

**HYSTERESIS  
1971**

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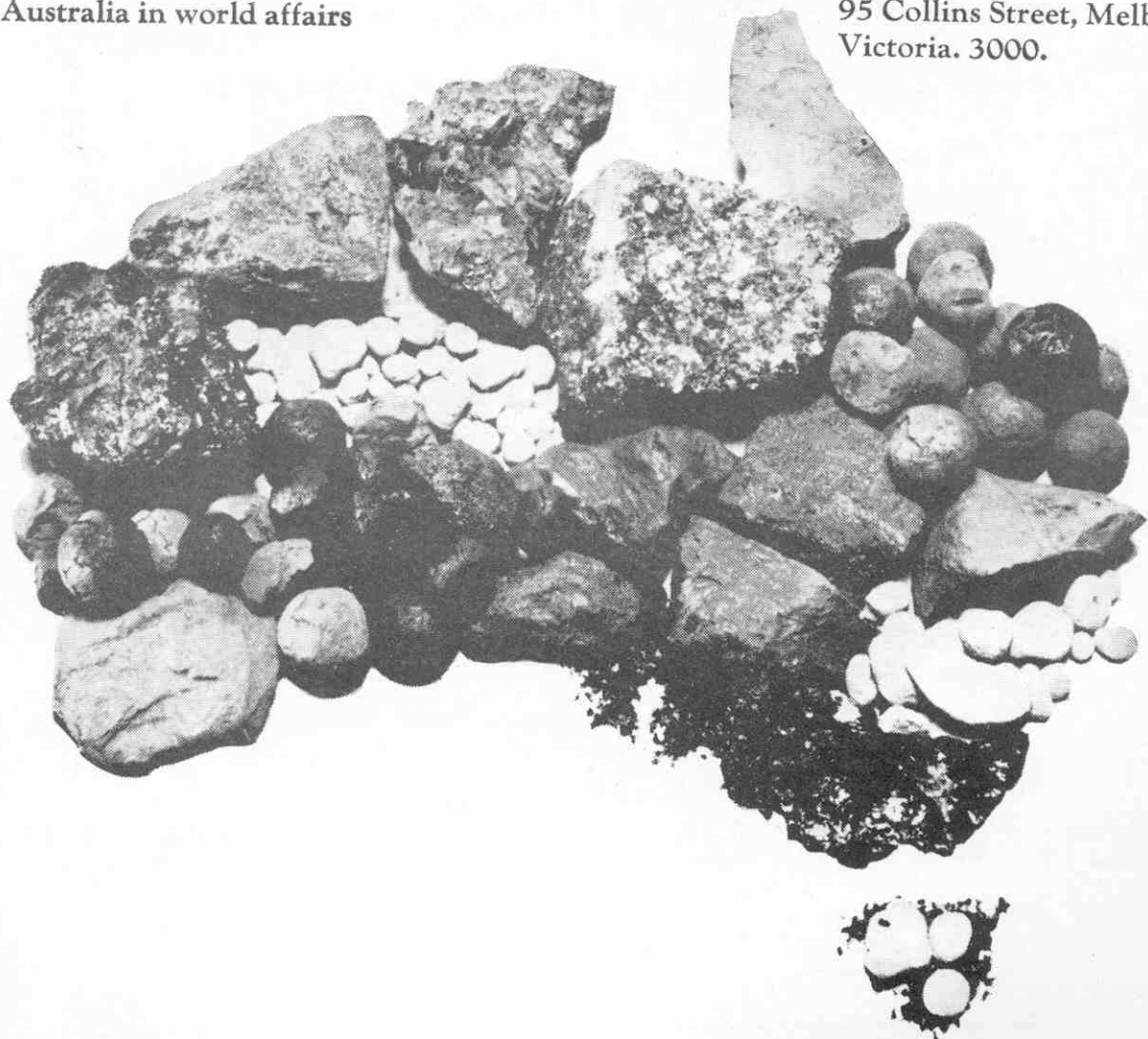
and to use our resources to help the economic and industrial development of Australia and Asia.

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# CSR opportunities

CSR offers opportunities for staff appointments, which can lead eventually to positions in senior management, to graduates and undergraduates in

## mechanical and chemical engineering

What CSR does: CSR is one of the largest industrial and commercial organisations in Australia. It employs about 20,000 people in Australia, New Zealand and Fiji, including 2,000 salaried staff officers of whom most are technically qualified. Its main business is the production and marketing of basic goods — food (mainly sugar), building materials and industrial chemicals. It also has important interests in mining ventures at Mt. Newman, W.A. and Gove, N.T. The company and subsidiaries operate 70 factories.

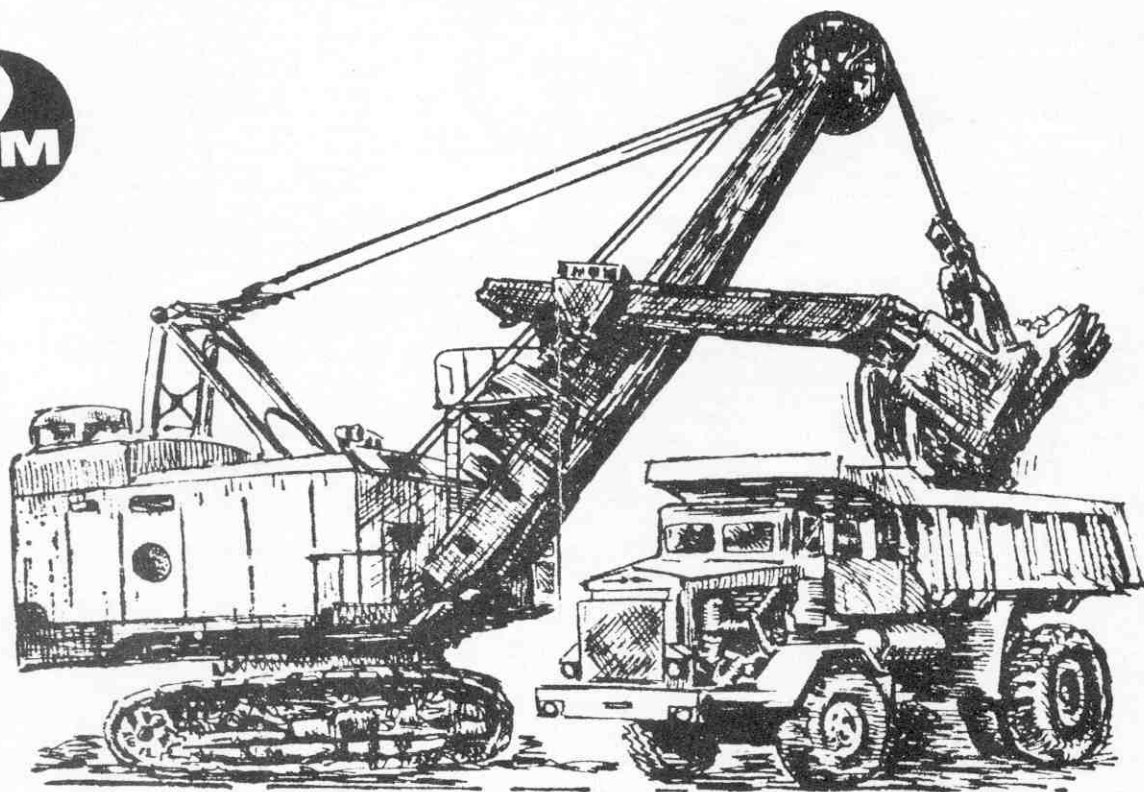
Mechanical and Chemical Engineers are employed in connection with design, development and production in its sugar mills, refineries, distilleries, building materials and other factories and in administrative positions. In these situations, considerable emphasis is placed on the training and development of staff.

Graduates are expected to participate in internal training courses and to undertake appropriate external courses. Job rotation within the company is used to provide knowledge for senior and more responsible positions.

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BHP is a leading industrial organization in Australia, with activities in every state and New Guinea. Its head office is in Melbourne. The group is actively engaged in export markets and maintains offices in London, New York, Singapore, Tokyo and New Zealand. Mining activities include large-scale production of iron ore, coal, limestone, manganese ore and dolomite. An extensive programme of mineral exploration is maintained. The Mount Newman iron ore project in W.A. is managed by a subsidiary.

Steelworks at Newcastle, Port Kembla, Whyalla and Kwinana supply most of the Australian market, and large tonnages are exported. The group also produces stainless and special steels, wire and wire products, tungsten carbide tools and dies, cement and manganese. Ships approaching 80,000 deadweight tons are designed and built at Whyalla, and the group operates a fleet of sixteen vessels.

In partnership with Esso, the oil and gas division is developing the Bass Strait oil and natural gas fields.

Fundamental and product research centres are at Shortland (N.S.W.) and Melbourne, and the operating centres maintain research laboratories. Economic and market research depart-

ments are at head office. There are computer installations at Newcastle and Port Kembla for both commercial and technical applications. Remote input/output terminals provide direct access from other centres.

The group employs 54,000. It is a decentralized organization in which the application of progressive management principles ensures that the individual has every opportunity to develop and carry responsibility.

### Type of graduate required

University and college graduates at all levels in mechanical, electrical, metallurgical, civil, chemical, fuel, petroleum, industrial, and mining engineering. Professional qualifications are held by about 2,000 company employees.

### Training and work of the graduate

The company operates four modern steelworks, fully mechanized collieries and quarries, a shipyard, an oil and gas division, and various ancillary production units, in which many operations are highly automated and computerized. Expansion runs at almost \$150 million annually. The company offers careers with

realistic advancement opportunities in many branches of engineering, in production areas, in marketing or technical service to customers, in administration, all of which can lead to senior management appointments.

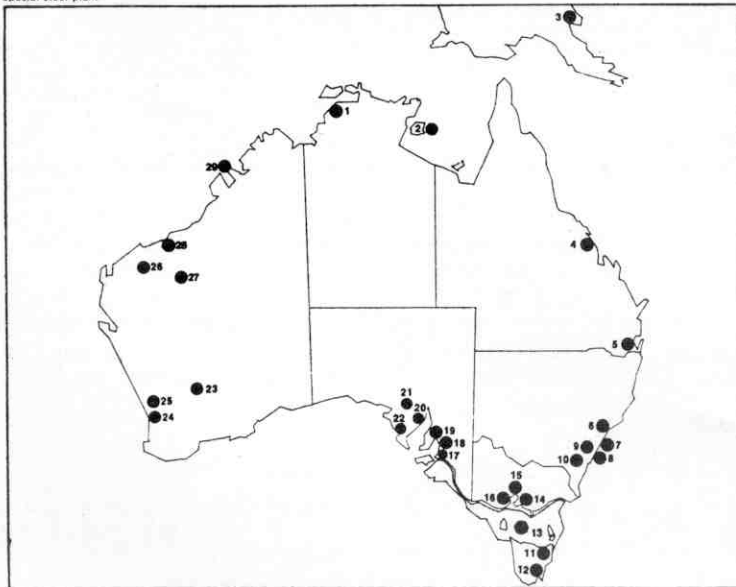
Much of the design and planning of major projects is carried out by company engineers. Overseas visits are often made in connection with the selection, design, operation and maintenance of new equipment and plant.

Engineering and science graduates may elect to work either in a field directly concerned with their own discipline or in a production area preferably after a cadetship which is an orientation and assignment training programme lasting for up to a year. Alternatively, after a short orientation period they may be appointed direct to an engineering position. Should they later feel that a change from one work area to another is desirable this can usually be arranged.

As well as specialist courses, the company uses Australian and overseas general development and management programmes and conducts its own management courses which are mainly residential. Study towards higher qualifications is encouraged.

## BHP IN AUSTRALIA

- |  |   |  |                                   |  |   |
|--|---|--|-----------------------------------|--|---|
| 1 Darwin<br>Wire products plant          | Tungsten carbide and mining products plant                              | 9 Berrima<br>Cement plant  | 15 Melbourne<br>BHP Head Office   | 20 Whyalla<br>Integrated steelworks            | Sinter plant  |
| 2 Groote Eylandt<br>Manganese ore quarry | Central Research Laboratories   | 10 Marulan<br>Limestone quarry and kiln                          | Wire products plant               | Shipbuilding yard                              | 25 Perth<br>Branch office   |
| 3 Lao<br>Wire products plant             | Collieries  | 11 Bell Bay<br>Ferro alloy plant                                 | Steel fabricating plant           | Solar salt production                          | 26 Desdale<br>Iron ore development                                |
| Branch office                            | 7 Sydney<br>Branch office   | 12 Hobart<br>Wire products plant                                 | Research laboratories             | Iron Monarch and Iron Prince iron ore quarries | 27 Mt. Newman Project<br>Iron ore quarry                          |
| 4 Blackwater<br>Coal development         | Steel fabrication plant   | 13 Bass Strait<br>Natural gas and oil production and development | 16 Geelong<br>Wire products plant | 21 Middleback Ranges<br>Lime sands production  | 28 Port Hedland<br>Treatment and storage of iron ore for shipment |
| 5 Brisbane<br>Branch office              | 8 Port Kembla<br>Integrated steelworks including flat products division | 14 Westport<br>steelmilk development                             | 17 Rapid Bay<br>Limestone quarry  | 22 Collin Bay<br>Lime sands production         | 29 Yampi Sound<br>Iron ore quarries                               |
| Fence post plant                         | Stainless steel rolling mill  | 18 Adelaide<br>Branch office                                     | 18 Adelaide<br>Branch office      | 23 Koolyanobbing<br>Iron ore quarry            |   |
| 6 Newcastle<br>Integrated steelworks     | Mining equipment plant  | 19 Androssan<br>Dolomite quarry                                  | 24 Kwinana<br>Blast furnace       | Merchant mill and fence post plant             |   |
| Wiremills and wire ropery                | Collieries  |  |                                   |  |   |
| Stainless and special steel plant        |   |  |                                   |  |   |



Contact The Manager Personnel and Training, 500 Bourke St, Melbourne 3000 [60 0701]  
The Manager Administration:  
Australian Iron and Steel Pty. Ltd., Port Kembla, N.S.W. [4 0411]  
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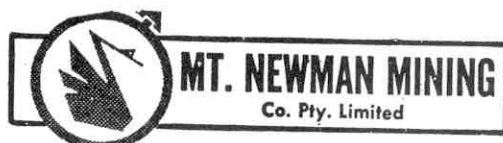
Orders for Mt. Newman ore now total some 280 million tons. To meet this growing demand Mt. Newman is stepping up production — now to 20 million tons a year and more later. Expansion of this magnitude requires mining-orientated talents and skills. Like Australia, everything about Mt. Newman is big . . .

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The General Manager, at G.P.O. Box N1122, Perth, W.A. 6001



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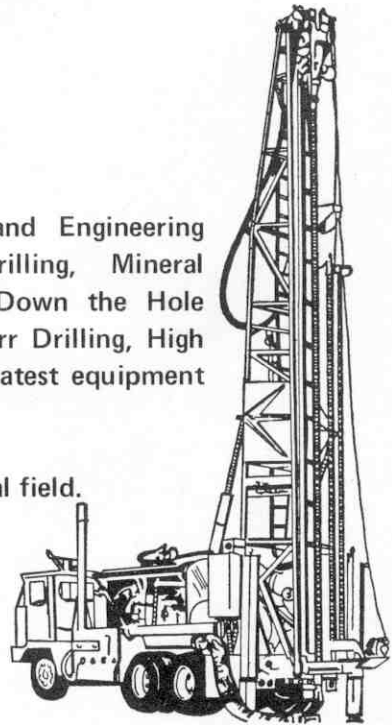


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# HYSTERESIS 1971

The official publication of the  
Adelaide University Engineering Society

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We wish to thank "The Association of Professional Engineers, Australia" and the "United States Information Service" for granting permission to reprint certain articles from their organisation's Journals, and to the U.S.I.S. for the transparency used for the front cover.

Our thanks to Mrs. Walls, Maxine and Kay for their willing assistance to the Society.

The editors would like to express their thanks to Cheryl and Wayne for their assistance and to all those who contributed to this magazine.

# "WHAT'S THIS WORLD COMING TO?"

DAVE GRAY & ANDY PARSONS

What is this world coming to?

Dr. Ehrlich, a noted American ecologist, seems to think that it is coming to an end if some drastic steps are not taken to solve three of the greatest threats to mankind — pollution, depletion of the world's resources and over-population. We tend to agree with him although possibly not to the same pessimistic extent.

Pollution as we know it today exists in four main forms; air, water, land and noise pollution. Already various solutions to these problems have been tested and found to be successful. However, the majority of these are extremely costly and hit at the very basis of our economy — the industries.

Examples of this unfortunate situation are many and varied. For instance the motor vehicle is claimed to be one of the biggest offenders, but to eliminate this means one of two things. Firstly eliminate the automobile. This means no transport and as we all know mobility is the very basis for economic growth and advancement of civilization, two necessary ingredients for a better world. The other solution is to reduce the pollution effects. This has already been achieved by engineers with the innovation of electric transport or cars which use liquid petroleum gas as a fuel. Politicians are very hesitant to introduce these solutions as they would be detrimental to the country's economy. Consequently, people are turning to engineers more and more in the hope that they will furnish the ideal solution.

Industries are the other main offenders in this field and although anti pollution devices are available to industries, expense is again the governing factor. Government could of course legislate the use of these devices but this may not gain votes. In London, however, after some 700

years of attempts at correcting the smog problem, the government together with modern technology did virtually eliminate this problem and since 1960 the air has been relatively clear.

Water, another area of pollution, is also being investigated thoroughly at the moment and recommendations in Canada concerning the "death" of the Great Lakes has caused some drastic action as far as detergents are concerned.

In fact, by 1972 the sale of biodegradable ingredients in detergents will be prohibited (simply because of their high phosphate content, a nutrient for the deadly algae).

Another example is the action adopted by a Federal Judge in Washington who recently halted work on a \$367m. canal. The canal, which would have provided a transportation link between the Gulf of Mexico and Central America, was regarded as a potential threat to the environment.

Rubbish on land is accumulating at an ever increasing rate. At the moment it seems that as fast as some people retrieve materials from the earth others are discarding them. Naturally this is quickly depleting the earth's resources (a finite quantity) which some estimate will be exhausted (in 25 years) if we do not attempt to reuse the now discarded materials. One answer is to provide alternative materials, plastics for example, but let us be sure that what we create can also be destroyed.

Noise is one of the more subtle types of pollution. Because it is a constant factor associated with factories and cities the majority of the population do not readily note its presence in the modern age. However, it is an insidious evil in society that can break down man's mental defences. Noise also reduces our work

capabilities by which it is vital for our body to operate efficiently. In the future we see engineers playing an ever increasing role in this field.

Over population is probably our greatest evil because the other problems stem from this cause. Every hour thousands of people are dying from diseases associated with malnutrition. However, lack of food isn't the only problem, lack of education is just as important and this issue is symptomatic of the developed countries as well as of the underdeveloped. Definite steps are being taken to solve this problem and in 1972 5000 villages in India will receive education on family planning and methods of increasing productivity of land by a direct satellite telecast. This is a major step in the program of educating the world, for, unless ignorance is eradicated, it will be impossible to solve not only India's problems but those of the rest of the world.

Today, Engineers, Scientists, Ecologists, Conservationists and Politicians are already tackling these problems of overpopulation, pollution etc. trying to find suitable solutions that will improve conditions in the world and make it a better place in which to live. The only query is, do we have enough time to right the wrongs that mankind has caused through the ages?



# APPOLLO - 15

**UP, UP AND AWAY!** — This dramatic photograph of the Apollo-15 launching at the Kennedy Space Center in Florida on July 26 was taken by an automatic camera mounted atop the 110-meter-tall service tower. Five first-stage engines developed  $3\frac{1}{2}$  million kilograms of thrust and consumed some 12,870 liters of liquid propellant a second as they started the vehicle, weighing 2.9 million kilograms, toward Earth orbit. Two upper stages completed the job. The third stage engines were later restarted to send Astronauts David Scott, James Irwin and Al Worden on their way to the Moon. Photos from ips (71-1749 A - D).



**SALUTE ON THE MOON** — Astronaut David Scott is shown saluting beside the U.S. Flag in this picture taken by fellow astronaut Jim Irwin. A part of the Lunar Module is seen on the right. Hadley Delta is in the background, with the base of the mountain about 5 kilometers away, looking south-east. Hadley Delta rises about 4,000 meters above the plain. (71-2061).

# THE HARVEST FROM SPACE

HENRY SIMMONS

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WHAT CAN AN ORBITING space platform contribute toward the eradication of yellow fever on earth? To the discovery of oil or valuable minerals? To flood control? To the efficient distribution of fertilizer at the beginning of the growing season?

The common-sense answer would be: very little.

Yet, like many things which have been learned from space research in the last dozen years, the common-sense answer to these questions is almost certainly incorrect. Photographs taken of selected areas of the earth by pilots of the U.S. Gemini and Apollo manned spacecraft since 1965, using only small, hand-held cameras with a variety of color-sensitive films and filters, have yielded a breathtaking volume of information to the trained eye of the photo-interpreter. The potential of these panoramic views from space is so great, in fact, that the United States is presently building two Earth Resources Technology Satellites to be launched in 1972 and 1973 and it is placing heavy emphasis on sophisticated earth studies to be conducted by the three-man Skylab space station workshop to be orbited in 1973.

Both sets of experiments are largely based on the "multispectral" technique in which several images will be obtained of each target, each in a narrow portion of the visible optical spectrum, as well as in the longer infrared wavelengths beyond the sensitivity of human vision. Confidence in the multispectral technique is based on both ground and aerial studies which have shown that individual types of crops, forest and other vegetation reflect and emit unique, recognizable spectral signatures during the growing season. It is possible to distinguish between fields of maize, oats, sorghum and wheat. It is also

possible to distinguish between diseased and healthy crops, trees and other vegetation, to predict yields and — in a broad sense — to inventory and monitor overall land use with a high degree of precision over the entire earth.

Multispectral images covering 26,000 square kilometers at a time can readily distinguish freshly-plowed fields, on a daily basis if necessary, to provide useful information on the geographical pattern of fertilizer demand, for example. Thus it should become possible for agricultural experts to predict crop, fiber and meat yields with a worldwide accuracy now possible in only a few advanced countries so that both surpluses and shortages equally ruinous can be avoided.

Similar services can be expected from the fishing industry. This was demonstrated a few years ago in the case of Iceland, whose fishing fleet was unable to find fish in traditional fishing grounds because of a shift in the Atlantic's Gulf Stream. It was discovered through the use of airborne infrared sensors that the Gulf Stream had meandered a considerable distance from its old course. On the strength of this information, Iceland's vessels were able to follow the new course of the Gulf Stream and located the fish again.

Geology from space? Even the low-resolution photographs taken by Gemini and Apollo of the well-surveyed United States have turned up major faults, fractures and other crustal features which had escaped previous aerial observation.

These are important because accessible mineral deposits are often found in these junctions of the earth. And in Saudi Arabia, numerous vast structural domes have been photographed which were not previously suspected;

these are often natural traps for gas and oil.

The impetus for increased earth resources studies stems in part from the striking success of weather satellites which for a decade have been mapping global weather with an ease and speed which are still surprising.

The tragic Indian Ocean typhoon which took hundreds of thousands of lives in East Pakistan last year was spotted by a U.S. weather satellite a week before it struck land and though ample warning time was available, communications in the disaster areas were too poor for effective evacuation measures or other safeguards.

A version of the astronauts' multilayered, flexible spacesuit is being explored as a pulsating device to assist in respiration for severely paralyzed patients — hopefully to replace cumbersome iron lungs. Based on early lunar mobility studies, a six-legged walking device has been adapted for handicapped persons, permitting them to negotiate curbs, stairs and other obstacles which would be impossible for ordinary wheelchairs.

Even more legion are the less spectacular industrial benefits derived from space research. A plastic resin developed for rocket motor chambers has found wide use as a commercial adhesive and coating, while special tooling devised for unique spacecraft and rocket construction tasks has found its way into routine industrial application.

Whether spectacular or mundane, the totality of the return from space has already proven itself a driving force in shaping a livable world today and the advances immediately in prospect promise much more, to the extent that the investment in space must soon be regarded as indispensable to human welfare.

# A LOOK AHEAD

JAY HOLMES

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AFTER MORE THAN A DECADE of spectacular achievement and moments of high human drama in space flight and exploration under the direction of the National Aeronautics and Space Administration (NASA), the United States paused early in the spring of 1969 to assess its role in space and to chart space objectives for the 1970's and '80's. A special task force headed by Vice President Agnew concluded that exploration, science and practical applications should be the major goals stressed.

Looking back, the President's Commission frankly recognized the intense competition that had characterized the first dozen years of the space age. They found the honors about equally divided. The orbiting of the first satellite, the lunar probes and the flight of Yuri Gagarin, the first human in outer space, were the highlights of Soviet achievement in the earliest years. The Apollo landings on the moon and the Mariner flights to Mars have been the dramatic accomplishments of the recent American programme. But as more ways are found to share information and to work out joint projects, cooperation will take the place of competition.

Reaching beyond the moon, plans are being made to explore other planets and the universe. Over the next two years, automated spacecraft will be sent to orbit and probe Mars and Jupiter as well as on a flight that would pass close to both Mercury and Venus. Plans for 1976 include the landing of an unmanned spacecraft on Mars. In later years, spacecraft are to be sent on "grand tours" that take advantage of the positions of the outer planets to fly past several of them on a single mission. For example, in 1976, a flight will be made to Jupiter, and possibly beyond to Saturn and Pluto.

Out of the growing wealth of space technology, an ever-expanding list of practical applications is coming. Already,

instruments in space are greatly enhancing weather forecasting and global communications, especially television. In the future, techniques will be improved and new applications developed that will include worldwide navigational aids, air traffic control, detection and measurement of earth resources — crops, mineral deposits, water supplies and ocean riches — as well as the mapping and measurement of air and water pollution. "The very act of reaching into space," declared President Nixon, "can help man improve the quality of life on earth."

Early in 1970, work began on the development of a rocket airplane that would rise vertically from its launch pad, fly into orbit, use a retro rocket for return to the atmosphere and land horizontally like an airplane at a large airport. NASA engineers believe that this rocket airplane — called a space shuttle — can be flown to space and back 100 times or more. If so, the cost of transporting men and machines to space and back may be cut to a tenth of the present cost for a one-way trip to earth orbit — perhaps even less.

Until now, men have spent relatively short periods travelling and working in space. Before they are sent on more extended missions such as the manned space station, we need a very detailed understanding of the effects space has on man over much longer periods. Answers to these questions will be provided by flights of an experimental space station, called Skylab, which are scheduled for early 1973.

Using this basic long-range concept — the orbiting space station with connection transportation supplied by an earth to orbit shuttle — NASA scientists believe a low-cost interplanetary transportation system can be developed. For example, to set up such a system between the earth and the moon

— or any planet — you would have orbiting space stations at each planet connected to the surface by shuttles. Between the space stations, transport propelled by nuclear rockets would carry passengers and supplies.

By the 1980's, this transportation system could be expanded to explore other planets. American plans currently assume that Mars will be the next target of manned exploration although this project has not yet been approved. For this venture a Mars excursion module would need to be developed.

The planets are in position about every two years for such a voyage. The earliest opportunity would appear to be in 1981. Such an expedition might be launched from earth orbit on November 12, 1981. It would arrive in Mars orbit on August 9, 1982. The expedition would leave for home in October 1982, arriving in earth orbit on August 14, 1983.

Another important experiment is in direct television broadcasting from space. Under an agreement between India and the United States, an Advanced Technology Satellite (ATS) will be employed for a one-year experiment in transmitting educational programmes prepared by the Indian Government to receivers in 5,000 villages. The principal subjects of the programme are expected to be agricultural productivity and population control.

Future NASA plans envision continued forward progress in aeronautics and the conquest of space mysteries. The basic goals remain the same: exploration of space, increased scientific knowledge and practical application of that knowledge to the benefit of life on earth. As in the past, results of these successful achievements, as well as some of the disappointing failures, will be shared with other nations of the world.

# THE DEAN'S PAGE

PROF. D.R. MILLER.

The winds of change are blowing through the University and while there are some cynics for whom this well tried cliché conjures up visions of wind of the indigestive variety, those of us who are fortunate enough to belong to the Engineering Faculty must surely see it in more optimistic terms as wafts of fresh air dusting away the oppression of overcrowded and unsatisfactory accommodation and as the sweet breath of youth bringing new involvement and enthusiasm into the life of the students and to the administration of our Faculty. For 1971 has turned out to be a Year of Promise for the Faculty of Engineering. At last the shimmering mirage of a quarter-million dollar building programme has condensed into a reality. After weathering some eleventh hour crises (brought about by the overall financial difficulties faced by the University), we are now able to proceed with the first part of a long-promised plan to give the Faculty a very considerable improvement in its standard of living. A new floor on top of the Mechanical Engineering building will be mainly used to establish drawing offices for the Engineering I students. This "shop front" of the Faculty will provide a sense of belonging for the first year students who have had, up till this time, only a tenuous association with the Faculty and nowhere in the University where they could feel at home. It is anticipated that work on this new floor will begin before Christmas so that the rowdy part, at least, will be finished before the start of first term 1972. The other new areas available to the Faculty will be those vacated by Architecture (on the western end of the top floor of the main building) and by Computing Science (1st floor of the Annexe building) and after some minor reshuffling and expansion of the space available to each of the Departments takes place, we should see by the end of 1973, a quite reasonable level of

accommodation for the Faculty.

The other development which holds great promise is the recently approved provision in the Statutes for student membership of the Faculty. The election of a postgraduate student, Mr. Alan Burgess, took place earlier in the year and already we have seen ample evidence of the very valuable contribution which student membership of the Faculty can afford. Towards the end of July the election to determine the two undergraduate members was conducted and it is anticipated that the successful candidates (Messrs. Morris and Riggs) will take their places on the Faculty in January 1972. The election was notable because of the interest which it aroused and the very satisfactory turn-out of the electors on the polling days (60% of eligible voters cast valid votes). This certainly augers well for a successful beginning to a new era of student involvement in the affairs of the Faculty and we wish the new members every success in what is undoubtedly an important and responsible duty. The advent of student membership of the Faculty, of course, removes the "raison d'être" of the Dean's Committee which was set up as an interim measure to enable the student voice to be heard; so it would seem that the Dean's Committee may well join that small select band of organizations which actually become disestablished! This need cause no feeling of frustration or despondency for it is clear (to quote just one example — by the very active part which Mr. Burgess plays on the Engineering Building Users Committee) that it has been superseded by a very much more direct and effective medium for the injection of the student viewpoint into the system.

Notwithstanding the establishment of these formal and official mechanisms of contact between the student body and the Faculty, the traditional informal,

cordial relationships between members of the staff and the students will continue to flourish. These are the associations — made during chance meetings outside the lecture theatres, on excursions, survey camps or the cricket field, which enrich the lives of us all and mark the Faculty of Engineering as an assembly of scholars and gentlemen.



# CIVIL

PROFESSOR F.B. BULL (Head of Department)

Life is full of surprises, I suppose that's what makes it so interesting. One moment you are plodding along on the same well defined course and the next precipitated into an unexpected happening. So it was for me on 15th October, 1970. One more day to go and teaching would be over for 1970, and we could stop to catch our breath after a record all time high of 40 in the final year. At noon on that day the news flashed around Australia that the West Gate Bridge was down, and for me catching that breath had to wait eight months.

The Royal Commission of enquiry into the causes of the disaster first met only two weeks after the accident and went on until July of this year. I found the Commission a vastly interesting experience, but it was an unhappy business to see the good names of engineers and indeed of the Engineering Profession dragged in the dust. Overriding it all was the awareness that, whatever the cause, thirty five men had died. A fascinating experience it turned out to be, trying to sort out what had happened and why, but not an experience one would lightly undertake or wish to repeat.

One of the interesting aspects of such an enquiry was to see the way in which the legal gentlemen could grasp the essentials of what was a fairly sophisticated piece of engineering and use their skill in cross-examining. I must say I formed a great respect of this ability on the part of the lawyers and could not help wondering if we, as engineers, could have done half as well if faced with a complex problem of law.

The lessons of West Gate are now a matter of history, but I hope some of you will manage to read the Report and carry over these lessons into your own professional lives. One lesson in particular is the importance of establishing good human relationships between all the members of the overall team working on a project.

This business of human relations is not something we talk about overmuch in the University courses, but unless a man can achieve harmonious working with his colleagues and with those who work under his direction, he will endanger the success of any project on which he is engaged. Poor human relations can be as important an element in setting the stage for disaster as, say, an error of calculation, or the use of sub-standard material.

My frequent absences in Melbourne for the first half of the year left me little time for other than the discharge of my formal teaching commitments. I am grateful for my colleagues who had to carry the burden of my share in the varied work going on in the Department on research and ad-hoc investigational work.

It was fortunate for me that long before West Gate fell we had been involved in a study of aspects of box girder bridges and this background was most helpful in tackling the technical problems raised in the Commission.

The work on House Foundations, under Mr. Cumming, has continued and culminated in a full scale test on four model houses of different construction which were subjected to a series of synthesised winter-summer cycles simulating the swelling and drying experiences on a Bay of Biscay soil. The results, which are still being analysed, should help in minimising the cracking problems experienced in houses built on such soils.

Mr. Crawley has been busy on a whole series of tests on concrete bridges, including those involving composite action between structural steel and concrete. Strain measurements on actual bridges are being made, with particular emphasis on the long term effect of creep and shrinkage on modifying the stress patterns. This work is being done with the help and co-operation of the

Cement & Concrete Association, the Highways Department and the Commonwealth Railways.

On the structural side, the work on box girders has already been mentioned. We have also been having a closer look at some of the more humble members of the industrial shed type structure, that is a study of the structural influence of the corrugated iron cladding, and the behaviour of the metal purlins supporting the iron. Two projects, one by Steve Lawrence and the other by Chris. Michelmore, have shown that there is a great deal to be learnt on these elements, which, it has been shown, have significant influences on the behaviour of the overall shed frame.

Bill Stacey has been working on plastic knee joints, which at first sight might look as if he had deserted us for the Medico's, but I'm afraid Bill's joints are in good solid steel frames, the plastic behaviour of which is keeping him busy.

Bryan Jenkins is bringing to a conclusion his work on stresses in concrete flat slab floors. Bryan was lucky in being able to carry out his experiments on one of the floors of the new Library Complex, while it was under construction.

John Beare has been busy trying to produce a super jet-stream, and to judge from the sleek beauty of his latest version, it looks as if he knows what he is doing!

There are many other projects going on in the Department, but your Editor says I've got to limit my contribution to 1,000 words, or he will cut me off in the middle of . . . . .



# MECHANICAL

PROFESSOR H. H. DAVIS (Head of Department)

**General.** Plans have been completed for the addition of a new floor on the Mechanical Engineering building and for modifications throughout the engineering complex to improve student and staff accommodation and facilities. Most of this work should be completed early in 1972.

Large increases in student numbers in relation to the virtually static staff situation in recent years have made heavy demands on staff and have considerably reduced research and consulting activity. If the improved accommodation in 1972 is followed by the long-overdue staff increases in the 1973-5 triennium, the Faculty once again should be able to make its proper contribution to the growing need for more and better engineers and a more sophisticated technology.

There is a rapidly increasing public awareness that scientists and engineers must pay much more attention to environmental improvement and conservation of expendable natural resources. There is little doubt that virtually all of the undesirable side-effects of our activities, such as pollution and noise, can be controlled and that the cost of sophistication to achieve such desirable ends must be budgeted for in future enterprises. It has even been suggested that the great exponential problem of the population explosion will depend not only on education and birth control propaganda in lesser developed countries, but also on the introduction to those countries of a technology which will raise living standards to a point where some leisure and enlarged interests and increased mobility makes smaller families attractive.

Thus from all points of view, and in all parts of the world, we engineers will have an expanding responsibility to develop and apply our art in a rational and controlled manner with a strongly social motivation.

Further progress has been made in organising a "training within industry" course of workshop practice to be provided for Mechanical Engineering students in their first long vacation. A number of larger private industries and government departments are willing to provide 6 to 8 week courses in their apprentice training schools under qualified instructors. There should be enough places for all students by the end of next year. These courses will count towards the 16 weeks vacation practical work required for the degree and should provide an excellent introduction to industrial experience.

**Academic Staff.** Mr. J.H. Fowler returned to the department in January after being seconded to the Department of External Affairs as a Colombo Plan Aid expert in computing. He spent two years with the Faculty of Engineering in the University of Singapore. His work involved setting up a data processing system presented by the independent philanthropic Ford Foundation of U.S.A. He was also responsible for establishing a basis for computer operation policy, for the training of local staff to run the computing centre, and for the running of computing education and application courses for engineering degree students. A pilot M.Sc. course in Systems Engineering was also established. Visits were also made to the University of Malaya in Kuala Lumpur and to Chulalongkorn University and the Asian Institute of Technology in Bangkok to give seminars on computing.

Professor H.H. Davis returned to the department in January after a year of study leave, part of which was spent overseas. Calls at the Universities of Singapore and Malaya enabled reunion with many former Adelaide Asian students and an opportunity to hear about and see some of their professional work. A period in India included visits to a number of University Colleges of

Engineering and Institutes of Technology, arranged through the Indian Ministry of Education, in an attempt to assess relative standards for engineering degrees on a similar basis to that used by the Institution of Engineers, Australia. The overproduction of graduates in India in relation to current demand has resulted in a steady stream of applications for professional and academic posts in many parts of the world. A report prepared as a result of this exercise has been used extensively as an aid in the accreditation of professional qualifications and in academic selection in Australia and a number of other countries. The opportunity was also taken to see something of university and governmental research and industrial activity and of course some of the great relics of Indian culture. Many visits were made also in U.K., Europe and Canada to discuss educational, research, and consulting interests of personal and departmental concern, with a good mixture of universities, governmental research organisations and industry. Much attention was paid to environmental engineering with emphasis on noise and vibration control, and on modern developments in high-speed transport on land and water including a thorough inspection of the activities of the air-cushion vehicle industry and the supporting governmental research.

Dr. M.K. Bull is spending his study leave during 1971 working on advanced gas dynamics research at the famous Cavendish Laboratories in Cambridge, U.K. He will also be making many other contacts in U.K., including his former haunts at the Institute of Sound & Vibration Research at Southampton, before returning in December.

Dr. G.L. Brown is to join our staff in October. He graduated in this department in 1963 and went to Oxford as a Rhodes Scholar. After gaining his D.Phil. at that ancient seat of learning in a



somewhat sophisticated area of modern gas dynamics, he has spent four years as a member of an elite research group of Aerodynamicists at the University of California, Los Angeles.

**Research.** The low level of normal University finance in recent years has made outside sources of research money very welcome. Current sources of grants to the department include the Australian Research Grants Commission (2), Australian Atomic Energy Commission, Australian Mineral Industries Research Association, and S.A. Department of Agriculture. Smaller gifts from local industries have also assisted various projects.

#### (a) Thermodynamics

A Biotron thermal environment control chamber has been successfully developed with a new approach to system design, providing a full range of climate simulation of temperature and humidity within very fine tolerances and with simpler control and lower power requirements than attained elsewhere. The system installed at Waite Institute is in use for plant growth studies. Additional instrumentation and controls enable the unit to be used also for research in two-phase heat and mass transfer.

Heat transfer by natural convection in vertical ducts has been further studied and satisfactory correlation obtained between theory and experiment.

Pollution control from diesel engine exhaust systems is being attempted by afterburning in a cyclone-type spark arrester-silencer under development.

#### (b) Fluid Dynamics

Boundary-layer turbulence studies are making steady progress considering the complexity of the phenomena involved and the sophistication of experimental techniques. The generation of aerodynamic or hydrodynamic noise and vibration at a fluid-solid interface associated with fluid flow in ducts or over submerged bodies, such as aircraft or submarines, is due to the pressure

fluctuations developed in the turbulent boundary layer. Experimental results from a specially designed research wind-tunnel are beginning to indicate the influence of mean streamline pressure gradients on various statistical properties of the fluctuating pressure field in the turbulent boundary layer and to allow comparison with theory.

Flow noise generation by aerofoils and in axial flow fans is being studied with present emphasis on determining the influence of fan design parameters on noise generation.

A long-term programme of study on gas lubricated bearings has been fruitful in the development of tapered-land air bearings with useful characteristics.

Cyclone-type particle separators of high separation efficiency are being developed for use as spark-arresters for engine exhausts. The fluid flow problem also involves modification to reduce pressure-drop to meet engine operating requirements.

Work has been initiated on the characteristics of flexible aerofoils with interesting possibilities.

Hydrodynamics work has involved continuation of projects on marine planing craft model test evaluation, water-jet propulsion for fast surface craft and the application of water-jet propulsion to air-cushion vehicles.

#### (c) Solid System Dynamics

Vehicle suspension system dynamics has been under theoretical and experimental study for some years. Present interest has been transferred from passive to active systems or 'live' suspensions for off-the-road wheeled vehicles. Electro-hydraulic servo-valve actuation of a hydraulic ram operating on an independent suspension axle is used to compensate for track profile displacement disturbances, using appropriate sensing elements and signal modification in the control loop, in order to produce a smooth vehicle ride over rough terrain.

Vibration and noise control studies include a project on sound

radiation from vibrating surfaces. Laser holography and interferometry will be used to obtain photographs of 3-dimensional vibrating surfaces from which nodal patterns and amplitude contours can be obtained. Correlation of vibration modes with acoustic radiation in an anechoic chamber will allow acoustic coupling to be determined and systematic studies made of the effectiveness of variations in 3-dimensional solid surface parameters and treatment techniques in reducing sound radiation. This is important in noise control design of machines, plant and vehicles.

Fluidic control elements for speed control in fluid powered systems are being developed.

Transmission-line multi-mode wind excited vibration control using modified forms of dynamic absorber are being studied experimentally.

#### PUBLICATIONS

Bull, M.K. & Lim, K.B. "Wall pressure fluctuations in a turbulent boundary layer. I.E. Aust. Trans. v Mc 6 n 1, 1970.

Bull, M.K. (Ed.), Pickels, J.M., Doble, W.D., "Noise generation and control" (Book) U. of A. 1970.

Thompson, A.G. "An automatic control demonstration unit. Bul. Mech. Eng. Ed. 1970. U.K.

Thompson, A.G. "Design of Active Suspensions." I. Mech. E. 1971.

Shaw, A. "Refrigeration in climate simulation for research." Aust. Inst. R.A.C.H. 1971.



This year two new staff members joined the department. Dr. J.R. Roach came to us from the S.A.I.T. and Dr. K.D. King from Stanford Research Institute, California. The full time academic staff now numbers eight.

Both Professor Tait and Mr. Jeffreson went on study leave in August. Professor Tait has gone to the U.K. where he will investigate current trends in chemical engineering education and recent developments in heat transfer. Most of his time will be spent at the University of Edinburgh. He expects to return in May, 1972. Mr. Jeffreson has gone to the University of California at Davis to collaborate with Professor J.M. Smith on further aspects of heat transfer in heterogeneous systems. He will be absent for twelve months.

The Department's share of new Faculty floor space will enable us to set up sedimentation and kinetics and thermodynamics laboratories. The latter will be a long overdue addition to the teaching program. Additional research space will also become available.

The Department, in conjunction with the S.A. Premier's Department and S.A. Natural Gas Producers, is carrying out economic analyses and design studies as background to the possible establishment of a large petrochemical complex (up to \$100 million) in South Australia, based on solar salt, natural gas and natural gas liquids. Possible products are caustic soda, chlorine, ethylene and ethylene dichloride for Australian consumption and export. The use of natural gas for cheap power and steam generation, and chlorine and natural gas for extractive metallurgy are also under consideration.

In Materials Science, research continues on the structure and engineering properties of metals and alloys used as canning materials for fuels in nuclear

reactors. Similar investigations are being carried out on the behaviour of pressure tubes for the S.G.H.W. reactor.

Another interesting aspect of the materials science research is an investigation into the mechanism of the reaction between silver-tin alloys and mercury (dental amalgam). It is hoped that these studies will throw some light on the use of possible alloying additives to improve the strength stability and corrosion resistance of teeth fillings.

Knowledge of the structure and behaviour of polymers is of prime importance in the use of plastics. The Materials Science Group is continuing its efforts in this field. Attempts are being made to correlate manufacturing variables with the above parameters.

It may be of interest to mention some research on ablative processes carried out at Stanford Research Institute. Ablation is a special kind of pyrolysis that has come to prominence in the space age. Polymeric ablating materials provide the heat shields for the Mercury, Gemini and Apollo space vehicles when re-entering the atmosphere. One object has been to learn, under NASA sponsorship, the behaviour of polymeric materials under the extreme heat of re-entry. The chemical, energy-absorbing reactions are extremely complex. Some products of the process probably react with each other and with the char already formed. Some continue burning as they pass through the char layer and reach the air. Knowledge of these processes is important to the creation of improved heat shields.

In an investigation of the mechanism of reinforced plastics, bench-scale simulation techniques for determining the ablation behaviour of various materials were evaluated. The pyrolysis of hydrocarbon gases in simulated char layers was investigated by one of the simulation techniques.

Studies have been made of the ablation behaviour of Teflon, honeycomb-filled with epoxy novalac, several phenolic-nylon compositions, and two silicone elastomers under high convective heating rates provided by a supersonic arc-plasma jet. Research has been conducted on the pyrolysis of phenolic-nylons, a polybenzimidazole, and several varieties of epoxy novalac in an arc-image furnace. The composition of the pyrolysis gases and of the char layer were determined.

The growth and complexity of our social structure has created troublesome and important problems of communication. Education is particularly sensitive to communication problems. Its activities must be articulated with the other activities of society if it is to contribute effectively for the benefit of man.

Is education flourishing? Are lines of communication fully operative? Do those responsible for education and educational policy understand the problems of students, of the politicians who shape State and Commonwealth goals and priorities, of citizens who pay the bills, of academics and industrialists who influence the marketplace for scientific manpower, of school teachers at the level where most career decisions are made? Answers to these questions seem to be pessimistic or ambiguous. To provide a base for more favourable answers to these questions we need to assess the current situation and make specific recommendations for change. A major effort is needed to establish effective communication among academics, school teachers, industrial and government workers, government policy makers (at the moment there is no science policy in Australia!), students, and the public.

**Staff of the Chemical Engineering Department and their Current Research Interests.**

**Professor and Head of the Department:**

R.W.F. Tait, B.Sc. (Edin), Ph.D. (Birm.)

Heat transfer in boiling processes.

**Professor of Materials Science:**

D.R. Miller, Ph.D. (Melb. and Camb.)

Properties of metals and metal alloys.

**Senior Lecturers:**

T.N. Smith, B.E. (Syd.), Ph.D.

Fluid and particle mechanics.

C.P. Jeffreson, B.E. (Syd.), M. Tech (N.S.W.)

Heat transfer in packed beds using dynamic testing techniques.

**Lecturers:**

K.D. King, Ph.D. (N.S.W.), A.S.T.C.

Kinetics, mechanism and thermochemistry of molecular and free-radical reactions. Pyrolysis of molecules at high temperatures and very low pressures. Applications of unimolecular reaction rate theories to experimental systems. Thermodynamics of gas phase equilibria.

M.J. Messenger, Ph.D.

Chemical engineering economics and plant design.

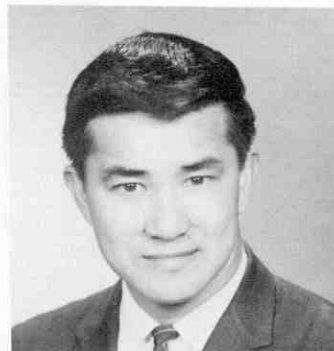
J.R. Roach, Ph.D.

Parameter fitting and

non-linear mathematical models. Fluid and particle mechanics.

D.R.G. Williams, Ph.D.

Structure and properties of polymeric materials.



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# ELECTRICAL

MR. D.C. PAWSEY (Acting Head of Department)

This year for the first time, the Electrical Engineering Department is in action without its present Head, Professor J.L. Woodward, who is on study leave and will join us again in January next. We are very happy to welcome back Dr. Bruce Davis after his stay last year with Bell Telephone Research Laboratories, U.S.A. where he participated in the development of mobile radio systems operating at frequencies of about one gigahertz. Dr. Griffin, one of our microwave enthusiasts, has paid the price of fame this year by orbiting the globe to give lectures and consulting services in connection with his research work. Perhaps you may think that gentlemen such as these would lose "the common touch" after reaching such pinnacles of success. This is certainly not the case however and like their colleagues throughout the Faculty, our staff are ever conscious of their obligations at undergraduate level. We hope you will approach us with any difficulties you may be encountering with your work. While on the subject of staff, we would point out that the successful operation of our Department depends very heavily on the skill and co-operation of a team perhaps unknown to many

students. We refer of course, to our hardworking secretarial and technical staff.

At the close of third term this year, operations will commence on the Faculty re-building programme. This has been scheduled to cause minimum interference to our teaching programme and in fact, although financial shortages will prevent completion of the plans for some years yet, the provision of new undergraduate facilities has been given a high priority.

Our postgraduate activities, including research publication, continue to flourish aided by the steady but limited flow of finance from such bodies as the A.R.G.C., P.M.G., R.R.B., and E.R.B., as well as private industry. In one area of research we have been offered the use, on loan, of expensive test-equipment from U.S.A. We have some ten Ph.D. and six M.E. candidates with us at the moment and expect these numbers will grow gradually as a result of the rising undergraduate intake. A list of the research studies undertaken within the Department is set out in the University's "Handbook on Postgraduate Studies and Research Leading to Higher

Degrees 1971." Interested students should seek further advice from their lecturers.

Finally we note that 1972 will be the last year in office for our foundation professor, Professor E.O. Willoughby, who has been largely responsible for building up the present scope of activities throughout the Department. In recent years he has devoted an increasing proportion of his time to his lifelong interest, antennae research, and he now commutes regularly between the University and the patent attorney's office. Adelaide is fortunate to have gained for so long the services of a man with his unusually creative imagination, capacity for inspiring others and sympathetic human insight. We wish him every success and happiness for the remainder of his stay with us and all the years beyond.



# A.U.E.S. '71



# Ramblings of a President

WAYNE GROOM.

When I first began thinking about this report it was difficult to decide whether to write about the events that have taken place this year or about the people who made them happen. I finally decided to write about the latter – a band of energetic, enthusiastic organisers who have worked so hard this year in an effort to make this the most successful year the A.U.E.S. has ever had.

The year began in a blaze of glory with over 150 freshers and staff packing the Institution of Engineers Hall in Bagot Street. Credit for the evening goes to the committee as a whole, but much of it is due to the sumptuous supper prepared by Maxine and Kay who gave up much of their own time to dish up this feast fit for Kings. Besides being an impressive introduction to the Society for the freshers, it was also a chance for the committee to dine out.

The first social event to occur was the Cricket match held at Heathfield. Trevor Daniells organised and captained a final year team which defeated a (“past their prime”) graduates team. Trev. spent many hours finding an oval with suitable facilities, cricket gear and also the players to compete, and the enjoyment had by all was indicative of the successful organisation by him.

The highlight of first term was the memorable Dave Gray Spectacular. The show was compered by Dave, and a host of stars from the Engineering Dept. performed songs and comedy for an hour in the Chapman Lecture Theatre, being judged by Bob Culver, Mrs. Walls and Dr. Williams. This fun packed occasion was an original idea by Dave Gray and it is hoped that future Society members have the ability to organise similar events in the same capable manner as Dave.

A combination of practicality, flamboyance and hard work led to the outstanding success of the

Engineering Ball. Chris Stanley was the practical one, Lou Baggio the swinger and Bruce Smith the reliable worker. Pouncing on each problem as it arose this group of engineers produced a memorable night for over 400 people – and to top it all, a profit was made!

It was known right from the start that the car trial would be a success because Hamish Robson was organising it – the question was how big a success? No one dreamed that over 50 cars would eventually arrive at the starting line on that Sunday in July. A list of zany instructions, typical of its zestful organiser, were distributed to the contestants and the rest was left to them. Final winner was Peter McSkimming who was presented with a specially prepared certificate by thoughtful organiser Hamish on behalf of the A.U.E.S.

**Just how important are these demonstrations about police brutality to the students. Not very, it seems, if we are to judge by the way everyone walked away from one protest meeting in August to witness a fun packed mini bike race in the Cloisters.** Organised by Lou Baggio and Chris Stanley on the afternoon before the Ball, this incredible event drew hundreds of spectators and gained first spot in front of world news in the Channel 7 news report that night. Organisation for the event began on the Thursday night and it was held on the following day – that’s speed and efficiency for you!

I’ve been here for 5 years and Ron Sainsbury’s been here for 6 (sorry Ron) and we both agree that we’ve never seen a better football carnival than the one held at Noarlunga oval this year. Credit for the event goes to Peter McSkimming who handled everything practically single-handedly – great work Peter!

The attendance at the Dinner at the Tonsley Hotel, exceeded 130, due to the efforts of the

suave Peter Wilson. This event has grown in stature over the past few years and I only hope that next year’s committee continue to up-grade this “event of the year”.

Cyclops, our society paper, got off the ground this year due to the talents of our publicity officer Mark Gilbert. Although not the success we hoped it would be, it nevertheless showed signs of wide acceptance and appreciation. It is to be expected that efforts in this direction will continue.

Space and the Police Dept., prevent me from saying anymore about the Car Hanging in prosh week but thanks Dean, Ron and Ross whoever they may be.

Special thanks must go to Prof. Miller for his help and guidance in running the Faculty elections, to Kay, Maxine, Meredith and the final year Civil class for their help during the elections and also throughout the year. To Ron Sainsbury for his constructive criticism and efforts, to Alan Palmer for looking after A.U.E.S. funds and to Dave Gray and Andrew Parsons for the work they have put into preparing this magazine. Also thanks to Jock Lankenau and Peter Visentin for their help and creativity.

And – I must make mention of the unselfish efforts of Andrew Parsons in providing drawing paper at the cut rate to Engineering Students.

In closing, remember the one ingredient for success, in any endeavour, as written in Roman manuscripts:

“Alit tlebit ofbu LL shitg oesa lon gway”.



# Fresher's Welcome

ANDY PARSONS

This year well over 150 freshers attended the welcome held in the Chapman Hall, Institution of Engineers, North Adelaide on the Wednesday night of Orientation Week. So great in fact, was the attendance that, for many, including some staff members, there was standing room only in the hall and entrance foyer. This magnificent turnout (over 75% of first year enrolment) was a tremendous start to what proved to be one of the most successful years for the Society.

The freshers were welcomed by President Wayne Groom, who then introduced the representatives from each of the Departments. The representatives, Mr. Sved (Civil), Dr. Pawsey (Elec.), Dr. Mannum (Mech.), and Prof. Tait (Chem.), in turn addressed the freshers and in the

usual convincing manner assured them all that they had chosen a worthwhile career. Prof. Miller, as Dean of the Faculty, also welcomed the freshers in an eventful address frequently interrupted by one particular fresher who had to leave the room several times shaking his head as he left. Members of this year's committee were introduced and slides of past years' activities shown. Yes – the same slides that were shown last year and the year before that.

After the formal business of the evening was over, the President then invited the freshers and staff to a chicken and salad supper, where freshers had an opportunity to talk informally with staff members. Many freshers, after listening to President Groom's stirring speech, took the opportunity to join the

growing ranks of the Society.

A new feature of this year's welcome was the release of the first edition of the new Society newsletter "Cyclops." Favourable comments from both members of staff and freshers gave great encouragement to the Committee for the production of future editions.

This year's welcome was undoubtedly a most successful and enjoyable night for all who attended and for freshers it provided a good introduction to the Faculty.

The Committee wishes to thank the Institution of Engineers, for the use of Chapman Hall, those members of staff who attended, and last, but definitely not least, those two gorgeous birds Maxine and Kay for helping with the supper.

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## "Shakedown"

LOU BAGGIO

This year the "Engee's Ball" again proved the theory, that although we may not have the biggest balls, we certainly do have the best. It had all the necessary ingredients to make it a success – booze and birds. For those who wanted it, beer was in great supply, while for those with a little more sophistication there was the odd glass of champagne. Unlike most shows the birds outnumbered the guys and by the end of the night there was hardly a single guy to be seen.

The Ball, which was formal, was held in the new upper refectories, which proved to be ideal for the occasion. Five hundred and fifty people swung to the beat of two of Adelaide's top bands and some of the best lighting effects that one could wish for.

The mini-bikes were a great success, as was the water bed, and by the end of the evening most couples had tried the bed for size with, I might add, favourable comments.

All seemed to enjoy themselves, if one can judge by the way everyone staggered home to recuperate after yet another Engee success.

The organisers wish to thank all those who helped, especially Chips Menadue who did a great job in producing the poster (even if the Women's Lib. didn't appreciate it).

Alias SMITH and  
STANLEY (and BAGGIO)

After he entered a packed subway train, the young man was crushed against a shapely blonde. Several stations later, as he started to get off, she kicked him in the shin. "What the hell did you do that for?" he asked.

"Next time," the indignant girl whispered, "don't start something you can't finish."



The engine, of course, is an optional extra . . .

# Treasurer's Report ALAN PALMER

## FINANCIAL REPORT FOR ADELAIDE UNIVERSITY ENGINEERING SOCIETY 1/12/70 to 31/8/71.

### BALANCE SHEET AS AT 31/8/71

ASSETS		LIABILITIES	
Cash at Bank	\$1024.62	Outstanding Cheques	\$ 6.50
A/c Receivable	70.59	A/c Payable	514.70
Badges (@ \$1.00)	97.00	Members' Balance	671.01
	\$1192.21		\$1192.21

ITEM	FUNDS	STATEMENT	INCOME	STATEMENT
	Receipts	Payments	Profit	Loss
Opening Bank Balance	\$ 845.83	—	—	—
Sale Members Subs, Ties, Badges	559.50	54.98	504.52	—
Coca-Cola A/c.	471.08	448.88	22.20	—
Cyclops & Hysteresis	100.00	53.29	46.71	—
Ball	1093.80	1028.21	65.59	—
Sporting Events	—	45.00	—	45.00
Car Trial	24.50	63.41	—	38.91
Symposium	521.00	1354.16	—	833.16
Dinner	331.50	499.08	—	167.58
Sundries	275.63	101.82	173.81	—
Closing Bank Balance	—	1024.62	—	—
Sub Totals	\$4222.84	\$4673.45	\$ 812.83	\$1084.65
Outstanding Cheques	6.50	—	Less Profit	812.83
A/c Payable	514.70	—		
A/c Receivable	—	70.59		
<b>TOTAL</b>	<b>\$4744.04</b>	<b>\$4744.04</b>	<b>Net Loss</b>	<b>\$271.82</b>

### RECONCILIATION OF BANK BALANCES

Opening Balance	\$845.83	Closing Balance	\$1024.62
Less Loss	271.82	Plus A/c Rec.	70.59
			\$1095.21
		Less A/c Pay & O.C.	521.20
<b>FUNDS AT CLOSING</b>	<b>\$574.01</b>		<b>\$ 574.01</b>

## Committee Members

### 1971 COMMITTEE

President: Wayne Groom  
 Vice-President: Ron Sainsbury  
 Secretary: Hamish Robson  
 Asst. Secretary: Bruce Smith  
 Treasurer: Alan Palmer  
 Publicity Officer: Mark Gilbert  
 Hysteresis Editors: Dave Gray

Andy Parsons

CONGRATULATIONS to Wayne Groom for efficiently organising a willing committee. The time he put into the A.U.E.S. is indicated by a most successful year.

### CO-OPTED MEMBERS

Trev. Daniell: Cricket Match  
 Pete McSkimming: Football Match  
 Pete Wilson: The Dinner  
 Chris Stanley: The Ball  
 Lou Baggio: The Ball,  
 The Mini-bike Race  
 Tug-O-War.

Thanks to all these people for organising these events, and to all those who gave assistance throughout the year.

### 1972 COMMITTEE

President: Bruce Smith  
 Vice-President: Chas. Allen  
 Secretary: Mike Elliott  
 Asst. Secretary: Ron Martin  
 Treasurer: Jeff Packer  
 Publicity Officer: Lelda Vitols  
 Hysteresis Editors: Mark Gilbert  
 John White  
 Cyclops Editor: Not elected.

# Dirty Dave's Spectacular

DAVE GRAY

"Dirty Dave Gray's Spectacular", held earlier this year, was attended by a near-capacity crowd of 180.

The show opened with a brief introduction of the judging panel: Miss Zelda Barbarella (Mrs. Walls), Dr. Williams, Mr. Doble, and chairman of the panel, Mr. Culver.

For the first five minutes the audience was entertained by the well-known Russian conductor George Sobolovoski, and his "Orchestra" Christani Stanlavani. They seemed to add a touch of culture to the show which was duly noted as they were later awarded equal first place.

Brian Kirk gained an "Honourable" mention for his realistic portrayal of an average lecturer, as he delivered one of his better lectures in Radicalism 1A.

The other first place getters were the final years, for their presentation of the distractions which one meets while trying to obtain an Engineering Degree: for example — wine, women and snooker.

Then ensued a brief interlude by Marty Newland who presented some of the old time folk of Peter, Paul and Mary.

Television was the theme for the next act as Wayne Groom presented "People in Profile". His guest, an Engineer, Sam Phoofnick, when confronted with the question of the failures of some of his larger projects such as Tacoma Narrows Bridge, the King Street Bridge in Melbourne, and more recently, the West Gate Bridge, simply replied, "I have had a little bad luck."

The final act was a group who called themselves MESS (Mechanical Engineering Singing Society). They gained an "Honourable" mention by presenting "Some Enchanted Evening" in French Foreign Legion uniforms.

The judges then gave their comments on the various acts using such phrases as: "You would have to see it to believe it", and "What a way to spend a lunch hour". One judge even mentioned that it was "Quite Enjoyable". It was also suggested that the show should have been called "Dave Gray's Dirty Spectacular".

The organisers of the show were pleased with its success and hope that this will become tradition in future years.

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## Mini-Bike Race

LOU BAGGIO

1971 saw the introduction of a stunt which may become an annual event, if not a national sport . . . . Mini Bike Racing.

A record crowd jammed the cloisters on July 2nd. to witness this exciting event between the Engees, and their favourite rivals, the Meds. Ace commentating by W.D. Groom kept the crowd on their toes throughout the event.

The Engee Team consisted of: G. Wallbridge; B. Saunders; P. McSkimming; D. Fitzsimmons; F. Loong; N. Spagnoletti.

The winning team was decided by an elaborate scoring system on events comprising individual sprints, team relays and a 10 lap marathon.

The Engee Team made a clean sweep of all events except the marathon, which was won in great style by Mike Bekoff, the Med. skipper. At the end, the race became more of an obstacle course, with riders dodging buckets of water, flour bombs and "treacle shampoos". The most

hazardous section was the home turn, now named "Dracopoulos Corner", which was the downfall of even the finest rider.

The event was brought to a close with the World Championship Title being contested between Sam Foofnick Tabalotny (Canada), and Primo Luigi Baggio (Italy). The young Italian defeated Tabs (5 years champion), only after a spectacular fall on the home turn.

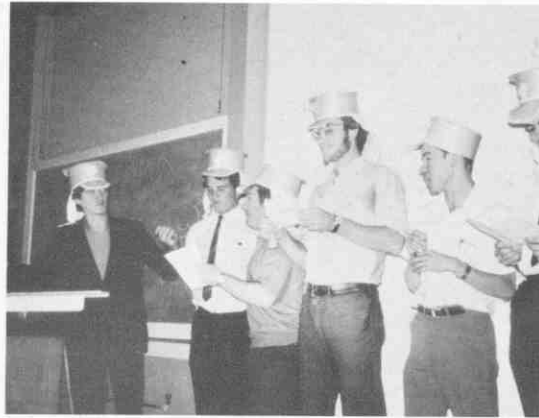
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While passionately making love, the couple was interrupted, by the phone ringing. The girl answered it, returning to bed a few seconds later. "Who was that?" her companion questioned.

"My husband," the curvaceous young thing sighed, snuggling up against her bed partner. "He wanted to tell me he'll be out late because he's playing poker with you and some of the other fellows."







# Chemicals Dissolve

PETE McSKIMMING

The Engineering Football League's finals were held at their football headquarters, the Noarlunga Oval, on Sunday July 18th. The matches went on despite a dispute with the Council which threatened to shift them to Nunjikompita. The A.U.E.F.L. and the Council reached an agreement only hours before the first match. It was agreed that the A.U.E.F.L. pay the Council 150% of the gate and allow them to sell their slimy garfish during the games.

Before an estimated crowd of 15,000, umpire Okker O'Keeffe bounced his ball to start the match between the Civils and Mechs. The critics were surprised to see the season's star recruits, Wily Wilson and Mugsy McSkimming, take the field with the Mechs., after pre-season training with the Civils. Coach Dinkum Daniell inspired the Civils to a great victory with his skilful ball handling.

The next game, between the strong Chemicals and the wiry Electricals, was delayed because umpire McSkimming would not take the field while it was raining. The umpire finally threw up and the game began. The Chemicals attacked continuously and ran out easy victors, with Terror Tardiff in complete control of the ruck all day.

It is sad to see the bottom teams so often resort to doubtful tactics to win the ball. An all-in brawl developed when the Electricals failed to heed the umpire's whistle and many Elecs were reported and will not be

playing again until next season. If the Mechs and Elecs don't want to be relegated to parklands football they had better do some extensive recruiting before next season. They have been encouraging the wrong type of player for years. Sunday's game between these two sides was the worst exhibition of Aussie Rules football I have ever seen and all I can say is that umpire Milky Miller did a wonderful job keeping the ball bouncing.

Lunch was taken just prior to the Grand Final between the Civils and the Chems. Stinker Stanley was seen buying fresh garfish. Umpire Fred Bloch commenced play before a crowd estimated to be in excess of 50,000. The Chemicals, fielding big name players Terror Tardiff, Fanny Adams and Mighty Mitchell, were first to attack. With Tiny Tieman and Mangy Mayo able to keep up with Tardiff and Mitchell in the ruck, the Civils held a slight lead at half time.

During the long break, the Chems were soaking in amber liquid whilst the Civils huddled together in a group and when they took the field the Civils united and got on top early. Okker O'Keeffe, despite being supported by Maxine on the boundary, was not able to produce his normal form. Killer Keily defended well for the Chems while Brainy Bartlett, Jan Wilson and Miny Martin produced patches of brilliance for the Civils. The Stinking Stanley Brothers overcame all opposition and credit must also go to coach Daniell and Dirty Dave Gray.

I am disappointed to see larrikinism creeping into our national game as it did and the Civils cheer squad should have been reprimanded for creating a severe fire hazard with their streamers. There was also a violent anti-apartheid demonstration near the end of the main game in which demonstrators rushed onto the field and assaulted players. However, all was in vain, as, contrary to popular opinion, Engees are not Springboks.

Thanks go to commentators Max Groom, Tom Robson and Barry Parsons and umpire Fred Bloch for making the day a successful one.

WEATHER: Cloudy  
GROUND: Firm  
ATTENDANCE: 50,609  
GATE: \$13.00  
SCORES:  
Civils 3-16 d. Mechs 2-1  
Chems 3-8 d. Elecs 2-3  
Mechs 3-5 dr. Elecs 3.5  
Civils 9-13 d. Chems 3.5

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Sounds drifting from the honeymoon suite kept the bellboy glued to the door. Between gasps, a male voice was saying, "Now will you let me?"

Throughout the night, this same exchange held the bellboy with his ear at the keyhole. As he was about to give up, he heard the man in a plaintive voice, say, "Honey, it's almost dawn. Now will you let me?"

"Oh, all right," sighed a sweet voice. "Go ahead and take it out."

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## The Great Pull

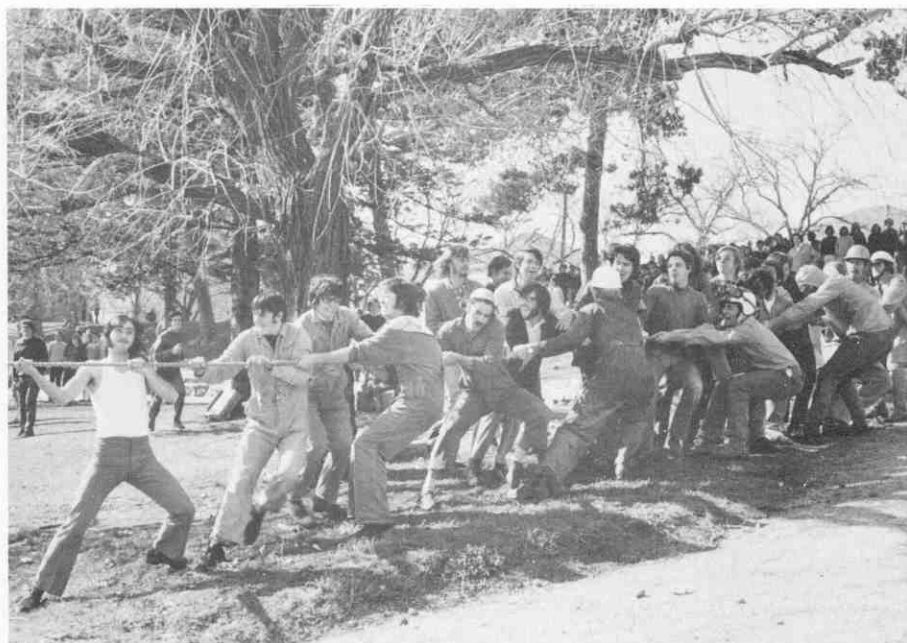
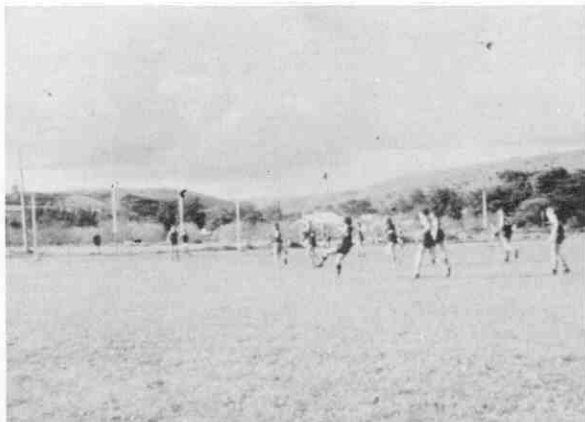
LOU BAGGIO

Owing to lack of water in the Torrens, the annual T-O-W was postponed to a later date, namely Friday of Prosh Week.

The Engee Team, one of the

biggest ever seen on campus, was comprised of Rudi Tieman, Greg. Dunn, Geoff. Wallbridge, G. Betros, Big Jim Ferry and Nick Spagnoletti. P. Burke (coach), and Lou Baggio (manager) stirred the

team to a 3 - 0 victory over the Meds. (with a little help from friends). All in all the Engees were superior all over the field, whether at the end of the rope or at throwing fruit.



# It's Just Not Cricket

TREV. DANIELL

The final years won the toss of the coin and decided to bat on a pitch which was hard: (hard as concrete actually). The weather was fine with a slight northerly breeze and the crowd filled the hill waiting for the expected Post Graduate win which was not to come. Newland and "Stropper" Dilliway opened the innings, but Newland was out in the first over for four. Then Groom came in to the thunderous applause of the crowd but he was out within the next six minutes after a fine contribution of 14 runs. At one stage, after Stanley's first controversial decision, the final years were 4 for 39. However, fine batting performances of Brent Smith, 33 retired, Dave Gray 26, and Brian Saunders 25 not out, aided the now champion final year side to a score of 154, at an average of 9.6 runs/over.

There is very little we can say about the post grads' bowling and fielding, except they would have been in real trouble if not for the excellence of "The Naked Ape" Kirk, who took two brilliant catches.

Jenkins and Mitchell then entered the arena and demonstrated to the crowd some of the finer points of the

gentleman's sport. The final year's bowled very tightly but a dropped catch off the bowling of Taylor did not help. Then the final year's hit with a vengeance with Brent Smith taking Mitchell's off stump in the sixth over, with a swinging delivery, and the post grads were 1 for 27. Although there were meritable performances by Jenkins 22, Michelmores 30 (retired) and Sobol 34, they obviously lacked the depth of the polished final year side. Special mention must be made of the bowling performances of Daniell, McSkimming, Wilson, Sainsbury, Robson and Newland. There were

many fine pieces of fielding with Benham's returns surpassing those of many test cricketers.

The post grads offered the excuse that the rarefied air of this ground affected their capabilities but they must resign to the fact they were beaten by the better side on the day.

## SCORES:

FINAL YEARS - 9 wickets for 154 declared.

POST GRADS - All out for 117.

NOTE: Mike Williams and Chris Stanley seemed to be enebriated.

## THE CURTAIN RAISER. (2nd - 3rd years v's. 1st. years).

The lads who played in this match must be congratulated for turning up.

The issue: Who won?

This is a good question and the answer cannot be resolved very quickly. The 2nd and 3rd years have still one over to bowl and the first years have one wicket in tact and need 7 runs to win. It was declared a draw. The man of this match must be the Captain and Wicket-keeper of the 2nd. - 3rd. year side with a fine batting performance of 58.

## SCORES:

2nd - 3rd YEARS - All out for 127.

(Bartlett 58; C. Stanley 14; Wilson 16; Mehrstens 10 not out).  
1st YEARS - 9 wickets for 121.

(Goddard 10; Tiggeman 12; Johnson 29; Agnew 16?? Not out).

ATTENDANCE: 56,397 (actually 115 approx.)

GATE TAKINGS: \$ NIL.

## THE INDISPENSABLE MAN

Some time when you're feeling important,  
Some time when your ego's in bloom,  
Some time when you take it for granted  
You're the best qualified man in the room;  
Some time when you feel that your going  
would leave an unfillable hole,  
Just follow this simple instruction,  
and see how it humbles your soul.

Take a bucket and fill it with water.  
Put your hands in it up to your wrists;  
Pull them out - and the hole that remains  
Is a measure of how you'll be missed.  
You may splash all you please when you enter  
You may stir up the water galore;  
But stop and You'll find in a minute  
that it looks just the same as before.  
The moral of this is quite simple;  
Do just the Best that you can,  
Be proud of yourself, but remember -  
There is no indispensable man!

# The "Tricky Ton"

HAMISH ROBSON

The 1971 A.U.E.S. Car Trial, entitled the "Tricky Ton", because it was originally planned around a one hundred mile course, was a highly successful event. The organizers were quite overwhelmed when an all time record of fifty-two cars lined up along Memorial Drive on Sunday the 27th of June, for the start of the trial. Unfortunately the large number of entrants meant that there were long delays at the start and the controls and as a result some of the later arrivals missed out on the free balloons and whistles which were issued with the instruction sheets. Amongst those cars which drew favourable attention from the large crowd, which gathered to cheer the cars away, were a VW beach buggy, an incredibly battered Austin A30 with three drivers and two navigators, a rebuilt Model A roadster, a Convertible Sunbeam Alpine (all occupants wearing crash helmets), a beefed up Monaro GTS and Terry Nicholl's Alfa Romeo. A light blue Valiant sedan with a blue sign on the roof was refused admission to the event when its occupants, two well dressed young men with distinctive chequered caps, refused to pay the entrance fee of fifty cents.

The route was designed to take competitors through the southern hills via Clarendon, Kuitpo forest, Meadows, "Ambleside" (Hahndorf), Heathfield and then on to the Loftia Park National reserve for a barbecue tea. The first difficult section was encountered south of the Happy Valley reservoir on the infamous

"Education Road". This very difficult stretch of pot-holed track was washed out and very slippery following a week of heavy rain. It had been confidently expected that all but the odd car club fanatic would choose to take the alternative route available to reach the first checkpoint. Nevertheless, doubtless inspired by an infectious rallying fever, seventeen of the total field were sufficiently foolhardy to attempt a charge up the hill. Bruce Smith (3rd year mechanical) retired on this stretch when the gearbox mounting of his Morris 1100 failed. Terry Nicholls spent a harrowing ten minutes replacing a fan belt as a procession of mud covered cars roared past within inches of his Alfa, each driver struggling desperately to keep the car pointed forwards. A number of eye witnesses claim that the A30 was carried by its crew most of the way up the hill, but this does not help explain how this vehicle came to have one inch of mud on the roof when it reported into the first control. There were two incidents worthy of note at the first control point. Full points were awarded to the Monaro crew when he ignored the steward's instructions and raced away from the checkpoint in the wrong direction. He was later found at Victor Harbour.

The rest of the trial was reasonably straight forward and was made more interesting by the inadvertent inclusion of two mileage errors in the instruction sheets. Many entrants spent an enjoyable hour or so circling Hahndorf while searching for the right road and it was at this stage

that Mark Cicozzi claims to have become bogged in a cabbage patch. Unfortunately it was quite dark before most competitors reached the abandoned farmhouse with the secret inscription written on one of the walls. As a result much fun was had as drivers and navigators staggered along the slippery creek bank and hacked their way through the blackberry bushes. About thirty cars eventually reported into the final control where large quantities of beer were required to calm ruffled nerves.

Last year's runner up, mad Peter McSkimming, eventually snatched the outright first position by a small margin from another final year civil crew. The Works team award (an encribed Violet crumble bar) was presented to the graduate mechanical engineers team from 'Reject Motors', despite a protest from one of its members that he had not lodged his answer sheet.

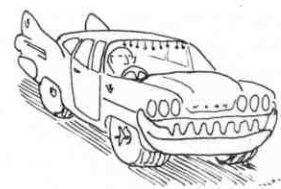
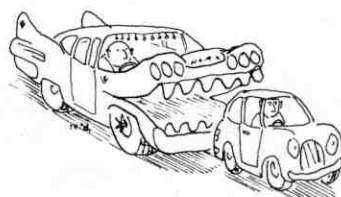
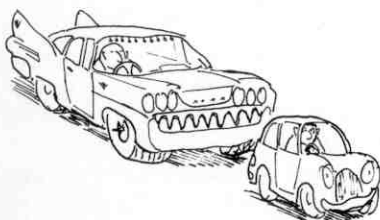
The car trial director would like to gratefully acknowledge the valuable assistance given by Alan Palmer (who blew up the engine of his Datsun 1600 while rechecking the length of Education Road), Tony Gunn, Kay the wonder typist of the Civil Department, Ron Sainsbury, Wayne Groom and friends.

## RESULTS:

First Outright: P. McSkimming, (XP Falcon), 156 points.

Second Outright: B. Saunders, (Cortina GT), 152 points.

Third Outright: T. Nicholls, (Alfa Romeo), 144 points.



# The Suspenders

RAM HOBSON

All names have been changed to protect the guilty

The blue FJ Holden glistens eerily in the light of a full moon as the three youths push frantically against it, searching for a footing on the loose gravel footpath. Slowly the cumbersome vehicle gathers speed, creaking and groaning like a wounded mechanical dinosaur as it lurches onto the grassy slope and heads towards the comforting darkness of the trees. Comforting on most occasions — but we have no headlights and that empty blackness now looks anything but comforting. Now there is no retreat. I am committed to my most difficult task.

With trembling icy fingers grasping the steering wheel I peer desperately through the misted windscreen trying to catch a glimpse of those two special trees I know must be out there somewhere. Time and time again I have paced out the route I must now traverse — twenty feet, first tree; thirty feet, steer between the two tall trees and bear left, but not too far because the sloping bank starts to fall away here. Take the old girl too fast and I'll never make the bend at the bottom — we all know what will happen then. If I brake too heavily the car won't have enough momentum to clear the small mound before the final approach.

The FJ is rolling quite quickly now, rushing onwards towards its final destination. Mingled with the gasps and puffs from those pushing the car, a sudden urgent command is hissed through the driver's side window. "Left! Turn left!" I recognise the voice of Captain Alan Farmer, mission co-ordinator. Visibility through the windscreen has now been reduced to virtually zero and I can see only a multitude of nebulous dark grey and black patches, each distorted into swirling ghosts by the layer of mist which blankets the outside of the glass. The order is repeated, this time tinged with panic. "Left! Left!" I jerk the steering wheel violently and without warning the driver's door

flies open, revealing a momentary blurred glimpse of the ground below. As I reach for the door the seat slides forward, pinning my left knee under the dash panel. Don't panic! Don't panic! But how can I act calmly when the whole machine is careering through the inky blackness, out of control and headed for that terrifying precipice. My agony is not to be prolonged, however, for without warning the car seems to suddenly collide with an unseen obstacle and with a series of almighty thumps it slides to a very abrupt halt.

There is a breathless silence as we wait, each of us frozen into immobility, for the piercing siren wail that will herald the mission failure and seal the fate of our task force. Up on the bridge, sitting astride a girder, Christopher Manly turns to his companion. "Hell! They've hit a tree!"

The preceding is an excerpt from "The Suspenders", my latest novel about the famous bridge hang of '71. (If you like it drop me a note and I'll write some more). Some of the finer details have been a trifle exaggerated and in particular I would like to point out that I did not, in fact, hit any tree. The loud crash that shattered the silence over the River Torrens at 2.30 a.m. on the morning of Friday, August 6th, was due to a collapse of the 'A' frame used to tow the Holden. The frame was still bolted onto the front of the car and was being held in an upright position by a piece of string which, with complete disregard for the gravity of the situation, broke. (The purist might argue that it was due to the gravity of the situation).

Operation Bridge-hang must rate as one of the most spectacular A.U.E.S. successes for 1971. The idea to hang a vehicle from the University footbridge was first conceived in 1970 by that bearded revolutionary of the Mechanical Department, Ross

Banjo. Regrettably there was an unfortunate design oversight and no allowance was made for impact loading of the supporting cable — as a result the bridge-hang of that year was very brief. In 1971 the responsibility for the successful completion of a bridge-hang was handed over to the final year Civil class with Ross Banjo again in charge of proceedings. Every small detail of the project was discussed at great length behind the barred doors of C127 by the select group of volunteers and such was the secrecy surrounding this important mission that on the Prosh eve night a mere thirty-six of the original sixteen volunteers turned up at the rendezvous.

Around midnight on August the fifth the hand-picked team, some of them showing visible signs of nervousness, assembled at the home of well known Irish entrepreneur, David Tse Tung. Doubtless still haunted by the memory of the previous year's disaster, Mr. Banjo arrived for the final briefing session carrying an inflatable dinghy and snorkelling equipment. As the crew impatiently paced the lounge, hall-way, bedroom and table tennis rooms, Dean Egghead and Alan Farmer desperately conducted last minute calculations in the kitchen (which had been commandeered as the officer's quarters). Finally at 1.30 a.m. all was in readiness and a hushed silence descended upon the throng as the job allocations were read out by Dean Egghead. A large diversionary group (including two drunks and a slightly-the-worse-for-a-pub-fight Nick Spagettie) were to proceed to the Angus Street Police Headquarters and there sing a medley of Christmas Carols, thus lulling the officers of the law into a false sense of security. The diversionary patrol was the first to leave the home base and as they slipped out through the secret exit there was much back-slapping and many whispered cries of "Good luck, chaps" filled the crisp night air.

Next to be selected were the lookouts needed to man the numerous torchlight communications posts along the banks of the Torrens. Amongst those issued with the specially designed shielded torches were Andrew Parsnip, Ron Sinsberry, Simon Fitzdavids, Ion Overdue and John Martins, with Arthur Slanders and Chris Manly as signal relay officers. The most vital task of guarding the men's toilet near the King William Road bridge against police attack was given to the man with a wealth of experience in this field, Lou Shaggio. Last to leave G.H.Q. were the two car crews along with the project photographer Mark Autopsi, a resourceful and determined young man who was to exhibit later that night, in keeping with the traditions of his countrymen, an extraordinary degree of daring and courage in his pursuit for a complete pictorial record.

Little need be said about the actual operation, which was executed with the precision of an 1812 steam pump. The FJ Holden was stealthily pushed from its hiding place in a North Adelaide shed and was then towed along Frome Road and straight past the first look-out sentry, despite the absence of an all clear signal. (The lookout later indignantly claimed to have been "hiding"). Further down the road the car crews were greeted by what looked like an impromptu Mardi Gras torchlight procession and it probably meant that the entire police force was hanging from the footbridge. Nevertheless it was decided to push onwards, ignoring the complete signalling system. The Holden was unhooked from the towing car and then pushed down the grassy slopes and onto the lower level gravel path. A small disaster was narrowly avoided when a sentry, told to direct the oncoming car over the lowest end of the stone wall bordering the path, wandered off and inadvertently stood on the highest

part. While friends and relatives of those responsible are still alive and living in this State, I am unable to explain in detail how the Holden was lifted by a single chain and suspended from the centre of the footbridge. Suffice to say that under the skilful leadership of Dean Egghead, Alan Farmer, Ross Banjo, Chris Manly and Wayne Grim, the entire lifting operation was completed in under four minutes. Within another three minutes the equipment used had been quickly bundled into a nearby utility and the triumphant crews were returning to the base camp for a well earned victory drink.

No description of this epic bridge-hang would be completed

without a mention of the irresponsible student action which followed as a result of this brilliant stunt. For reasons which remain quite unclear, a large number of radical students gathered on the bridge next morning and proceeded to "bounce" the car into the river. This exhibition of uncontrolled mob violence clearly showed that: (a) long haired students have no respect for cars hung from footbridges; (b) there is still room for improvement in the vehicle suspension system.

Let us hope that in future years those who are to follow in our footsteps will learn from our costly mistakes and buy a huge bloody big chain!!



# '71 Dinner-Tonsley Style

PETE WILSON

Traditionally, this year's dinner was held on the Wednesday of Prosh Week. The venue was the Hotel Tonsley which provided a first class meal. No show was provided by the management but Jim Tabolotny did provide a performance later in the night.

This year did not provide a warm-up at the brewery in the afternoon; however, most people managed to arrive early to whet up an appetite and set the stage for a lively evening. Two in particular, Jim and Con Koutsamanis, who, drinking steadily, seemed determined to get a head start on the rest of the field.

The dinner started off slowly until "The Queen" was toasted, whereupon the final year Civil class, in true patriotic spirit, showed the benefit of their practice at Leigh Creek, when they presented their touching rendition of "God Save the Queen". The remainder of the Faculty joined in heartily, the event being marred slightly by the Greeks stumbling over the words. The pace for the evening had been set.

The Dean of the Faculty, Prof. Miller, responded to a toast to the guest and staff and a couple of "hot" anecdotes went down well (along with the beers) among the swilling multitude. However, as the speech progressed the natives became increasingly restless, especially one of Greek origin, no names Con, who interjected regularly. A special thanks must go to Prof. Miller, who made a stirring effort to race back from Sydney to attend the dinner.

The highlight of the evening was our guest speaker, Mr. Mick Young, Secretary of the A.L.P. This was the first time tradition had been broken by inviting a non-engineering person to talk. Undaunted by frequent interjections, he enlightened us on his recent trip to Red China and those who listened found it informative and interesting, even though a touch of politics was introduced. The classic comment

of the evening came when Tabolotny, still leading the field by a jug, interjected randomly with "What about Canada?", causing Mick to fly off on a tangent to answer.

The final speech of the evening, the President's report, was presented by the inimitable Wayne Groom, who, surprisingly, could sustain enough interest to keep the masses quiet.

By this stage everyone was sufficiently conditioned for the more elegant part of the evening, viz. the jokes, which could be enjoyed over dessert and, for a few, coffee. It was about this time that the staff and guests were seen hurriedly making for the door. The two members of the gentle sex did not appear particularly perturbed by the proceedings but

the management did, which forced an early closure of the bar.

For some this was the close of the night but for others it was time to catch up on a few more beers at a party. The final year Civils ended up at Brian Saunders' home, where a small group delighted in singing some well known ballads into the early hours of the morning. Thanks must go to Andy Parsons who had enough foresight to buy a dozen during the evening. A hard core, led by Lou Baggio and Geoff Wallbridge, eventually found their way to the Bay Ganew where their frustrations were duly satisfied.

Thus ended the '71 Dinner, highly enjoyable and boasting a record attendance, now but a clouded memory of the past.





# A.N.E.S.A. SYMPOSIUM

BRUCE SMITH

From the 16th to the 21st of May the annual Engineering Symposium was held in Melbourne. This was organised by our national body, the Australian National Engineering Students Association. The topic for discussion was the Philosophy of Engineers. About a dozen Adelaide students contributed to the total attendance of slightly over one hundred and fifty.

There were two main themes for the week; secondly to consider the Philosophy of Engineers, and firstly to enjoy yourself. Seven talks were arranged which were all quite good. The speakers were from a broad background of industry and Government, which produced balanced viewpoints on your responsibilities as an Engineer:- it also produced some contradictions which led to show the value of such discussion. All speakers allowed a generous question time, which more than one must have regretted!

However, only the big industrial representatives showed any evasiveness, and without a doubt those who attended the talks gained a lot.

Towards the end of the week there was a noticeable decrease in attendances at the lectures. This was not due to a drop in interest or quality, but rather over-involvement in the social activities.

We became acquainted at the informal welcome on the first night. A few (quite a few) chairs, glasses, etc. went West and a number of the other guests at the Federal Hotel went elsewhere too! The cabaret at the George Hotel was not as successful as it could have been. It seems the birds thought that St. Kilda was a rough neighbourhood, and they'd also heard a few stories about a football I.V. at night at that hotel, so they weren't keen to come. The next night at the Eltham

Barrel was a different story. The girls showed no hesitation in rolling up to one of the classiest places in Melbourne. A.N.E.S.A. showed no hesitation in shouting the beers. This was probably the climax of the visit, even if the Ball or Dinner were supposed to be. However, I must not detract from these events, even if the organisers of the Ball could have taken a few notes from "Shakedown".

At the conclusion of the Dinner (which represented the wind-up) some of the boys got a bit wound up and tried their hand at demolishing the hotel. They did a good job.

Besides all this, it was still possible to view the sites of Melbourne, Tullamarine, Westgate, the Universities and the dirty streets.

I'm sure everyone enjoyed themselves and expect to see many of them in Brisbane in "72" as well as you?



"Er . . . it would appear that, essentially speaking, the . . er . . . transfer of momentum, as it were, . . er . . . and the plastic shear flow . . . er . . . in general terms . . . ."

# 2nd YEAR SURVEY

BILL SHEPHERD, LELDE VITOLS.

This years camp was the best ever held for two main reasons:

1. N.F.C.'s new stadium was opened for the first time.
2. Lelde (SEX).

The first week was spent in brilliant sunshine, with campers utilizing it with quiet strolls along wooded paths or by the river banks. One favourite was up through the woods to a lovely little clearing which overlooked the lush valley of the Onkapinga River. To lie here in the shade of a large gum, occasionally dozing, occasionally scribbling down some number that some fool on some kind of telescope thing would call out, and then changing it because he was wrong, was really living. To add to this one soon found himself surrounded by incompetence and the stink of insect repellent.

After a day of peaceful rest, the evenings brought with them a lot of hard work. This included sorties to the Algate pub., table tennis, bridge and then off to the gym for either basketball or volley ball. After a nourishing supper the hard work continued and then off to bed for a good night's sleep.

The second week brought with it the rain, and of course, out came the football and the golf clubs. A swing between circular

curve readings was most enjoyable.

Several worthwhile events happened during this week. Firstly, because we weren't getting enough exercise. D.A.C. decided we should have an "organized" basketball match. Three teams played off and most players would have been suspended for life. The most enjoyable afternoon of camp arose because it was too wet for field work. At 2.p.m. sharp a past exam paper was handed out, to be completed and handed in at 5.p.m. sharp. At 3.p.m. the bridge and table tennis stopped and each person set about doing their allotted problem. Once done it was checked with someone else who had done it and then passed around for xeroxing. A blazing log fire roared the whole time and, our spirits warmed, an impromptu sing song took place; one table trying to outdo another with harmony and originality. I don't think anyone failed the "exam".

Butch had been having trouble with the small shower recesses and so it was no surprise to find Craig had persuaded him to use the dam. Butch would not go it alone and I believe they were both looking for the soap in the mud when the law arrived. Punishment

— including those who stood by and laughed — extra work after tea.

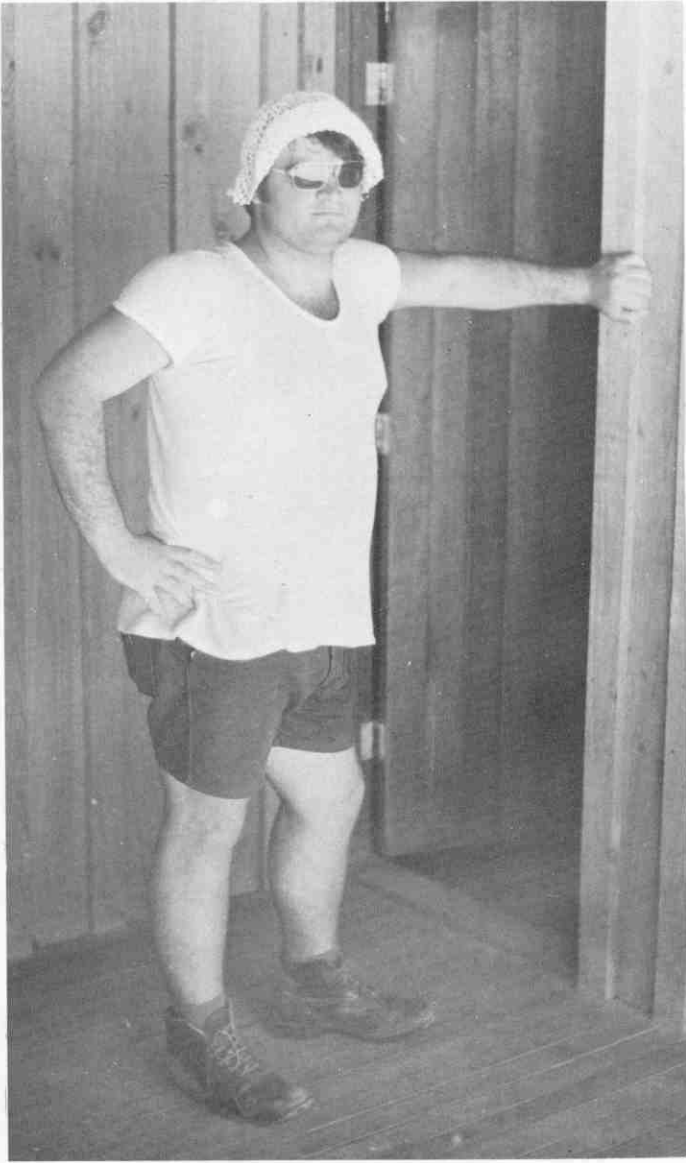
The final evening also had its moments. Andy Close had a close shave when he brushed with a razor. Fortunately it only removed half his beard. For the bridge enthusiasts, bridge was played by the fatigueless four from six in the evening to five the next morning (11 hours) after which time the scores only varied by 20 points. The pillow fight only lasted about one hour and the score after that was several sore bodies.

In conclusion I must thank the silent minority who spent the best part of the two weeks slogging away at surveying. If it wasn't for these stoppers camp for the rest of us would have been torture. Thanks also to J.D. White who kept our mums happy by keeping lecherous Lelde away from us after dark.

A warning to all those women hoping to find refuge from domesticity in Civil Engineering — Beware, for you are destined to:  
(1) Carry all heavy instruments e.g. theodolites, levels, and axes.  
(2) Wash dishes and sweep floors.  
(3) Nurse suffering Engees with allergies.  
(4) Travel 7 miles to bed and 7 miles to breakfast.



"You're not going to another peace meeting, Albert!"



# FINAL YEAR SURVEY

ROD MOORE

Leaving Adelaide's early winter rain and cold, twenty-six final year Civils set forth on the May vacation survey camp. Ahead lay the untamed wilderness of the Leigh Creek area, soon to have civilisation thrust upon it in the form of seven separate railway lines set out between two hills approximately one mile apart.

With the reassuring advice that it would be fine and cloudless in Leigh Creek at that time of the year, the Thomas Tour coach conveyed us to the site. Jim Ferry, having been awake for an incredible thirty minutes, quickly adjusted himself to the new surroundings and proceeded to sleep for the next couple of hours in the back seat of the bus.

The first main stop was at Quorn where the 'Old Mill' cafe was suggested as a good victualling point. Investigations showed that:

- (1) the food, although good, was relatively expensive, and
- (2) the establishment was not licensed.

A quick retreat from the 'Mill' with a mass migration to the 'Transcontinental Hotel' with its Western style swing doors, case-hardened barbecued chops and COLD BEERS — it was then easy to see where the preferences lay.

Continuing on towards the promised lands, Dilliway and McSkimming cracked under the pressure of the parching sun and retired to the rear of the bus to partake of a few discrete "cold ones". Soon after, by sheer coincidence, an unscheduled stop was requested resulting in the local saltbush thinking that all its Christmasses had come at once.

Arriving at Leigh Creek at tea-time, a meeting was held in which it was divulged by Mr. Robinson, that the weather prospects were bad, and regardless of earlier advice, but true to form, it looked as though Leigh Creek's annual rainfall was due to fall within the next two weeks. Needless to say, many a (crocodile) tear was shed even by the more hardened members of the group.

That night, after the pictures, a football game was conducted on the primary school oval. Many a painful imprecation was emitted into the night air as misguided feet hit the ground instead of the ball.

The following day the Aroona Dam was visited. In true pioneering spirit everyone started the arduous climb to the summit. Dr. Brooks (alias King of the Wild T2), possibly still recovering from last year's effort (refer "Hysterisis 1970", p42) declined to make a second attempt.

The men were soon sorted from the boys as the going became tougher, the air thinner and the idea more ridiculous. Eventually, the summit was conquered by the remaining 12 (out of 26!) thus adding another page to the role of those illustrious and courageous mountain climbers — the "Old Aroonians".

Other highlights of the survey camp were the odd bit of surveying and astronomy, a successful attempt at the record for a group one arm bridge girder hang and the successful combination of beer and calcs. in the converted lounge of 'A' Block.

Awards for the camp are as follows:

**Worst photographers:** Dr. Brooks and Peter Martin for taking so long to adjust their cameras while everyone else was grimly hanging from the bridge girder.

**Optimist of the Camp:** Peter Visentin, for his high spirited comment: "I must do it because I have to do it, but I won't do it, because if I do do it, I won't be able to do it, so I won't do it because I can't do it." Peter has also been recommended for the logic award.

**Fire-warden:** Andy Dracopoulos for ably maintaining a stand at the indoor fire base, and suitably dousing the floor etc., with water thus protecting the building from the outbreak of fire.

**Animal of the camp:** "Stropper" Dilliway, for knocking Lou Baggio unconscious while indulging in-a pillow fight.

**Playboy:** Pete Wilson, for attracting the attention of every young lady in Leigh Creek, 14 years and younger.

**Songwriters' Award:** to Geoff Wallbridge for completing under considerably alcoholic duress, the "Davey Brooks Song", which was later presented in the form of a midnight serenade outside the residence of its hero. The award winning entry was:

"Born in a concrete lab in the university,  
Bent a 5/8ths bar when he was only 3,  
Raised in a lecture theatre C101,  
And calculated stresses for 65 ton."

Chorus:  
"Davey, Davey Brooks  
King of the Wild T2."  
(Tune: "Davey Crockett.")

**Sir Edmund Hillary Encouragement Award:** to Brian Saunders for giving a graphic display, showing why it is preferable, in mountain climbing, to travel along the ridges instead of scaling almost vertical valley walls.

**Group most likely to cause Col. Light to turn in his grave:** goes to Group 5 for maintaining a one day minimum lag behind the other groups, and for having a closing error, in the last curve, of the order of hundreds of feet and dozens of degrees.

However, if the maxim "you always learn from your mistakes" is correct, then the group can now be considered as being a veritable encyclopedia of surveying.

**Impersonation of the camp award:** goes to Wayne "Pink Pussycat" Groom who mimed several members of the staff so well that in the interests of Wayne's survival, details of the winning entry cannot be published.



# PLANT TOUR

KEV MILLER

This year the annual Plant Tour took place in Sydney from May 17th to 21st. Nineteen Chemical Engineering Students plus one staff member, Dr. J.R. Roach, became part of Sydney for these few days.

To get to Sydney on time, all left Adelaide by train on Saturday the 15th, spending Sunday in Melbourne. The two nights spent on the train were used most profitably, e.g. conning birds, drinking, chucking, bridge etc. Consequently none were too alert on arriving at Sydney on Monday morning. The plant trips started that afternoon, and the weeks' itinerary was as follows:

Monday 2.00 p.m.  
Unilever (better known as  
Lever and Kitchen)  
Tuesday 9.30 a.m.  
I.C.I.A.N.Z.  
2.00 p.m.  
LaPorte Chemicals  
Wednesday 9.30 p.m.  
C.S.R. Chemicals  
2.00 p.m.  
Union Carbide  
Thursday 9.30 a.m.  
Caltex Oil Refinery  
2.00 p.m.  
Phillips Imperial Chemicals  
Friday 9.30 a.m.  
C.S.R. Sugar Refinery.

The above tours, which were meant to be the highlights of our "holiday", turned out to be the in-betweens, with our day starting at 5.00 p.m. and finishing at 5.00 a.m. We slept in between, mainly at St. Paul's College, next door to the University of Sydney. The tour was meant mainly for final years but some third years were blooded to corruption also.

A quick resume of our more exciting tours and activities follows: Kings Cross was quite a popular place with the Pink Panther being right abreast of proceedings. The White Horse pub about 100 yards from St. Paul's proved its worth on most nights, the sober amongst them played snooker and billiards, whilst all night card schools were not exactly unpopular.

Almost everyone on the tour seemed to say or do something which became quite noteworthy, and unfortunately too much to recount here. However, one point worth including is that which was considered by all to be the animal act of the trip. A phantom chucker went into action one night and a sleeping Chem. Engee bore the brunt of the action, much to his disgust. Although top

detectives were called in to investigate, the phantom chucker remains at large. During the drinking sessions, which, by the way, induced the phantom to do his deed, many feats were performed and quite a few Engees were drunk under the table (i.e. competition style) and many a wavering line was taken back to St. Paul's.

All too soon, the trip, hence activities, came to an end and two more nights were spent on the train back to Adelaide, leaving Sydney on the Friday night with another day in Melbourne. The same activities were pursued on the train as those undertaken on the trip over. On arrival at Adelaide, 19 Engees were seen to stumble on to the platform and be collected by their respective owners. I say stumbled because 19 people with an average of about 3 dozen hours sleep in 8 nights don't exactly look nimble and athletic.

Next year the trip is to Melbourne where no doubt, this year's tour, though very memorable, will easily be outdone.

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Copy of letter from General Food Corp.  
Green Rice Purchasing Department.

Messrs. Lykes Bros. Steamship Co.,  
Houston. Texas.

Dear Mr. Lykes,

We quote verbatim letter received from our clients:

Hans Gruber,  
Wilhelmstasse  
Hamburg, Germany.

"Der last schipments uf rice ve gedt from you on der lykes schip vas vitt mice schidt mixt. Der rice vas gut enuff budt der mice durds schpolis der trade. ve did nodt see mice schidt in der sample vich you sendt us.

It takes too much time to pick der mice durds from der rice. Ve order kleen rice, und you schipt schidt vitt der rice.

Ve like you to schip us der rice in vun sak and der mice schidt in anoder sak, und den ve mix to soot der customer.

Please write if ve should ship back der schidt and keep der rice or keep der schidt and schip back der rice or schip back der whole schidttten vorks.

Ve vont to do ride in diss matter, budt ve do not like diss schidt business.

vitt much respects,  
Hans Gruber

# COMMITTEE REPORTS

## BUILDING—USERS COMMITTEE

By ALAN BURGESS

Early in 1971 a Committee was set up by the University Council to supervise the proposed building extensions and alterations to the Engineering buildings. The Committee is comprised of the Dean (Chairman), acting heads of Departments, Dr. Brooks as Faculty Representative, Alan Burgess as Student Representative, and the Staff Architect (Secretary).

The proposed extensions and alterations will create additional space for laboratories and lecture rooms in each of the Engineering Departments. In broad outline, Mechanical will take over the second floor of their building and the drawing offices will be located on a new third floor. Electrical will vacate the top floor of the Annexe and move to the western end of the top floor of the main building, into the space vacated by Architecture. Chemical will take over the space vacated by the Electrical Department, in the Annexe, and Civil will occupy the space vacated by the Computing Science Dept. on the first floor of the Annexe. These moves will entail considerable rearrangement of the facilities in those areas which are changing hands, and in some cases changes will also be needed in improving existing laboratories and lecture theatres.

In the past few months the committee has been involved in fairly detailed planning, following submissions from each Department and the students, and the final plans are now being drawn up. If these plans are approved by the Australian Universities Commission, and the work goes ahead according to the present schedule, most of the major building work should be commenced in the 1971 Christmas vacation. It is also planned that as much as possible of the newly acquired space in the existing buildings be ready for use

in First Term 1972. In this way, it is hoped that the inconvenience to the occupants of the buildings will be minimised.

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## DEAN'S COMMITTEE

By ANDY PARSONS

Following the successful election of two student representatives to the Faculty, it appears that this is the last year in which the Dean's Committee will meet. The Dean, Professor Miller, now feels that with two student representatives on the Faculty, there is no reason for the Dean's Committee to continue. Will this result in a loss of student representation?

The effectiveness of the Dean's Committee can only be judged by the regularity with which it met. This year the Dean chaired only one lunch-hour meeting.

The purpose of calling this single meeting was to discuss various proposals for the running of the Faculty elections, which were successful.

The other topic raised for discussion was the introduction of humanities lectures into the formal curriculum of the Faculty. Several members of the committee believed that this would be an effective means of broadening the intellectual horizons of engineering students.

However this proposal was rejected by the Dean on the following grounds:

- (a) it would be too expensive;
- (b) it had been tried before and failed;
- (c) students are here to learn the disciplines of engineering not history.

As an alternative, Geoff Wallbridge and Paul Wilkins, both committee members, decided to try and organise a number of lunch-hour lectures, presented by guest lecturers invited from other Faculties. The attendance at these lectures should be indicative of

the interest shown by students in these types of subjects.

As 1971 spells the end of the short-lived Dean's Committee, one can only hope that the general student body takes a greater interest in communicating with the student representatives which they elected. If this interest is not shown, then we are going to lose our representation on the Faculty.

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## ON THE FACULTY

By DAVE GRAY

This year for the first time elections for student representation on the Faculty of Engineering were held.

For the election to be valid a 50% vote from enrolled Engineering students was required. In fact, as a result of strong campaigning by members of the A.U.E.S. a 62% vote was obtained with only 2 informal votes.

As a result of these elections Tim Morris and Robert Riggs are now representing the students on the Faculty. This means that if anyone has any academic problems, grievances or constructive suggestions these two students are the people to see.

For many years now students have been striving to obtain representation on the Faculty and now that their goal has been attained it is hoped that their efforts were not in vain.

Those to see regarding any problems as mentioned above are: Tim Morris — 3rd year Electrical; Robert Riggs — 1st year Electrical.

Others who stood for election were: John White, Reg Coutts, Mike Elliott, Peter Harland.

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# NEW MINIMUM AWARD SALARIES

Reprinted with permission of A.P.E.A.

Since May of this year, private industry employers and the APEA have been negotiating in an endeavour to reach agreement on new minimum award salaries for professional engineers employed under the terms of the following awards:

Professional Engineers Award 1969

Metal Trades Award Part II, Section II

Aircraft Industry Award Part II, Section II

Professional Engineers (Construction Industry) Award

Professional Engineers (Consulting Engineers) Award

Professional Engineers (Chemical Industry) Award

Professional Engineers (Vehicle Industry) Award

An agreement has now been reached which will result in the variation of these awards to prescribe new minimum salaries as set out hereunder:

Group "A"

Qualified Engineer - \$4,525 p.a.

Qualified Engineer - Graduate - \$4,925 p.a.

Experienced Engineer - \$6,850 p.a.

\*Group "B" - \$7,350 p.a.

\*Group "C" - \$8,600 p.a.

\*where these classifications are presently included in these awards.

The establishment of new minimum award salaries as set out above does not in itself constitute grounds for increases in current actual or "paid" salaries and employers retain the right to absorb over-award payments where they so desire.

However, it is understood that in arriving at the total remuneration of professional engineers in their employ, employers will pay regard to all factors they consider relevant, including the general level of total remuneration for the professional engineering services of the type and level concerned.

The term of the award variations shall be for two years. The minimum salary rates agreed upon are to be varied in accordance with national wage adjustments but not for other

reasons unless the parties agree that circumstances have changed in a way which would warrant claims for variation within the period of operation.

The Commonwealth Conciliation and Arbitration Commission varied all of the above Awards on Thursday, 26th August 1971, and the variations will operate from this date.

It should be noted that this agreement is the first to be reached in private industry for the general variation of professional engineers' salaries (i.e. extending beyond one award). Employer organisations request their members to co-operate in the implementation of this agreement which affects an important sector of the salaried work-force. The APEA calls upon its private industry members to assist in the smooth introduction of new industrial relationships between employers and the profession which should act to the present and future advantage of all concerned.

## DETERGENTS - A POLLUTION HAZARD

Reprinted from "Professional Engineer", with permission of A.P.E.A.

The current battle to stem the continuing deterioration of the quality of Canada's fresh-water resources is being fought on many fronts. The problem of control is complex - as complex as the range of pollution sources is wide. Many of the once beautiful waterways are slowly being stifled by the injurious effects of bacteria-laden human wastes, by massive quantities of organic industrial wastes and by toxic pesticides and chemical effluents.

Adding further to the growing burden carried by our lakes and

rivers is the special form of pollution caused by phosphates and nitrates. While these components do not in themselves pose any threat to health at the concentrations involved after diffusion in receiving waters, they do possess nutritive properties which encourage the excessive growth of algae and other forms of undesirable aquatic vegetation.

When large amounts of this vegetation decompose at the end of the growing period, depletion of the vital life-sustaining dissolved oxygen in water occurs.

This form of pollution, which is caused by excess nutrient enrichment, is also referred to as eutrophication and in its extreme form results in the accelerated ageing or dying of lakes.

Phosphates and nitrates are both released to water by the breakdown of human and animal wastes and other organic matter. They are found also in chemical fertilisers and industrial wastes. But scientists have now shown that a substantial part of the increasing nutrient load in our lakes and rivers can be traced



directly to the phosphate-based detergents used extensively in home and industry.

To understand the role of phosphates in water pollution, one must first look at the process of eutrophication. Briefly, eutrophication can be regarded as the progressive increase in biological productivity in a body of water, supported by a continuing abnormally-high input of nutrients which stimulate growth.

Many other factors are also involved which contribute to excessive aquatic plant growth. While some of these factors can be controlled, the phosphate nutrient factor is considered to be one of the most critical and one that can be controlled in such a way as to restrict excessive growth.

Under natural conditions, moderate amounts of nutrient material found in water and in lake and river beds encourage the growth of aquatic vegetation. This vegetation is a food source for fish and for the small organisms on which many fish feed. Left to its own resources, nature provides an ecological balance which may change but little over a long period of time.

The addition of even small quantities of nutrients, particularly phosphates, upsets the ecological balance and triggers an abnormal growth of aquatic vegetation, the most troublesome of which is algae. Decaying algae use up oxygen which is vital to the survival of fish and other organisms — oxygen which is essential also to the growth of aerobic (oxygen-using) micro-organisms which destroy solid and liquid organic wastes in water.

Gradually, with the depletion of dissolved oxygen, anearobic micro-organisms which thrive in the absence of dissolved oxygen became predominant, giving rise to the malodorous by-product of decomposition generally associated with gross pollution.

As the process of eutrophication proceeds, lake shores and beaches become fouled by the evil-smelling accumulations of decaying algae

which have drifted in from open water. If the process is allowed to continue, the condition of a lake can deteriorate to the point where the quality of the water and the shore environment is, to all intents and purposed, destroyed.

The housewife of an older generation got by on washday with scrub-boards, copper boilers and soap. The soap she used was made from animal or vegetable fats and caustic soda (lye). In the 1930's the first synthetic soap-like products appeared on the market. The principal ingredients were derived from petro-chemicals produced by the petroleum industry.

The soaps and the synthetic soap-like products both suffered from disadvantages which reduced their effectiveness as cleaning agents. With soaps the main problem is the fact that in most water supplies, the hardness constituents (ions of calcium, magnesium, iron, etc.) react with the soap, forming a curd or precipitate. Soap is wasted in forming the precipitate and to compensate for this, more soap must be added before washing can take place.

The synthetic soap-like materials do not form a scum with the harness salts, but their effectiveness is nevertheless much reduced by the presence of hardness constituents in the water. Today, these synthetic soap-like materials such as LAS (linear alkylate sulphonate), are commonly referred to as "surfactants". In the 1940's it was found that combining surfactant materials with a special type of phosphate yielded a product with considerably improved performance. It was this discovery that led to the development of today's detergents.

At the upper end of the scale were the heavy-duty laundry detergents and automatic dishwasher products with phosphate content between 28 and 66 per cent. Testing generally less than one per cent were the liquid detergents for manual dishwashing and fabric softeners.

The phosphate level is high in products used specifically for

softening and conditioning water for laundry and washing purposes.

Today, many detergents contain enzymes which have been added for the specific purpose of removing stubborn stains. The enzymes are bacteria-produced chemicals which can break down proteins to form soluble amino-acids. When they are used to launder cloth on which there are protein stains, such as those caused by blood or chocolate, the enzymes convert the normally-insoluble stain to soluble derivatives which are then removed in the washing process.

For many years, the surfactant used in detergents was the petroleum industry product called alkyl benzene sulphonate (ABS). This was the foaming ingredient which produced large quantities of suds when it was mixed with water and agitated. Since ABS was non-biodegradable (that is, it was not broken down to harmless end products such as water and carbon dioxide by the action of bacteria in sewage treatment plants or in open waters), it retained its surfactant properties and continued to produce unsightly foam in rivers and lakes.

The question of biodegradability, however, has no bearing whatever on the problem of nutrient enrichment caused by the phosphate. The fact that a box of detergent is labelled "biodegradable" is no indication that the contents will not contribute to nutrient enrichment and the resulting pollution problem. Biodegradability as represented on these labels refers only to the surfactant (LAS) which constitutes no more than about 20 per cent of the material in the package. The agent which works with the surfactant to give the detergent its tremendous cleaning power is usually sodium poly phosphate (STP). This agent is not biodegradable and on that basis the package product cannot properly be considered biodegradable.

In modern detergents, science has offered the house-wife a powerful and effective cleaning agent but the cost, measured in terms of gradual deterioration in the quality of our water resources,

is frighteningly high. A workable solution to the problem becomes daily more urgent.

Much controversy has arisen in recent months among scientists and industrialists as to the effectiveness of phosphate removal from detergents as a means of controlling the growth of algae and the consequent deterioration of water quality in our lakes and rivers.

Restricting the amount of phosphate used in detergents throughout the country as an immediate measure would reduce the quantity of algae-producing

nutrients being discharged. It would also stimulate the industrial development and production of harmless substitutes for phosphates. The next logical step would be an outright ban on the use of detergent phosphates.

Of the various complete or partial substitutes for phosphates which have been investigated, the best hope at present is sodium nitrilotriacetate (NTA). Although NTA does not contain phosphates, it does contain a small amount of nitrogen which is also a plant nutrient. The nutrient effects of nitrogen, however, are

in most cases much less potent than those of phosphates.

It may be one or two years before harmless substitutes for phosphates are available — or available in sufficient quantities — to provide the same level of cleaning effectiveness offered by existing phosphate detergents. If this is so, the consumer, in the interests of reversing the stifling process of eutrophication, may be called upon to accept detergents that are somewhat less effective, until such time as a satisfactory substitute for phosphates is available in quantity.

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## ELECTRICIANS

GREG WILD



**LEN (LEONARDO) BRAY** — Len is known to be keen on motor bikes, films and cats, while his pet hates are car drivers and dogs. His ultimate ambition is “to better myself in off road bike riding”, but a career on the stage is not unlikely.

**CHRIS COOK** — A past master at the arts of fiddling, sculling and rowing, Christ plans to devote his

life to designing toilet paper that tears along the perforations.

**BRUCE (THE VOICE) CUTTING** — Bruce had a lapse during the year and joined the ranks of the married. Apart from his interest in children, he enjoys microwaves and golf (not necessarily in that order), and has recently developed a dislike for getting out of bed in the mornings.

**PETER CROOK** — Between counter lunches and films, Peter spends most of his time devising methods of living on the dole. He is a Zeta fan from way back and his pet hate is football commentators.

**DICK (B.B) HAWKES** — Dick's main claim to fame during this year has been his ability to shatter lectures with perfectly

timed sound effects. He was the only one of us brave enough to name his project as his pet hate, and naturally enough his ambition is to become Prime Minister.

**PAUL (STAN) HOLLOWAY** — The undisputed final year sculling champion, Paul is reported to practice on Pine-O-Clean. He is a foundation member of the counter lunch club and hates lectures.

**ROBERT (FANG) JACOBS** — Bob's life has recently revolved around his new hi-fi speakers. Few things upset him as much as climbing poles at Buckland Park, and his ultimate ambition is to win the lottery and buy a new mine.

**F. JONES** — "Frew" keeps fairly much to himself, and probably wishes that a few more of his contemporaries would follow his example. A consistent "back bencher", he rates high amongst the regular late entries.

**TONY KAPPLER** — Another "bikie", Tony is believed to be somewhat of a Honda man. His other interests include swimming and camping, and like most other bike riders hates car drivers and wet weather. Tony has been classified as executive material, since his ultimate ambition is to become a bum.

**LE N. H.** — Affectionately known as Larry and has the highest consumption rate on a pound for a pound basis. A star performer in classroom antics, he spent many hours getting his program "walking".

**LO C.C.Y.** — Chris, a staunch Port Adelaide fan, was married during the year. His dislike of doing the dishes is surpassed only by his reluctance to start his project. Ambition is to complete his project in three weeks and make a killing as a bookie on the grand final.

**JOHN (MAC) MACKENZIE** — John's interests include a blue Consul, a red Jeep, half a vermilion fire Zephyr and a dirty — white Ford F100. Despite all this, John still manages to take an interest in grouping. A master at the art of telling Volkswagen stories, John is known to become faint at the sight of blue paint.

**ANDREW (NODDY) MANDER-JONES** — Rumour has

it that Andrew is somewhat of an authority on organs and railway spikes. His pet hate is Sandwich Neal, and by hook or by crook he hopes to own the CDC 6400. Despite all our efforts, we never did discover what happened in the Flinders Ranges.

**ANDREW (SANDWICH) NEAL** — Contrary to all rumours, Andrew does not devote all his time to eating sandwiches, but takes a great interest in his fiancée and trains. His pet hate is Noddy-Jones, and he seems destined to achieve his goal of porter, second class, Terowie.

**DAVID (ANDY CAP) NICHOLLS** — Dave was nominated as "Strapper of the Year", but was defeated on the grounds that his pet hate is strapping. Believe it or not, Dave's ambition is to lift his game.

**GARTH (DRIBBLES) PEDLER** — Apart from his groovy blue F.J. Garth takes an interest in basketball. Although he seems destined to spend the next 18 months in the clutches of the army, Garth's ultimate ambition is to lose his nickname.

**TERENCE O'SHAUGHNESSY** — Little hope is held for Terry ever arriving on time for a lecture. He is a debater of some note and has an aversion towards the establishment and long shirts.

**DAVID (DR. PORSCHE) PITTS** — There has been an ugly rumour circulating to the effect that David is a satisfied Volkswagen owner. He is known to shoot well under pressure, hates Ralph Nader, and wants nothing more out of life than a Porsche.

**JAMES ROENNFELDT** — A foundation member of the counter lunch club, Jim is known to be a successful football coach. With much hard work he will probably achieve his ambition of becoming a class 4 postman.

**ROBERT ROHRLACH** — Bob is to be commended for putting up with Roy Schmidt for 5 years. Holds the record for the greatest number of job interviews and free trips. Will finally free himself of Roy when he gets married next year.

**ROY SCHMIDT** — Roy really smashed his way to the Driver of the Year award. His principal

interest is a TR4, and his pet hates include insurance companies and sandwiches. Ambition is "to give people the schmidts".

**MIKELIS (MAX) SVILANS** — Mich's main interest is sculling of one sort or another. He hates Monday mornings and his ambition is to see the world.

**GREG (GRABBER) WILD** — Receives Faux Pas of the Year award and has a nickname of doubtful origin. Has an aversion to Nicholls and grouping. Greg's ambition is to be the only general manager of B.H.P. to receive more than one Magarey Medal vote.

**HENRY WRONIAK** — Henry (the Twistie Kid) skilfully out-manoeuvred all other candidates this year to obtain his first preference for a posting next year, a directorship in Perth. His parents, on learning this, promptly left home, and Henry got an unexpected preview of what was to come.

**YAP (RAYMOND) S.** — Ray showed a tremendous amount of enthusiasm when he started his project. Ultimate ambition is to build 100 tankers by 1981, while completing a Ph.D. in interior decorating.

**PAUL (BLACK FAIRY) DEWARD** — Dubbed the Black Fairy by the 3rd years for his prowess in law enforcement. For 2 years Paul has subjected himself to continual radiation in an attempt to fail his army medical. Self-confessed ambition is to become a sex-maniac.

**PAUL (WILBUR) WILKINS** — Although Paul has been at Uni. longer than most of us, he still doesn't know the starting time of lectures. Paul represents our interests on most student committees and his ultimate ambition is to graduate.

#### FICKLE FINAL YEAR FINGER AWARDS

Strapper of the Year — **BRAY, L.R.**

Driver of the Year — **SCHMIDT, R.A.**

Punctuality Award — **O'SHAUGHNESSY, T.J.**

Degenerate of the Year — **NICHOLLS, D.R.**

Faux Pas of the Year — **WILD, G.R.**

Satorial Elegance Award — **PITTS, D.J. and WILD, G.R.**

# MECHANICS

HAMISH ROBSON



"Sniffles" HO can always be relied upon to ask an indefinite number of questions during seminar sessions. This is probably the reason why the cry of "HO must go" was heard at various times during the year. HO excelled himself during the machine design exam by asking three questions (aloud) which Mr. Doble proceeded to answer (also aloud).

BOEY is the little Asian chap whose deep bellowing voice reminds one of a polar bear singing through a megaphone.

MUNRO is a rower. It is hard to say anything about a rower without risking prosecution for writing obscenities. For those who must know more I suggest you contact Ian and ask him about the Whyalla trip. Ask the rest of the class, for that matter . . . Ian is otherwise known as "Fungus", a term which I believe refers to a blotchy spread of discolouration directly below his lower lip.

PHIL SKENE is at present working on the design of his revolutionary Skene gun, an awesome device which the designer claims will have the capacity to desex wombats at 12,000 yards. Phil has been in great demand as a table tennis opponent, such is his incompetence . . .

"BIG C" MARK CICOZZI is the Italian wonder boy of the

class and our answer to Valentino. Don't sit in front of Mark when he's eating stewed prunes. Don't sit behind, either. Mark is rightfully seeded the number one Italian table tennis player of the class.

VIC "BEARD" MUSSOLINO stunned lecturers and students alike when he announced a six litre, fuel injected, air cooled truck engine as his design project. This ambitious design was later modified. Watch out for Vic's big, bushy, black beard which is said to have a hypnotic effect.

TONY BROOKMAN is the grandpa of the class. In fact, he's so old that he's married. He spent first term designing cupboards, the May holidays building cupboards and second term designing more cupboards. By now his whole house is probably one huge cupboard. All enquiries regarding mechanical door stops should be directed to Tony, one of the world's leading authorities on this subject.

TAN, TAN, KESAVAN & VUONG spent so much time in the library that I can't remember who is who, except that one of them looks like an Asian version of Elvis Presley. All the aforementioned would be a handy asset for any engineering class as they represent a walking reference library and are invaluable as laboratory practical group leaders.

ALAN "THE FARMER" PALMER is a rally fanatic who practices what he preaches in a Datsun 1600. Alan seems to spend most of his time commuting between the final year room and Balaklava, where it is rumoured he runs a mouse farm. Alan was the 1971 A.U.E.S. treasurer.

ASH CAMPBELL may be seen eating his lunch during any lecture conducted after 9.00 a.m. Simply look for a large pile of lunch wraps, banana peels and bread crumbs. Ash will be in the middle somewhere.

TREVOR PITKIN wears a leather jacket to look tough. He's not really as tough as he looks. Actually he doesn't even look tough. It is not commonly known that Trevor glows a bright red in the dark.

TERRY NICHOLLS looks and dresses like a smart young executive. As they say looks can be deceptive. An avid speedboat enthusiast, Terry has nevertheless failed to extract more than five knots from the departmental hydrofoil much to his disgust. He is now trying to sink it.

DAVE RENMOON occasionally blunders into the final year room, looking like a fresher who has lost his way.

HAMISH ROBSON is rumoured to be related to Henry Ford, Rigby & Mario Lanza. He was Secretary of the A.U.E.S. and organised this year's car trial.

# CHEMICALS

VIC FARRINGTON



**ROD ANDERSON** — (Plant trip, on the morning after) “O.K. you guys, who’s the phantom chucker?”

**DAVE RYAN** — (On the train to Sydney) “Canty’s trying to Mac-beth.”

**ROGER CANTY** — “All lies, we are the Beth of friends.”

**VIC FARRINGTON** — “An early bird no, a nester well . . .”

**IAN “THE FOOT” COEDECKE** — (At the Pink Panther) “What you’re are not leaving yet, you pikers? It’s only 3 a.m.”

**DAVE “THREE TO THE LEFT” HACKETT** — (At Union Carbide Hormone Plant) “This place is a brothel. You can almost hear the hor-mones.”

**MARTIN JONES** — (On the train) “I fell alright, it’s only my stomach that hurts.”

**KADIR** — Remembered by Shell for conscientious work for the company. Those 4 or 5 pastel-shaded drawings were sought by everyone.

**GEORGE KOKOTI** — Champion of the working class. Demonstrates his ability well.

**LIM** — Annihilated the Civils at bridge, teamed with the veteran of three hands of bridge, Rod Anderson.

**KEVIN “DEAL ’EM OUT” O’KEEFFE** — (To stripper at Pink Panther) “Stop stuffing around and get your gear off.”

**JAVET SHAKOOR** — The unknown member of the class. Nobody knows whether he is a member of the class or not.

**BOB TITLEY** — Words defy Bob.

**BOB TUCKER** — (To pro. at the Cross) “O.K., no group concession but how about student concession?”

**JOHN KEILY** — (Fiancee-less on the train) “I woke up this morning, and my pillow was . . . censored.”

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## PESSIMIST

And of course you’ve heard about the pessimistic historian whose latest book has chapter headings that read “World War One,” “World War Two” and “Watch This Space.”

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When the Creator was making the world, he called Man aside and bestowed upon him 20 years of normal sex life. Man was horrified. “Only 20 years?” But the Creator refused to budge.

He called the Monkey and gave him 20 years. “But I don’t need 20 years,” the Monkey protested. “Ten is plenty.”

Man spoke up, “Can I have the other 10 years?” The Monkey graciously agreed.

Then the Creator called the Lion and gave him 20 years. The Lion, too, only needed 10 years. Again Man asked, “Can I have the other 10 years?”

The Lion roared, “Of course.”

Then came the Donkey. He was given 20 years, but 10 years was enough for him, too. Man again asked for the spare 10 and got them.

This explains why Man has 20 years of normal sex life, 10 years of monkeying around, 10 years of lion about it, and 10 years of making an ass out of himself.

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**CONSTANTINE KOUTSAMANIS** – Rumoured to actually be George Sved's long lost son. "Con"-stantly asking "intelligent" questions in lectures in an effort to impress lecturers. Will probably fail.

"Aw come on G.S., it wasn't that funny!"

**PETER McSKIMMING** – Only known father in the class. Constantly sporting new pair of shoes. Will probably end up as salesman for Raoul Merton's.

"I had to buy some new thongs – my seminar is this week."

**JOCH LANKENAU** – A messy dresser – spends much of his time at Salvation Army Sales. Reported to be a "close" friend of Andy Dracopoulos.

**GEOFF WALLBRIDGE** – Never seemed to be able to fully grasp the meaning of each lecture. Constantly confused the lecturer, the class and himself in an effort to discover what he couldn't understand.

"Yes ... I know ... but why?"

**TREV DANIELLS** – Don't know how this boy ever got to final year. Has not studied past 9

o'clock in his life. A keen Port follower, he was very disappointed to see North win the grand final.

"What's that Mum? ... 4 a.m. already?"

**BRENTON SMITH** – Upset other members in his group at Survey Camp by wanting to measure distances with a micrometer gauge. Enjoys a quiet game of bridge and doesn't object to being "dummy" – as long as its not more than once in every hundred hands.

"Look – if you lead the queen of spades that will finesse his king which in turn means ..."

**RALPH BENHAM** – One of the most well liked and respected members of class. Found constantly giving Ray "Stroker" fatherly advice on how to play his hand. Will most probably end up as a barber.

**PETER WILSON** – Can attract every girl, 14 years and under within a radius of 10 miles just by undoing his top shirt button. Acts tough until challenged.

"I'm not handsome – just irresistible!"

**PETER VISENTIN** – Optimist of class – hopes to become President of U.S.A. Will probably write a best seller titled "I CAN ... AND I WILL".

**LOU BAGGIO** – Tough good looking Italian, mobbed by women wherever he goes – at least that's his story.

"Hey you guys – it looked so nice out today so I thought I'd leave it out!"

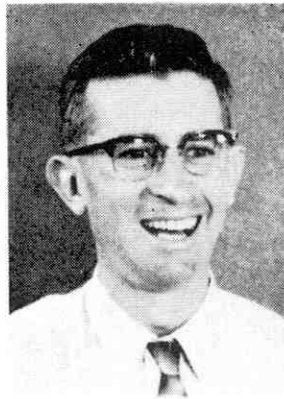
**DAVE GRAY** – Successful lawyer, entrepreneur, compere and magazine editor, his future looked rosy once he finished his honours degree – unfortunately he got married and was never heard of again.

"Dr. Brooks – do you want these rocks removed from under the wheels?"

**ANDREW PARSONS** – Won't allow anyone to criticise Brenton Smith while Brent's not around – encourages them to when he is around. Will probably end up working for Brent as a draughtsman.

"My solution was perfect – but Smithy enlarged on it!"

## ABOUT 10 YEARS AGO



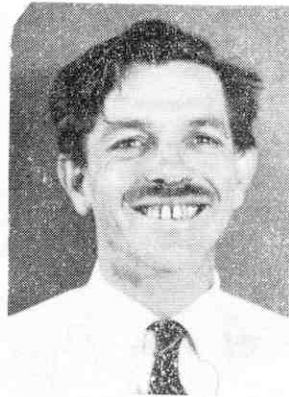
*"I have a fine set of teeth, haven't I?"*



*"Looking for someone with a little authority? I have as little as anyone."*



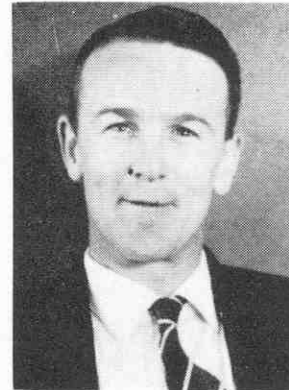
*"SMILE! Later today you won't feel like it."*



*"Eureka !!"*



*"Worrrk is the curse of the drinking class."*



*Thinks: "That Sabrina is a nice big. . . ."*

### THE STORY OF A PRINCESS

Many years ago there lived a wise old Professor who was head of a department in a far off university. One day he found a rusty old strain gauge lying in a field, so he took it home and began to vigorously polish it. Suddenly, in a puff of smoke, a huge geni appeared and said to the Professor.

"You may have any wish you desire."

Upon hearing this the Professor thought deeply for a long while and finally he replied.

"What I really want is a princess for a secretary. She must be someone who is beautiful and always happy but at the same time is reliable and efficient."

To this request the geni of the strain gauge replied.

"Your wish will come true. She will appear when North Adelaide win their next premiership — but it is written in the law of the Genis that she must leave again when they win their next premiership after that."

As the years passed by, the Professor waited patiently, hoping

that North Adelaide would win a premiership. Finally in the sixtieth year of that century, North Adelaide won their premiership. Remembering the promise of the Geni, the excited Professor immediately rushed to his office. There, sitting behind the typewriter was Mrs. Walls — his wish had come true, for here was the beautiful princess.

For a long time they sat and talked. The Professor could hardly believe his ears, for she was so kind and warm. As the years progressed, he found that she was also very reliable and efficient.

For not only did she handle all of his business, but she also helped the other staff members as well as taking good care of all the students and their needs. Everybody was so happy because they all knew a princess — and they knew that she was not an ordinary princess because they found that she was capable of giving an equal share of her love to all who were around her.

Everybody was happy — everybody, that is, except for the Professor. For he kept remembering how the geni had told him that she would have to

leave when North Adelaide won their next premiership.

Finally after eleven years the unhappy day came — North Adelaide won their next premiership. The rumour that Mrs. Walls would have to leave spread like wildfire throughout the department. At first the people were very unhappy and they cried out despairingly

"Mrs. Walls, please don't go."

But then the Geni reappeared and he seemd very angry. He told the tearful people that they had been lucky to have a princess for eleven years and they should not be greedy but should be willing to let her share her warmth and love with other people.

Immediately the people knew that the wise old geni was right and so they wished Mrs. Walls all the happiness in the world and said goodbye.

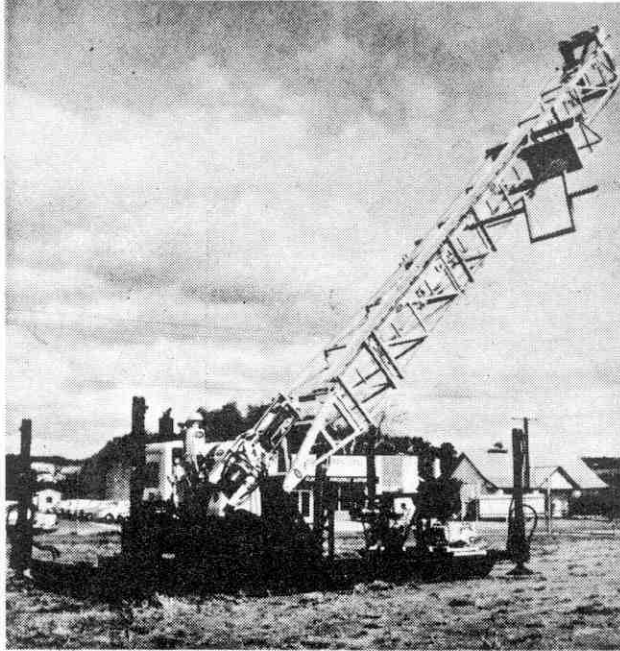
But even today, whenever you travel through this faraway department, you can always tell these people from the rest by the warm smile that lights up their faces whenever you mention the word "PRINCESS".





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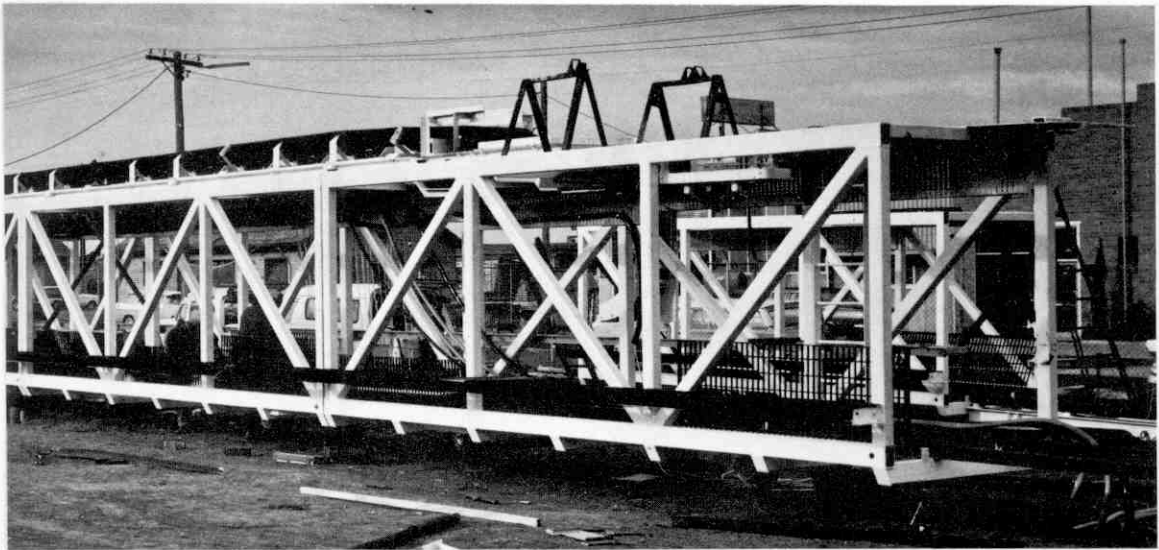
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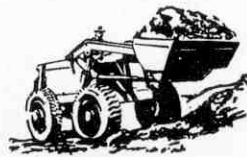


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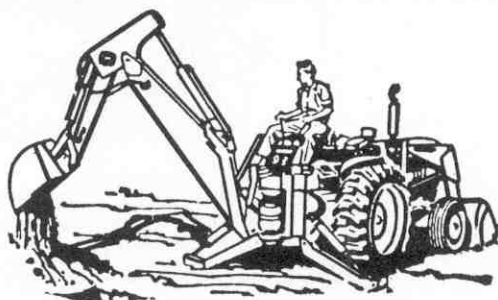
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For information on career opportunities at Altona Petrochemical Company apply to:

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**Altona Petrochemical Company Ltd.**

*Maidstone Street,  
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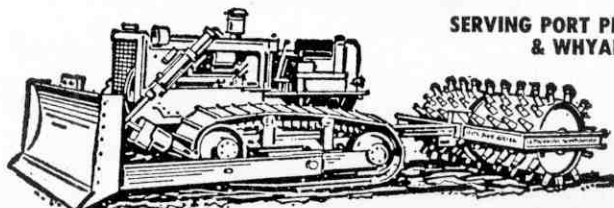
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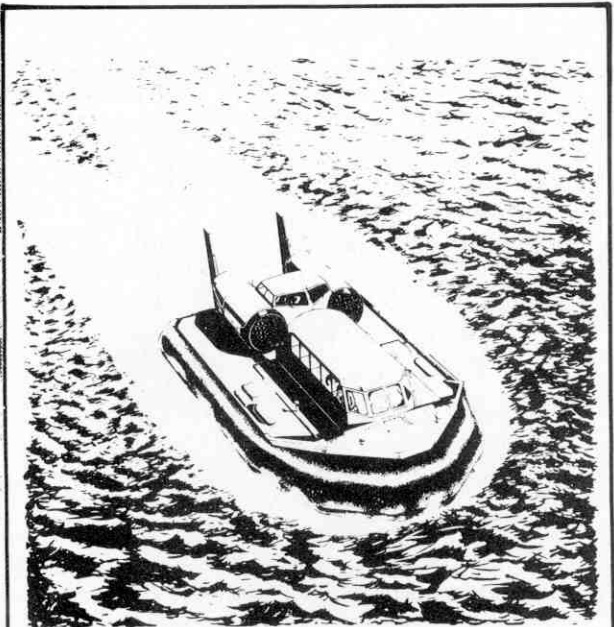


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30 years: Married with one or two children?  
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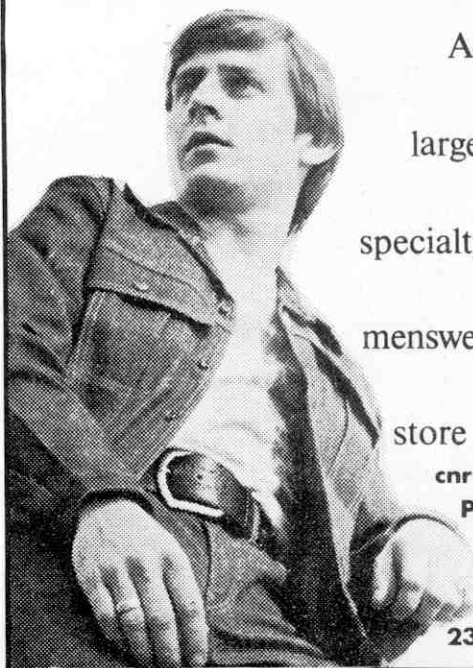
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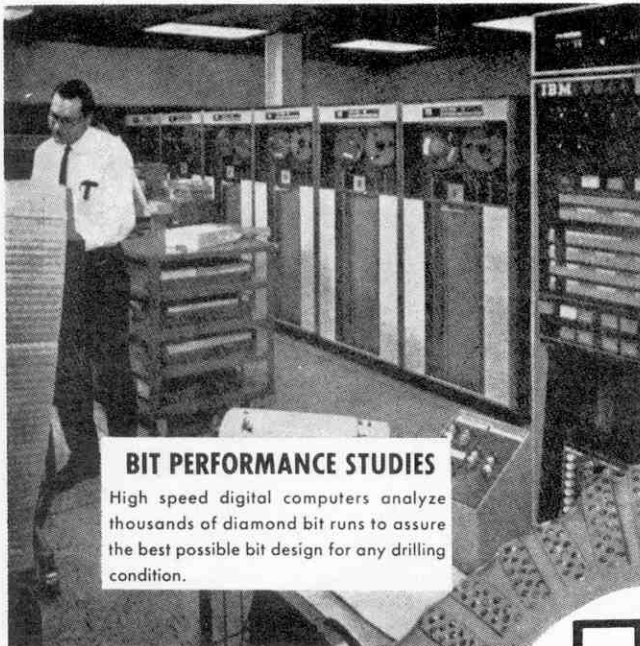


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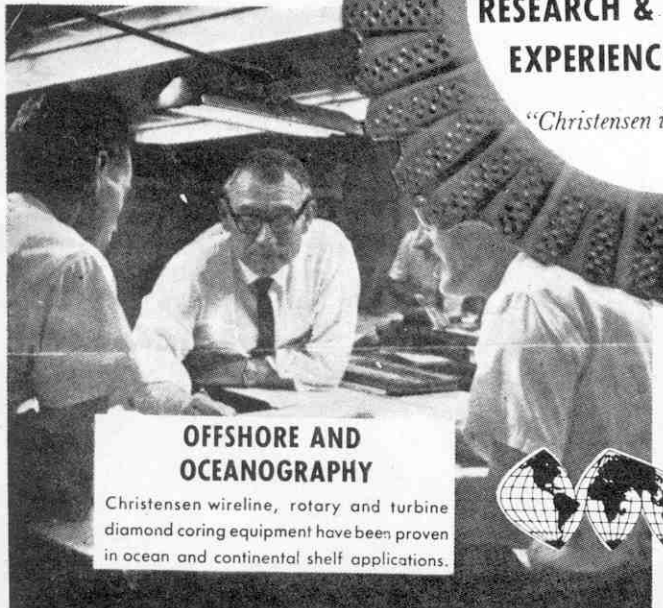


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Then there's David Jones' menswear . . . casual, sporting or formal . . . from the best men's fashion houses all over the world . . . plus just the right accessories to put the finishing touch to the outfit of your choice.

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David Jones' sculpture 'Progress'  
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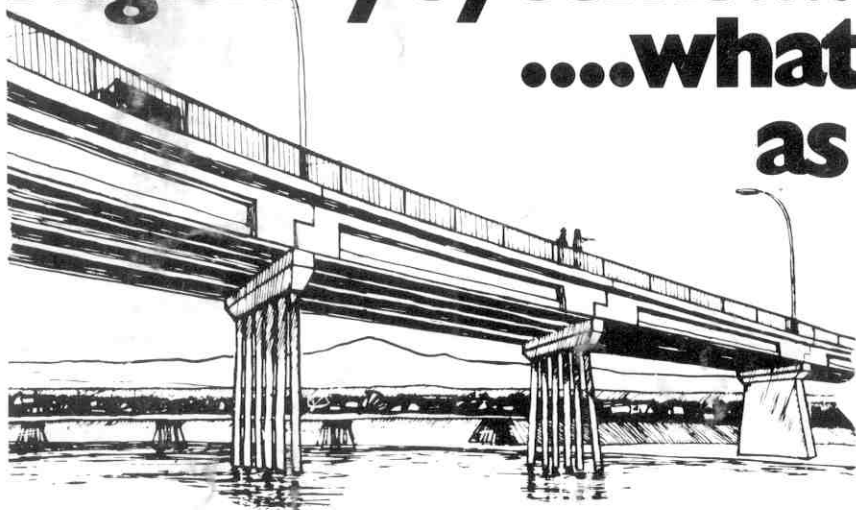


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Take the Port Augusta Bridge, for example. Spanning the head of Spencer Gulf it will be the only effective road connection joining Eyre Peninsula and the West to major centres in the East. It is part of a scheme estimated at \$2,000,000.

The entire project was designed by the Highways Department, South Australia. The Public Service of South Australia is one of the largest employers in the

State, employing approximately 400 professional engineers and a large group of sub-professional engineering and technical officers.

### **THE CHALLENGE:**

To be part of the team on an exciting variety of major State projects.

**The work:** In one of the Departments of the Public Service of South Australia:

**Highways**  
Plan, design and construct far-reaching arteries of transportation.

**Engineering & Water Supply**  
design and construct reservoirs and pipelines.

**Public Buildings**  
design, mechanical, electrical, structural and civil engineering work for building projects. Supervise contracts.

**Marine & Harbors**  
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