<u>\$208,762</u>	Accumulated funds at 31 December 1989		<u>NIL</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

ANNEXURE E

SPECIAL RESEARCH GRANT
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988		Note	1989
\$			\$
	Income		
441,000	Commonwealth Government Grant	1(f)(i)	-
	Expenditure		
115,754	Salaries and associated charges		-
273,403	Maintenance (materials, etc.)		51,843
<u>389,157</u>			<u>51,843</u>
51,843 CR	Deficit for Year		51,843
-	Accumulated funds as at 1 January 1989		51,843 CR
<u>\$51,843 CR</u>	Accumulated funds as at 31 December 1989		<u>NIL</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

SPECIAL PURPOSE FUNDS (RESEARCH)
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988 \$	Note	1989 \$
	Income	
670,429	Australian Research Grants Scheme	1,047,022
306,261	National Energy Research Development and Demonstration Council	455,251
380,800	National Health and Medical Research Council	407,283
110,350	School of Mines Centre for Advanced Manufacturing and Industrial Automation	65,000 DR
186,500	Other Grants and Donations	184,800
<u>1,523,177</u>		<u>1,962,650</u>
<u>3,177,517</u>		<u>3,992,006</u>
	Expenditure	
683,334	Australian Research Grants Scheme	965,975
359,116	National Energy and Research Development and Demonstration Council	498,805
366,348	National Health and Medical Research Council	370,639
7,872	School of Mines	42,546
-	Centre for Advanced Manuf & Indust Auto	319,416
<u>1,708,918</u>	Other Grants and Donations	<u>1,830,093</u>
<u>3,125,588</u>		<u>4,027,474</u>
51,929 CR	Deficit for Year	35,468
<u>1,237,265</u>	Accumulated funds at 1 January 1989	<u>1,289,194</u>
<u>\$1,289,194</u>	Accumulated funds at 31 December 1989	<u>\$1,253,726</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

ANNEXURE G

OTHER SPECIAL PURPOSE FUNDS
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

	Balance at 1 January 1989 (refer note 25)	Income	Expenditure	Balance at 31 December 1989
	\$	\$	\$	\$
Scholarship, Bursaries & Prizes	313,996	883,088	787,644	409,440
Special Services				
Appropriation Account	2,036,737	1,477,283	1,968,259	1,545,761
General Development Account	400,033	1,421,688	1,570,948	250,773
General	502,950	9,821,935	8,373,612	1,951,273
Other Working Accounts	527,391	63,826	12,120	579,097
	<u>\$3,781,107</u>	<u>\$13,667,820</u>	<u>\$12,712,583</u>	<u>\$4,736,344</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

ANNEXURE H

INTERNATIONAL STUDENT OPERATIONS
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988 \$		Note	1989 \$
	Income		
782,108	Fees		2,628,091
200,000	Export Market Development Grant	10	200,000
<u>982,108</u>			<u>2,828,091</u>
	Expenditure		
188,168	Academic Activities		545,163
-	Academic Services		133,979
402,933	Promotion & Student Attraction		572,656
111,246	Student Services		154,665
-	Transfer to Student Residences		558,115
<u>702,347</u>			<u>1,964,578</u>
279,761	Surplus for Year		863,513
	Less adjustment for prior year		
15,523 CR	- Export Market Development Grant	10	35,638
<u>295,284</u>			<u>827,875</u>
261,601 DR	Accumulated Surplus at 1 January 1989		33,683
<u>\$33,683</u>	Accumulated Surplus at 31 December 1989		<u>861,558</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

ANNEXURE I

STUDENT RESIDENTIAL SYSTEM
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1989

1988 \$		1989 \$
	Income	
1,523,825	Residential Fees	1,781,312
155,635	Transfer from Recurrent Funds	150,000
277,971	Other	417,570
<u>1,957,431</u>		<u>2,348,882</u>
	Expenditure	
523,622	Administration	635,391
441,679	Cleaning and Maintenance	387,136
197,140	Loan Interest and Charges	232,855
603,672	Catering	743,694
13,425	Provision for Long Service Leave	8,585
45,000	Provision for Major Repairs and Replacements	35,000
86,504	Rent	113,608
55,141	Refurbishment	201,701
144,571	Building Extensions	95,757
<u>2,112,754</u>		<u>2,453,727</u>
155,323	Deficit for Year	104,845
-	Add Building Deficiency - Annexure J	1,325,379
2,093,348	Accumulated Deficiency at 1 January 1989	2,248,671
<u>\$2,248,671</u>	Accumulated Deficiency at 31 December 1989	<u>\$3,678,895</u>

This statement is to be read in conjunction with the notes to and forming part of the accounts on pages 115 to 124.

No results were available for the company when the University's financial statements were prepared.

The company held shares in
Transport Communication Australia
Pty Ltd

49% holding (1988 100%)

The Automation and
Engineering Application
Centre Ltd

30 June 1989 30 June 1988
\$ \$

Company \$15,350 (deficit) \$2,977 (deficit)
Group \$16,155 (deficit) \$39,796 (deficit)

At 30 June 1989 the group included:

Automation Extension Services
Pty Ltd

100% Holding (1988 100%)
\$807 (deficit) \$36,819 (deficit)

Wollongong Uniadvice Ltd

31 Dec 89 31 Dec 88
Company \$53,019 (deficit) \$37,869 (deficit)
Group \$153,444 (deficit) \$73,315 (deficit)

At 31 December 1989 the group included:

a) Toubia Pty Ltd 100% holding (1988 100%)
Name changed to P. S. T. Pty Ltd
in July 1989 and then to Polymer 6 mths to Period to
Systems Technology Pty Ltd 30 June 89 31 Dec 88
in November 1989 \$100,425 (deficit) \$35,446 (deficit)

b) Tecoglen Pty Ltd
trading as The Computations Institute 50% holding

No results were available for the company when the University's financial statements were prepared, and the results have not been included in the above group result. The directors will be seeking to place the company in receivership.

Illawarra Technology Corporation Limited.

The company has only recently commenced trading and no results are available.

- (c) With the exception of stores stock, monetary assets only are carried forward in the Statement of Balances. Other non-monetary assets are written off in the year of purchase against the relevant fund.
- (d) Stock holdings in the University's Central Store were valued using the most recent purchase price as cost for each item. This is a departure from Accounting Standard AAS2 in relation to the Valuation and Presentation of Inventories in the context of the Historical Cost System but the amount involved is not considered to be material.
- (e) The financial statements have been prepared to comply in all material respects with all other Australian Accounting Standards where they have been found to be applicable to the University.
- (f) i) Following changes in the Higher Education Funding Act 1988, capital grants for Equipment and Minor Buildings which were paid as separate grants in 1988 have been merged in the Operating Grant in 1989. Similarly the Special Research Operating Grant which was separately defined in 1988 has been merged in the Operating Grant in the current year.
- ii) In 1989 the Federal Government introduced the Higher Education Contribution Scheme to replace the Higher Education Administration Charge Scheme which operated in both 1987 and 1988. The new scheme requires students to pay a fee (based on their student load) which can be either paid in advance or deferred and repaid at pre determined rates via the Taxation system when their income exceeds certain levels. The HECS Trust Fund Grant is based upon the anticipated amount which would be paid to the Commonwealth, based upon full time equivalent student load. Up front payments are offset against the amount of the grant advanced and the balance is recovered via the Taxation system in the manner referred to above.
- iii) Section 8 of the Higher Education Funding Act, 1988, allows financial transfers to special funds which are to be used only for future expenditure on equipment or minor building projects of the institution to be treated as expenditure for operating purposes in the year in which the amount is transferred.

In the current year the following transfers were made to special funds accounts:-

Equipment	2,450,385
Minor Building Works	691,000
	<u>\$3,141,385</u>

A summary of movements on the Special Funds Accounts is shown in note 8(iii).

2. ACADEMIC ACTIVITIES

1988		1989
\$		\$
Teaching and Research		
20,951,229	Salaries	22,252,329
3,041,301	Salary Related Costs	4,229,021
1,676,953	Maintenance	1,745,875
383,535	Equipment	605,182
149,156	Conference and Study Leave	233,278
131,521	New Appointment Expenses	146,072
41,518	Other	314,880
<u>26,375,213</u>	TOTAL Teaching and Research	<u>29,526,637</u>
Research Only		
165,831	Salaries	250,519
8,217	Salary Related Costs	22,672
105,259	Maintenance	260,060
117,804	Other	153,870
<u>397,111</u>	TOTAL Research	<u>687,121</u>
<u>\$26,772,324</u>	TOTAL ACADEMIC ACTIVITIES	<u>\$30,213,758</u>

3. ACADEMIC SERVICES

Library		
1,623,391	Salaries	1,665,315
235,678	Salary Related Costs	273,276
1,035,384	Purchase of Books, Periodicals etc.	1,298,964
180,702	Maintenance	133,353
14,595	Other	6,539
<u>3,089,750</u>	TOTAL Library	<u>3,377,447</u>
Computing		
581,844	Salaries	638,215
48,781	Salary Related Costs	79,284
26,097	Supplies	69,632
204,245	Maintenance	202,610
27,694	Other	26,030
<u>888,661</u>	TOTAL Computing	<u>1,015,771</u>
Other Academic Services		
-	Learning Assistance Centre	121,983
271,648	Centre for Teaching Development	361,744
68,669	Scientific Workshop	80,040
2,132	Other	12,561
<u>342,449</u>	TOTAL Other Academic Services	<u>576,328</u>
<u>\$4,320,860</u>	TOTAL ACADEMIC SERVICES	<u>\$4,969,546</u>

4. STUDENT SERVICES

126,809	Counselling	139,312
620,584	Scholarships	779,613
179,249	Union/Sports Association	167,683
60,906	Other	81,095
<u>\$987,548</u>	TOTAL STUDENT SERVICES	<u>1,167,703</u>

5. GENERAL UNIVERSITY SERVICES

Administration		
3,704,075	Salaries	4,013,999
965,572	Salary Related Costs	761,272
555,343	Maintenance	537,520
17,942	Equipment	92,054
129,848	Travel	91,193
306,455	Other	465,880
<u>5,679,235</u>	TOTAL Administration	<u>5,961,918</u>

Overheads		
229,811	Postage	294,024
324,773	Telephones	527,001
150,490	Advertising	337,574
276,875	Insurance	254,888
336,014	Contributions	380,991
167,288	Furniture	165,154
785,345	Power, Lighting and Heating	888,893
233,295	Publications	255,050
35,000	Audit Fees	37,200
422,257	Other	549,923
<u>2,961,148</u>	TOTAL Overheads	<u>3,690,698</u>
Buildings and Grounds		
2,686,631	Salaries	2,957,761
303,215	Salary Related Costs	477,689
341,861	Materials	299,305
107,556	Water and General Rates	98,023
753	Other	26
<u>3,440,016</u>	TOTAL Buildings and Grounds	<u>3,832,804</u>
<u>\$12,080,399</u>	TOTAL GENERAL UNIVERSITY SERVICES	<u>\$13,485,420</u>

6. CURRENT ASSETS

(i) Receivables:		
1,380,888	Debtors	2,178,522
15,500	Less Provision for Doubtful Debts	25,000
<u>1,365,388</u>		<u>2,153,522</u>
520,307	Sundry Advances	231,832
1,407,399	Accrued Income	1,860,550
<u>\$3,293,094</u>		<u>\$4,245,904</u>
(ii) Investments:		
-	Government and Semi-Government Securities - unquoted	450,000
4,889,629	Short term deposits	13,110,753
<u>\$4,889,629</u>		<u>13,560,753</u>
(iii) Other		
\$75,546	Prepayments	\$196,427

7. NON-CURRENT ASSETS

(i) Receivables:		
25,656,513	Amount owing by Commonwealth/State Government (refer note 23)	27,595,421
93,990	Loans to Staff (refer note 16)	91,954
<u>\$25,750,503</u>		<u>\$27,687,375</u>
(ii) Investments		
2,901,330	Government and Semi-Government Securities - quoted	2,901,330
2,579,098	- unquoted	2,129,098
519,287	Term Deposits	519,287
1	SSAU Nominees Pty Ltd One (1) \$1 share at par	1
<u>\$5,999,716</u>		<u>\$5,549,716</u>

8. CURRENT LIABILITIES

(i) Creditors and Borrowings.

28,611	Cash book balance	-
3,009,583	Creditors and accrued expenses	4,048,896
390,660	Secured loans (refer note 13)	177,543
150,000	Advance (refer note 13)	150,000
<u>\$3,578,854</u>		<u>\$4,376,439</u>

(ii) Provisions

<u>\$176,535</u>	Provision for major repairs and replacements.	<u>\$192,083</u>
------------------	---	------------------

The provision for major repairs and replacements was created for student residences only.

(iii) Special Funds (refer note 1(f)(iii))

	Equipment \$	Minor Works \$	Total \$
Amount transferred from			
Recurrent funds (Annexure A)	2,450,385	691,000	3,141,385
Less payments	2,161,359	527,000	2,688,359
Balance at 31 December 1989	<u>\$289,026</u>	<u>\$164,000</u>	<u>\$453,026</u>

(iv) Other

190,387	Income received in advance.	
1,336,619	- Government Grant	7,566,093
	- Student fees	1,751,233
<u>\$1,527,006</u>		<u>\$9,317,326</u>

9. NON-CURRENT LIABILITIES

Creditors and Borrowings.

150,000	Unsecured Advance (refer note 13)	-
1,017,171	Secured loans (refer note 13)	1,042,839
<u>\$1,167,171</u>		<u>\$1,042,839</u>

10. FULL FEE COURSES

- (i) Under the Export Market Development Grants Act 1974, certain approved promotional expenditure is refunded by way of a Grant. In 1988 the University submitted a claim for \$200,000 of which only \$164,362 was allowed. The difference of \$35,638 has been recorded as a prior year adjustment. A claim for \$200,000 submitted in 1989 for approved expenditure incurred in the year ended 30th June 1989 has been accrued.
- (ii) At December 1989 \$1,722,240 had been received from students in respect of 1990 courses.

11. AUDIT FEE

The fee paid to the Auditor-General for auditing services in 1989 was \$37,200 (1988 \$35,000). The Auditor-General received no other benefits.

12. INTEREST PAID

The total amount of interest paid, or due and payable on loans for the 1989 year was \$178,777 (1988 \$194,898).

13. SECURED LOANS AND ADVANCES

(i) Debts due no later than 1 year.

Advance - Commonwealth Government (refer part (iv) below)

Secured loan - Australian Iron and Steel Pty Ltd.

The loan from Australian Iron and Steel Pty Ltd is secured by way of a first mortgage over the property known as Weerona.

(ii) Loans due later than 5 years.

Commonwealth Trading Bank Loan No. 1

Commonwealth Trading Bank Loan No. 2

National Australia Bank

The Commonwealth Trading Bank loans are secured by way of a first mortgage over the property known as International House. The National Australia Bank loan is secured by way of a second mortgage over this property.

(iii) Secured Loans

1988		1989
\$		\$
	Current liability	
123,360	Commonwealth Trading Bank Loan No. 1	13,914
20,040	Commonwealth Trading Bank Loan No. 2	2,494
97,260	National Australia Bank	11,135
150,000	Australian Iron and Steel Pty Limited	150,000
<u>390,660</u>		<u>177,543</u>
	Non-current liability	
437,001	Commonwealth Trading Bank Loan No. 1	526,272
69,680	Commonwealth Trading Bank Loan No. 2	83,842
360,490	National Australia Bank	432,725
150,000	Australian Iron and Steel Pty. Limited	-
<u>1,017,171</u>		<u>1,042,839</u>
<u>\$1,407,831</u>	Total Secured Loans	<u>\$1,220,382</u>

- iv) During 1988 the Commonwealth Government provided an amount of \$300,000 from the legislated grant to fund an early retirement scheme. This amount is repayable in equal instalments over two years, the final instalment being due in the 1990 year.

14. CONTINGENT LIABILITIES

- (i) As at 31 December 1989 outstanding Loan Guarantees provided by the University under the University of Wollongong Staff Members Housing Loans Scheme with The National Australia Bank totalled \$26,967 (1988 \$30,872).
- (ii) Two loans from the National Australia Bank Limited have been approved for the construction of student residences. As at 31st December 1989 no funds had been drawn against these loans. Details are as follows:
- | | |
|--------------------|-------------|
| Kooloobong Stage 3 | \$1,700,000 |
| Weerona Stage 2 | \$1,600,000 |
- (iii) In 1987 the University furnished Letters of Comfort to the National Australia Bank Limited in support of loans given to the University of Wollongong Union and the University of Wollongong Recreation and Sports Association. These arrangements do not involve the University in any undertaking to pay any shortfall in repayments.

15. PROVISIONS FOR DEFERRED EMPLOYEE ENTITLEMENTS

- (i) (a) Professorial Superannuation Scheme

The provision for Professorial Superannuation Scheme was established to provide members with a pension of up to 25% of salary on retirement. In 1984 the Scheme was amended to provide for the payment of an additional contributory pension to members of the scheme on retirement. The scheme was closed to new members on 1 December 1987. In reports dated 17th January 1989 and 2nd March 1989, the University's liability at 1 January 1989 in respect of unfunded past service was actuarially assessed at \$4.1822 million based on membership of the fund at 1 January 1989. This result complies with the requirements of the Federal Government's May 1988 Economic Statement which introduced a 15% tax on employer contributions and superannuation fund investment income from 1 July 1988, and the application of the Occupational Superannuation Standards from 1 July 1990. Assumptions adopted by the Actuary in determining this liability were:

Rate of salary increase:	8% per annum, plus promotional increases at younger ages
Rate of investment return:	9% per annum (net of tax)
Rate of increase of pensions:	8% per annum.

It is anticipated that further Actuarial reviews of the Scheme will be undertaken every three years.

Movements in the provision during the year were:

1988		1989
\$		\$
1,006,184	Balance at 1 January 1989	1,153,893
57,988	Add Contribution from general recurrent fund	75,375
	Contribution from members for optional contributory 5% pension scheme	7,033
6,333		
136,805	Interest earnings from investments	164,075
<u>1,207,310</u>		<u>1,400,376</u>
53,417	Less payments	90,768
<u>\$1,153,893</u>	Balance at 31 December 1989	<u>\$1,309,608</u>

(i) (b) **Professorial Superannuation Pension Scheme**

In previous years the Widows' Annuity Accumulated Fund and the Managed Fund have been reported under Other Special Purpose Funds (Annexure G). These form part of the Professorial Superannuation Scheme and are included in the Statement of Balances in the current period under that heading.

Movements in the funds during the year were:

Widows Annuity Accumulation Fund	
Balance at 1 January 1989	98,672
Add: Contributions	5,133
Interest Earnings from Investments	14,737
	<hr/>
Less: Payments	118,542
	2,598
	<hr/>
Balance at 31 December 1989	\$115,944
	<hr/>
Managed Fund.	
Balance 1 January 1989	640,070
Add: Contributions	28,174
Interest Earnings from Investments	38,593
	<hr/>
	706,837
Less: Payments	376,405
	<hr/>
Balance at 31 December 1989	\$330,432

The balance reported under Professorial Superannuation Scheme in the Statement of Balances is made up as follows:

Provision [Refer note 15(i)(a)]	1,309,608
Widows' Annuity Accumulation Fund	115,944
Managed Fund	330,432
	<hr/>
	\$1,755,984

(ii) **Long Service Leave**

1,328,484	Balance at 1 January 1989	3,538,263
409,730	Add Contributions	464,602
15,006	Transfer from ANU	-
167,099	Interest earnings from investments	508,362
	Transfer from Provisions for Superannuation	-
2,330,681		<hr/>
4,251,000		4,511,227
712,737	Less payments	640,182
		<hr/>
\$3,538,263	Balance at 31 December 1989	\$3,871,045

The accrued long service leave liability in respect of employees with ten or more years' service at 31 December 1989 is estimated at \$5,713,553 (1988 \$5,063,355).

Amount unprovided at 1 January 1989	1,525,092
Amount unprovided at 31 December 1989	1,842,508
	<hr/>
Increase in amount unprovided	\$317,416

(iii) **State Superannuation Fund**

The University contributes to the New South Wales State Superannuation Fund in respect of present and former members of staff who are, or were, members of the Fund. In a report dated 25 February 1988 the Government Actuary assessed the gross liability of the University at 31 December 1987, at \$23 million. In accordance with a formula provided by the Actuary, the gross liability at 31 December, 1989 was \$26.82 million (1988 \$25.07 million). The unfunded liability has been brought to account as an amount owing by the Commonwealth/State Governments (refer Note 23). Assumptions adopted by the Actuary in determining the University's liability were:

Growth of salaries	7% per annum plus a salary scale
Indexation increases in pensions	5% per annum
Interest earnings on assets	8% per annum

The Actuary advises that changes in the economic bases will not substantially affect the valuation results while the age distributions and proportions of the various classes of membership remain reasonably stable.

A number of changes to the scheme came into effect from 1 July 1985. However, the Actuary advises it does not appear these changes will dictate acceleration of the next actuarial review due at 31 December 1990.

1988		1989
\$		\$
22,613,606	Balance at 1 January 1989	25,069,697
580,933	Add Contributions	-
	Increase in amount unfunded	
2,011,780	(refer note 23)	1,747,432
254,294	Interest earnings from investments	-
386,394	Adjustment to prior year	-
<u>25,847,007</u>		<u>26,817,129</u>
777,310	Less Payments	-
<u>25,069,697</u>		<u>26,817,129</u>
1,914,859	Less transfer to Long Service Leave Provision	-
<u>23,154,838</u>		<u>26,817,129</u>
	Add Adjustment to amount owing for	
1,914,859	Unfunded liability	-
<u>\$25,069,697</u>	Balance at 31 December 1989	<u>\$26,817,129</u>

(iv) State Public Service Superannuation

The New South Wales State Superannuation Fund was closed to new members on 1 July 1985 and was replaced by the State Public Service Superannuation Scheme. Staff members appointed after 1 July 1985 could optionally join the new scheme. The N.S.W. Government Actuary has advised that if the University desires to start funding its liabilities under the Scheme, then a contribution rate of 2.5 times total employee contributions paid since 1 July 1985 will provide a reasonable estimate until a full actuarial review can be undertaken. The estimated liability at 31 December 1989 was \$778,292 (1988 \$586,816).

367,287	Balance at 1 January 1989	586,816
-	Add Contributions	-
170,994	Increase in amount unfunded	191,476
	(refer note 23)	
48,535	Interest earnings from investments	-
<u>586,816</u>		<u>778,292</u>
	Less transfer to Long Service Leave	
415,822	Provision	-
<u>170,994</u>		<u>778,292</u>
415,822	Add adjustment to amount owing for	
	Unfunded liability	-
<u>\$586,816</u>	Balance at 31 December 1989	<u>\$778,292</u>

The State Public Service Scheme was closed to new members on 31 March 1988. The new schemes currently in operation, the State Authorities Superannuation Scheme (SASS) and the Superannuation Scheme for Australian Universities (SSAU) are both fully funded schemes with no deferred liabilities.

(v) Annual Leave

The University has an undetermined liability for untaken annual leave. Payments for leave taken in-service or on termination are charged to current revenue.

16. LOANS TO STAFF

In 1984 the University established a Housing Loan Scheme for staff at professorial level with a maximum loan available of \$30,000. Outstanding loans at 31 December 1989 amounted to \$91,954.

17. CAPITAL PROJECTS

During 1989 the following capital projects were contracted for on the basis that funds would be made available under Commonwealth Legislative provisions and from University Development Funds and Bank Loans

Commerce Building	\$6,552,957
Kooloobong	\$1,222,937
Weerona	\$556,782

18. LEASE OR HIRE EXPENDITURE

Contracts for lease or hire expenditure are estimated at \$246,118 as at 31 December 1989, detailed as follows:

Photocopying machines		
1990 Commitment	\$142,268	
1991 Commitment	\$103,850	

19. INVESTMENTS

Investments are shown in the Statement of Balances at book value which is acquisition cost as adjusted for interest bought.

Summary of portfolio as at 31 December 1989:

	Face Value \$	Book Value \$	Market Value \$
Government and Semi-Government Securities			
- Quoted	3,000,000	2,901,330	2,891,230
- Unquoted	2,550,000	2,579,098	2,480,733
Term Deposits	13,110,752	13,110,753	13,109,894
Bank Bills	519,287	519,287	494,560
One (1) share in SSAU Nominees Pty Ltd	1	1	1
	<u>\$19,180,040</u>	<u>\$19,110,469</u>	<u>\$18,976,418</u>

20. The Combined Statement of Income and Expenditure has been prepared in accordance with the Public Finance and Audit (Statutory Bodies) Regulations in a format suggested by the Auditor-General. This statement combines a number of funds which, under granting conditions, can only be utilized for specified expenditure purposes. These special funds cannot be allocated to general purpose expenditure categories.

To comply with the above-noted regulations and suggested format, the statement includes an amount of \$317,416 (1988 \$398,874) for unprovided Employees' Accrued Entitlements.

21. HIGHER EDUCATION CONTRIBUTION SCHEME

In 1989 the Commonwealth Government introduced the Higher Education Contribution Scheme to be collected by the University. Funds collected under the Scheme are offset against the legislated grant from the HECS Trust Fund.

In 1989 an amount of \$1,035,000 of the \$1,064,311 reported on Annexure A was withheld from the legislated grant of \$8,963,000, being the amount estimated to be collected. The amount collected in excess of \$1,035,000 represents funds paid by students in 1989 which will be reported to and adjusted by the Commonwealth Government in 1990.

22. COMMONWEALTH GRANT

Legislated Grant	41,155,700	\$
Add amount deducted (including interest) for early retirement scheme (Refer Note 13(iv))	<u>155,000</u>	
Amount received from Commonwealth Government for recurrent	41,310,700	
Balance of HECS Trust Fund Grant (Refer Note 21)	<u>7,928,000</u>	
	<u>\$49,238,700</u>	

23. AMOUNT OWING BY COMMONWEALTH/ STATE GOVERNMENTS

The State Grants (General Revenue) Amendment Act 1987 indicated that the Commonwealth Government, and the New South Wales State Government will share Superannuation Costs in a way that recognizes the respective responsibilities of Commonwealth and State Governments which prevailed when the liability was incurred.

In 1989, an amount of \$1,938,908 was brought to account to meet the increase in the net unfunded past service cost for State Superannuation (refer notes 15(iii) and (iv)).

	State Superannuation \$	State Public Service Superannuation \$	Total \$
Amount owing for unfunded liability at 1 January 1989	25,069,697	586,816	25,656,513
Add Increase in amount owing for unfunded liability	1,747,432	191,476	1,938,908
Amount owing for unfunded liability at 31 December 1989	<u>\$26,817,129</u>	<u>\$778,292</u>	<u>\$27,595,421</u>

24. Superannuation Productivity Supplementation

From 1st April, 1988, the University became liable for employee Superannuation entitlements equivalent to 3% of salary per annum, arising from a productivity wage claim decision handed down in 1986. The Commonwealth Government provides supplementary funding to cover this cost. In 1989, an amount of \$609,286 was accrued being the balance owing from the Commonwealth Government for 3% Productivity Superannuation in respect of members of the State Superannuation Schemes as estimated by University officers.

25. The Accumulated Balances at 1 January 1989 have been adjusted as follows:

	Balance Reported at 31 December 1988 \$	Adjustment \$	Adjusted Balance at 31 December 1988 \$
Other Special Purpose Funds (Annexure G)	4,519,849	738,742 -	3,781,107
Non Current Liabilities Professorial Superannuation Pension Schemes	-	738,742 +	738,742

26. In accordance with Section 41B(1)(d) of the Public Finance and Audit Act 1983 and the Public Finance and Audit (Statutory Bodies) Regulation 1985 a summary of land owned or occupied by the University together with the values thereof accompanies these Financial Statements.

General Recurrent Funds Budget

AS REQUIRED UNDER SECTION 7(1)(A)(III)
ANNUAL REPORTS (STATUTORY BODIES) ACT 1884 AND REGULATIONS 1985

	1989 Actual \$,000	1989 Approved Budget \$,000	1990 Approved Budget \$,000
Income			
Federal Grants			
General University Purposes	50,303	50,268	50,942
Productivity Superannuation	609	-	
State Grant			
General University Purposes	2,318	2,318	2,361
Other Income			
Charges and Fees	255	255	-
Rent from Properties			
Contribution towards expenditure from other University accounts	368	368	-
Contribution towards expenditure from external organisations	49	49	49
Miscellaneous	135	184	164
	54,037	53,292	53,516
Less Expenditure			
Teaching and Research	29,527	29,079	31,878
Research Only	687	693	938
Library	3,377	3,317	3,482
Computing Services	1,016	981	999
Other Academic Services	576	484	769
Student Services	1,168	1,185	576
Administration	5,962	5,861	5,101
Overheads	3,691	3,550	3,044
Buildings and Grounds	3,833	3,764	3,773
Public Services	992	1,080	1,114
Provisions	-	147	906
Equipment	2,450	2,450	2,444
Minor Works	691	691	526
	53,970	53,282	55,550
Excess of income over expenditure for the year	67	10	(2,034)
LESS Adjustments for prior years	18		
DEFICIT FOR YEAR	49		
Accumulated deficit 31.12.88	511		
ACCUMULATED DEFICIT 31 December 1989	462		

Notes: The budget shown for 1989 is the amended budget at 31 December 1989. The 1990 budget is the first budget approved for the financial year and was prepared towards the end of the preceding year at December 1988 cost levels for salaries and associated costs and December 1988 cost levels for non-salary costs. Both expenditure and Federal and State grant income are updated in line with salary award variations during the financial year.

NOTES

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