Applied Mathematicians Research Sail Design and Construction

FOLLOWING the success of the Australia II campaign there has been a widespread awakening of public interest in sailing. A dedicated few endeavor to improve sail performance. Such is the case with the researchers Dr Ross Paull (University of Wollongong) and Mr Allan Paull (University of Queensland), who, over the past three years, have designed, constructed and tested mainsails exhibiting a property of 'minimum induced drag'.

Their analysis aims to minimise the drag produced by the vortices generated at the tips of a sail. Historically the techniques and theory for minimising induced drag date to the 1920s and the work by Prandtl. The methods were used in the 1930s to develop the distinctive elliptic Spitfire wings, but few serious attempts have been made to adapt the theory for use with sails. After all, the operation of a sail and a wing differ only in that a wing creates lift in a non-uniform velocity field; the theories of the 1920s should be applicable to sails as well.

Pursuing these ideas in a real application, the researchers constructed two 4.3 meter catamarans with identical hulls to act as test beds. One was fitted with a conventional mainsail (115 sq ft, aspect ratio 3.14), while the other mainsail was designed to satisfy the minimum induced drag requirement (120 sq ft, aspect ratio 6).

In two years controlled testing under cruising and race conditions, the low-drag, high-aspect-ratio mainsail has produced a consistent overall improvement of 10 per cent to 20 per cent in boat speed. Under ideal conditions (5-7 knots wind speed), footing speeds have shown an improvement of more than 50 per cent.

The adaptation of an old standard has thus achieved some quite surprising results. What is slightly disturbing, however, is that traditional sailmakers are often unable to guarantee construction of a sail to the minimum induced drag requirement.

This has prompted the researchers to investigate construction methods within the sailmaking industry. Over the past year they have developed personal computer software for the construction of mainsails and jibs. Once the particulars of a sail surface are known, a very simple finite element type algorithm develops the sail, automatically determining panel shapes. Fabric reinforcing and stretch are calculated from a numerical stress analysis incorporating a self-regularating stress-strain relation.

Applications of this recent research are, however, far wider and extend generally to the development of stressed surfaces such as may occur in wind turbines, hang gliders, boat construction, the clothing industry and even to children’s paper cut-outs.

Exaggerated sail surfaces demonstrating applicability of the algorithm even to surfaces of large curvature
SHAPE MEMORY IN METALS

Stimulated by aerospace needs, University research confirms Moses’ experience...

In 1957 Sputnik I blazed across the skies and the space race was under way. New technologies were born to provide the aerospace engineers with the means to be part of that race. Materials differing from those previously available were needed and technological research spawned a myriad of new polymers, ceramics and metals necessary for the immediate development of extra-terrestrial space craft and the devices to operate them. These activities stimulated interest in materials of all kinds with the result that there is now sustained interest in the development of any material that has properties or behavioural characteristics that are out of the ordinary.

One such characteristic is the shape memory effect that occurs in a relatively small group of metallic alloys. These alloys are currently being studied at The University of Wollongong in the Department of Metallurgy. The research group — Associate Professor N. F. Kennon, Dr D. P. Dunne and Ms L. A. Middleton — is supported through the Australian Research Grants Scheme. This article, then, describes shape memory, some shape memory devices and some potential applications.

The shape memory effect is quite simple. A piece of metal having the right composition is deformed at the right temperature — often room temperature. On moderate warming, usually much less than one hundred degrees Centigrade, the metal returns to the original shape — it remembers that shape, faithfully regains it and retains it on cooling back to room temperature.

Repetition of the deformation-heating-cooling cycle sufficiently often, perhaps a hundred or so times, will result in considerably improved memory. After this treatment the metal will, as usual, return to the original shape during the moderate heating, but in addition will have learned to return to the deformed shape during cooling. The actual deformation process will no longer be necessary.

Heat the metal and it will change spontaneously to the original shape. Cool the metal and it will change spontaneously to the deformed shape. This effect is called two-way shape memory.

The prototype shape memory alloy consists of 50 atomic % nickel and 50 atomic % titanium, or 55 weight % nickel, 45 % titanium. This alloy was developed at the Naval Ordnance Laboratory in the USA and is known as nitinol (Nickel-Titanium Naval Ordnance Laboratory). Other alloys having the shape memory property are copper-zinc, nickel-aluminium, copper-zinc-aluminium, copper-

aluminium-nickel, gold-cadmium, manganese-copper and iron-platinum.

Work in the US, England, Belgium, Japan and here in Australia, has established that shape memory alloys have a common structural feature that underlies their unusual behaviour. At moderately high temperatures each alloy consists of grains of a particular crystal structure which is called the ’parent’ structure because, on cooling, it produces a different (’offspring’) structure. This product structure consists of distinctive plate-shaped crystals called ‘martensite’. The illustration shows martensite in one of the copper-based alloys. An important feature of this martensite is that on warming it reverts to the parent grain structure and on subsequent cooling it re-forms from the parent structure. The cyclic structural change always occurs during cyclic heating and cooling.

How does a shape memory alloy remember its shape prior to deformation? Consider a straight piece of memory alloy wire which is bent into a U shape at room temperature. The strain on bending occurs through systematic rearrangement of the martensite plates present in the wire structure. Self-straightening of the wire on subsequent heating to usually less than 100 deg C, results from the reversion of these plates to the original parent grain structure.

Research on shape memory has followed several lines of inquiry:

- survey of potential alloys to identify those that have the shape memory property and those in which the capability might be best developed and studied;
- determination of the processing most appropriate to each alloy;
- detailed study of the processes which occur during deformation and during heating of the deformed structure to gain fundamental knowledge and understanding of the behaviour;
- measurement of the properties and behavioural characteristics to gain appreciation of ways in which the alloys may be exploited;
- development of application.

Shape memory alloys can be used for industrial, medical or energy conversion purposes in a number of ways (see opposite).

An illustration showing martensite in a copper-based alloy. Martensite of this type, on warming, reverts to the parent grain structure and, on subsequent cooling, re-forms from the parent structure.
Friends 'Creation' Musical Highlight of Sesquicentenary Year

THE musical highlight of Wollongong's sesquicentenary year was surely Haydn's 'Creation' sponsored by the Friends of the University and the BHP Group of Companies.

This two-hour masterpiece of the choral art was performed on Saturday June 30 in Wollongong Town Hall under the baton of David Vance, the University Music Development Officer.

Vance had drawn over 130 singers together from the choirs of the region, and individual singers of distinction. They came from the Illawarra Choral Society, The University Campus Choir, The University Singers, the Conservatorium Madrigal Group, the St Marks Church of England Choir, the Promusica Dutch Australian Choir, the German Ladies Choir and the San Souci German Male Choir.

Orchestral backing was provided by the ABC Sinfonia — a 40-piece orchestra. Soloists were Jennifer Bates (Soprano) and Stephen Bennett (Bass).

The BHP Group of Companies set the pace in funding the occasion with a donation of $1,000 through the 150th Anniversary Committee. The remainder needed to fund this peak in the 1984 musical calendar came from ticket and program sales and by donations from the Friends of the University.

Ron Witton appointed to Population Council

DR RON WITTON of the Centre for Multicultural Studies has been appointed to the National Population Council, a high-powered Commonwealth body that advises the government on immigration and labour market requirements in Australia.

The National Population Council has been established by the Minister for Immigration and Ethnic Affairs, Mr Stewart West. It replaces the former Australian Council on Population and Ethnic Affairs.

Dr Witton's appointment recognises the importance of the work currently being done by the Centre for Multicultural Studies.

Visit from Soviet Ambassador

HIS EXCELLENCY Evgeny Samotetein visited the campus on 14 May 1984. He was accompanied by Mr and Mrs Dombroski of the Australian/USSR Society and by Mr Rod Paterson, President of the Australian Peace Committee, and Ms Doreen Borrow, the Secretary of the Peace Committee.

His Excellency attended a lunch party hosted by the Deputy Vice-Chancellor, Professor Alex Clarke, and Professor Peter Rousch, Director of the Institute of Education, and Mrs Anna Rousch. He then made a tour of the School of Creative Arts.

Community Billboard

weekend on campus

THE University Union and the Wollongong Advertiser are staging 'Weekend on Campus' — a celebration of Wollongong's Clubs and Societies — on July 28 and 29.

All Wollongong's Clubs and Societies have been invited to participate in erecting displays and exhibitions, and in providing lectures and other means of information sharing with the general public.

The weekend has the backing of the Friends of the University and a financial contribution from the BHP Group of Companies through the 150th Anniversary Committee Ltd.

Premier to open Conference on HSLA Steels

THE Premier of New South Wales, Mr Neville Wran, has agreed to open the International Conference of High Strength Low Alloy Steels to be held at The University of Wollongong in August. The Premier's opening address, at 10.30 am on Monday August 20, will be followed by a short talk by Dr W. J. McG. Tegart, Secretary of the Department of Science and Technology.

The Conference will extend over five days and over 60 papers will be presented by Australian and overseas delegates. In conjunction with the Conference industrial plant visits have been organised and local companies will participate in an Engineering Exhibition in the Union Common Room.

Shape memory in metals

The utilisation of shape memory components as the working elements for engines designed to convert low-grade thermal energy to usable electrical or mechanical power. The stress generated in nitinol during shape recovery on heating is about ten times the stress needed to deform the martensite at lower temperature. Consequently, moderate heating can create mechanical force that can be utilised in heat engine design.

The future prospects for industry based on shape memory are clearly in the hands of the inventors to devise ways of utilising the phenomenon of shape memory, the experimentors to develop the materials and the researchers to provide the fundamental understanding of the behaviour.

Incredible though shape memory behaviour may be, it is really old hat for, in Exodus, Chapter 4, we are told of Moses' experience:

2. And the LORD unto him, What is that in thine hand? And he said, A rod.
3. And he said, Cast it on the ground. And he cast it on the ground, and it became a serpent; and Moses fled from it.
4. And the LORD said unto Moses, Put forth thine hand and take it by the tail. And he put forth his hand, and caught it, and it became a rod in his hand.
River bank erosion and channel migration

Dr Gerald Nanson of the Geography Department of The University of Wollongong has been working with Dr Ted Hickin of Simon Fraser University (British Columbia, Canada) on developing a predictive model of river-bank erosion and channel migration on meandering rivers.

Channel migration is one of the most dynamic landform processes and is therefore of considerable scientific and engineering significance.

The accompanying aerial photograph of the Beatton River in British Columbia shows scroll patterns on the floodplain surface formed by the lateral activity of this river.

In early work, Doctors Nanson and Hickin showed that the rate of bank erosion is a function of channel-bend curvature.

River channels migrate by eroding material from the outer bank of meander bends and by depositing a similar amount of sediment against the inner bank. As the curvature of the bend tightens the shear stress on the outer bank increases, causing greater bank erosion and more rapid lateral migration.

The maximum rate of erosion occurs on the outside bank of a river bend when the radius of bend curvature (r) is three to four times the average channel width (w). On bends tighter than this, conservation of angular momentum in the flow causes the high-velocity flow, which normally erodes the outside bank, to cut across to the inside of the bend, thus reducing outer bank erosion and limiting channel migration. Indeed, under these conditions the outer bank is sometimes protected by an envelope of slack water (a separation zone).

Figure A shows the relationship between channel migration (outer-bank erosion) and bend curvature.

Figure B shows the cause of this reduction in bank erosion as the shift in fast flow towards the inside bank of the bend and the

Continued on column 3 opposite
Prospects for the University in 1985

by the Vice-Chancellor

It is now evident that the Cabinet will be alarmed if the numbers of first-year enrolments for 1985 are below the level of 1984. It is not known how many overseas students will be able to obtain visas, how many applicants changed their minds and did not take up offers, or how many places were offered in colleges of advanced education. Without growth the capacity of the higher education places in New South Wales will grow to an alarming level. So far as can be ascertained there were approximately 50,000 applicants for admission to higher education places in 1984, of whom about 31,500 were able to secure places in either universities or colleges of advanced education. The figures have to be approximate because it is not known how many overseas students were not able to obtain visas, how many applicants changed their minds and did not take up offers, or how many places were offered in colleges of advanced education in courses not requiring matriculation.

The number of applicants for 1985 will almost certainly be greater because of the higher retention rates in the upper levels of secondary education in recent years. Without growth the capacity of the higher education institutions to take even the same proportion as in 1984 will not be there.

So far as the universities in New South Wales are concerned, enrolments in 1984 were nearly 4,000 beyond the maximum of the student ranges for which the universities were funded. Because of the particularly high first-year enrolments in 1984 there will be a bulge as they move on in 1985, reducing capacity to take first-year enrolments below the level of 1984 unless there is growth. At the higher levels more students are being retained and more are enrolling on a full-time basis, further reducing capacity to take in first-year students.

Consequently it is important that all authorities be aware that universities cannot cope with the increased numbers of enrolments. There is no elasticity left. Without some relief standards would suffer. As the University of Wollongong the first-year enrolments in the faculties were over 1,500 compared with nearly 1,000 in 1983. In the Advanced Education courses beginning enrolments were over 800 compared with nearly 600 the previous year. The University was funded for 200 of this increase from the ‘disadvantaged’ funds.

It will be seen that within a static total enrolment there will be some 700 less capacity at least for first-year enrolments in 1985 as the present first-year students move into second year.

A second feature of the difficult situation is the inability of the federal government to provide capital funds at a fast enough rate to construct necessary buildings for teaching spaces, laboratories and staff offices. The University will have under construction a new Science/Engineering building which will relieve some of the problem by the end of 1985. It will not, however, have any capacity to relieve the situation from the beginning of 1986. It will therefore have to make do with rental and other accommodation, even if additional finance becomes available, to cope with an intake level in 1985 equivalent to that in 1984.

The situation is exacerbated by the planning process. It is unlikely that the Commonwealth government will be able to make known to the University its budget for 1985 until about September of this year. In the fortunate circumstance that sufficient funds are available to meet the problems, we will have only a short time to complete planning and recruit necessary staff for the beginning of the 1985 academic year. In less fortunate circumstances it will be necessary to finalise quickly stringent quotas on student enrolments for 1985 in all the faculties and departments, ensuring that the University is in a position to manage adequately with the resources it will have.

While we are very pleased that the University does have the problems of plenty in terms of students enrolments, it is a matter of concern that this phenomenon is happening at a time of scarcity of resources. We are hopeful that the federal government will give some priority in funding to higher education because of the encouragement it has already given in public statements to greater student enrolments in higher education, but we face an uncertain period until the colour of their money becomes apparent.

Ken McKinnon

Dr Gerald Nanson

formation of a zone of flow separation against the outside bank. The interesting practical implication of this work is that, for certain flow conditions, abrupt changes in river direction may cause less erosion of the banks than will occur in more gradually curving bends.

These observations also appear to explain why, in naturally meandering rivers, very few bends are tightly curved. Most river bends have a radius of curvature which is too to five times their average channel width. If they become more tightly curved than this they almost cease to migrate and are usually cut off and left as oxbow lakes (billabongs) by the more vigorous erosional activity of adjacent bends.

Dr Nanson has also shown that tilting of the earth’s crust can influence channel migration. In parts of Canada the crust has rebounded many metres after losing the enormous weight of glacier ice which melted at the end of the last ice age. Rivers flowing over this tilting surface have a preferred direction of meander-bend migration down the direction of the resulting surface dip, even although the total amount of dip is as low as 300 mm per kilometre. Rivers appear to be very sensitive to such changes and indeed can be used to detect areas of crustal warping.

In their most recent work Nanson and Hickin have developed a predictive model for anticipating bank erosion and the resultant shifts in channel position. They have shown that channel migration is a multivariate problem in which bank erosion is largely determined by channel curvature, total river power (essentially the product of the volume of water and the slope) and the size of the sediment particles in the base of the outer bank.

In October of last year Dr Nanson attended a speciality conference in New Orleans to present these findings to the American Society of Civil Engineers and the International Association for Hydraulic Research. The conference was specifically intended to bring fluvial geomorphologists and river engineers together to exchange ideas and information on mathematical, statistical and physical modelling of meandering rivers.

As well as the obvious applied value of this work, it also contributes to an understanding of the way river processes operate to form natural landforms. Dr Nanson is a geomorphologist and it was his work with natural river systems that led him to develop an applied aspect to this research.
AID RETARDED PERSONS (WOLLONGONG)
works with the university to improve
serves for disabled persons

Prepared by LYN GOW

At the Aid Retarded Persons (Wollongong) workshop, which trades as South Coast Advance Enterprises, a group of intellectually disabled people are seen here preparing floral arrangements.

Only the brave dare look upon the gray—
upon the things which cannot be explained
easily,
upon the things which often engender
mistakes,
upon the things whose cause cannot be
understood,
upon the things we must accept and live
with.
And therefore only the brave dare look
upon difference without flinching.
(Richard H. Hungerford, "On Locusts").

We hear many claims that we are created
equal. But, unfortunately, this is far from
the truth for intellectually disabled people
who must not only overcome cognitive
and physical hurdles but also the social side-
effects of their disabilities.

The International Year of Disabled
Persons (IYDP) affirmed that it is the right
and not just a privilege for intellectually
disabled people to have life experiences
which coincide as much as possible with
the mainstream of life. Intellectually disabled
individuals must be encouraged and as-
isted to live the way other members of
their community live, even if this requires
considerable community assistance and
support. This includes going to work and
receiving a wage; enjoying the company of
friends (particularly age peers); engaging in
leisure time activities; and living in the
community in 'normal' residences.

Following IYDP, there has been growing
lay and professional commitment to the
education of intellectually disabled people.
This growth, coupled with the many
findings that intellectually disabled persons
can learn a variety of difficult skills,
including those skills required to live
independently in the community, has
resulted in an awareness of the need to
improve services for these people. In line
with these developments, all teacher train-
esters from The University of Wollongong
are required to develop the skills necessary
to educate intellectually disabled persons.
Many of the present students and past
graduates of these programs have actively
sought invaluable training and on-the-job
experience with intellectually disabled
developed and disseminated
people. These people are instructed and
monitored by me, a lecturer from the
Faculty of Education, and many programs
have been developed and disseminated
throughout Australia.

Following is a description of one group
of the community-based programs in
which graduates and undergraduates of
The University of Wollongong have been
involved. The main aim of this program is
to provide a group of intellectually disabled
persons with the skills needed to increase
their chances for living a normal and pro-
ductive life and to be accepted on equal
terms by the community at large.

The programs operate at ARP (Wol-
longong), trading as SOUTH COAST AD-
VANCE ENTERPRISES which consists of a
workshop and a hostel. The workshop,
located near the university, is a modern
building. The hostel is located in a residen-
tial area of Corrimal, within easy walking
distance of Corrimal Court and the railway
station.

The workshop provides employment for
43 intellectually disabled adults and the
hostel accommodates nine residents. There
are nine permanent staff and two wage-
pause staff at the workshop, and one full-
time houseparent and three casual house-
parents at the hostel.

The type of work performed by the
employees is light industrial, including
process work, lawnmowing, house clean-
ing, ironing, floral arrangements and the
filling of pre-made baskets according to a
tHEME (e.g., baby care, hair care, Christ-
mas, Easter).

All staff members of ARP and the sub-
committees of the organisation (Education
& Personal Development, Hostel and Wel-
fare, Workshop and Finance) are respon-
sible to the Branch Committee which
comprises ten elected, honorary members
of the organisation.

The graduates and undergraduates of
the university involved with these programs
work closely with the staff and man-
agement committee of ARP and personnel
from Wollongong T.A.F.E., The Depart-
ment of Youth and Community Services,
and the Wollongong Adult Evening
College (Wollongong) to develop and
implement a range of activities and
programs which can broadly be grouped
under the headings of employee develop-
ment; staff development; parent and friend
education; and community awareness.

Independent Living Skills Programs

Independent living skills programs (e.g.,
budgeting, travel training, meeting pro-
cedure training, telephone skills, decision
making and writing skills) are presently
being implemented at the workshop and
the hostel. The aim of these programs is to
provide participants with the skills to live
independently and for several of the
participants so far this has been achieved.
The detailed programs were developed and
piloted over the past two years by teachers
and trainee teachers from The University
of Wollongong with funds provided by the
University and the Illawarra Handicapped
Persons' Trust.

Submission Writing

A graduate from The University of
Wollongong recently assisted a group of
disabled ARP employees in preparing a
written submission to obtain funding for a
project. The main aim of this project is to
produce a video about the workshop, to
familiarise new employees with their work
place. A secondary aim is to train ARP
employees in the use of video equipment
and this will be achieved by a small group
of disabled employees who have suc-
cessfully completed a video workshop con-
ducted by staff from The University of
Wollongong.

Following the preparation of the sub-
mission, a disabled employee successfully
represented his fellow employees in
explaining the project to the Allocations
Committee of the Illawarra Handicapped
Persons' Trust, and the grant was
obtained.
In addition several graduate students have jointly prepared submissions with me to obtain funding for further program development at ARP.

The Leisure Club

Many of the employees occupy executive positions in the Illawarra Region Leisure Club, described in Vol. 1 No 4 of the Gazette. Facilitated by a University graduate club continues effectively and fully upon available leisure activities; provided opportunities for exercising personal responsibility and mature judgements; and contributed greatly to positive community relationships.

Leisure Newsletter

Several of the employees of ARP are assisted by a University of Wollongong graduate in producing a monthly leisure newsletter which is distributed to interested people in the Illawarra Region.

The Newsletter was named Tag Times by an ARP employee, and it was originally developed and produced by the university graduate. This newsletter is now designed, compiled, printed, collated and distributed by ARP employees in conjunction with the trainees from the Illawarra Human Resources Centre. Both groups of employees are being taught the skills necessary to design and produce the newsletter by one of our graduates. The skills they are developing through this program are self-expression and confidence; organisation and co-ordination; reading, writing and listening; the expression of creativity; time management; awareness of responsibility and commitment to self and others; decision-making; co-operation and interaction with others; job skills for open employment; improved motor co-ordination and alertness.

Jazzercise

It was found that many of the workshop employees of ARP, if not overweight, were unfit and engaged in very little exercise. On the initiative of a University of Wollongong graduate a jazzercise program was designed to influence the employees to follow a regular 'Keep Fit' program in order to increase their overall fitness, improve their physical and mental health and, thereby, indirectly to increase productivity in the workshop.

To develop and implement this program,

The University of Wollongong provided the funds to pay final-year trainee teachers. In this way both the disabled participants and the trainee teachers have gained from the experience. These students have now finalized a specialized jazzercise program which uses photographs of the employees to demonstrate the exercises. This ARP program is soon to be implemented at other facilities for intellectually disabled people.

The next goal of this program is to prepare a small group of disabled employees to conduct the class for the rest of their workmates.

Soccer competition

A University of Wollongong graduate co-ordinated with the employees and staff of Parameadows in organising a very successful soccer competition against teams representing many groups of disabled people in the Illawarra Region. A regular weekend inter-workshop soccer competition is now being planned, with University of Wollongong students acting as coaches.

Staff Education Program

As a result of the expressed needs of the workshop and hostel staff, a staff education program has been developed and implemented by me, by a post-graduate student from The University of Wollongong, and personnel from T.A.F.E. and the Department of Youth and Community Services with specific expertise in the field. This 16-week program is designed to provide the staff with the necessary skills to effectively teach the workshop employees and hostel residents and is thus practical in nature.

I have undertaken discussions with several organisations interested in developing educational programs for ARP. The role of this co-ordinator is to ensure that the employees and hostel residents receive the best possible teaching in the areas they most need and, to this end, the co-ordinator has been involved in developing a record system to improve delivery of services for the disabled employees.

Community-based work

Many of the more recent contracts obtained by the workshop are community-based, such as housecleaning and lawnmowing. These contracts have been found to be very valuable, not only by demonstrating the potential of the employees to the community-at-large, but also by providing the employees with an opportunity to learn independent living skills.

Open days

Open days will be held at ARP workshop and hostel from October 18 until October 20 this year. The main aims of these days are to promote community awareness and to encourage participation of the employees in community activities. Roles and functions of ARP will be introduced by the employees, staff and Branch Committee; use will be made of audio-visual materials developed by the employees; there will be demonstrations of woodwork, lawnmowing, ironing, sign language and photography; educational materials will be put on display; and refreshments will be organised by the employees. Some of the products of ARP will be for sale and a sausage sizzle at the hostel will end the activities on the 20th.

National Finance Award

Dr HELEN BENDALL, recently appointed lecturer in the Department of Economics, has won the National Prize for the most outstanding student with the highest aggregate pass in Australia in the Securities Institute Diploma Course.

In addition to the Securities Institute Prize, Dr Bendall received a prize from the Council of the Authorized Money Market Dealers and the Trans City Holdings Prize. These prizes were granted on the basis of a combination of practical and theoretical knowledge of money market and fixed interest investments and were presented by the Securities Institute of Australia at the Sydney Stock Exchange on Thursday, March 15.

Dr Bendall returns to the Wollongong Campus after a number of years lecturing at the University of New South Wales. She is a graduate of the Institute of Education.

A NEW initiative of The University of Wollongong has opened its doors for business. The Centre for Technology and Social Change has been funded by the University to undertake empirical and theoretical research into the effects of technology and technological change. The Centre is also operating as a consultant to governments, industry and unions, and is already undertaking work for the New South Wales and Victorian governments.

The centre is headed by Professors Ron Johnston and Stephen Hill.
Exciting developments in the Visual Arts

IN ADDITION to the Music and Drama facilities in The University of Wollongong, the School of Creative Arts has a rapidly growing Visual Arts facility including Ceramics, Print Making, Sculpture and Textiles. For example, at the beginning of the current Session there was a simple Painting Studio — there are now three and the setting up of a superb Sculpture Studio with the nationally famed sculptor Bert Flugelman responsible for this area of study, a recent addition.

One of the unique features of the School of Creative Arts is that a student studying one art form as a major subject must minor in a second — say, majoring in Sculpture and minoring in Music or Drama and Ceramics. Thus we have a crossing of barriers.

The Associate Diploma Course has been operational for some time. The Bachelor of Creative Arts Course (as just described) started under the Head of School, Professor Edward Cowie, last March.

Barely 16 weeks into the course and in spite of many teething problems, Bachelor of Creative Arts students have held their first end-of-session exhibition in the large first floor corridor of Building 25 and in the new ground floor Painting and Sculpture Studios.

University staff and students thus had an opportunity to see the first public exhibition of Bachelor of Creative Arts Students and to evaluate what were hitherto the first printing sold out within months of Wollongong University in the city's future.

He is keen to promote Uniadvice to a wider range of industries throughout New South Wales and Australia. The present promotion of Uniadvice has been confined mainly to Illawarra and the South Coast.

Teaching literacy

THOSE readers who saw the first issue of this journal (autumn 1983) will probably recall the supplement in which Dr Brian Cambourne described his studies into new concepts in the teaching of reading, writing and spelling to very young children. Head of the Centre for Studies in Literacy at The University of Wollongong, Dr Cambourne has recently been doing a series of country, as well as local, workshops. Among the places visited were Echuca, Deniliquen, Moama, Bendigo, Canberra, Sydney and Moe.

The basis of Dr Cambourne's new theories on early-age literacy is that children have to be taught reading, writing and spelling together and with minimal direct teacher-interference or influence. Teachers work very hard to let learning occur naturally, just as it does when children learn to talk.

Some of Dr Cambourne's findings during his research produced unexpected results. At one stage, when he asked his university students whether they liked writing; how many pages they do in addition to what they had to do; and whether students thought they were good writers, he was astonished to learn that some 90 per cent of his class replied no, or none, to all three questions.

He concluded that the reason for this was that they had come to dislike reading and writing because of the way they were taught: direct, fragmented instruction on little bits of the task simply make learning too difficult, and many children opt out.

The principal of Moama Public School, Mr Jerry Heaney, said that his staff have changed their teaching methods and will in future be adopting Dr Cambourne's approach to teaching literacy. Many of the teachers involved expressed interest in taking courses, offered by The University of Wollongong, in the area of literacy studies.

Future tense

THE book, Future Tense? Technology in Australia, edited by Stephen Hill and Ron Johnston and authored by members of the Centre for Technology and Social Change, has proved to be a fast seller.

The first printing sold out within months and a rush reprinting was necessary to meet demand. The book has been chosen to lead the non-fiction titles of a new Queensland University Press/Penguin paperback publishing series.