Open weekend on campus
an introduction to computer literacy — and all the fun of the fair

Perhaps never before has The University of Wollongong campus experienced the tread of so many feet or have staff and students answered so many questions. Open Weekend, held on October 20 and 21, sponsored by Radio 2WL and staged in conjunction with 2WL’s ‘80s Lifestyle Expo, forced the floodgates wide open.

Estimates as to the head count vary. The Mercury estimate was a conservative 80,000 visitors. Radio 2WL was more optimistic with a figure of 118,000. The real total, which presumably lies somewhere between the two, is in any event largely irrelevant.

Suffice to say that those arriving by car on Saturday afternoon and on Sunday morning had to contend with a traffic jam not only en route to the crowded carparks but also on the way out. Between the entering and the leaving, however, the links binding the University and the city were reforged by the hour.

The Open Weekend serves several aims. It opens the University to local business interests who are able to set up stands and exhibit their wares, expo style, in pleasant surroundings. It gives local people an opportunity to see the University, sample its amenities, learn a very great deal about what university teaching and learning entail, and to see Engineering and Chemistry and Science experiments in progress.

This is the age of the computer and the term ‘computer literacy’ has entered the Australian lexicon. Thus, the University opened the doors of its computer classrooms and encouraged adults and youngsters to sit down to keyboards and visual display units to test their skills.

And since October was designated Information Technology Month, a good deal of information was available on a broad range of computer technologies, not least through a special exhibition staged by the University in conjunction with Aussat, Telecom, AWA (with an optical fibres optical display), the NSW Department of Education (with a demonstration of distance teaching using a terminal and a facsimile machine); Westpac demonstrated Electronic Funds Transfer; and the School of Industrial and Administrative Studies exhibited video discs.

A university can be a wonderland of delight and awe to the uninitiated. This was certainly true of the displays in the Physics Department where by far the biggest draw was a dramatic display of lightning-like...
images — and a great deal of noise — as a Tesla coil provided a spectacular demonstration of one of the basic laws of electro-magnetism. Also in the Department of Physics visitors could see an artificial rainbow created by over one billion glass spheres, and much more besides.

Nor were the commercial exhibits any less exciting. On one stand for example you could see a model maker carving wood by means of a Moto-Tool instrument — a high-speed, hand-held carving bit — and cutting incredibly small-section timber strips with what might well have qualified as the world's smallest circular saw.

Over in the School of Creative Arts one could examine the paintings of Willy Tirr, the brilliant English artist whose spell at the University had just ended.

The weather by midday on the Saturday was less than perfect but although the sky was overcast the rain stayed away. Cloudy conditions appeared to work well for the Town players in the Town versus Gown cricket match, for they won with a score of 5 for 212, against Gown's 8 for 210. Highest scorer was Town's Test player Doug Walters with 79. Gown's Test player Ian Davis was run out when his score stood at 25.

During the lunchtime break in the cricket, the South Coast Tug of War Association took to the pitch. The contest was won by the Army, second was Albion Park Bushfire Brigade and third was the team from the Albion Park RSL.

Prizes for both the cricket and the tug of war were donated by the Wollongong Paddy’s Market and the cricket match was sponsored by both Wollongong Paddy’s Market and the Swire Group.

And for those too young to appreciate such heady stuff there was no shortage of amusements — even a ride in a carriage pulled by a magnificent model steam locomotive that even smelled the part. Ah, the aroma of that combination of steam and coal smoke . . .

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International Conference on High-strength, Low-alloy steels

THIS conference, which, as recorded briefly in the previous issue of the Gazette, the University hosted partly as a contribution to the 150th anniversary celebrations of the City of Wollongong, attracted 140 delegates from Australia and overseas. Forty-five of the delegates came from abroad — representing England, France, Sweden, Italy, South Africa, India, China, Japan, USA, Canada, Brazil and New Zealand.

The official opening was performed by the Premier of NSW, Mr Wran, who spoke about the importance of the Australian steel industry and the policies adopted by the NSW Government in relation to industry in Wollongong and Newcastle. Mr Wran was followed by Dr W. J. McG. Tegart, Secretary of the Department of Science and Technology, who discussed his department’s policy draft on a National Technology Strategy.

The morning session was completed with a keynote lecture by Dr M. Korchynsky of Union Carbide, USA, entitled The Expanding Field of HSLA Steel. This presentation was a general overview which provided an excellent introduction to the subject for an audience of delegates with a wide variety of technical backgrounds.

The technical program which followed that day, and through to Friday, was consistently well attended, and parallel sessions were necessary on Tuesday morning to enable the eight keynote lectures and 50 contributed papers to be presented over the five days of the conference.

Two distinguished Japanese metallurgists, Dr C. Ouchi from Nippon Kokan K.K. and Dr T. Tanaka of Kawasaki Steel Corporation, provided keynote lectures on the latest developments in industrial processing techniques to optimise the properties of HSLA steels. More fundamental aspects of the origins of the structure and properties of HSLA steels were covered by Professor M. Sellars of the University of Sheffield; Professor J. Jonas of McGill University, Canada; and Professor A. DeArdo of the University of Pittsburgh.

Engineering applications were keynoted by Dr P. Kirkwood of British Oil and Gas, who spoke on steels for offshore platforms; Mr T. Baker of the Australian Pipeline Authority covered pipeline steels for the petroleum industry; and Mr R. L. Clarsen of BHP discussed applications in the Australian automotive industry.

The conference was smoothly organised and its success, both socially and technically, was attested by the number of compliments paid to the organising committee by visiting delegates. Visitors were impressed with the University campus and facilities, the Illawarra region, the hospitality, and the technical excellence of the program. The success of the conference was the end result of strong support and commitment by individuals, groups, companies and institutions, each contributing to particular aspects of the conference organisation.

The Illawarra Industrial Development Board supported the conference financially and, through Peter Curtis, organised a successful engineering exhibition in the Common Room. The City of Wollongong arranged a civic reception at the ICC Building for delegates on the Monday evening and entertainment was provided by the visiting Chinese Piano Quartet and the University Singers.

Metallurgy played key roles in the organisation, providing the chairman and co-chairman, Doctors Tara Chandra and Duce Dunne, the secretarial support through Ann Webb and Margaret Standen, and the staff to operate audio-visual equipment and to perform the many tasks necessary for a conference of this magnitude.

Metallurgy undergraduates, through the Metallurgical Society, also strongly supported the Department, and not only helped with the arrival, accommodation and registration of delegates but also organised a highly successful buffet dinner in the Institute Staff Room, which was attended and enjoyed by some 100 delegates, staff and students.

Joins editorial board

DR ROBERT WHELAN of the Department of Biology at The University of Wollongong has been elected to one of the three positions on the editorial panel for the Australian Journal of Ecology.
The way ahead for secondary schooling

OVER 200 PEOPLE attended the seminar held recently to look at future directions of secondary education in New South Wales. The seminar was held in the new auditorium at Smiths Hill High School. It was conducted by the Illawarra Educational Research Council (IRERC) whose chairman, Dr P. de Lacey, introduced guest speakers, including Professor McKinnon, Vice-Chancellor of The University of Wollongong and co-author of the recent Report on Future Directions; Dr F. Sharpe, assistant Director-General of Education, attending for the Director-General, Mr D. Swan, the other author; Prof L. Chipman, chairman of the Australian Council for the Preservation of Standards in Schools; and Ms Anne Junor, research officer for the Teachers Federation in Sydney.

Issues raised by the speakers, and questions from among those teachers, parents, children and other members of the community present, included whether the new proposals would provide studies that were more relevant to children's present and future lives than at present; whether the pursuit of 'alternative' or non-academic courses would preclude late developers reverting to professional or academic studies later; whether industry, employers and universities would find any new examination system acceptable for their selection purposes; whether a new certification system would allow for the encouragement and identification of talented children as well as the less able; and whether there was any practicable alternative to the recommendations in the Report.

A questionnaire drawn up by Dr Tony Fielding was distributed, asking participants their opinions about the major concerns of the report and the recommendations. Any participants who have not returned completed questionnaires are asked to do so directly.

Educational research for the 1980s and beyond

PROCEEDINGS of the inaugural conference of the Illawarra Educational Research Council (IRERC), held at The University of Wollongong last March, are available in a booklet available from the University. Editors of the booklet are Dr Philip de Lacey and Dr Tony Fielding.

The conference was opened by the Vice-Chancellor of the University, Professor Ken McKinnon, and participants were accorded a civic welcome by Mr Frank Arkell, the Lord Mayor of Wollongong.

Keynote addresses were given by Professor Jack Walton of the University of New England, Dr Shirley Smith of the University of New South Wales, Mr Barry Jones, Minister for Science and Technology, and Senator Peter Baume, Shadow Minister for Education and Youth Affairs. Several community representatives gave talks covering a range of concerns within the region.

Copies of the proceedings are available from Dr Philip de Lacey in the Department of Education in the University (PO Box 1144, Wollongong 2500).
$280,000 — slightly ahead of the amount provided for 1984.

The University has fared rather better for capital grants. Construction of a Science II/Engineering building began recently. This building is estimated to cost $6.5m when complete. Some $0.5m of this will be spent during the remainder of 1984 and we hope substantially to complete the building during 1985. Other building projects approved for the University for the triennium are:

- an Administration building which will further relieve the pressure on engineering space by allowing re-allocation of the present building. This is estimated to cost $2.7m and work will begin during 1985;
- work on an extension to the Library, estimated to cost $4m, will be started during 1986;
- in addition, the University will have available $0.5m for extension of student accommodation, either by extending the complex under construction on Northfields Avenue or through collaboration with one of the bodies interested in building a student residence on campus.

The minor new works allocation available to the University will be $410,000 for each year of the triennium, as compared with the 1984 allocation of $155,000. The decrease is to be expected in view of the help given with capital projects. On the other hand, partly as a consequence of the amalgamation, the University has to undertake roadwork which is very expensive and, in addition, because of shortage of space, will need to extend office accommodation for staff at its own expense.

Recently the University has reviewed its site planning, utilising the services of Mr. G. Harrison who first advised the University on its master plan in 1976. Mr. Harrison's preliminary report indicates that the space available, even when the present projects are completed, will be 50 per cent less than is normally available to a university of comparable size. In other words, the building projects approved are merely part of a necessary catch-up process which will have to be increased in the next triennium if we are to have space comparable with other universities.

The tertiary education commission has resisted the temptation to spread the very small additional funds so thinly as to give every university some. With the limited funds at its disposal, it has tried to help the newer, developing universities. For Wollongong the funds have not been sufficient to overcome the effects of enrolment increases and the poor funding provided at the time of amalgamation. We must therefore keep pressing for a more adequate funding and capital facilities base for the University.

On the other hand, the University will be in a strong growth position in many important academic respects. At present, advertisements are current for over 30 new academic staff so that departments are in a position to consolidate their staffing and spread loads more evenly. Additional capital facilities will help to relieve strains which have become increasingly apparent. Better equipment allocations will enable some relief on the equipment side. Increased activity on several other fronts is yielding noticeable benefits. We have received notification of some sizable research and training grants. The Technology Centre has commenced operations and has received a boost of $0.75m from the Department of Science and Technology for the Industrial Automation component, with a strong commitment from the State Government for more substantial funds for the main thrust of the Centre.

All in all, the University can look forward during the triennium 1985-87 to an exciting and interesting period which will consolidate it as one of the stronger, middle-sized universities — one with a rapidly enhancing reputation.

Ken McKinnon

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**Researching children's potential**

THERE is growing evidence that a deal of human potential has been more greatly underestimated than was previously thought. A recent study at Macquarie University found that a group of only curiously educated elderly people were sometimes capable of credit-level performance in university studies.

Other work in Canada and in Israel, and by Dr. Lynn Gow at The University of Wollongong, has achieved some success in improving the performance of mentally retarded people.

Less-advantaged and ethnic-minority children who score low on achievement and intelligence tests have shown to increase both level and rate of cognitive development in the long term, as a result of particular kinds of intervention-education programs.

Pursuing this last study, Dr. Philip de Lacey and Prof. B. Randhawa in The University of Wollongong have been collaborating for four years on studying the elements of thinking, learning and communicating as one total process rather than considering them as separate entities. Prof. Randhawa has just completed a year's sabbatical leave, mostly in the Department of Education, with Dr. de Lacey but preceded by three months at Yale with Dr. Sternberg, working on a number of projects in this area, which are the basis of some ten joint articles and two joint books already completed or nearing completion.

Much of this work has been undertaken this year in Wollongong and Bourke. The enterprise has attracted the interest of several students, most of whom have made some positive contributions, and will be joined in 1985 by another visiting professor, Dr. Dennis Hunt, who, like Prof. Randhawa, is from the University of Saskatchewan in Canada.

The inquiries are already showing several differences in reasoning, thinking and personality variables across ethnic, sex and socio-economic boundaries which are likely to be useful in planning educational programs in the future.

Achievement, coping and adjustment estimates provided by teachers of the children studied are proving reliable; but establishing connections between self-concept, and level of mental functioning and school achievement, are more difficult than had been anticipated.

Long-term effects of broad-based early intervention seem more substantial and better sustained than was previously thought and there is interest from some local schools in incorporating elements of the intervention programs in their own schooling. A manual describing early intervention is well on the way.

The research is likely to be continued for some years in both Australia and Canada with the prospect of academics in other universities in New South Wales and Queensland joining the work in an expanded form. Resources have been provided by the Social Sciences and Humanities Research Council of Canada, The University of Wollongong and some private research foundations.

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Prof. B. Randhawa, Ms. Megan Doring (research assistant) and Dr. P. de Lacey check procedures for administering a reasoning task and a balance test for children in NSW and Canada. The apparatus was constructed in the University Science Laboratory.
WOLLONGONG people will remember a major flood that occurred on February 17 and 18 this year. The storm caused serious damage to the suburbs of Brownsville and West Dapto as well as lakeside properties and caravan parks. Despite the damage to roads, bridges and properties, the storm provided a rare opportunity for Dr Gerald Nanson of the Department of Geography to examine something of the character of these extreme events in the Illawarra. He undertook this study as part of a larger investigation of stream erosion and associated sedimentation of Lake Illawarra.

The storm was centred along the escarpment in the West Dapto area of Wollongong city. It was the result of the coincidental occurrence of a number of unusual meteorological conditions and caused a flood which, in all probability, will not be equaled or exceeded in the West Dapto area for a very long time.

A high-pressure system centred southeast of Tasmania directed strong moist airflow onto the South Coast behind a front which crossed the area on the evening of Friday, February 17. A small cyclonic depression also formed behind this front just south of Newcastle before tracking down the coast and centring near Mount Keira early Saturday morning.

This clockwise-rotating vortex drew warm moist air off the ocean before passing it over Lake Illawarra and onto the Illawarra escarpment.

The presence of an upper level low-pressure trough across the area, and the physical barrier provided by the escarpment, caused the air to rise and cool. The result was torrential rain from about midnight until noon on Saturday, and probably the worst flood in the history of the West Dapto area. Between 6 and 7 am, a Public Works Department automatic raingauge at Wongawilli recorded a maximum intensity of 123 mm per hour. This gauge received a total of nearly 800 mm during the storm, with most of that falling in a 12-hour period on the Saturday morning. The maximum 24-hour rainfall ever recorded in Australia was 1140 mm in the tropics near Cairns in 1979. For temperate Australia, the Wongawilli fall would appear to be very close to the record 12- or 24-hour event.

In order to obtain a detailed picture of the distribution of rainfall throughout the area, Dr Nanson appealed, through the newspaper and radio, to local residents for unofficial 'backyard' raingauge records. Over 60 residents responded, and their information, combined with values from official Water Board and Public Works Department gauges, permitted the construction of an isohyet map showing the pattern of rainfall throughout the Wollongong and Shellharbour area (Map 1). The map shows a marked topographic effect with the storm centre elongated parallel to the escarpment crest between Mount Kembla and Avondale, and

**The Dapto deluge of 1984**

*Pictures showing sections of Robins Creek where the stream cut a new channel, even scouring into bedrock*
with a very sharp drop in rainfall intensity to the northwest and southeast.

From an analysis of 83 years of recorded rainfall at West Dapto, Dr Nanson estimates this storm to have a probable recurrence interval (return period) of about once every 250 years. However, this is only an average value, and it does not mean that a similar or larger flood will not happen in West Dapto next week or next year!

Another aspect of the storm was its very localised distribution, a feature characteristic of other extreme rainfall events in the Illawarra.

From an analysis of rainfall recurrence intervals from official gauging stations throughout the area, Dr Nanson has produced a map of the distribution of recurrence intervals for the rain which fell at these stations during the February 1984 storm (Map 2). Immediately apparent is that while this storm was a very rare event in the West Dapto area, it was relatively commonplace at Shellharbour, Wollongong or Woonona.

In fact, looking at the areal distribution of this and other severe storms in the Illawarra (such as the March 1975 storm centred on Mount Keira and Jamberoo), Dr Nanson has estimated that the urban area of Wollongong-Shellharbour can expect a 100-200-year storm somewhere in the area once every 25 years. This has important planning implications for the State Emergency Service in the district as well as for evaluating flood hazards around Lake Illawarra. The Lake basin is a receptacle for many of these localised storms which, although having infrequent recurrent intervals at their point of origin, result in more frequent flood-recurrence intervals around the Lake.

Catastrophic storm events such as the West Dapto flood should be regarded as a relatively common type of hazard in the Illawarra area. They will rarely strike the same spot twice, but the downstream flood risk will be considerably greater than the risk of any individual storm.

In the aftermath of the February storm, Dr Nanson and Mr David Hean, a postgraduate student in the Department of Geography, have been examining the resulting erosion along stream channels draining the West Dapto area. They found that headwater channels increased their size by up to four times during the flood, whereas downstream low-gradient channels showed only minor erosion. The accompanying photographs show sections of Robins Creek where the stream abandoned the old channel and cut an entirely new channel during the storm, even scouring into bedrock. The house in one photograph was surrounded by swirling floodwaters carrying large boulders from Forest Creek; the occupants had to be lifted out by helicopter at seven o'clock in the morning.

This evaluation of the channels is to provide quantitative information on the sedimentation of Lake Illawarra and possible erosional effects resulting from future urban expansion into the West Dapto area.
FOR obvious environmental and economic reasons, chemical technologists are continually seeking new energy-efficient and chemically clean (no side-products) routes to the synthesis of important new molecules — drugs, pesticides, hormones and so on — in as few steps as possible. Avoiding a messy ‘witch’s cauldron’ or cookbook approach to chemical synthesis is an important goal which a better understanding of chemical reactivity, through theory, would facilitate.

Better insight into the mechanism of action of such key molecules, through the analysis of the structure and rigidity, the spatial relationships and electrical nature of structural components of those molecules active in some biochemical process, is a related goal. The attainment of that goal also requires accurate models of molecular electronic and vibrational behaviour.

In 1929, Paul Dirac claimed that the mathematical theory of ‘all of chemistry and most of physics’ was already known, but that the equations of quantum theory describing molecular structure and chemical properties were too difficult to solve. The advent of high-speed computers over the past 30 years has created an optimism among many scientists that accurate computational solutions to the equations representing molecules could be found for realistic representations of molecules. And only 60 years after the invention of quantum theory, we are finally approaching the realisation of this goal.

Accurate theoretically based mathematical models of chemical structure and behaviour are essential if we are to understand chemistry: while experimental data can be systematically collected and rationalised, the underlying reasons for particular chemical behaviour cannot be reliably interpreted in the absence of a theoretical framework. The importance of proven theoretical models of chemical behaviour based on first principles is that prediction of chemical behaviour finally becomes possible. And this opens the way to the design of new chemical processes.

In the quantum chemistry group at The University of Wollongong, research over the past ten years has concentrated on three basic areas where even the best computer models had been well short of providing an accurate or realistic accounting of observed behaviour of representative small molecules.

The first of these separate research projects has involved modelling the electronic structure of the most stable few electronic states of molecules. Most ‘chemical intuition’ is based upon analysis of the ground (or lowest) electronic state of each molecule: each different excited electronic state behaves (transiently) like a completely individual molecule and essentially nothing is known about such behaviour since it is so difficult to probe experimentally.

Work at The University of Wollongong by Norm Carlsten (now a public servant), Bruce Markey (now a research scientist at ICI), Trevor Lewis and Ulrich Senff on the design of the mathematical basis of the representation of small molecules was the foundation of recent work (involving Peter Burton, Peter Gray and a lot of assistance from Greg Doherty in Maths) on a systematic restructuring of the full quantum equations for the electronic structure of the molecules.

This enables a systematic series of approximations to the exact solution to be devised, from which an extrapolation to the exact result is possible.

Initial trials of the extrapolation proved extremely promising in simple, model problems, and now from the latest work it seems that the extrapolation technique will provide a quite general route to the solution of otherwise impossibly difficult equations for realistic modelling of real molecules. This extrapolation provides a breakthrough of an almost decade-long impasse!

The techniques for electronic structure analysis just outlined must be used again and again for each configuration or geometry of the nuclei of the atoms in a given molecule. The change in electronic energy with clear displacement is what determines the strength of interaction (‘intermolecular forces’) between molecules or the nature of internal vibration of the atoms within a molecule.

The second research area of the University quantum chemistry group has focused on the molecular interactions between small molecules (the modelling becomes more difficult exponentially with more electrons!).

Ulrich Senff has achieved some excellent results in his work modelling the interactions involving helium atoms and hydrogen molecules and is now analysing his comprehensive data with a view to devising semi-empirical techniques for modelling the interactions between more complex molecules.

One of the world’s leading scientists in this field, Professor Wilfried Meyer, from Kaiserslautern (FRG), is expected to visit the group over next summer to further the group’s work on molecular interactions.

Greg Doherty, Margaret Hamilton, Ellak von Nagy Felsobuki and most recently Bruce Martire and Peter Burton have all been involved in the development of new techniques for the simultaneous modelling of all internal vibrational modes of a molecule — the prototype system being H$_3^+$. Margaret’s Ph.D. and follow-up work by Dr Felsobuki (now a lecturer at the University of Newcastle) led last year to the first astronomical detection of H$_3^+$ in an interstellar dark molecular cloud (PGB, EvNF, Lindsey Smith from Physics and Dave Allen from AAO, Siding Springs).

More theoretical work is planned, as well as further astronomical observations, because H$_3^+$ is such a potentially central diagnostic of the chemistry leading to complex molecule formation in the interstellar environment.

The vibrational analysis techniques that have been proven in the H$_3^+$ case are now being extended to other molecules — a long-standing problem of some complexity (and interest, given water’s importance in the biosphere!)

The progress in each of these three areas over the past ten years, from extreme uncertainty about whether any close approach to realistic modelling could be achieved, to a stage of some surprise (even among the group) that just such accuracy could be demonstrated in such a short time by work at Wollongong University, vastly opens the scope of problems that the quantum chemistry group at Wollongong (and of course elsewhere) consider soluble.

The problems in moving to work with larger molecular systems will be mainly computational (bigger, faster machines, and better software, are always needed!) but, if the past decade’s experience is any guide, problems considered soluble, and problems easily soluble, are two vastly different categories!
First-ever social atlas for the Illawarra — a tool for planners

As to the choice of variables, the scales at which maps were to be reproduced and the orientation and format of the commentaries. As will have been gathered from the introductory paragraph to this article, the atlas is based on the Census 33 on Population and Housing conducted on the night of June 30, 1981.

Almost all the published maps are of the choropleth type: that is to say, the individual areas are shaded at different densities in such a way that areas with high values or concentrations of the characteristic being mapped are more densely shaded than areas having lower concentrations. This method serves to highlight the characteristics of greatest importance or which reach unusually high values. And such shading provides a visual impression of internal homogeneity within areal units.

International congress of psychology

THE 23rd International Congress of Psychology, completed in September in Acapulco, Mexico, confirmed Sydney as the venue for the 24th International Congress in 1988.

The decision to hold the Congress in Australia is interesting, not only because it is the first such congress to be held in the southern hemisphere but because it is to be part of the Australian Bicentenary Celebrations.

Professor Ron King, chairman of the 1988 International Congress Committee, commenting on the congress, said that the plans for the Australian Program, to be hosted by the Australian Psychological Society, had already attracted the attention of psychologists around the world. Scientific papers were to be arranged so that the common interests of physiologists, biochemists, ergonomists and psychologists, working at the edges of these disciplines, would be met.

For the first time, a major congress in psychology will also include substantial sections open to the public and to special-interest groups, such as business executives. Professor King said that neither the scientific nor the professional aspects of psychology were well understood by the public-at-large, and it was time that steps were taken to remedy this problem.

Professor King said that his committee was impressed by the willingness of the 50,000-strong American Psychological Association’s decision to shift its 1988 conference from New York to the west coast so that American psychologists could move on to the congress in Australia.

The Assembly and Executive of the International Union of Psychological Sciences, representing more than 100 member nations, has also greeted the Australian proposals enthusiastically, with officials from eastern and western Europe, China, Japan, India, North America, Central America and Africa pledging their support.

Principal venues for the congress will include the Sydney Opera House, the Sydney Entertainment Centre and Sydney University.
A recession-proof industry in the Illawarra

IN difficult economic times, The University of Wollongong has been a source of stability and economic growth for the Illawarra. During the 1980s, while 10,000 local people have lost jobs in manufacturing and mining, there has been continued growth in local employment and local spending by the University. Equally important has been the increase in student spending on food, accommodation and services resulting from a 55 per cent increase in student numbers between 1980 and 1984, and a 139 per cent increase in the number of students coming from outside the Illawarra.

With the equivalent of 730 full-time employees, the University is one of the largest employers in the region. In a city with Australia's highest rate of female unemployment, the University is a significant employer of women. About 250 University employees are female, and the University has instituted equal opportunity and affirmative action programs to increase the female proportion of the University workforce.

Moreover, the University employs a high proportion of workers with administrative, professional or technical qualifications. Such jobs are relatively scarce in the Illawarra, and the University helps to balance the unusually high proportion of unskilled and semi-skilled jobs characteristic of employment in the region.

by John Steinke
Senior Lecturer in Economics, University of Wollongong

Computerised data banks now available to all

THE University of Wollongong Library has joined with Uniadvice to offer to the public a revolutionary new service. Indeed, the computer data banks of the world are now no more than a local telephone call away.

Uniadvice has agreed to handle inquiries for anyone who wants to have the very latest information on technical matters. The information may come from technical papers, data specific to yellow pages, for example patents search, laws statutes and the environmental effects of chemicals. These are merely a few random examples. The range of information available is almost limitless.

In this new development, information stored in huge data banks, such as the National Library of Medicine in Washington or the Lockheed Data Base, can be made available in Wollongong. The information is up-to-the-second, to the extent that much of it is still not included in the technical literature.

The University Librarian, Howard Petrie, has extensive experience in accessing such data bases. His partnership with Uniadvice thus promises to provide local industry and professional groups with tremendous value for money. Until now, access to such data banks has been restricted to big business with the ability to hire the necessary expertise.

The new service holds great promise — the promise of help for the region to become even more competitive than in the past; in the battles for available resources; in the expertise needed to design and manufacture new products. All these, in turn, could lead to new industries, and to more jobs, in the Illawarra.

Further information from Mr Peter Sophios at The University of Wollongong, telephone number (042) 27-0076.

Ms Mary Tow at the Library computer terminal. Also in the picture is the University Librarian, Howard Petrie
THE UNIVERSITY OF WOLLONGONG GAZETTE

University and its students, it appears the University will be responsible for bringing about $30,500,000 of outside income to the Illawarra in 1984. Of that sum, approximately two-thirds is available for spending within the region.

However, the total impact of the University on spending and income in the Illawarra is greater than the sum of local spending by the University and its staff and students. This is because University spending creates income for the owners and employee of local retail and service establishments, who in turn spend a part of their income on local purchases of goods and services. The money passes on, being spent and respent.

The size of the multiplier is determined by how rapidly income leaks out of the Illawarra. In tax payments to Canberra and Sydney, in payment for goods and services purchased from other areas, and in savings sent out of the Illawarra by individuals or local financial institutions.

The best estimate of the size of the Illawarra multiplier was produced by Dr Shamsher Ali, of the University's Economics Department, through preparation of a regional input/output table. Dr Ali estimated, based on 1968/69 data, that the Illawarra multiplier for educational expenditure was 2.294. In other words, every $1 brought into the region by the University and its students creates another $1.29 of spending on goods and services supplied or produced in the Illawarra.

Applying Dr Ali's multiplier to the gross income of the University and its students yields an estimate that spending by the University, and by its staff and students, will result in $39,450,000 of sales of other goods and services in the Illawarra in 1984. This, in turn, supports a large number of jobs outside the University — probably at least as many jobs as the 730 within the University.

There is ample evidence that University education adds substantially to the productivity of workers, thus making possible higher wages and profits. For example, surveys by the Australian Bureau of Statistics have shown that University graduates earn more than double the average Australian income over the period of their working life.

The University also contributes to the retraining of the Wollongong workforce through acceptance of a relatively high proportion of students on the basis of completion of a technical college certificate or passing of a special entrance examination. With local unemployment running at 20 per cent, retraining is one of the University's important activities.

Large numbers of University of Wollongong and Wollongong Institute of Education graduates are now employed by the major companies of the Illawarra, and in the schools, the city and county councils, and the State and Federal Government departments. In the long term they, and the many generations of graduates yet to come, are the University's greatest contribution to the Illawarra economy.

On tour with Theatre South

MENTION the name Dorothy Hewitt in Sydney and you can 'pack them in'. Not so much so in Wollongong; and there the booking office was less busy when Theatre South put on a season of Ms Hewitt's The Man from Mukinupin. Nevertheless, Theatre South was well pleased with the turnout.

When The Man closed in Wollongong, it was taken on a festival beginning in Mittagong on October 3 and ending at Ulladulla on October 22.

Tent Festival

Other news of Theatre South is that Wonderful Wollongong was the title of the company's salute to the city's 150th birthday celebrations. The spectacular show was a Playbill of songs and sketches set around the year 1834.

In the tradition of the 19th-century Playbill, there was a full-blown melodrama complete with villain, heroine, hissing and booing. Theatre South called it Only a Convict Girl.

The show provided laughs galore, with a step back in time to Wollongong as it was 150 years ago.

A big attraction was the show's unusual venue: it was the centre of Theatre South's Tent Festival, and it all took place in a tent erected in McCabe Park with support from the 150th Committee.

Wonderful Wollongong was a family show, but Theatre South also wanted to do something for the youngsters. Thus, Inside, Outside, Upside Down was a folksy collage of tales from all over. Four actors moved from role to role as the show moved from continent to continent — from Australia to Europe to Asia — with people and animal antics and songs.

National conference on work, income and leisure

A CONFERENCE held at Wollongong University on September 28 and 29 on the theme of work, income and leisure in the years ahead, organised jointly by the Department of Economics and Centre for Technology and Social Change, focused on the effects that continuing high levels of unemployment, changes to industrial structures and technological change are having on the Australian economy.

The three major issues considered were changes in the economy, work and leisure and the policy options available to cope with these changes.

Speakers included Mr Barry Jones, Federal Minister for Science and Technology, who gave the keynote address on the Friday morning. Also present were Professor Peter Dixon of Melbourne University, Professor Don Lamberton of Queensland University, and Mary Gaudron, QC. Thirty other papers were given by academics, trade unionists, public servants and welfare workers from Australia and overseas.
Professor Lauchlan Chipman delivers Sir Erle Page Trust Memorial Lecture

WOLLONGONG University Professor Lauchlan Chipman delivered the Sir Erle Page Trust Memorial Lecture in the Great Hall of the University of Sydney on Thursday, November 1. He chose as his theme 'Equality, Rights and the Rule of Law'. His attack in his address on the Human Rights Commission, on the grounds of bias and incompetence, received wide publicity the following day.

The occasion was the second on which Professor Chipman had delivered a formal address in the Gothic magnificence of Sydney's Great Hall. In 1982 he gave the George Judah Cohen Lecture entitled 'The State of Education'.

A person given to almost non-stop activity, Professor Chipman has been notable, too, in other areas. He has been elected a member of the Mont Perlin Society, an international group of philosophers, economists and political scientists on the basis of his contribution to 'the literature of freedom'.

Professor Chipman has published over 80 refereed articles, monographs and conference proceedings, more than half of them touching on human freedom.

Next year Professor Chipman will return to Wollongong University full time following the completion of his three-year joint appointment in the Department of Jurisprudence in the Faculty of Law in the University of Sydney. During that period he had major responsibility for teaching on human rights subjects, dealing particularly with international conventions on human rights and Australian antidiscrimination legislation.

David Murray to write for Botany

DR DAVID MURRAY of the Biology Department has been invited to write for a new series, Research Studies in Botany. The series is to be edited by Phillip S. Nutman, F.R.S., and published by Research Studies Press (John Wiley, UK). The title of Dr Murray's monograph will be The Nutrition of the Angiosperm Embryo. It will emphasise the development of experimental and analytical techniques that have made possible an improved understanding of the functions of the various parts of the fruit and seed-coats during embryo growth and reserve synthesis.

Since coming to The University of Wollongong from Melbourne five years ago, Dr Murray has become recognised as a leading world authority on seed biology. The new book will be Dr Murray's fourth on various aspects of this vital topic. He recently edited two volumes on seed physiology to be published by Academic Press in October this year. The first of these is devoted to seed development, the second deals with seed dormancy and germination. A third volume entitled Seed Dispersal is currently being prepared for Academic Press. Dr Murray will edit this volume and contribute a chapter on seed dispersal by water, concentrating on seed dispersal by ocean currents. Dr Robert Whelan, also from the Biology Department, will contribute a chapter on seed dispersal after fire.

Edwards/Hewett opera published

CHRISTINA'S WORLD, an opera written by playwright-in-residence Dorothy Hewett, and with the musical score by Ross Edwards, will soon be published by Universal Edition. A great part of the opera was composed on campus last year when Ross Edwards was the first composer-in-residence at Wollongong University.

The theme of Ms Hewett's libretto is the subject of a painting by American artist Andrew Wyeth. The picture is of a crippled girl — Christina — lying on the grass before a group of derelict farm buildings. From this slight thread, Dorothy Hewett has produced an allegory of reality and illusion as Christina traces through memory a lost childhood, only to find the sinister aspects of her youth revealed.

The work was premiered by The Seymour Group in November and was enthusiastically received.

Universal Edition is one of the major European publishing houses of contemporary music and their catalogue includes composers such as Webern and Schoenberg.

New book on cross-cultural psychology: Randhawa and de Lacey

CONTRACTS have been signed for a new book on intercultural issues with the Harcourt group of publishers in Sydney. The title is Culture and life possibilities: Australia in transition. Two of the editors are Dr de Lacey and Professor Randhawa, both widely published internationally in cognitive and intercultural psychology and related fields. For Dr de Lacey, it is a fourth book. The others dealt with Aborigines, Australian minorities and education: the most recent was Mosaic and Melting Pot, used as a text since 1979 in several universities and colleges, and now out of print.

The book is scheduled to appear in the early months of 1985, and is to be followed by a more popular book, now being negotiated, by Drs Randhawa and de Lacey.

Representing Australia

DR TARA CHANDRA of the Department of Metallurgy in The University of Wollongong was one of 14 people from around the world to be invited to attend a high-level conference on the Behaviour of Metals at High Temperatures. Dr Chandra was the only academic invited from Australia.

The conference was held at Sunnyvale, California, in September. The visit was funded by aerospace organisations.

Other countries represented were Japan, USA, Canada, Brazil, Argentina and South Korea.

Dr Chandra presented her paper on the extrusion rate sensitivity of materials at high temperatures — work which she had begun in Canada in 1970-71 before coming to Australia.