SPACE MOLECULE PROBE
Success for University scientists

ON Sunday morning 30 January 1983 a team of University of Wollongong scientists made the first observation of the molecule $\text{H}_3^+$ (trihydrogen cation) in interstellar space. The observations were made on the 3.8 metre telescope of the Anglo-Australian Observatory at Siding Springs, NSW, with the aid of the infrared photometer-spectrometer detector (IRPS).

Dr Ellak Von Nagy-Felsobuki and Dr Lindsey F. Smith, assisted by Dr David Allen of AAO.

The Wollongong team's intention was to search only for emission in those interstellar gas clouds where chemical markers of the presence of $\text{H}_3^+$ (such as $\text{HCO}^+$ and $\text{NH}_2^+$) had been observed in greatest abundance by radio telescope observations. The first nine hours of the search within the three different astronomical objects — Orion (near the Becklin-Neugebauer IR source), NGC2264 and RCW57 — proved fruitless. By the time that the prime candidates ($\text{L134N}$ and $\text{L134}$) for $\text{H}_3^+$ emission rose above the horizon around 4 a.m., the team had developed two techniques for screening out the possibility of spurious signals. A precautionary photometry scan of the source eliminated the possibility of bright stellar sources of infrared radiation just outside the observational field of view. An hour of signal averaging was sufficient to see a beautiful emission line 'grow' out of the telescope detector 'noise' exactly on a known $\text{H}_3^+$ frequency. When a second hour of signal averaging in a shifted frequency window gave the same signal at the same frequency there was no question that the signal was real. No line had been previously observed at this frequency.
No co-ordination — a problem for future transport

That title pretty well summed up the feelings of many delegates to the Vice-Chancellor's Seminar held on April 15 as part of the University's contribution to Heritage Week. The seminar's theme — 'The Tyranny of Transport' — formed the basis of the Vice-Chancellor's closing statement. And here, summarised briefly, is what Dr McKinnon had to say.

is Wollongong dominated by transport? Yes it is. the north/south railway and the freeway split the city; and the way the traffic is organised, the dominance of heavy traffic through residential and commercial areas, and even pedestrian traffic, are not very satisfactory.

Who, then, is responsible for the fact that we seem to have an unco-ordinated pattern of transport? There appears to have been no agency in the past responsible for co-ordination. Like Topsy, the area seems to have grown without any idea of how it should be shaped.

Who is responsible for improving the system? It seems that nobody is. There is no single authority that has the overall responsibility for the overview of transport.

is there in fact a conception of the future? Yes, it does seem that our experts do have some view of the future but there is no one agency to impose this and to bring the different elements of a transport plan together. Road and rail are talked about separately rather than as complements to one another. Even with the development of the port, it is difficult to see the proper co-ordination of the different interests and modes of transport.

The pedestrian mall is a very good development as part of a broader plan to revitalise the centre of the city; but it must be fully integrated with other developments — better retailing practices, better parking and traffic flows and so on.

Is all the information needed for transport planning available? There are pieces of information available — feasibility studies — though these seem to be mainly of a technical nature.

Have the feelings of the people been taken into account? It seems to be easier to find out what people don't want rather than what they do want! But it will be important to have a future plan which will give equal prominence to social desires and needs as well as to economic viability.

Is action proceeding? Yes, but again in a variety of agencies, and the lack of bureaucratic co-ordination is patently obvious from the papers presented.

Is there a community consensus? There seem to be various coalitions of interest, mostly anti, and it is difficult to see that any coalition is able to work up enough head of political steam or be sufficiently all-embracing in its interest to provide an adequate overall transport plan that will be both economically viable and socially acceptable.

What of ten years hence? Will we be shaped by the transport system or will we begin to shape it? That is still an open question though it is clear that there are important developments for the future. But we must take further the question of shaping a transport system that suits us — and does not tyrannise us!

Ross Robinson
Study into pneumatic conveying by University research group

PULVERSISED coal is today becoming an increasingly important industrial material. And in the wake of this development has come a search for technologies for the efficient handling of the commodity. As manpower costs continue to rise the search has moved away from labour-intensive to bulk-handling systems, and in particular to pneumatic systems — which offer the manifold advantages of economy of space, simplicity of construction, flexibility of layout and the ease by which they may be fully automated.

This development has led to the spawning of various designs of pneumatic handling systems, many of which have become available to industry. But the growth has led in turn to the intriguing problem of assessing the merits and demerits of the various designs — a problem exacerbated by the fact that the technology for such assessment has not been available.

Research now under way in the Department of Mechanical Engineering in The University of Wollongong is focused on this question and concentrates on a mechanical handling system of considerable merit. Involved in the project are Dr P. C. Arnold, Dr A. G. McLean, Mr P. W. Wypych and Mr D. M. Cook, of the Bulk Solids Handling Research Group.

The rig being used in the research is a Sturtevant Pulse Phase Pneumatic Conveying System. This equipment had been bought by a Melbourne company for testing and was purchased in 1980 for the University for the purpose of research, by the Electricity Commission of New South Wales. The research is supported by funds from the National Energy Research Development and Demonstration Council and the Electrical Research Board.

Currently installed in the laboratory are a blow-tank-fed pneumatic conveying system, in which the conveying line comprises four horizontal loops of 50 mm diameter pipe permitting conveying lengths of between 25 and 100 metres. This rig is fully data-logged to provide comprehensive information on conveying rates, air consumption and pressure drop.

A working relationship with NEI John Thompson (Australia) has enabled a second conveying rig to be installed, whereby a blow tank incorporating a material cone dosing system will feed a conveying line which will be composed of several loops up to a total length of 1,000 metres. This rig will be employed by the University for fundamental conveying research and be available for commercial evaluation and demonstration of product conveyability together with the determination of system design data.

Bushfire conference

THE second Illawarra Bushfire Conference will be held on Monday August 22 (start of term break) and it is expected that the venue will once again be the Mount Keira Boy Scout Camp.

The conference will concentrate on developing management strategies for areas such as the Illawarra where the varieties of vegetation types demand the development of specific management practices for each area, and suggesting that current 'blanket' approaches to 'hazard reduction' practices are unsatisfactory.

The organisers are hoping that the conference will attract members of the public and local bushfire brigades who have experience in bushfire control and management, to add to the points put forward by invited speakers.

Inquiries to Dr R. Whelan or Dr Hugh Spencer, Department of Biology, in The University of Wollongong tel (042) 282 994.

Johnston elected to local board

Ron Johnston, Professor of HPS, has been appointed to the recently reconstituted Illawarra Industry Development Board. Professor Johnston’s appointment follows recent studies of the impact of technology on employment in the Illawarra region, and the technological capability of NSW manufacturing industry.

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The joint research program of the Geology and Chemistry Departments in the University has received a major impetus from the purchase of a new quadrupole mass spectrometer. The instrument (a VG12-12F) cost $100,000 and was delivered in September.

Using an interface designed by Dr G. Trott (Electrical Engineering), Associate Professor Peter Bolton has developed software to link the mass spectrometer to a Nova 3 computer.

The computer drives the mass spectrometer and instructs it to scan a predetermined atomic mass range each time a discrete compound comes out of the gas chromatograph. The mass spectral data are stored in the computer and the compounds subsequently identified by matching their mass spectra with library mass spectra on the hard disc or deduced by the operator studying the masses of fragment that the compound has been broken into. The combination gas chromatography/mass spectrometer/computer (GC/MS) enables the analysis of extremely complex mixtures with great sensitivity. It can detect and identify as little as $10^{-9}$ g of a single compound! This is about $1/100,000$ of the mass of one grain of table salt.

The group is researching a variety of problems related to the future use of Australian oil shale for fuels and chemical feedstocks. It has analysed shale oils from Rundle, Condor, Duaringa and Julia Creek. With funding from CSR (more than $70,000 over the past two years) the group has also worked on:

(a) the evaluation of various catalysts used for removing nitrogen, sulphur and oxygen compounds from shale oil to give hydrotreated shale oils (gasoline, diesel).

(b) a process to remove organic contaminants from the retort waters which are produced as a byproduct during shale-oil production.

Crude oil and natural gas are produced from organic matter in sedimentary rocks under the influence of moderate temperatures acting under confining pressures over very long periods of time. Figure 1 shows how the burial of the older rocks in a basin is associated with the development of zones within which oil and natural gas are generated. Measurement of vitrinite reflectance and determination of organic matter type and abundance allow modelling studies used to predict the possible occurrence of oil and gas in undrilled areas (fig. 2).

GC/MS is also being applied to petroleum source rock analysis. By analysing a solvent extract of drill core sections, chemical evidence can be obtained which supports geological data on the maturity and prospectivity of a geological formation.

Chemical analysis can also complement geological examination of oil shales and coals using reflectance and fluorescence microscopy. In this way we can learn more about the nature of the original buried organic material and the maturation processes which have occurred over the geological time scale.

Academic staff involved in the joint research are Geology Department: Professor Alan Cook, Mr Adrian Hutton, Dr Brian Jones, Chemistry Department: Dr J. Ellis, Dr P. T. Crisp, A/Professor P. D. Bolton.

Postgraduate enrolments in this area have grown sharply and now number 12 Ph.D. and 19 M.Sc. Funding of $350,000 has been attracted over the past three years for fossil fuel-related research.

The GC/MS system can also be used to examine environmental problems associated with the use of fossil fuels. It can detect hydrocarbons in air and can establish the source of oil spills. Petroleum from each different geographical source has a characteristic composition which serves as a 'fingerprint'.
ON Thursday May 12 two Conferring Ceremonies were held in the University Union Hall. At the morning ceremony, for Engineering and Mathematics graduates, the Occasional Address was given by Sir Mark Oliphant. At the afternoon ceremony, for Commerce and Science graduates, the Occasional Address was delivered by Emeritus Professor Beryl Nashar.

Two further ceremonies were held the next day. At Friday's functions both of them for Arts and Education graduates, the Occasional Addresses were by Sir James Killen and Sir Richard Kirby respectively. Senator Peter Baume delivered the Occasional Address at a later Conferring Ceremony, for graduates of the Institute Sector, held in the Wollongong Town Hall on Friday May 27.

Themes of the addresses to graduates, their friends and relatives were sober and tended to focus on the problems facing Australia in the fields of the economy and employment, and the implications of technological change. Professor Beryl Nashar discussed, too, the problems for women in today's society. And she concluded with a challenge to the women graduates of 1983 to do everything they could to bring about the achievement of equal partnership with men in areas of high endeavour.

Appropriately enough in view of Professor Nashar's theme, one of the outstanding students to receive her degree this year was a woman, Mrs Lyann Clapham, who graduated with First Class Honours in a male-dominated field — Metallurgy. She was said to have been one of the most capable students ever to pass through the Metallurgy course. A bright future for her in her chosen field was widely predicted.

Mrs Clapham's next move, however is to Canada, to Queen's University, to undertake work for her Doctorate...
Two members of the University staff gained degrees: Terry Clout became a Bachelor of Arts, and Jane Cook a Bachelor of Arts, Honours.

During the conferring of degrees and afterwards the university Chancellor, Mr Justice Hope, had a warm smile for everyone present. Here he is with two Ph.D students, Dr John Land, Chemistry, and Dr Gregory Smith, Geology.

Sir Mark Oliphant’s Occasional Address to graduates raised important issues — they are discussed by the Vice-Chancellor on page 9 of this issue. Here Sir Mark is seen with the Vice-Chancellor, Dr Ken McKinnon, and Mrs McKinnon.

After the blood, sweat, toil and tears — time for large grins: the cheerful trio are from left Michael Martin, Lex Metcalfe and Mark Smith; Martin and Metcalfe gained Diplomas in Education and Smith a Bachelor of Arts degree.

Delivering a particularly eloquent Occasional Address is Emeritus Professor Beryl Nashar, former professor of Geology at the University of Newcastle.

Short of height but long on grey matter: Debra Keenahan gained her Bachelor of Arts degree with a major in Psychology. She is seen here with Associate Professor Linda Viney, Chairman of the Psychology Department.
Among the happiest couples were Gordon Arthur, who graduated Bachelor of Engineering, Civil, and his wife, Christine.

A graduate from Bangladesh to gain a Bachelor of Science degree was Sylvia Sunity, seen here with her father, a medical practioner from Blayney in the central west.

Sir Richard Kirby delivering his Occasional Address. He is a member of the University Council.

Posing in a group for the camera, Bachelor of Commerce graduates display a cheerful spirit of camaraderie.

Proud Ph.D graduate in Economics, Dr Anthony Mark Endress, poses with the University Chancellor, Mr Justice Hope, and Dr Don Lewis, Professor of Economics in the University.

Garielle Smith a member of the staff of the University, graduated BA (Honours Class 1) and won the Australian Psychological Society Prize in Psychology. With her is a friend, Taryn Norris.

Kim Aubin, seen here with Sir James Killen, gained an Honours degree in Arts and won the Marjory Brown Prize for Literature.

Right: Lois Walker, Bachelor of Arts graduate, with her fiance and parents.

Far right: James Russel Hagan, Bachelor of Arts Honours graduate, is the son of Professor James Hagan of the University's Department of History.
Conferring Day for the Institute, School of Education, held in the Town Hall, was especially significant for Institute lecturer Bevan Ferguson (right). His wife Freya received her diploma of primary teaching (conversion course) and his son, John, received his B.Ed, degree in Physical and Health Education. With them is the Fergusons' grandchild, James Robertson.

Jill Hiddlestone and Helen Anne Moore, both of whom were awarded M.A. Honours degrees, are seen with Professor Alex Clark, Deputy Vice-Chancellor.

Also at the Institute, School of Education, conferring ceremony: sighs of relief all round.

... and baby came, too: but wasn't aware that mother, Maureen Margaret Ronczka, was now a Master of Studies, in Education.

... and mother came, too: and saw Beatrice Henderson, employed at The University of Wollongong for many years, gain her B.A. degree.

Above: Tom Moore, Schools Liaison Officer, poses with Soraya Issa, B.A. Below: Pamela Bradley, Diploma in Teaching (Primary).
The role of the university

by the Vice-Chancellor

ONE of our graduation speakers in May, the eminent scientist Sir Mark Oliphant, always a wise commentator on the current scene, used as his theme the dangers unleashed by modern scientific effort.

He used three examples. First he referred to the way in which knowledge of the structure of the atom had led to utilisation of nuclear energy as a source of electric power and weapons of limitless destruction. The threat posed by nuclear weapons has become the greatest problem of survival facing the world today.

Second, he said that knowledge of the solid state of matter, which is being applied through microelectronics to computers and robots, is certainly taking away the drudgery of repetitive, soul destroying work in factories and farms, but is also likely to lead to increases in unemployment.

Third, he spoke of the way in which knowledge of the structure of complex organic molecules is finding rapid commercial exploitation in biotechnology and how the rules and regulations designed to prevent the worst abuses have been relaxed under commercial pressures. Moral and ethical considerations have faded from public consciousness.

Sir Mark used these examples to show how little is known of coping with the implications of technological advance.

We of course are a University founded on the technological needs of the steel industry and the general educational needs of the region. In a sense, the University makes a major contribution, just by its presence. The more young people who emerge from the University and from the Technical College the higher will be the educational base of the region and the more conducive the conditions will be for high-technology industries.

Some people look to the University as if it should itself start the new industries. Such a concept is a misunderstanding of our role. The high-technology industries which have come into being around Harvard and MIT universities in Boston on Route 128, those in 'Silicon Valley' near Stanford University in California and around other universities are not owned by the universities — although they were initiated by bright graduates. This University has some such graduates, but hardly in large enough number to allow emulation of these places. We have some way to go before such a situation can develop.

Nevertheless this university has made a good beginning; our scientific and technological departments are making valuable contributions to the industry in this region, particularly the steel industry. For more to be done, more quickly, as is so clearly necessary, a greater flow of resources to create an enlarged effort will be necessary.

At the same time as technological advances are being made it is important for the University to be educating young people to cope with the needs of the new society. Sir Mark called for the greatest priority to be given to interdisciplinary research for the enlightenment of ourselves and those to whom we delegate the task of government. In this University on several Humanities and Social Science departments attention is being given to this type of inquiry. Hill and Johnston's recent publication 'Future Tense' explores the implications of technological and social change for Australia. Other contributions to knowledge in this area are being developed.

The University is very conscious of its role in the region. As a regional university it has to make the maximum possible contribution to the traumatic reconstruction facing the area. Our graduates, our research programs and our involvement in the community are all valuable toward that end. The University is also of economic importance in the region, for of course its expenditures generate considerable economic activity. Most of all, however, the University as an intellectual centre helps create the circumstances through which new and high-technology industries might be encouraged here. There will have to be other factors, but the presence and growing reputation of the University are among the more important.

Ken McKinnon

The science of programming

The first Wollongong Summer School on the Science of Programming, held at Sponar's Chalet in Perisher Valley, was the first summer school in computing science to be held in Australia. It was also the first summer school anywhere devoted to the Science of Programming, held at the University of Wollongong. It was also the first summer school in computing science to be held in Australia. It was also the first summer school anywhere devoted to the Science of Programming, held at the University of Wollongong.

Including lecturers and organisers, some 104 people were involved in the school. Some two-fifths were students or graduate students, another two-fifths comprised academic staff and the remainder were from industry and government research laboratories. Those taking part were from all states of Australia, New Zealand, South Africa, Singapore, Malaysia, Philippines, the Netherlands, Canada and the USA.

There were two strands of lectures: Professor Edsger Dijkstra of the Netherlands, and Professor David Gries of Cornell University, USA, lectured on the Application of Predicate Calculus to the Construction of Correct Programmes; and Tony Hoare, Professor of computing at Oxford University, lectured on the latest version of his Theory of Co-operating Sequential Process.

A new methodology of program construction was studied — a method which is proving successful and on which work is in progress to extend it to large programs. If successful, it is believed that the method will increase programmer productivity by at least an order of magnitude and render current hit-and-miss methods uneconomical.

Lecturers and Director of the Summer School. From left are Dr E. W. Dijkstra, Professor David Gries, Professor C. A. R. Hoare and the Director, Professor Jim Reinfelds.
Cancer research controversy

NOT so long ago Genentech — a multinational drug company — announced to the world that it was in a position to make peptide hormones including insulin by using recombinant DNA technology — tersely referred to by the Americans as gene splicing. Overnight the book value of Genentech increased from $11 million to $360 million. Genentech increased from $11 million to $360 million. Another company, Biogen, with headquarters in Switzerland and affiliations with Hoffman-La Roche, announced later (not in a medical journal but at the Waldorf Astoria in New York) that it was able to produce interferon using recombinant DNA. Within months there were at least four similar companies with, it is believed, paper value of around $160 million. The market value in the US for interferon treatment of the common cold is in itself expected to be worth $1000 million a year. Add to this the potential $270 million a year from its use in cancer treatment, and there can be little wonder that interferon has become the glamour drug of all time.

Yet, according to Dr Evelleen Richards, a researcher in the Department of History and Philosophy of Science at The University of Wollongong, interferon is far from having been proved in the way the investment into its marketing might suggest. Indeed, she maintains, the French government has cancelled trials on interferon after several patients receiving interferon in cancer treatment died suddenly from heart attacks. Dr Richards contends that it was primarily on commercial grounds that interferon was seized upon by the establishment as a 'magic bullet!' in the battle of cancer — while Vitamin C was rejected for its links with unorthodox medicine and because it was a relatively inexpensive treatment.

According to Dr Richards, a major criticism of Vitamin C in cancer therapy (which gained currency in the 1970s) was that it had not been tested in rigorously controlled trials.

The ultimate test of a randomised double blind trial — one involving randomly selected groups of patients who would either receive or not receive the treatment — was demanded of Vitamin C.

Dr Richards says that the reality of modern medicine is that only a minority of medical innovations are tested by randomised, controlled trial. Many cancer chemotherapies have been applied widely in practice without benefit of such trials.

Dr Richards makes clear that she is not rejecting interferon. But, she insists, if the anti-viral, and anti-tumoral mode of action of Vitamin C is suspect, then so must be that of interferon.

Dr Richards foresees signs of burgeoning controversy in the interferon area, but one different to that surrounding Vitamin C. The former will be a dispute between experts within the scientific community. The Vitamin C controversy was between experts and non-experts.

New Opera

By the time these words appear, Ross Edwards will be close to completing his period as composer-in-residence at the University. During his stay he has been working on the composition of his new opera, to be entitled 'Christina's World'. Dorothy Hewett is collaborating — having written the libretto — a tale woven round the subject of a painting by the American artist Andrew Wyeth — a picture of a crippled girl (Christina) lying on grass before a group of derelict farm buildings. From this slender 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.

When the Gazette visited Ross he was working in a contemplative mood on the draft of the score — and faced with a production deadline of November 24. He was, as the saying goes, quietly confident...

Opera singer at University

SOPRANO Carmel O'Byrne Ferlisi visited the University of Wollongong recently to present recitals of Italian music in association with the Department of European Languages and the Wollongong Chapter of the Dante Alighieri Society.

Signora Ferlisi was born in Ireland. After university studies there she went to Italy to continue her vocal studies at the Palermo Opera House. As well as performing for the most important concert societies in Italy she has travelled extensively in recent years, singing in a large number of countries.

During her visit Signora Ferlisi presented a programme entitled 'Puccini's Heroines', during which she sang some of the most famous arias from Puccini operas including 'One Fine Day' from Madam Butterfly and 'They Call Me Mimi' from La Boheme.

Signora Ferlisi also presented a lecture recital to students in the Performing Arts Course at the Institute of Advanced Education. The programme was devoted to the history of Italian song.
High ideals in future planning

New School for creative and performing arts

IN the early 1920s an entirely new concept in Art Education/Art in Action complex was established in Germany. The complex, which was named the Bauhaus, became the byword for experimental Arts Education, and attracted teachers and pupils who made deep and significant marks upon the world of arts and ideas. The basic concept was simple, in the words of Paul Kee: Imagine a world of Artistic thought where there are no barriers between the Arts. Imagine a world where the inquiry into Art is able to cross over into other disciplines! There should be no limit to the scope of the ‘atlas of possibility’ desired by the good artist. I do not believe that the Renaisance ideal of multi-disciplinarian investigation of fantasy and technique is dead. The Bauhaus will re-kindle the fires of LEONARDO, NEWTON and GOETHE!

The Bauhaus was closed by the Nazi Party in 1935 and its ideals were submerged in the catastrophe of war. It was not until the 1960s that moves to re-establish the Bauhaus principles and to apply them to tertiary education took place in the USA, in particular in Denver, Colorado, where degree schemes were set up to allow students to take multiple subjects in order to obtain a single degree.

In the Arts Faculties these degrees became labelled ‘Degrees of the Synthesis of Arts.’ The structures of the schools themselves, however, imposed problems and the schemes today have largely died out. In the UK of the seventies the new breeds of Polytechnics and Arts Faculties in universities began to take up some of the US principles; and, once again, problems were encountered.

Now, however, in Wollongong University, the challenge and the high ideals of the Bauhaus are to be taken up by Edward Cowie, who in April this year was appointed to the first chair in Creative and Performing Arts at the University.

Among his aims are that the school will seek to give three categories of degree:
1. BCA (Bachelor of Creative Arts) — single Art major with at least one alternative Art minor.
2. MCA (Master of Creative Arts) — one-year research/post-graduate course for artists/executants of high standard.
3. DCA (Doctorate in Creative Arts) — a two-year full-time research/performance degree.

In Music, the aim is to make composition a powerful unit. There will be moves to achieve major improvements in facilities within the music centre, to build up library stocks, to find increased rehearsal and practice space, to increase purchases of instruments. And in Fine Arts major plans are being formulated which will call for more working space, improved equipment and increased staff.

It is hoped that a new building/complex will be constructed in order to create a ‘matrix laboratory’ in which, in Professor Cowie’s words, ‘the allied arts may fuse, and become a reactor for Art in Action where artificial boundaries between the disciplines are broken down’.

It won’t all happen overnight. But if imagination, drive and energy and the pursuit of excellence count for anything then, given time, happen it will.

On the Road

THE Theatre South season is now well under way but still to come are three plays to be staged in the Wollongong Town Hall Theatre: On Our Selection, the Steele Rudd/George Whaley musical, will open on July 1, with guest actor Harold Baigent in the role of Dad, and with music by the North Bulli Bush Band. On August 27, in conjunction with the Festival of Wollongong, the company will open The Birds Have Flown, a new adaptation of Aristophanes’ Lysistrata, a bawdy Greek comedy about an imaginative (and imaginary) precursor of the United Nations Peace Keeping Force. The Birds Have Flown has been sponsored by the Friends of the University, with a donation of $3,000. David Williamson’s newest success, The Perfectionist, acclaimed by critics as his best work, winds up the season, playing from October 6 to 22.

During the season Seagull, Theatre South’s schools touring company, took plays to Cambelltown, Cooma, Bega, Narooma and Moruya, and from each of those towns visited schools in outlying areas.

They took two participation plays: Earthsong, by Faye Montgomery, for the infants schools, and Geoff Morrell’s Newcomers for the primary years, to areas too distant or too isolated to attract the usual stream of touring entertainments.

For Faye Montgomery, as director of the schools programme, the Seagull tour fulfilled an ambition she has had since Theatre South was founded in 1980. The company has had countless requests from small or isolated schools to bring a schools programme to their areas. However, until this year, when such a comprehensive tour could be organised, it was impossible for Theatre South to finance visits to small schools. On this tour, however, several small schools in isolated areas were visited, and others grouped together in central locations for the Seagull shows.
**Honour for University Scholar**

PROFESSOR Peter Rousch has been made a Fellow of the Australian College of Education. The College was founded in 1959 as a professional institution to foster educational thought and practice and promote the ethics of high professional responsibility. It is an Australia-wide organisation which includes all fields of education. While membership is open to professional educators with appropriate formal qualifications who have shown evidence of further development in the service of education, the category of Fellow is reserved for a small group who have made outstanding and distinguished contributions to education.

Professor Rousch was originally a teacher in Victoria before becoming a research officer in curriculum in that state. In 1970 he was awarded the annual Ph.D. fellowship by the Victorian Department of Education to undertake studies in psycholinguistics in the USA. Subsequently he became Senior Lecturer at Canberra College of Advanced Education and then Dean of Education at Riverina College of Advanced Education. In 1979, prior to assuming his appointment as Director of the then Wollongong Institute of Education, Professor Rousch was Visiting Professor at the University of Arizona.

Although in recent years his educational contributions have been in consulting and administration, Professor Rousch had established an international reputation for his research in literacy. He has published extensively in this field and been the recipient of federal research grants. He has also presented papers at international literacy conferences in the USA, UK, New Zealand and the Philippines. Professor Rousch is currently on the World Reading Congress Committee for Oceania and is a consultant to the Australian Universities' International Development Program.

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**Bourke Children Gain in IQ**

LARGE, long-term gains in verbal intelligence have been measured over 7 to 10 years among Bourke children. The average gains amount to 19.8 IQ points. The measurements have been made by Nicola Ronan and Allen Barlow, working on a follow-up study of the Bourke preschool with Dr Phil de Lacey who has been associated with the project almost since its inception.

Dr de Lacey stated that four cohorts of children were followed through to upper primary and high school after they attended the Bourke Project Enrichment Preschool for one year each between 1970 and 1973. The preschool at Bourke is specially designed to increase children's mental-growth rate through a broad-based programme which includes, besides mental-enrichment lessons and activities, high protein and mineral food snacks, home visiting and medical support. The results showed some variation between the children, one or two even losing ground; and there was also variation between the years. But over 90 per cent of the 52 children studied showed significant, and often very large, gains.

Other factors likely to have contributed to the positive result are educational, health, social and television programmes introduced some years after the preschool. Interest in the project is now appearing from overseas. Two scholars from Canada are scheduled to visit Wollongong University to work with Dr de Lacey and the research team later in the year.

There is no known comparable programme in Australia. It has been funded by state and federal governments, and also by the Australian Minerals Industries Research Association and COMALCO.

Three students are currently contributing to the project through writing Honours or Masters theses. One of them, Gabrielle Blattman, is studying the long-term perspective of the project.

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**Professor Sam Marshall dies**

PROFESSOR Sam Marshall, Chairman and Professor of Mechanical Engineering in the University, died on April 10 after an 18-months fight against cancer. He had become a prominent and popular figure at the University since he came to Australia in 1975.

Born in Goole, Yorkshire, and educated at Bradford Grammar School, Professor Marshall took his first degree at the University of Wales, and his Ph.D at Cambridge.

Through his leadership as Department Head, and through his published papers, in Australia, China and the USSR and other countries, Sam Marshall made a substantial contribution in and exercised considerable influence on the training of young mechanical engineers and to the disciplines of engineering as a whole.