Powerful new education database from Know Ware, Wollongong Technology Centre

THANKS to innovation from The University of Wollongong program to take University research to the commercial market, students all over Australia are now able to tap into a powerful database program recording the era of Australian exploration. The Australian Explorers program was released in June by Know Ware Pty Ltd, a company formed two years ago by Mr Allan House.

Know Ware is based at the Illawarra Technology Centre, a joint venture between the NSW State Government, the Commonwealth Government and The University of Wollongong. Allan House was previously manager of the microcomputer laboratories at the University and was responsible for the creation of the first microcomputer laboratory in tertiary education in Australia, featuring Apple II equipment.

The Explorers program was released less than a year after the release of Know Ware's first educational package, Australian Bushrangers.

With advance orders for 300 units of the PB110 program already in hand, the Explorers is expected to sell over 1,000 units in the first 12 months, thus eclipsing the success of Australian Bushrangers. According to figures released by the key Eastern states education software distributors, Australian Bushrangers was among the five best-selling education software products in Australia in 1985.

Sales of over 1,000 units give a 'platinum' statue to an education program in the Australian market.

The authoring system developed from the Bushranger prototype will allow Know Ware, rapidly and inexpensively, to produce a large number of database products directly relevant to Australian curricula, according to Allan House.

'Powerful software in the form of an authoring system overcomes the principal problem for Australian developers—that of market size related to development cost,' House says.

'With the Bushranger project we stayed out of the mainstream subjects in the history curriculum, principally because we identified a high pentup demand for Australian software of this type. We needed to be able to assess actual demand for the software based on the quality of the interface and the program functions.'

The Bushranger program was released in February 1985, after some 2,500 man-hours of development. The Victorian Department of Education was an early bulk customer and the product is now on the 'recommended purchase' list for all Australian state education departments.

After the release of Bushranger, House gained substantial support from specialists within Australian education who advised on the development of the program interface between the child and the computer. The result is claimed to be a unique delivery system for educational databases, combining a sophisticated text manager, a high level database and graphics capability.

Software performance

A substantially enhanced version of the authoring system is utilised in the new Australian Explorers program. The database is claimed to be a unique delivery system for educational databases, combining a sophisticated text manager, a high level database and graphics capability.

Canberra Liaison Officer

THE University of Wollongong has appointed a Canberra Liaison Officer. He is Mr Gratton Wilson.

Mr Wilson retired recently as Corporate Secretary of the C.S.I.R.O. He has been a long-term resident in Canberra and is well known in many circles in that city. During his career Mr Wilson was involved in many developments in the C.S.I.R.O. including the establishment of SIROTECH. A particular interest of his lies in the areas of development of science policy. Over the years he has been actively involved with Unesco. He has served as Chairman of the Australian National Commission of Unesco and is now a member of the Commission. He has represented Australia at five Unesco conferences and is an expert on science and technology policy internationally. Currently he is a freelance consultant to Unesco and several other organisations concerned with science-policy development.

Mr Wilson has opened an office to be known as The University of Wollongong, Canberra Liaison Office, Room 7, The Bank Building, Jamison Centre, ACT 2814. Phone: (062) 51 6884. Postal address: Box 170, PO Jamison, ACT 2614.

The office will serve as a focal point for the University's activities in Canberra.
University Centre attracts $340,000 order for robotic arc welding system

THE Automation and Engineering Applications Centre Ltd (AEAC), a non-profit company set up by The University of Wollongong (with the aid of funds from the Department of Industry, Technology and Commerce and with the support of the NSW State Government and the Illawarra Technology Centre Ltd), has received an order for a robotic arc welding system worth $340,000.

This is one of the largest orders of its type (involving robots mounted on tracks) ever placed in Australia.

Chris Cook, AEAC’s Managing Director, said that the order was a tribute to AEAC’s engineering ability and the enthusiasm and hard work of all AEAC’s staff. This, together with other orders received from industry to date, indicates the strong support given to AEAC by the University and illustrates technology transfer between the University and industry in action.

(AEAC already has an excellent track record with leading Australian companies, among them Qantas, GEC, Lincoln Electric and James Harden.)

The robotic arc welding system consists of two interacting robots mounted on computer-controlled tracks. The robots will be equipped with sensors to allow them to adjust automatically to changes. The tracks and their control computers were developed as part of AEAC’s R&D program, and will be manufactured entirely in Wollongong.

In order to build the system, approximately $175,000 worth of equipment will have to be ordered from Japan, illustrating yet again Australia’s relative technological backwardness and its inability to manufacture its own modern equipment. However, most of the balance of the contract will be spent in Australia, and most of this in Wollongong.

The final system will substantially enhance the end-user’s ability to compete and survive in the future. Unless more Australian manufacturers also modernise, Australian industry, and Australia’s standard of living, will continue its rapid decline relative to its competitors. There is still time, however, to arrest this decline if Australia acts now to use its native talent to implement modern techniques in its factories.

More recently, AEAC has received $200,000 from the Department of Industry, Technology and Commerce towards its recurrent costs. This makes a total of $700,000 which has been received to date to fund the activities of the Centre.
The new building is designed with two wings. Here, between the wings during the opening ceremony, is, on the left, Mr M. S. Wong of the Building and Grounds section of University Administration. With him is the architect, Mr Brian Griffin.

**New engineering/science building formally opened**

ANOTHER great leap forward in the growth of The University of Wollongong was marked on Friday June 27 when the new Science/Engineering Building was formally handed over to the University by the Chancellor Mr Justice Hope. The press release for the opening made the point that the six-million dollar building ($6.7m in fact) incorporates totally modern design features in providing urgently needed required teaching, laboratory and office space for the Departments of Biology, Electrical and Computer Engineering and Geology.

The words totally modern are well chosen, for they aptly describe the design and decor, both of which are in marked contrast to anything else in this university and are perhaps indicative of the sort of buildings which will more and more be seen in Australian teaching institutions.

Lecture theatres, laboratories and offices are all light and airy and the predominant colour, light grey, is a marked improvement on the darker hues of past decades. Wall covering, a material designated Front Runner, appears to be a sort of velour and the sort of thing one might have at home. It appears vulnerable to marking but is apparently easily cleaned.

Floor covering is mottled-grey, also very relaxing. Lab benches sprout space-age colour co-ordinated consoles, locating taps, power points and where appropriate outlets for gas, oxygen and air and so on.

The building consists of two wings, each of two levels. Net usable floor area is around 3,300 sq m—approximately 5,000 sq m gross.

Construction began in September 1984. The work was punctuated by time lost through bad weather and industrial disputes but despite these the southern wing—Department of Electrical and Computer Engineering—was completed at the end of last year and the northern wing—Department of Biology and Geology—in the early part of this year.

**New education database from page 1**

utility follows a hierarchical format with records of variable lengths stored in defined fields. A search formula can involve up to four fields. Disk access is fast-limited only by the Apple hardware.

A query/word search utility allows single or all files to be searched for words, parts of words or a combination of words using an 'And/Or' connector. In the context of history a search may be structured through time periods using the 'Before', 'After' and 'From/To' commands.

Individual records and the results of all analyses can be printed.

Supported with full documentation and activity sheets suitable for both primary and secondary school use, the *Australian Explorers* database contain 150 records with up to 96 fields each. There are five 'general subject area' files and 32 individual explorer 'story files'.

More than 200,000 characters make up a substantial base of information on the exploration phase of Australian history, compacted to run on an Apple II Plus with 48K RAM or any subsequent Apple II model.

Know Ware plans to release further databases for use in Australia and the USA.
HOW does a university ensure that it is providing equal and fair opportunities for all its staff? What is the University of Wollongong doing to promote such opportunities?

The raising of community consciousness has resulted in legislation promoting equal opportunities and anti-discrimination legislation at the state and federal levels. Conservative groups claim that opportunities are already properly equal and that ‘affirmative action’ can only be discriminatory and not based on the abilities of individuals.

This University does not accept the latter view. In any case, there can be no justification for complacency or failure to examine new arguments. We preferred to respond to the challenge by examining the facts. An extensive study of the advertising, interviewing, selection, appointment, training, promotion, grievance resolution and other processes, was carried out within the University during 1984 and 1985.

Parallel with the study of the data has been the necessity to ensure common understanding of the terms involved. Many academics reject the possibility that anyone but the best person has been chosen for each post in the past. It is often regarded as insulting even to question traditional processes, despite the fact that the results in all universities have been nearly all male senior staff.

On the other hand, it offends our common sense knowledge of the equal abilities of both sexes to suggest that imbalance in proportions of staff occur for other than extraneous reasons.

Accordingly, it has been necessary to assure people that support for equal opportunities and affirmative action need not imply any diminution of adherence to the merit principle. In short, it must be made plain, as we have sought to do, that it is possible without contradiction of terms to support, simultaneously, appointments based on merit, equal opportunities and affirmative action.

Examination of employment practices also involves examination of whether qualifications, experience or other criteria are structured in ways which specifically, systematically and unfairly exclude any group.

Re-examination of these matters is the process in which the University has been engaged. Early in 1986 we finalised a management plan which provides for exploration of changes needed to allow all staff, whether academic or general, to reach the career levels their talents justify. Artificial barriers to advancement will be progressively removed. Such a policy does not mean that anybody can expect appointment, transfer or promotion. Unless par-

Statistical methods used in bird surveys

DR FRED RAMSEY has been visiting the Mathematics Department in The University of Wollongong since July last year. Over the past decade he has been working on developing and evaluating statistical methods for estimating wild animal and bird populations. His work has been particularly directed towards estimating bird populations on numerous Pacific Islands, usually US possessions, and has emphasised species which are rare or endangered and/or threatened by loss of their natural habitat. Much of this work was done for the US Fish and Wildlife Service, while he was at Oregon State University.

The survey method used is known as variable area survey. Variable area surveys, which include line transects and variable circular plots, are enjoying a growing popularity.

They have the advantage that they can be used to provide substantial coverage over a large area. They endeavour to take account of the fact that during observation of an area, not all animals which are present are actually observed.

The field procedures involve a team of observers which goes out and, over a fixed period, each observer notes members of relevant species together with their distances from the observer. A common arrangement is for the observers to survey at equally spaced points along a straight line. For birds, special training is needed for the observers to be able to recognise the bird calls and estimate the distances of the calls from the observer. When birds are mainly sighted in flocks, the flock is treated as a single observation; other techniques are used to estimate flock sizes.
The distance data are analysed to produce estimates of the area which has been surveyed, which can then be used to estimate the populations under consideration. The results give a clearer understanding of the distribution and habitats of the various species and, in the case of endangered species, the extent to which their survival is threatened.

While in Wollongong, Dr Ramsey has been consulting with the National Parks and Wildlife Service of NSW. The service will be using variable area surveys to estimate the kangaroo and waterfowl populations in Western NSW. At the invitation of the service, Dr Ramsey recently visited Noloecke Nature Reserve, an area noted for its waterbird population.

Professor of Statistics

THE Chancellor of The University of Wollongong has approved the appointment of Dr David Griffiths as Professor of Statistics. Dr Griffiths will join the University in time for the start of the 1987 academic year.

Dr Griffiths was awarded a Bachelor of Science Degree with First Class Honours in 1966 from the University of New South Wales. He was also awarded the University Medal and the STC Award and Medal.

In 1968 he was awarded a NSW Rhodes Scholarship which culminated in the award of his D.Phil. from Oxford University in 1971. At the end of 1971 Dr Griffiths joined the staff of CSIRO, Division of Mathematics and Statistics, as a Research Scientist, progressing to Senior Research Scientist in 1976, Acting Senior Regional Officer NSW in 1979-1980, and Principal Research Scientist in 1982. Dr Griffiths joined the University of New South Wales as a Lecturer in 1984 and was promoted to Senior Lecturer in 1985. Within the University Dr Griffiths is Assistant Director of the new Industrial Mathematics and Statistics Group. He was a member of the NSW Rhodes Scholarship-Selection Committee 1974-1977.

Dr Griffiths has published extensively in a wide range of prestigious journals on a wide range of topics. Current research and interests, both personally and as a member of the Group, include Analysis of Traffic Crash Patterns, evaluation of vaccines, modelling the shape of lenses, investigation of concrete faults in high rise buildings and research on length-based sampling for cancer screening trials.
EFTPOS is not a Greek Island

SO begins a recent report to the Prime Minister entitled 'Towards a Cashless Society'. It was prepared by members of the Australian Science and Technology Council's Technological Change Committee, including Professor Ron Johnston, Director of the Centre for Technology and Social Change (TASC).

And EFTPOS? That stands for Electronic Funds Transfer at the Point of Sale, symbolised by the ubiquitous plastic card, the PIN number you have to remember, and the instantaneous removal of money from your own account to that of the retail shop or petrol station.

The Report shows that the use of plastic cards, and of electronic funds transfer (EFT) machines, is growing rapidly, in response to strong promotion by the financial institutions, and the convenience of access to banking facilities out of banking hours. Indeed, for once Australia leads the world, this time in the establishment of a national EFT system.

However this is also raising areas of serious concern. It is apparent that the terms and conditions of use of EFT systems are less favourable to customers than the more traditional financial services. Customers carry far more responsibility for loss of cards, or for error, including malfunction of the banks' own machines. New legislation to control those contracts was considered, but it was regarded as more appropriate to support the establishment of a set of strong and consistent standards, with provision for monitoring and publication of non-compliance.

The second major problem area related to the threat to privacy offered by a national EFT system. EFTPOS is able to store information about purchases which could be of considerable value to retailers. If one card could be used to make all payments and EFTPOS were universal, governments could employ the information generated to match individual income against expenditure. Used in parallel with the proposed Australia Card, there could be every opportunity for unobtrusive surveillance of citizens.

To counter this, the Report has urged the Prime Minister to establish a Data Protection Agency with stringent safeguards for access to data but at the same time a mechanism which permits individuals to regularly review their own file.

In its study, the Committee also found a growing concern that the widespread availability of plastic cards, ATMs and EFTPOS has placed new strains on the management of personal finances. The most common source of fraud was reported as occurring within families. In particular, children, with access to the family card and knowledge of the PIN number, can obtain cash readily without the knowledge of their parents.

Also, at times of the break-up of a relationship, it appears that the partner who possesses the plastic card, or who is first to the machine, is the one who gets away with the money. There was a recommendation that the effects of EFT on the level of debt, and personal and family control of finances, be more closely examined.

So next time you use that card to buy petrol from a service station not on your route to work, pay for a meal and drinks, order theatre or football tickets by phone, buy a few bottles for the cellar, and expensive perfume, just think. Could someone, somewhere, be watching?

Former Head of European Languages awarded French decoration for work in Wollongong

FORMER Head of European Languages and now Deputy Vice-Chancellor at Macquarie University, Professor R. Barry Leal, was made an officer of the Palmes Academiques by M. Georges Zask, Cultural and Scientific Counselor at the French Embassy in the Northern Lounge of the Union on June 5.

The Palmes Academiques are awarded by the French Minister of Education to people who have made an outstanding and significant contribution to French Studies.

M. Zask praised Professor Leal's work in the Department of European Languages and his initiative in founding the Alliance Francaise de l'Illawarra. He outlined Professor Leal's career as an academic starting with his two years in France in the 1960s, his work at the University of Queensland and finally his 11 years as Foundation Professor of French and Head of the Department of European Languages at Wollongong. Professor Leal in accepting the decoration stressed the need for Humanities research and particularly language and literature studies in today's university. Professor Leal also highlighted the importance of foreign-language studies for broadening students' intellectual horizons and quoted the Department of European Languages' motto: 'Languages unlock the world.'

Community radio and the University

ILLAWARRA FM Community Broadcasters (ICB), the community-based FM Radio group, were granted a Class C (Community) licence by the Australian Broadcasting Tribunal earlier this year, to establish an FM Community Access station to serve the Illawarra region from Helensburgh to Gerringong. This group has been active for over five years in its efforts to establish the station.

The University of Wollongong has been involved in test transmissions held by the group over the past five years and is presently a Corporate member of the group. The University has now been invited by ICB to become permanently involved in producing programs which have some relationship to University interests, research, teaching or other activities.

Examples of possible programs would be broadcasts of concerts and performances by the Conservatorium and the University Singers; drama; political and social comment; discourses on research activities (possibly a Wollongong-based 'Science Show'); and informative or promotional programs. Some idea of the style such programs may take may be gained from listening to 2SER-FM in Sydney. This station is controlled by Macquarie University and the NSW Institute of Technology, and despite being licensed as an educational station 2SER functions as a community station of the type that it is anticipated will be established in Wollongong.
Full ahead for CAD/CAM at Wollongong University

CAD/CAM—Computer Aided Design/Computer Aided Manufacture—at The University of Wollongong has been under steady development for some ten years. And today the expertise, knowledge and development of some departments in the Faculty of Engineering are all being integrated and updated. This is part of an overall plan being developed, in conjunction with the University Computer Centre, to establish within the Illawarra region a centre of technical excellence in CAD/CAM.

Of course, over the past few years there have been major advancements with terminals, software, and manufacturing techniques, and all these are being incorporated.

Developments today are becoming more diverse as more engineers take advantage of the offerings of CAD/CAM. Really the acronym CAD/CAM is almost out of date and CIM—Computer Integrated Manufacture—is more usefully employed to describe where it is all heading.

To those who have been involved with CAD/CAM the area can be broken down into just a few headings. Thus:

<table>
<thead>
<tr>
<th>Description of model</th>
<th>Preparation of shape for analysis</th>
<th>Stress analysis of model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of tapes for a numerically controlled manufacturing process</td>
<td>Preparation of scaled and dimensioned drawings</td>
<td>Visual inspections of stresses and distortion in model</td>
</tr>
</tbody>
</table>

This schematic may look involved, but most work (and time) from the engineer is in the first phase. When the model is described, or visually designed, a sketch is made of the part, whether it is a bracket, a gear or an automobile, and gradually it is built up, changed, and modified many times before it is visually correct, aesthetically pleasing, and suitable for the market.

At that stage, stresses and relative movements of the part under load are required, and hence loads, type of material, and possibly temperatures, are all added to the model, which is then analysed.

Finally, those stresses are listed or displayed—often by colour coding on the object shown on the screen, and its shape is possibly modified. If all is satisfactory, then the computer will prepare drawings, fully dimensioned for the manufacture of the part.

With today's advancements in milling machines, lathes and other construction equipment, even robotic components, a programmed tape is often the means of relaying instructions for carrying out manufacturing processes (usually movement of a milling machine cutter).

As noted earlier, by far the major segment of this process is the first—the description of the model. If the model is to be a motor vehicle, then its shape must first be defined in terms of points, lines, arcs and solids such as cones, cylinders and so on.

All these must be integrated and the resulting shape must be aesthetically pleasing to the designer. This is a long and interactive process—rather analogous to the work of artists or sculptors.

The University has seen fit to purchase three Apollo terminals, very much state-of-the-art systems, that respond very quickly to instructions and are first class for building models. Once this long stage is completed and the model prepared for analysis, the program is sent up to the Univac Mainframe for analysis—usually with MSC NASTRAN, leased and used by the Department of Civil and Mining Engineering for some years.

After analysis, the results are passed back down to the Apollo terminals and various details—such as stresses induced, and relative displacements resulting from loads applied to the model, are examined. It is thereafter a short path to send the model for preparation of drawings, and to instruct the numerical control module to prepare a tape for a manufacturing machine or process.

The Faculty of Engineering in the University and the Computer Centre are currently testing the Sperry software product, CIM/ME, which will effectively carry out all the above procedures except for analysis. However, to keep abreast of the world, a new system, ANVIL, is currently under investigation, as well as a further software product, PATRAN. Both these products interface and communicate with NASTRAN and other software such as ANSYS, which is also being investigated.

It is generally conceded that if the University is to be a centre of technical excellence, then it must not depend upon one system, but must keep looking for, and developing, better systems.

The CAD/CAM system will also be used by the Illawarra Technology Centre, which will, to a large degree, concentrate on the commercial aspects of computer-aided manufacture in the region.

To initialise and make manufacturers and others around Wollongong aware of the University's involvement in CAD/CAM, the Department of Civil and Mining Engineering, in conjunction with the Computer Centre, gave a course to industry in July on computer-aided drafting. This was the first of a number of industry courses. The next two are project management and CAD/CAM. Registrants for this first course came from a wide area—from Canberra, the Snowy Mountains Authority and outlying local-government establishments.

' The Gazette' — issues to come

The next issue of 'The Gazette' will be published on September 20. Articles discussing Departmental activity, particularly research activity, are wanted by not later than noon on Friday August 29. The final issue for 1986 will appear on November 20.
The University of Wollongong on May 21 entered into a formal agreement with ICI Australia Operations under an award made by the Commonwealth Government in relation to the Teaching Company Scheme. This scheme was introduced earlier this year by the Department of Industry, Technology and Commerce. It is designed to enhance industry performance and to assist restructuring by improving links between industry and the tertiary education sector. The scheme involves a company working in partnership with a tertiary education institution on an R&D program that will substantially improve the company's technology and performance.

The University has previously entered into an agreement with Metal Manufactures under an award made in the first round of Teaching Scheme grants. A Research Associate is now engaged at MM implementing a program for computer-assisted quality control monitoring systems.

The successful submission linking the University with ICI was initiated by Dr Gordon Wallace of the Department of Chemistry. The project will be concerned with the development and application of an electro-chemical sampler.

A Research Associate will be employed at ICI's Botany plant to optimise the cell design of a reticulated vitreous carbon-based sampler. The researcher will work under Dr Wallace's direction.

It is hoped that on development the sampler will be commercialised and offered for sale to industry on the scientific industry market.

The University has recently been advised that it has been successful with a further joint application made with Metal Manufactures. This project, which links MM with the Department of Mechanical Engineering, is concerned with the development of aluminium conductor data for transmission lines.

It appears likely that a fourth award may soon be made to the University under the Teaching Company scheme. The University's performance in this area would appear to rival that of any other Australian university.

Presentation sculpture

At the annual general meeting of the Friends of the University of Wollongong in May a fine bronze statue of the campus fig tree—a monumental tree by any standard—was presented to the University by Miss Ethel Hayton OBE. Miss Hayton is a founder member of the Friends and a Fellow of the University. The presentation piece had been commissioned from the well-known local sculptor, Gino Sanguineti.

The gift is the second Sanguineti donated by Miss Hayton. The first is the handcrafted Friends Lectern donated in 1981—the first year of the Friends' operation.

Geographer reveals skill

GRAHAM HAUGHTON, visiting lecturer in Geography at Wollongong, is currently celebrating having received a $250,000 research grant with Peter Lloyd at the University of Manchester's North West Industry Research Unit (NWIRU). The grant was given by the Economic and Social Research Council (ESRC) and will last for two and a half years.

Entitled 'The Dynamics of Skill Creation and Utilisation in the North West' the project covers issues revolving around the adoption and adaptations of emerging technologies by the engineering industry. Dr Haughton developed the research proposal following earlier research on changes in labour market behaviour during the 1980s recession and other parallel work in the NWIRU monitoring UK youth training schemes.

In addition to his new project Dr Haughton will continue his association with a major project on 'Technical Change and the Division of Labour' in Rochdale which is being funded under the ESRC's Economic and Social Life initiative. Graham's recent commercial contract work has included a study of retail and distribution facilities in Humberside funded by the EEC, a study of change in the UK fish industry for the Sea Fish Industry Authority and an economic impact study of the proposed closure of the Upper Reaches of the Manchester Ship Canal.

While in Wollongong Graham is continuing his lecturing commitments with detailed research on BHP and the Wollongong local economy. Before his scheduled return next February Graham also hopes to have found time to undertake research at Broken Hill, with the aim of completing a comparative study of the recent UK and Australian experience of ‘Companies and Communities in Change'.