Mr Jack Sharp's Farewell

24 July 1974

Richard Bramley  Bev Cooper

Alec Macdonald
Arthur Birch

Arthur Smith

JACK SHARP'S FAREWELL

Soccer Grandfinal 1974

1974

AUSTRALIA 75 10-15 MARCH 1975

Vol. 6 No. 3 28 March 1975

# ANU Open Days: the people got to know us . . .

**The University opened its doors to the public for the first time in several years during the Australia '75 Festival.**

There were models, displays, films explanations of scienfitic equipment and demonstrations to excite the interests of the many school students and Canberra and interstate people who visited ANU during the week 10 – 15 March.

The Research School of Physical Sciences threw open its doors, attracting questions and furrowed brows with its homopolar generator, magnet laboratory, rail gun, lasers, plasma laboratory, high energy nuclear particle accelerators and variable length drift tube.

Altogether, four research schools, 14 departments and two faculties participated in ANU Open Days.

More Open Days pictures page 9.

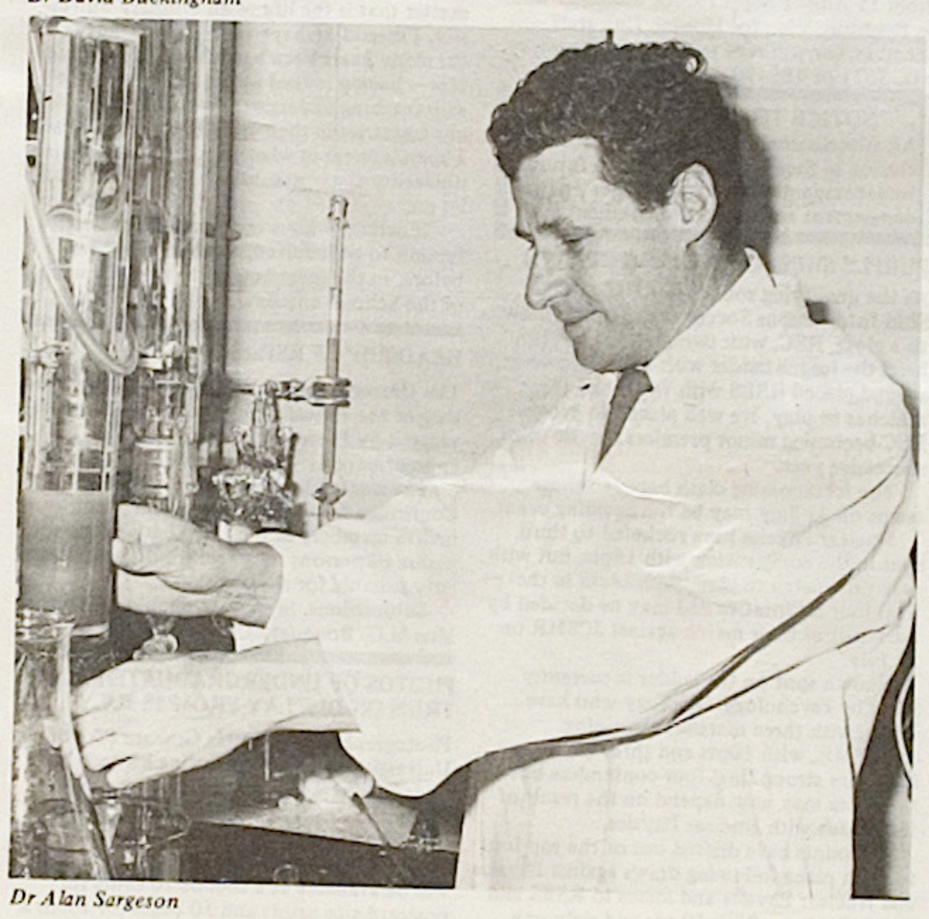
*Left: A study of intense concentration and skilful hands. Mr Chris Tomkins, of the Research School of Chemistry, gave demonstrations to large group of visitors during University Open Days of an art which is not often seen in public – glassblowing. In his hands formless pieces of glass became not only pieces of scientific use but of artistic beauty.*



*Upper left: Of special interest to visitors to the Research School of Chemistry during University Open Days was a display in the School's foyer of a collection of original books on atomic theory, structure and stereochemistry and the Periodic System. The books, dating back to the 18th Century, have been collected by Professor A.J. Birch, (pictured), Dean of the Research School of Chemistry, who interspersed them with models of atoms and photographic enlargements to make up the display, entitled 'The History of Atoms and Molecules'. The collection, which will be on display for another few weeks, includes such valuable publications as John Dalton's 'Chemical Philosophy', accepted as the origin of atomic theory; 'Periodic System' by Newlands, probably the first publication on the Periodic System, although this is disputed by supporters of Mendeleev, and 'Organische Chemie' by Adolf Kekule, showing the first authentic structural formulae in organic chemistry.*

*Top right: This macrame tapestry by Janet Brereton, of New Brighton, NSW, was selected from exhibits at the Craft '75 Exhibition, during Australia '75, to win the $2,500 acquisitive prize offered by the Darling Art Fund of the University. The tapestry, of bleached and dyed cotton rope and measuring 260 cm by 160 cm, is entitled 'Erosion of Memory'. It is now hanging above the reception desk in the entrance foyer of the Research School of Chemistry where one of the Craft '75 judges and University Registrar, Mr W.S. Hamilton, (left) and Dean of the Research School of Chemistry, Professor A.J. Birch, inspected it last week. The work, on display for all interested people, may eventually be hung in the University's Arts Centre, now under construction.*


*Dr David Buckingham*



*Dr Alan Sargeson*

# Two RSC scientists win awards

**Dr David Buckingham, Senior Fellow in the Research School of Chemistry, recently returned from a short visit to the United States where he received the Bailar Medal and delivered the John C. Bailar Jr Lectures at the University of Illinois.**

Dr Buckingham is the first Australian to receive the Bailar Award.

The Bailar Lectures were established in 1972 on the retirement of Professor J.C. Bailar Jr, a distinguished Professor of the University of Illinois, who is widely considered the father of the inorganic chemistry of metal co-ordination compounds in the USA.

During his visit to the US, Dr Buckingham also gave the 1975 Reilly Lectures in Chemistry at the University of Notre Dame. He is the second Australian to be a Reilly Lecturer. The Reilly Lectures were endowed in 1945 by Peter Reilly, a US industrialist, who made his mark in the distillation of coal-tar at the turn of the century.

Dr Buckingham, a former New Zealander, joined ANU in 1965 as a Research Fellow in the Biological Inorganic Chemistry Unit, JCSMR, and became Senior Fellow in the Research School of Chemistry in 1970.

**The 1975 Royal Australian Chemical Institute Award for Inorganic Chemistry, has been awarded to Dr Alan Sargeson, Professorial Fellow in the Research School of Chemistry.**

The award is for Dr Sargeson's outstanding contributions to co-ordination chemistry and for his studies on the structural aspects of metal compounds, their reaction mechanisms, and how metals can influence the reactivity of organic molecules.

Dr Sargeson joined ANU in the Biological Inorganic Chemistry Unit, JCSMR, in 1958. He transferred to the Research School of Chemistry as a senior fellow in 1967, and in the following year became a Professorial Fellow.

He has been a visiting fellow at several overseas universities and has acquired an international reputation for his work in various fields of inorganic chemistry.

1975

The "Australian" 13/1/1976

Professor CORNFORTH

# National award goes to Nobel winner

THE Australian of the Year, named yesterday by the Australia Day Council of Victoria, is a research scientist and Nobel Prize winner who left Australia 36 years ago.

He is Professor John Cornforth, 58, who has lived in England since 1939. He has been director of a Shell research laboratory working on chemical enzymology in England since 1962 and an associate professor at Warwick University since 1965.

Professor Cornforth has been deaf since childhood but is described by associates as a brilliant chemist, an exceptional chess and bridge player and an excellent golfer.

His deafness caused him to switch his university studies from the classics to chemistry. He left Sydney University for England on a sholarship in 1939.

Last year he shared a Nobel Prize for chemistry for his research into the stereochemistry of enzyme-catalysed reaction. A friend of 45 years, Professor A. J. Birch, said in Canberra yesterday: "His work is very difficult to explain. It is like explaining blue sky to a blind man — all you can say is that it is blue and very beautiful."

## LITERARY GIFTS

Professor Cornforth will be unable to attend the official Australia Day luncheon on January 23 with the Prime Minister, Mr Fraser. The Victorian Governor, Sir Henry Winneke, will probably hand the Australian of the Year plaque to the chairman and chief executive of Shell Australia, Mr L. Froggatt.

Professor Birch, dean of the research school of chemistry at the Australian National University, said: "Professor Cornforth has considerable literary gifts — he has a flair for limericks on scientific topics — and is an ambidextrous athlete who plays excellent golf and tennis and exceptional chess."

A Melbourne businessman who was at school and university with Professor Cornforth, Mr J. Graves, said yesterday he had become an excellent lip-reader after a childhood illness caused his deafness, but had difficulty with articulation and was hard to understand.

"He is a brilliant man. The only pity is that he could not pass on his brilliance through normal verbal communication. He has retained his brilliance and the originality of mind he had when he was in his twenties."

Nominations for the Australian of the Year Award are received from all States. It is open for any person who is an Australian by birth or naturalisation or qualified for citizenship in any way.

Professor Cornforth is the second Nobel Prize winner to be named Australian of the Year. (Patrick White received the Nobel Prize for literature in 1973.)

1975

# *Breakthrough in copper processing*

*By JOHN McILWRAITH*

NEW methods of extracting, refining and recycling copper which could revolutionise the economics of the industry have been developed by Australian scientists.

The new techniques promise a dramatic saving in energy costs in copper processing, and significant environmental benefits and are likely to be used by producers throughout the world.

The final stages of the development were carried out by scientists of the mineral chemistry research unit at Murdoch University in Perth after initial discoveries made in 1972 at the research school of chemistry at the Australian National University.

Professor A. J. Parker, director of the mineral chem-

Continued page 4

# COPPER PROCESSING BREAKTHROUGH

From page 1

istry research unit, said the inventions opened up a number of possibilities for processing materials containing copper.

Perhaps the two most exciting were for recycling scrap copper, and of refining concentrates in a faster and cleaner way than the conventional methods of smelting and electro-refining.

The world processing industry sold products worth about $8,500 million last year.

The new process for copper concentrates was more acceptable environmentally than the conventional methods because little or no sulphur dioxide was emitted and unlike smelting and electro-refining, it would use low-grade waste steam, rather than electricity and oil as its energy source.

Energy requirements were less than 60 per cent of those for conventional copper processing.

Producing a pound of copper now absorbs 15,000 BTUs a lb, or 33 million BTUs a tonne.

At present energy costs, this could cost up to $50 in energy usage for every tonne produced.

The copper industry is a significant user of energy, through the concentrating and smelting processes.

Last year world copper production reached 8.64 million tonnes (of which an eighth was recycled scrap).

The original work on the new processes at the ANU has been supplemented by recent inventions by Dr D. M. Muir and Professor Parker, at the University of Western Australia last year, and more recently at Murdoch University.

Patents, originally sought by the Australian National University, have been granted in eight major coppers producing countries and are pending in six others.

An agreement for the development of the inventions has been signed between Anumin, a company wholly owned by the Australian National University, and a major American chemical engineering firm, Air Products and Chemicals Incorporated.

An understanding has also been reached between Anumin and Murdoch University, which has co-operated throughout the negotiations.

The agreement grants an exclusive world-wide licence for development and exploitation of the inventions to the metallurgical systems division of Air Products and Chemicals Inc.

The licence is not exclusive for groups wishing to use the inventions in Australia and discussions are being held with Davy Ashmore Pty Ltd of Melbourne with a view to development in Australia.

Professor Parker will describe the process at an international copper symposium to be held in Las Vegas next February.

His paper will precede a description by Dr Arbiter of the Anaconda Company's widely publicised Arbiter process for processing copper.

The Arbiter process uses ammonia as a solvent, is competitive with the Parker-Muir reactions and has some similar steps, including production of gypsum or ammonium sulphate as by-products.

The Parker-Muir method is based on leaching cuprous sulphate solutions from roasted copper concentrates, using a relatively cheap solvent, acetonitrile in acidified water.

Distillation of the acetonitrile produces pure copper.

Concern is being expressed in copper-processing countries about the continued use of smelting and electro-refining because of the environmental aspects of sulphur doxide emission and the energy requirements of existing technology.

ProfessorParker said the need for an easy, low energy method to recycle scrap copper, as well as refining copper ores, was becoming apparent.

If Air Products and Chemicals, Inc, were able to successfully commercialise the inventions, under the licensing agreement a significant return to Murdoch University and the Australian National University was expected. Part of any proceeds, would be used to support further research in Australian tertiary institutions into methods of processing minerals.

Professor Parker said the need intensive efforts had been made by Anumin in 1972-74, to encourage Australian companies and Government agencies to help with pilot plant development of the inventions.

His group had received generous financial support, advice and encouragement to continue their laboratory-scale work from Mt Isa Mines Ltd, Western Mining Corporation, two WA Goverments, and the CSIRO.

# Scientist wins Russian honor

By PHILIP CORNFORD

PROFESSOR Arthur Birch has become the first Australian to be admitted to the USSR Academy of Science. He says a scientific discovery is like a revelation from heaven.

"It's a rare, thrilling, elating moment, a time when the spirit really soars," said the 61-year-old dean of the School of Chemistry at the Australian National University in Canberra, where he has worked since 1967.

"Most scientists give the public the impression that scientific discovery comes from dull, slogging work.

"It's just the opposite. It's creative, artistic. It's taking a creative leap into the dark and then, when you've jumped, proving that you were right."

Professor Birch, a passionate boffin, should know. The award — only 36 scientists outside Russia have been elected to the Academy — was given for his contribution to international science through his research work at Oxford, Cambridge, Sydney and Manchester universities, and now ANU.

He was told of his appointment in a letter from Professor Reutov, chairman of the academy's chemistry branch. Russia's most distinguished scientists appraised his work before voting to award Professor Birch Russia's top scientific honor.

## LECTURED

Professor Birch knows several of them personally. His second visit to Russia was last September when he lectured to scientists in the Kazahk Republic.

He has been honored by the world's most famous scientific organisation, The Royal Society, founded in 1660, and by scientific societies in the U.S., Belgium and Czechoslovakia. Professor Birch has lectured and travelled in every major country except China.

He has been treasurer of the Australian Academy of Science, chairman of the science committee for the Festival of Australia 1975 and a member of the Commonwealth Advisory Committee on Science and Technology. He has published more than 250 scientific papers and a book, How Chemistry Works, in 1950.

| PERTH: | SYDNEY: |
|---|---|
| Fine | Cool, with a few showers |
| Max 22 | Max 16 |

"THE AUSTRALIAN"
THURSDAY JUNE 17
1976

# 'Reservation' on CSIRO review plan decision

The Federal Opposition said yesterday it had reservations about a three-man committee the Federal Government had set up to make a major review of the objectives, structures and programs of the CSIRO.

The Prime Minister, Mr Fraser, announced the review in Federal Parliament yesterday saying it would be the first major inquiry into the CSIRO for almost 30 years.

He said the review would be conducted by the foundation dean of the research school of chemistry at the Australian National University, Professor A. J. Birch; a past president of the Australian Associated Stock Exchanges, Sir Cecil Looker, and the chairman of Hamersley Holdings, Mr R. T. Madigan.

Professor Birch

Sir Cecil Looker

Mr Madigan

## Science more diverse

Mr Fraser said the CSIRO had earned a high reputation over the past 50 years, both in Australia and overseas. But science had become increasingly diverse since the last major inquiry into the CSIRO was held in 1948-49.

"It is appropriate at this time to engage in a rethinking of the objectives of the CSIRO", he said.

Mr Fraser said an independent examination was needed of the ways in which the CSIRO could sustain its vigour, its ethos and its capacity to deal with the challenge of the future.

The Opposition's health spokesman, Dr Moss Cass, said the Opposition welcomed the inquiry but added that he had reservations about the composition of the committee.

He asked why there were two businessmen on the committee and only one scientist.

## Four main points

"Do they have special attributes, or is the main thrust of the inquiry to turn the CSIRO into a business or a business-support organisation?" he asked.

The Government has asked the inquiry to look at four main points.

The relevance of the CSIRO's present objectives to Australia's present and future requirements.

The extent to which current research programs accord with the objectives recommended for the CSIRO.

An examination of the CSIRO's internal arrangements, and its relationships with other government agencies, tertiary institutions, research institutes and people who used its results, and its place in Australia's international scientific relationships.

The extent to which CSIRO programs could attract revenue to support research, and also how it could attract payment for results achieved.

The chairman of the CSIRO, Sir Robert Price, said the inquiry would prove to be a worthwhile exercise for the CSIRO and Australian primary and secondary industry.

"CSIRO, by its very nature, must be closely in touch with the needs and priorities of this nation to be an effective national research organisation", he said in a statement issued in Canberra.

Canberra Times 6 October 1976

THE SUN, Friday, October 8, 1976

# Desk is out for uni head

**MONASH University's new vice-chancellor does not intend to be deskbound in his job.**

Prof. Ray Martin, 50 is a world-renowned research scientist and said yesterday he would like to keep dabbling with test tubes.

"Being realistic, I think a vice-chancellor's job is all-absorbing and one's time is likely to be totally committed to the responsibilities of the job," he said.

"I would love to be able to keep a smallish research interest going, but that is the most I could hope for."

Prof. Martin, who is dean of chemistry research at Australian National University in Canberra was appointed to his new post last month while on an overseas lecture tour.

"I don't know the Monash scene at all and my approach to these sort of things is that when I am in a job, only then will I find out what I might do," he said.

"I regard it as a challenging and very interesting opportunity."

Prof. Martin is the son of Sir Leslie Martin, professor of physics and dean of the Military Science faculty at NSW University. He was educated at Scotch College, Melbourne, and North Sydney Boys' High.

After graduating from Melbourne University, he spent five years at Cambridge, where he won a tennis blue.

He lectured in inorganic chemistry before joining Imperial Chemical Industries Australia and New Zealand as a research chemist.

In 1962 he was appointed to the foundation chair of inorganic chemistry at Melbourne University and was later dean of science before he went to the ANU in 1972.

● PROFESSOR RAY MARTIN, his wife Rena, daughter Lisa, 18, and sons Leon, 20, (left) Michael, 10 (front left) and Antony, 14.

## DEAN OF ANU'S RSC APPOINTED VICE-CHANCELLOR OF MONASH

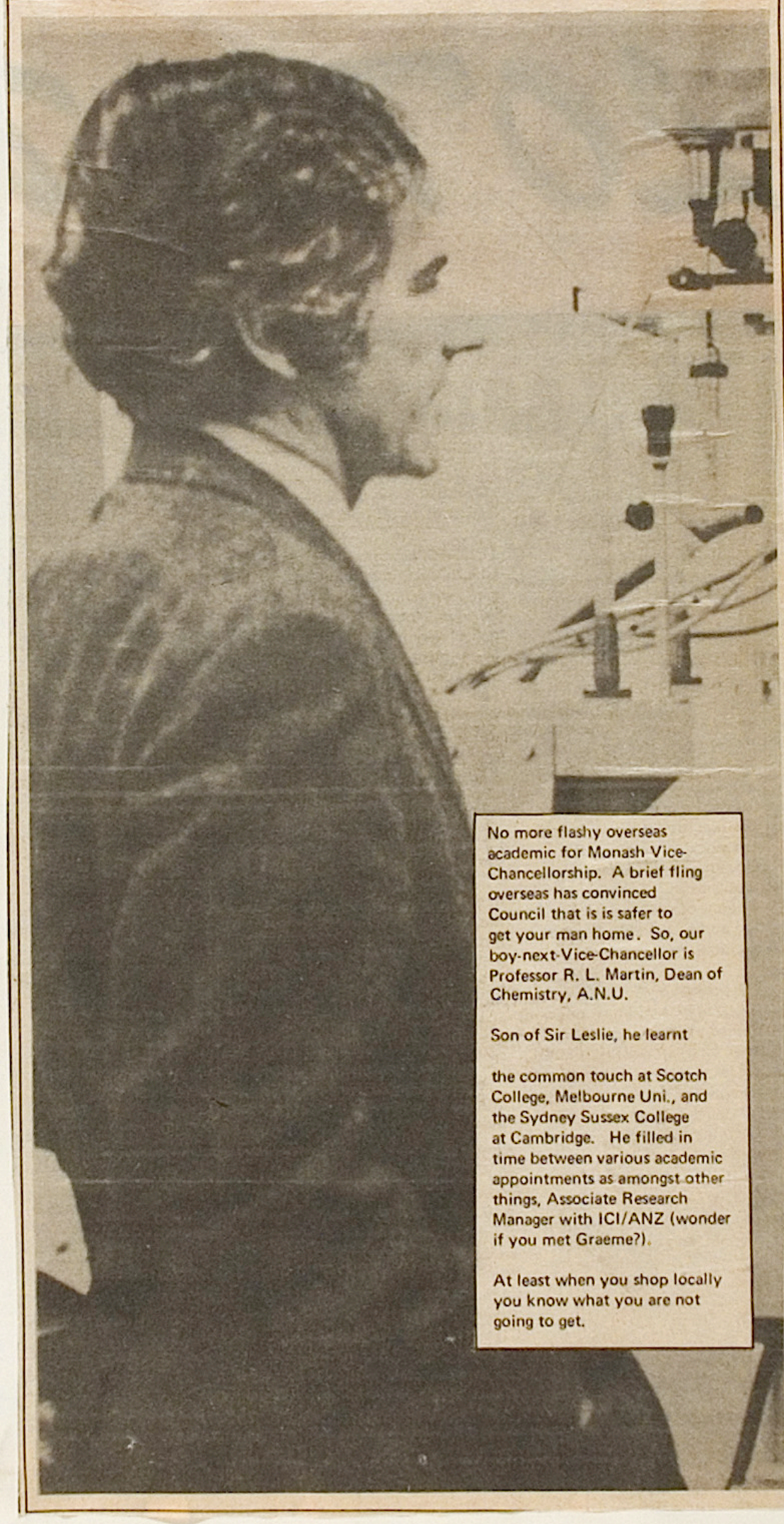
The Dean of ANU's Research School of Chemistry and the Professor of Inorganic Chemistry, Professor Raymond L. Martin, has been appointed Vice-Chancellor of Monash University.

His term of office as Monash's third Vice-Chancellor is for 10 years, starting early next year.

In a statement issued last week, ANU's Vice-Chancellor, Professor Anthony Low, said 'Professor Martin is a scientist of great distinction, a perceptive and experienced academic, and a man greatly liked and admired by his many friends and associates here. His departure will be a great loss to ANU'.

Vol.7 No.15 24 Sept 76

FROM THE MONASH UNIV. STUDENT NEWSPAPER (PAGE 2)



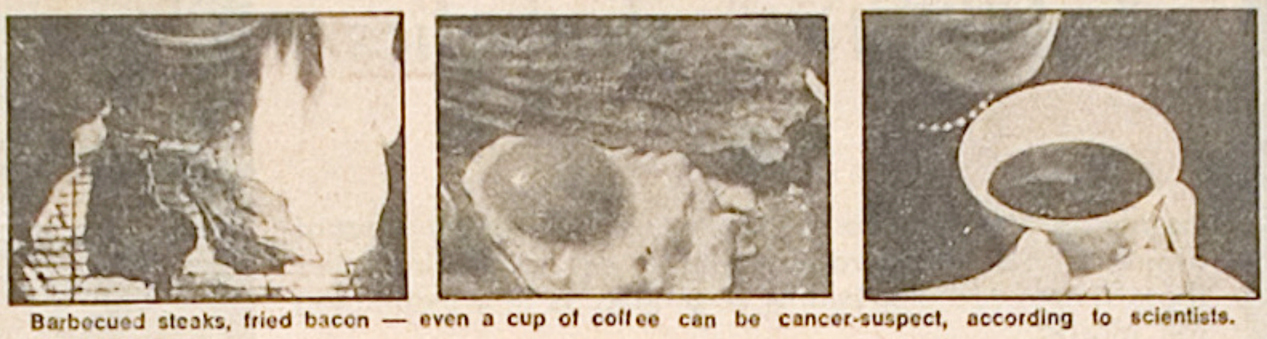
No more flashy overseas academic for Monash Vice-Chancellorship. A brief fling overseas has convinced Council that is is safer to get your man home. So, our boy-next-Vice-Chancellor is Professor R. L. Martin, Dean of Chemistry, A.N.U.

Son of Sir Leslie, he learnt

the common touch at Scotch College, Melbourne Uni., and the Sydney Sussex College at Cambridge. He filled in time between various academic appointments as amongst other things, Associate Research Manager with ICI/ANZ (wonder if you met Graeme?).

At least when you shop locally you know what you are not going to get.

# A research scientist on food has some reassuring news on the safety of Australia's normal daily diet



Barbecued steaks, fried bacon — even a cup of coffee can be cancer-suspect, according to scientists.

# SCARED OF CANCER? — EAT AND FORGET IT

**In their battle to beat cancer, scientists have uncovered disturbing links between some processed foods and carcinomas in laboratory animals.**

Many foods which are a regular part of the daily diet of Australians have become suspect.

Barbecued steak, fried bacon and even a cup of coffee have been found to contain cancer-causing chemicals.

For those who wonder whether it is safe to eat anything, a research scientist at the Australian National University has some reassuring news.

According to Dr Andy Liepa, of the Research School of Chemistry, the chances of being killed in a car accident far outweigh those of developing cancer from a normal Australian diet.

Immediately before taking up his present appointment in 1974 Dr Liepa worked in the United States on advanced work on treatment of cancer by chemicals.

Dr Liepa says that discoveries in the testing and use of food additives have made food considerably safer than it was 50 years ago. Cancer-causing agents in food have induced cancers in rats, mice and guinea-pigs, but under laboratory conditions and with massive doses.

## Wood smoke

One of the earliest discoveries occurred earlier this century when people working in specific industries producing coal tar products tended to show an abnormally high incidence of skin cancer.

These cancers were usually developed after years of exposure to the chemicals.

This problem was relatively easy to solve, but it led to the greater worry that many of the chemicals occurred in food eaten by people throughout the world.

The practice of smoking food to prevent spoilage and enhance flavour was widely followed.

The smoking process on fish, meat and sausages preserved the food partly by drying and partly through the absorption of phenols and other materials toxic to micro-organisms.

But the wood smoke contained aromatic hydrocarbons such as 3,4 benzpyrene and benzanthracene which were known to cause cancer.

Dr Liepa says the carcinogenic effects of these in small quantities was not known, but it was discovered that there was a high incidence of stomach cancer in Icelanders and Baltic fishermen who consumed large quantities of heavily smoked fish.

This indicated that smoked foods had to be eaten in large and regular quantities to be dangerous.

Few Australians would be at risk and recently new processes have been developed which reduce the temperatures necessary to smoke food and which minimise the formation of carcinogens.

Dr Liepa . . . the chances of being killed in a car accident are far greater.

The popular Australian barbecue also came under scrutiny because it was discovered that carcinogens could be generated when grilling meat.

Even the cup of coffee was suspect because coffee beans during roasting acquire very small quantities of benzpyrene much of which is extracted when the coffee is brewed.

But, according to Dr Leipa, it has now been reassuringly stated that the small amounts involved in these processes are innocuous.

He also says that earlier reports that the artificial sweeteners known as cyclamates caused cancer in rats have not been substantiated in subsequent tests.

The only result of the new tests indicated that in male rats the ingestion of excessive quantities of saccharin reduced the average life span.

One of the most commonly used forms of food additives are sodium nitrate and/or nitrite.

They are toxic to micro-organisms and also have a cosmetic effect on meat, converting unstable purplish blood pigments into a relatively stable red product.

## From NEIL O'REILLY in Canberra

But serious doubts have arisen about the use of nitrites with the discovery that many nitrosated amines are potent carcinogens.

Bacon has been found to develop dangerous nitrosamines when fried.

Another hazard is that when nitrite-treated meat is ingested, stomach acids can cause unexpected nitrosamine formation.

But here again, Dr Liepa has some reassuring information. Prophylactic measures to guard against the damaging effects of nitrites have been found.

A diet rich in vitamin C protected guinea pigs from the mutagenic (cancer-causing) effects of nitrosomorpholine.

Similar results were encountered in other animals.

## Hazards

These results with vitamin C have led to suggestions that vitamin C should be incorporated into nitrite-containing food to counter the risk of nitrosamine formation.

Dr Liepa says that it has also been suggested that vitamin C could also be used in drugs which could cause similar effects to the nitrosomine.

Many synthetic dyes have been removed from use because they have been shown to produce tumours in rats.

One notable example was butter yellow, or P-dimethylamino-azobensene used to make butter appear more appetising and nutritious.

The removal of many synthetic dyes from use in food has made it safer, according to Dr Liepa.

One of the greatest hazards in our food could be caused by the aflatoxin group of compounds which are among the most powerful carcinogens known.

• Cont, Page 92

## SCARED OF CANCER?

• From Page 54

These compounds are not artificially added to any foods but can occur through formation of a fungus — aspergillus flavus — caused by careless handling or storage of ground nut or cerial crops.

According to Dr Liepa this risk is far greater in the underdeveloped countries than it is in Australia. But there is always a risk of it finding its way into the diet of animals or birds.

Dr Liepa says that all examples of cancer-causing agents appearing in food must be treated with concern.

But it should be remembered that with few exceptions, most cancers in test animals had been induced by administration of massive doses on a scale unrelated to normal food consumption.

Dr Liepa points out that the fewer the damaged cells the more readily will normal cells and the general defence mechanism of the body be able to control their unlimited multiplication.

Cancer is caused by damaged cells multiplying more rapidly than normal cells.

According to Dr Liepa exposure of an organism to sub-critical amounts of carcinogen could result in an induction period which would exceed the normal life span of the organism.

As a further reassurance he points out that in all cases of testing laboratory animals, any attempted extrapolation to humans must have dubious validity.

While he believes that the dangers from food are now less than venturing on to the roads, increased awareness of food processing dangers are making it even safer.

# PILL PIONEER CAN REFLECT ON HIS LOST FORTUNE

**The Australian pioneer of the Pill, Professor Arthur Birch, may well consider his own hard luck this week when he begins work as chairman of a sweeping inquiry into the CSIRO.**

Having lost the chance of becoming a millionaire after his discovery may weigh heavily when he considers whether the CSIRO should increase its use of patents.

"I was the first to devise the series of sex hormones to which the Pill belongs," Professor Birch said.

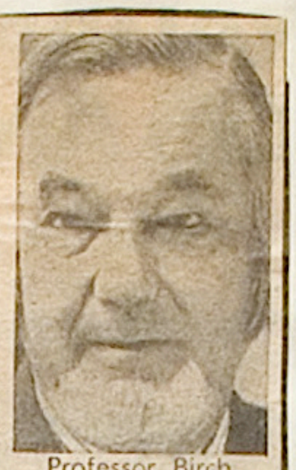
One of his former students and an American scientist who realised the importance of his discovery had since retired on the proceeds of their patent rights, he said.

"I merely decided the compounds, it was not my idea to use them for this purpose.

"Since I did not realise their importance I did not take out any patents, unfortunately perhaps."

Professor Birch, now 61, produced the first synthetic male sex hormone while a fellow at Oxford in 1948.

He published a paper on his work the following year and American researchers, recognising its importance, went on to produce the first synthetic female sex hormone.



Professor Birch

Sunday 7 November, 1976.

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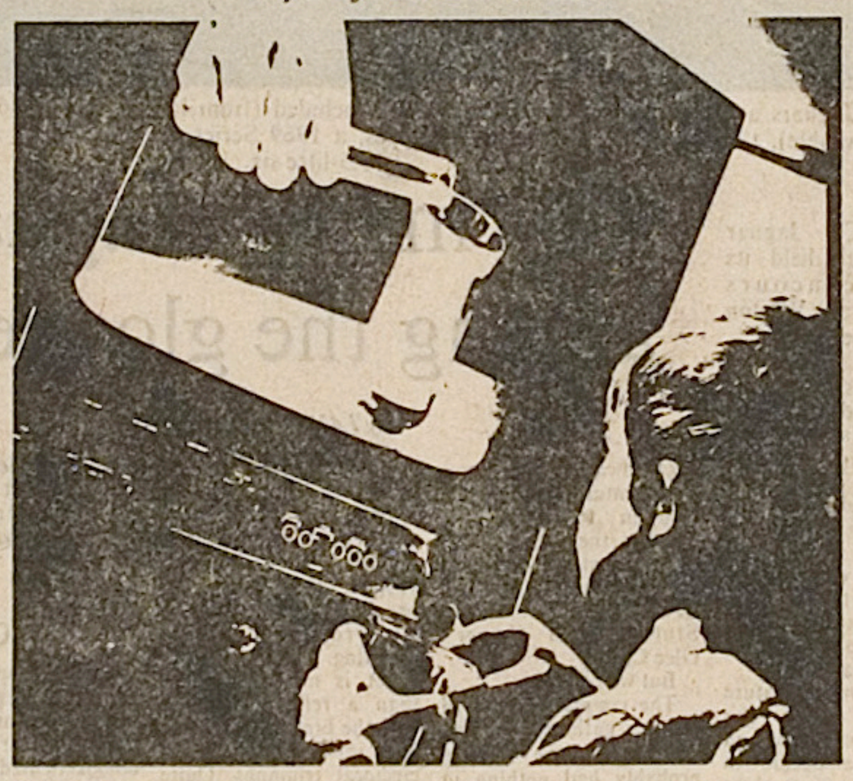
CANBERRA TIMES 30 MARCH, 1977

LIFE STYLE
TALKING POINT

Research for the man in the street

# Canberra 'needs science centre for the people'

*By Professor A. J. BIRCH**



AUSTRALIANS making a second or third tour of their national capital have little in the way of new museum-like attractions to visit once they have seen Parliament House and the War Memorial. What Canberra needs is a science centre that may form a precursor to part of the future National Museum of Australia.

It would provide a visual impression for the man in the street of how the research that affects his life is carried out and remind former science students of the knowledge they may have left behind.

Australia 75, the festival of creative arts and sciences that was held in Canberra in March, two years ago, proved the need for a science centre. The festival's science exhibition at Melville Hall was extremely popular — entertaining and educating more than 20,000 people in nine days. It contained 17 exhibits that ranged from display material on the search for the origins of life by astronomers, studies on influenza and cancer to geological information on Gondwanaland, a piece of the moon and dung beetles in action.

## Limited

In our community there is limited opportunity for people to gain an understanding of science and its ramifications. A science centre would go some of the way to rectify this situation. It would inform the community about science and its methods of discovery, about scientists and the evolution of their ideas and it would provide scientific information so that the community would be better informed to take social decisions about scientific issues.

Traditional science museums have concentrated on the acquisition and classification of scientific material, and academic research on collections has been considered a primary function. In contrast, the major purpose of the science centre would be to generate enthusiasm in the visitor to learn about science so that he would be stimulated to inquire further. To achieve this, the science centre must divert as well as inform, it must involve the audience in meaningful participation; indeed, it would not be successful in its purpose to educate and inform unless it was entertaining.

A science centre could be a precursor to part of the National Museum of Australia. But it would be able to start much more rapidly, operate on a very modest budget and, perhaps, act as a pilot study for what is required in the display areas of the future Museum.

Alternatively, the centre could operate independently on the basis of a different, but equally valid, concept.

Features of a permanent science centre could be:

An educational facility to some 60,000 school children in the ACT and visiting inter-State school parties. Core exhibits and inventors work and special exhibits could cover topical issues like Australia's energy resources, Antarctic research, weather prediction, war on flies, the ecology of forests, fats in the diet, the influenza virus, landings on Mars and so on.

It could provide, without major expense, a forum for debates and discussions and show films on science.

A bookshop could operate, providing popular scientific material at all levels of comprehension. Sales of books, magazines, posters and postcards could provide a service to the community and contribute to the running costs of the centre.

The centre could become a focus for work on design excellence.

As a tourist facility, it would attract large numbers of people. The War Memorial is visited by 700,000 people a year. If a science centre attracted a third of that figure it would cater for between 200,000 and 250,000 people a year. A small refreshment centre could operate and, during peak tourist periods, special popular science displays could be arranged. Tourists could also be provided with ample opportunity for relaxation.

During 1973-74, the total expenditure on research and development in Australia was $650 million. Taxpayers would be able to find out what their money was being spent on in the latest budget.

## Amazed

Many visitors to the Australia 75 science exhibition expressed both amazement and ignorance about many Australian achievements in science, invention and technology. A science centre could become a showcase for Australian scientific research.

It would provide the ANU and other universities, Bureau of Mineral Resources, CSIRO, Department of Science and Australian industries with opportunities for demonstrating their research activities. It would also give these institutions and the Academy of Science, in particular, an opportunity to promote public understanding of science in Australia.

Without much additional expenditure, exhibits could be designed as travelling displays for showing in appropriate museums and exhibitions elsewhere in the country.

If the recommendations of the Piggott Report, Museums in Australia, are accepted by the Government then at least $50 million will be required for the Museum of Australia. However, it is unlikely that this project will be completed before 1985 and budgetary estimates will undoubtedly escalate during the next eight years.

The proposal for a science centre is for a modest exhibition (at least 1,000 square metres) for short-term completion (within a year, provided a suitable building is available). The estimated cost would be a fraction of that necessary for a national museum; running costs could be partially offset by a small entrance charge and the sale of appropriate material, literature, etc. There would be no expenditure on acquisition and research, and only a small staff would be necessary.

## Pilot scheme

The Australia 75 science exhibition was a successful pilot scheme for a more permanent venture. The total cost for the nine day exhibition, taking into account all expenditure by participants, amounted to at least $250,000.

The estimated cost for a permanent science centre, exclusive of accommodation, is approximately $330,000 for setting up during the first year and $225,000 a year for running. However, these amounts could be reduced substantially by the donation of exhibits and by possible income.

The centre would not intend to present a comprehensive, encyclopaedic coverage of scientific facts; rather it would select a limited number of areas to illustrate the objectives mentioned earlier. Pure science would be illustrated by implication rather than directly — the approach would be topical and informational rather than didactic and disciplinary. For instance, the basic principles of pure chemistry would be elucidated by explaining them in the context of live topics such as pollution, molecules in space, the chemical effects of drugs, radioactive isotopes in medicine.

It is intended that the information should be presented at the senior high school level but with important provisos: the presentation should be attractive to anybody, even if they do not fully understand or wish to understand; audience participation should allow younger children to participate at their own level of comprehension.

As far as possible, scientists, technologists and inventors would be personally involved in the centre from time to time in features such as promenade lectures of "Meet the Scientist" programs.

If some modest beginning is not made along the lines of this proposal, the impetus of Australia 75 will be lost. The scientists and organisers, and designers like Derek Wrigley and Adrian Young, learned a great deal which could be put into effect. If nothing happens shortly there should be no illusions that a similar proposal can get off the ground in the foreseeable future.

* Professor Birch is professor of organic chemistry, Research School of Chemistry, ANU.

2/9/77

# OBITUARY

## Mrs. M. T. Maly

THE LATE MRS MALY

**The funeral was held in Queanbeyan this afternoon of Mrs. Marie Therese Maly of 45 Surveyor Street, Queanbeyan.**

Relatives and friends were shocked to learn of Mrs. Maly's unexpected death at her residence on Tuesday, following a sudden collapse.

Interment took place in Tharwa Road Lawn Cemetery following Requiem Mass at St. Raphael's Church.

Relatives and friends from Wauchope, Dubbo, Sydney, Marulan and Goulburn attended, besides Canberra and Queanbeyan.

Born in Sydney, Mrs Maly had been in Queanbeyan since the age of four years. She will be sadly missed.

A very active community worker, she was particularly associated with Queanbeyan AOOB organisation and the Polish Youth Club.

Mrs Maly was a member of the staff at the ANU Research School of Chemistry for 10 years.

She is survived by her husband Tad and baby daughter Melissa, mother Mrs. Hazel Edlington and step-father Mr. Ron Edlington.

Also mourning Mrs Maly's loss are brothers Brian, his wife Gloria and Andrew Edlington, sisters Margaret (Mrs J. Johnson, Queanbeyan) and Gayle Edlington.

She was the daughter-in-law of Mr and Mrs Joseph Maly, of Sunnybar Parade.

# A Mother's Tribute to Friends

**Sir, — The word thanks seems inadequate to express the deep feelings of gratitude to the many friends and relatives who offered their help and consolation during the recent sad loss of my loving daughter Marie.**

I would like to extend a special thanks to my sister Mary as without her help I could not have coped.

A very special thank you to the staff of the Research School of Chemistry at the ANU also the AOOB's for their generous donations towards the well-being of Marie's baby Melissa Jane.

Thanks also to all the staff at the John Curtin Medical School of the ANU and my present workmates for their kind thoughts and floral tributes.

To Dr. Gillespie and the staff at our Queanbeyan Hospital for their efforts to save Marie's life. I will always be grateful.

Would everyone please accept this as my personal gratitude as many addresses are unknown.

With sincere thanks
Mrs. Hazel Edlington
Alanbar Street
Queanbeyan

# RETURN THANKS

**MALY:** We would like to thank our many friends for their help and expressions of sympathy given to us in our recent sad loss of a devoted wife and mother, Marie. A sincere thank you to all who attended Mass and graveside prayers. As many addresses are unknown, a special thanks for floral arrangements, wreaths, cards and letters. Your kindness is gratefully appreciated.

—Tad and baby Melissa Maly.

FOR NOTICE-BOARD?



# Int'l Confab On Organometallic Chemistry In Kyoto

The so-called autumn international conference season in Kyoto will feature the Eighth International Conference on Organometallic Chemistry this year.

### Sept. 12-16

The conference, in a continuing biennial series, is primarily devoted to the exchange of ideas and research findings in all aspects of pure and applied organometallic chemistry and related areas.

The Kyoto Congress opens Monday, Sept. 12 for a five-day run at scenic Kyoto International Conference Hall, sponsored by the International Union of Pure and Applied Chemistry (IUPAC). It has been planned by the Japanese Organizing Committee which represents the Chemical Society of Japan, Catalysis Society of Japan, the Society of Polymer Science, Japan, and the Society of Synthetic Organic Chemistry, Japan.

### Over 900 Scientists

Some 370 Japanese and about 560 foreign scientists representing 23 countries have registered to attend the conference.

Among the participants from abroad, the USA heads the list with a delegation of more than 70 followed by Germany with 34, France 16, the United Kingdom 11, Canada 9 and Australia, Belgium and the USSR with 5 each.

Other participating nations are Switzerland, Italy, South Africa, Austria, Sweden, Denmark, Israel, Poland, Czechoslovakia, Lebanon, Venezuela, India, Holland, Iran and Norway.

VIII
KYOTO 1977

Organometallic chemistry, which has made remarkable strides in recent years both in basic and applied research, is called the "third chemistry," and combines organic chemistry and inorganic chemistry.

### The '3rd Chemistry'

Not only as a research field but also as an industry, organometallic chemistry has been drawing attention as a research area with great potential.

Industrial processes that use organic conversion metal compound catalysts such as the Ziegler-Natta polymerized catalysis, Wacker process, Oxo process and Reppe process are contributing greatly to the synthetic chemical industry.

It is recognized worldwide that organometallic catalytic reaction can play an important role in conserving energy. Research has consequently been stepped up to study new ways to utilize oxygen, nitrogen and carbon dioxide.

Thus, organometallic chemistry has begun to have an impact on sister sciences, medicine, the environment, energy and society as a whole.

It has become an urgent task for Japan to seek new directions in the field of chemistry and in the chemical industry, particularly since the 1973 oil crisis.

### Various Aspects

Because of both the fundamental and practical rewards to be found in organometallic chemistry and associated areas, many major universities in Japan and abroad as well as many chemical and petroleum companies have been engaged in programs of research on various aspects of organometallic chemistry.

With the proliferation of research in this area, it is becoming increasingly difficult to keep abreast of recent developments.

The Japanese Organizing Committee notes that the Congress, being held in Japan for the first time, will be a fine opportunity for scientists to overcome the time lag in communication, and to share together in the mutual exchange of new knowledge as well as to chart new courses.

## —MESSAGE—

By Prof. Yoshio Ishii
Faculty of Engineering
Nagoya University

On the occasion of the opening of the Eighth International Conference on Organometallic Chemistry, I would like to take this opportunity to extend a hearty welcome to all the delegates.

As is known all over the world, some of the most important developments made in the last two decades in the field of chemistry have been in organometallic chemistry, the third chemistry, which combines organic and inorganic chemistry.

Many organometallic compounds have been synthesized, and research on reactions with these new compounds, their structures and combinations has prompted scientists to publish their findings worldwide.

Organometallic chemistry, a research area with great potential, has also contributed much to the synthetic chemical industry.

Recent findings indicate that organometallic catalytic reactions can play a vital role in saving energy. Thus organometallic compounds are becoming increasingly important to mankind.


Prof. Y. Ishii
Conference Chairman

There is much pioneering yet to be done on this exciting new frontier.

I sincerely hope this congress will be a truly significant experience and that the delegates will find clues that will help them in their important research.

And in conclusion, I, on behalf of the Japanese organizing committee, hope all the foreign participants enjoy their stay in Kyoto.

## Organometallic Chemistry & Compounds

Organometallic chemistry is a major field uniting organic and inorganic chemistry, and thus removing the artificial boundary lines between those two fields.

Organometallic chemistry is truly interdisciplinary, since it deals with other scientific disciplines such as structural chemistry and polymer chemistry.

Organometallic chemistry, including organometalloid chemistry, has grown at a phenomenal rate during the past 20 years since the discovery of ferrocene and the advent of Ziegler-Natta catalysis. Many practical applications of organometallic compounds have emerged during this period. They include fuel and oil additives, smoke and flame retardants, metal-plating agents metallic conductors, pigments, pharmaceuticals, anticancer agents, fungicides and bactericides.

More fundamentally, synthetic and structural organometallic chemistry has uncovered countless interesting new chemical compounds whose compositions and structures are unprecedented in chemistry.

Such unique compounds have led scientists to a greater understanding of the binding forces between carbon and metals, and have stimulated theoretical thinking.

Likewise, organometallic compounds, because they often possess different forms (structures, symmetries, coordination numbers, etc.) in different phases have helped to reveal to chemists truths about complex chemical structures.

In addition, organometallic compounds are particularly illustrative of the success with which spectroscopic methods can be applied to chemical systems, and thus the discovery of novel organometallic compounds has served as a great stimulus to spectroscopy.

Organometallic compounds have been shown to play an important role in organic synthesis, from the diethylzinc compounds of a century ago through the Grignard and organolithium reagents to the present day. In this regard, organometallic chemistry has provided a means of "trapping" otherwise very unstable organic compounds of great theoretical interest.

Organometallic compounds are chemical substances containing a metal or metalloid in direct association with one or more hydrocarbon radicals. These compounds never arise by natural processes in the vegetable and animal kingdoms, being produced synthetically by the art of the chemist. They have played an important part in the development of modern chemistry, and among them are several substances of great practical utility.

Tetraethyl lead, a most effective antidetonant in motor fuel, and salvarsan, used in treating syphilis, are two outstanding examples of organometallic compounds of proven worth.

Included in this group of carbon compounds are the organic derivatives of magnesium known after their discoverer as "Grignard reagents."

The application of these reagents in chemical synthesis has proved to be without doubt one of the most fruitful and far-reaching advances in practical organic chemistry since the end of the 19th Century.

### Past Congresses

| | Site | Year |
|---|---|---|
| 1st Congress | Cincinnati, USA | 1965 |
| 2nd | Madison, USA | 1965 |
| 3rd | Munich, Germany | 1967 |
| 4th | Bristol, England | 1969 |
| 5th | Moscow, USSR | 1971 |
| 6th | Amherst, USA | 1973 |
| 7th | Venice, Italy | 1975 |

## Conference Schedule

The conference, which consists of session lectures and presentation of papers, will be opened at 10 a.m. Monday.

Opening lectures will be given by two distinguished guests, Dr. R. Hoffmann of the U.S. and Dr. G. Wilke of Germany. Dr. Hoffmann is to speak on "theoretical aspects of the coordination of small molecules to transition metal centers," and Dr. Wilke on "organo-transition metal compounds as intermediates of homogeneous catalytic reactions."

In the session lectures, a total of 13 scientists including two Japanese are scheduled to report on independent topics. Among them are R. Bau of the U.S. who will report on "neutron diffraction studies of metal hydride complexes," A.E. Shilov of the USSR, speaking on "activation of saturated hydrocarbons by transition metal complexes" and M. Tsutsui of the U.S., speaking on "new trends in the chemistry of organometalloporphyrins."

Dr. M. Ishikawa of Kyoto reports on "photolysis of organopolysilanes: generation and reactions of silicon-carbon double-bonded intermediates," and Dr. A. Nakamura of Osaka reports on "enantioselective reactions through chiral metal-carbene intermediates."

In addition, more than 300 selected contributed papers dealing with aspects of pure and applied organometallic chemistry (both main group elements and transition metals) will be presented during the scientific sessions. The oral presentation of each paper will last for about 15 minutes, to be followed by five minutes of discussion.

These papers cover the following six major topics: 1. Structure and Bonding; 2. Synthesis; 3. Reaction and Mechanism; 4. Organic Synthesis via Metal Compounds; 5. Homogeneous Catalysis; and 6. Biological and Environmental Aspects.

| | |
|---|---|
| **Sept. 12 (Mon.)** | |
| 8.00 a.m.-10.00 a.m. | Registration |
| 10.00 a.m.-10.30 a.m. | Opening Remarks |
| 10.30 a.m.-12.30 p.m. | Opening Lectures |
| 2.00 p.m.- 5.00 p.m. | Session Lectures & Contributed Papers |
| 5.30 p.m.- 7.00 p.m. | Get-Together |
| **Sept. 13 (Tues.)** | |
| 9.30 a.m.-12.30 p.m. | Session Lectures & Contributed Papers |
| 1.30 p.m.- 6.00 p.m. | Excursion |
| **Sept. 14 (Wed.)** | |
| 9.30 a.m.-12.30 p.m. | Session Lectures & Contributed Papers |
| 2.00 p.m.- 5.00 p.m. | " " |
| 7.00 p.m.- 9.00 p.m. | Banquet |
| **Sept. 15 (Thurs.)** | |
| 9.30 a.m.-12.30 p.m. | Session Lectures & Contributed Papers |
| 2.00 p.m.- 5.00 p.m. | " " |
| **Sept. 16 (Fri.)** | |
| 9.30 a.m.- 1.30 p.m. | Session Lectures & Contributed Papers |
| 2.00 p.m.- 4.00 p.m. | " " |
| 1.30 p.m.- 2.00 p.m. | Closing Remarks |

The Japanese Organizing Committee, in keeping with the traditions of the earlier conferences, has arranged a number of social events in conjunction with the conference.

A get-together has been planned for Monday evening to give the participants a chance to get better acquainted. It is informal and is free.

An excursion planned for Tuesday afternoon in the city of Kyoto includes a visit to the Golden Pavilion, Nijo Castle and other tourist spots. A banquet will be held the following evening at the Kyoto Hotel.

For accompanying ladies, a special program has been arranged for three days on Monday, Wednesday and Thursday. It includes do-it-yourself activities such as Japanese tea ceremony and flower arrangement, and sightseeing and shopping in the city.

## Committee Members

### International Advisory Committee Members

E.W. Abel, U.K.; E.C. Ashby, USA; U. Belluco, Italy; M.A. Bennett, Australia; M. Cais, Israel; V. Chvalovsky, Czechoslovakia; H.C. Clark, Canada; U. Croatto, Italy; L.F. Dahl, USA; R.E. Dessy, USA; E.O. Fischer, Germany; G. Fritz, Germany; W.A.G. Graham, Canada; M.L.H. Green, U.K.; S.P. Gubin, USSR; J. Halpern, USA; Y. Ishii, Japan; M. Kumada, Japan; M.F. Lappert, U.K.; L. Malatesta, Italy; L. Marko, Hungary; J. Nasielski, Belgium; A.N. Nesmeyanov, USSR; J.G. Noltes; Holland; R. Okawara, Japan; O. Yu. Okhlobystin, USSR; S. Otsuka, Japan; S. Pasynkiewicz, Poland; M.D. Rausch, USA; G.A. Razuvaev, USSR; H. Reinheckel, GDR; E. Samuel, France; K. Schlogl, Austria; H. Schmidbaur, Germany; F.G.A. Stone, U.K.; J. Tirouflet, France; M. Tsutsui, USA; Yu. A. Ustynjuk, USSR; L.M. Venanzi, Switzerland; N.S. Vyazankin, USSR; R. West, USA; and G. Wilke, Germany.

### Japanese Organizing Committee Members

Yoshio Ishii, Nagoya University; Makoto Kumada, Kyoto University; Rokuro Ohkawara, Osaka University; Sakuji Ikeda, Tokyo Institute of Technology; Yoshiji Izumi, Osaka University; Atsumu Ozaki, Tokyo Institute of Technology; Seinosuke Otsuka, Osaka University; Shun Kanbara, National Inspection Association of Chemical Products; Ohiko Kammori, Chemical Society of Japan; Kazuo Saito, Tohoku University; Takeo Saegusa, Kyoto University; Kikumasa Sato, Yokohama National University; Teiji Tsuruta, Tokyo University; Jiro Tsuji, Tokyo Institute of Technology; Nobue Hagihara, Osaka University; Akira Misono, Tokai University; Teruaki Mukaiyama, Tokyo University; Shunsuke Murahashi, Osaka University; Akio Yamamoto, Tokyo Institute of Technology; Sadao Yoshikawa, Tokyo University; and Zenichi Yoshida, Kyoto University.


1973 Nobel Prize winner for Chemistry E. O. Fischer of the Federal Republic of Germany, one of the members of the International Advisory Committee.

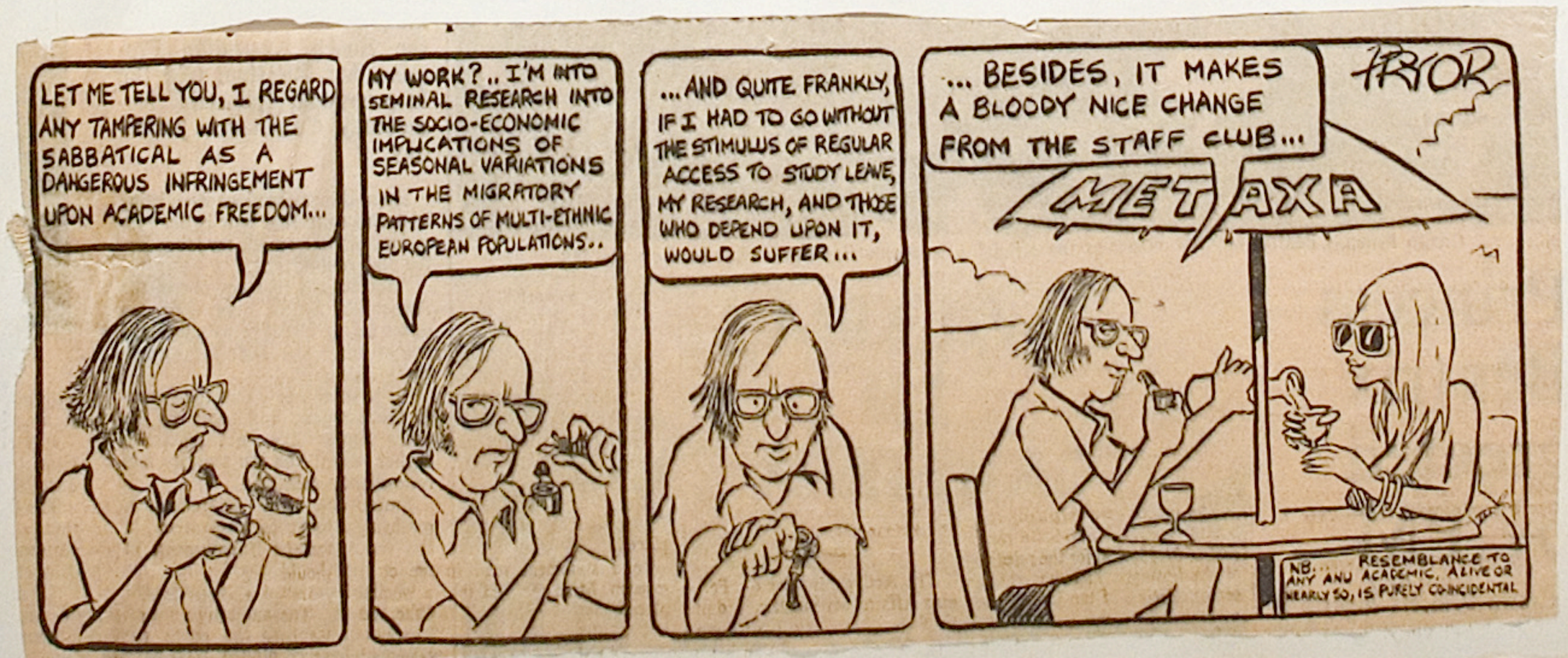

Executives of the organizing committee at the table facing the camera (from right): R. Ohkawara, program secretary; Y. Ishii, conference chairman; M. Kumada, general secretary, and S. Murahashi, fund-raising committee chairman.

# The Institute Presidents

**President of the Institute**

Professor Arthur J. Birch *(F)*, has had a distinguished academic career commencing with an 1851 Exhibition Scholarship to Oxford in 1938. He was successively ICI Fellow (Oxford), Smithson Fellow (Cambridge) and Professor of Organic Chemistry at Sydney, Manchester and the Australian National University. With Professor D. P. Craig, FRS, he set up the new Research School of Chemistry (ANU) of which he was the first Dean. He has received many international awards, including the Davy Medal of the Royal Society, and election as a full Foreign Academician of the USSR Academy of Science. He is active in the Australian Academy of Science of which he has been Treasurer. He was for many years a consultant of industry in Europe and the USA. He has been active in science policy matters and recently Chaired an Inquiry into CSIRO.

He was awarded the H. G. Smith Medal in 1954, and has been a Fellow since 1968.



DR PETER DONALDSON, RESEARCH FELLOW, R.S.C. (LEFT)
PREPARING TO LAND ON SABRINA ISLAND (BALLENY GROUP)
DURING THE OCEANIC RESEARCH FOUNDATION ANTARCTIC
EXPEDITION. DECEMBER, 1977 - MARCH, 1978



# ANU man recalls rigors of expedition

**Seven thousand nautical miles in an unheated small yacht, 17 days in pack-ice, two hurricanes which whipped up 12-metre waves and pounded the boat unmercilessly. These are some of the memories of Dr Peter Donaldson who went on Dr David Lewis' Antarctic expedition in the 18-metre yacht, *Solo*, recently.**

Dr Donaldson, Research Fellow in ANU's Research School of Chemistry, was one of the eight members of the expedition. Dr Lewis had made maritime history in 1974 by sailing to the Antarctic single-handed. His boat capsized three times and was dismasted twice. The latest expedition, according to Dr Donaldson, was no less adventurous and 'we had several close calls'.

During this expedition, *Solo* travelled further south than a boat of its size had ever been, Dr Donaldson says. It encountered rough seas and wild winds with the barometric pressure falling as low as 950 millibars in one place. The yacht was holed once, requiring repairs in mid-ocean. The wildness and the inaccessability of various islands meant that they had been rarely visited since their discovery in 1839.

'Scientifically, the expedition, sponsored by the Oceanic Research Foundation, was a success', Dr Donaldson says. 'Although hampered by shocking working conditions, we studied icebergs, collected varied samples for many scientists and regular bird, whale and weather logs. Much careful work is now in progress before the results are published.'

The expedition, which set out from Sydney in December last year, spent 21 days south of the Antarctic Circle. It carried out scientific studies in various locations. Its route included the Balleny Islands, Cape Adare, Antarctica and Macquarie Island.

Dr Donaldson's research at ANU concerns reactions of metal carbonyls and acetylenes, subjects far removed from studying icebergs and wildlife in the Antarctic which was his job on *Solo*. Additionally, he worked as a sound recordist and second cameraman for the Australian Broadcasting Commission during the expedition. So great was the interest raised by the expedition that the ABC sent Mr Ted Rayment, as director and cameraman, to film the trip, a film which is now being edited.

Dr Donaldson says that he developed an interest in wildlife photography and sound recording while studying for his PhD at Alberta University, Canada during 1969-73. He then worked with Mt Everest climber, Sir Edmund Hillary, in New Zealand and Nepal as a sound recordist. In Nepal, he accompanied Sir Edmund to about 20,000ft in the Himalayas – at about the same time when Dr Lewis was battling on to the Antarctic single-handed.

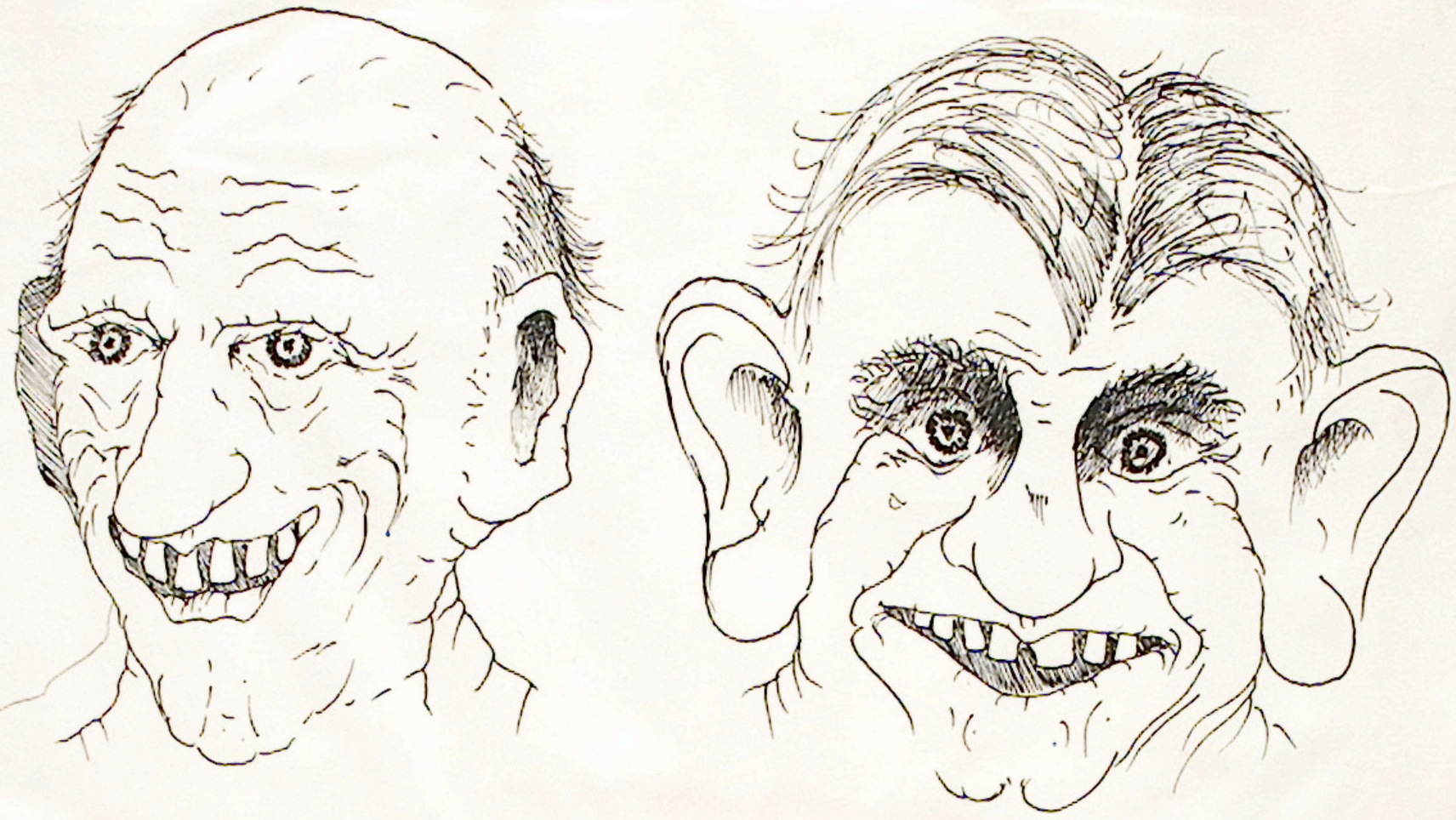
'I would think more than twice about heading south again in such a small vessel', Dr Donaldson now says. But describes the expedition as fascinating. The constant movement and the seasickness took their toll – he returned 13kgs lighter. As for the human angle, it was quite an experience for eight people to be herded into such a small space for a stormy passage. And it was not until the expedition reached Macquarie Island, two months from Sydney, that a change of clothing was possible.

Asked if he had learnt any particular lesson from the expedition which could be of assistance to future sailors to Antarctica, Dr Donaldson replied 'One particular lesson we learnt was not to urinate downwind during a hurricane – such a gale creates a fair vacuum past one's body'.

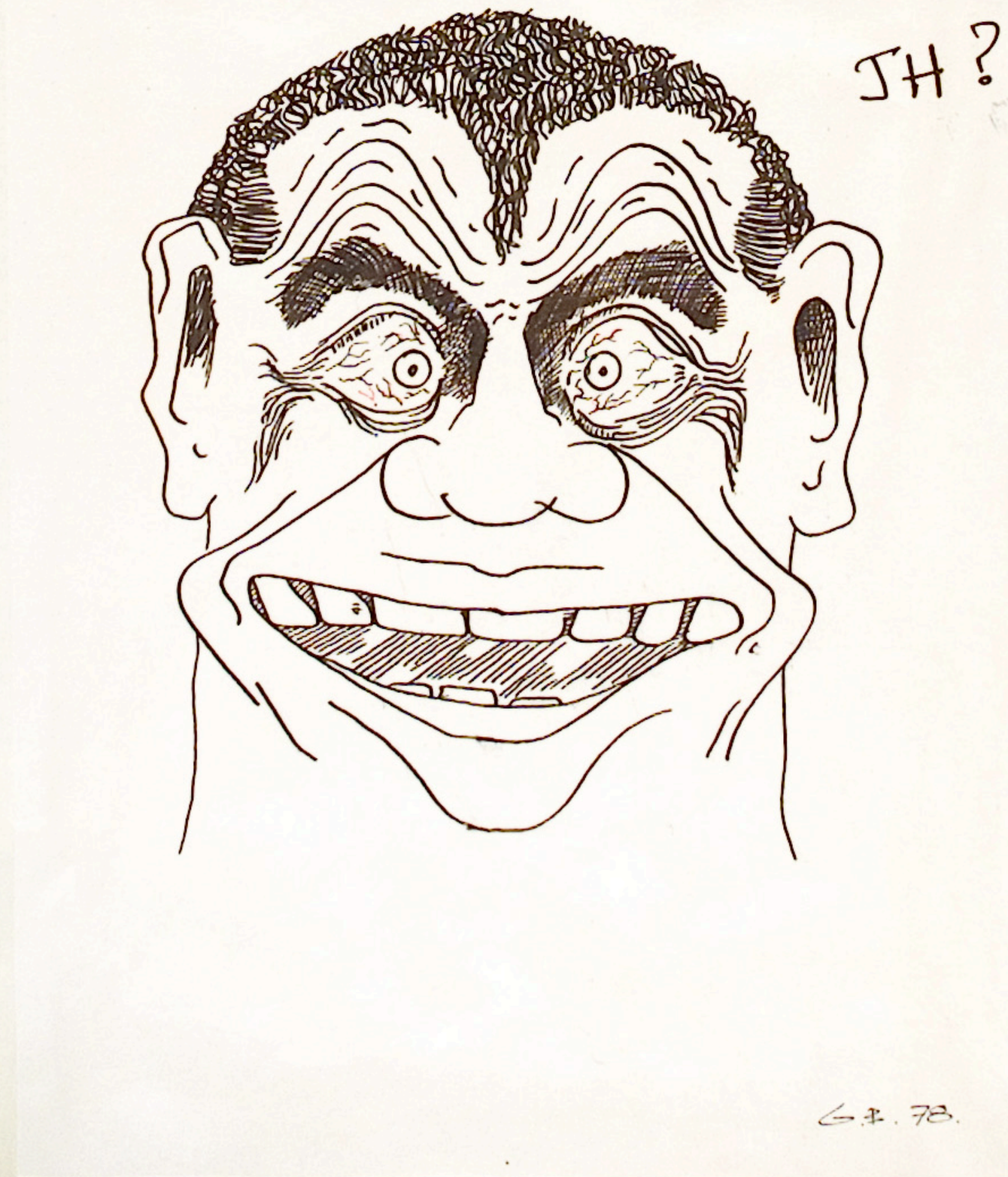
Dr Pieter Arriens (Copyright)

*Preparing to land on Sabrina Island from a rubber dinghy are (from left), Dr Donaldson; the second-in-command of the yacht 'Solo', Lars Larsen, and Ted Reyment from the ABC. In the foreground is Jack Pittar who, at 28, was the youngest crew member.*

DISTINGUISHED SCHOOL VISITOR - 3M 1975
PROFESSOR G. SCHWARZENBACH
INORGANIC CHEMISTRY
E.T.H. ZURICH
DECEASED 1978



G. B. 78




G. B. 78.

FRIDAY, OCTOBER 27, 1978
Canberra Times

# ANU breakthrough in making prostaglandins

**The ANU has patented a new process, developed by research chemists, which could make prostaglandins — an important group of hormones — more readily and cheaply available.**

According to an article in today's edition of the ANU Reporter, prostaglandins have been hailed as "the new frontier in medicine, the do-it-yourself abortion pill, the cure-all chemical, and have had other eulogies bestowed upon them".

Prostaglandins are found in minute quantities in humans and animals. They control many body functions including reproduction, respiration, kidney, central nervous system and cardio-vascular activity, and temperature.

They were first identified about 35 years ago, and were first thought to be produced by the prostate gland — hence their name.

While their medical potential is vast, their complexity has been a major obstacle to their widespread therapeutic use. They can be derived from natural sources, such as sheep, or manufactured synthetically.

Natural prostaglandins (including those made in a laboratory but identical to the prostaglandins found in animals) are difficult to use because they break down quickly in the body and have many different effects.

However, by altering the chemical structure slightly, it is possible to make artificial substances, call prostanoids.

The new process has been developed by a three-member team, headed by Mr Ron Rickards, professorial fellow in the ANU's Research School of Chemistry. The other members are Dr Melvyn Gill, a research fellow, and Mr Tony Herlt, a senior technical officer.

It uses as a starting point the common and cheap compound, phenol. In a five-stage process, this is transformed into an "intermediate" compound, from which the desired natural prostaglandin or synthetic prostanoid, can be made.

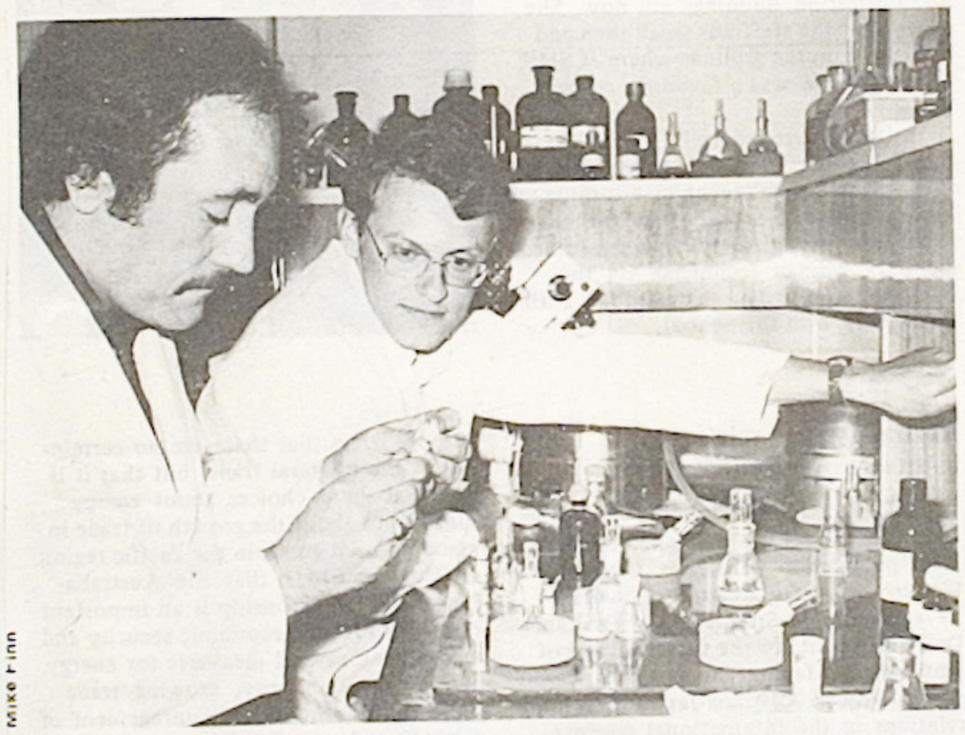
The team has proved the process by manufacturing one of the most important natural prostaglandins. Mr Rickards stressed yesterday that the team's research was limited to the fundamental chemistry and synthesis of prostaglandins, not their medical applications. Most of the work had been done in the past 18 months, although the project began about four years ago. Synthesis of prostaglandins in the laboratory was not new, but the team had found a new chemical "route" which worked, was simple and relatively efficient.

Its other main advantage was its flexibility. With minor alterations a whole range of prostaglandins could be made. It was therefore the method of synthesisation which had been patented, not the end products.


# ANU Reporter

*Convocation Issue*

*Published by the Registrar for private circulation to members of the Australian National University*

Mike Finn

*Members of the Research School of Chemistry prostaglandins research group, Dr Melvyn Gill and Mr Tony Herlt. The RSC research has simplified the production of prostaglandins in the laboratory.*

**The recent patenting by ANU's Research School of Chemistry of an invention relating to processes for synthetic preparation of compounds of the prostaglandin group offers a new method for the production of these very significant chemicals which may be put to a wide range of clinical and therapeutic use.**

## Prostanoids have immense medical possibilities

The presence of natural prostaglandins in humans and animals has been known for about 35 years. They are a family of biologically active lipids which are normal constituents of human and animal tissues. Their chemistry and their biological activity have been the subjects of extensive research in many parts of the world.

Although present in very low concentrations, they are believed to be involved in the control of a wide variety of biological processes including reproduction, muscle expansion and contraction, respiration, lipid metabolism, kidney function, central nervous system activity, gastric secretion, cardiovascular activity, immune response and temperature control.

No wonder prostaglandins have been hailed as the new frontier in medicine — the do-it-yourself abortion pill, the cure-all chemical — and have had other eulogies bestowed on them. But while their medical potential is vast, their biological complexity has posed a major obstacle to their widespread use in therapy. The range of activity of the natural prostaglandins is extremely wide and their quick metabolism in the body changes their chemical structure to inactive forms.

The ANU team led by Mr Rod Rickards, Professorial Fellow, has developed a new route to synthesise these compounds which offers significant advantages in the preparation of prostaglandins. Other members of the ANU team are Dr Melvyn Gill, Research Fellow, and Mr Tony Herlt, Senior Technical Officer.

Mr Rickards says that the ANU patent extends to both the natural substances (that is, although prepared in a laboratory they are identical to the natural substances) and also to purely synthetic analogues of the natural materials. These compounds have been collectively termed prostanoids. The viability of the synthetic route developed by the ANU group has been demonstrated for the case of prostaglandin $E_1$, one of the important natural prostaglandins.

The humble substance phenol is used in the ANU process, thus ensuring a cheap and readily available starting point. A sequence of chemical reactions then leads to a common intermediate compound, from which a range of either natural or unnatural prostanoids can be prepared by further reactions.

However, naturally occurring prostaglandins have drawbacks of rapid metabolism and wide range of activity which hinder their general use in therapy. Synthetic analogues of the natural prostaglandins, with slightly altered molecular structure, may overcome these problems. Such analogues, for example, are already in veterinary use for the control of breeding in cattle and horses.

By preparing a range of unnatural prostaglandins it may be possible to design ones with specific biological activities and which are more stable towards degradation in the human body. An advantage of the ANU synthesis is that it lends itself to preparation of such analogues.

Mr Rickards says that the processes involved are convenient to carry out and efficient in their synthetic yields. The route compares favourably in its flexibility and simplicity with other established routes to prostaglandins. There are few, if any, classes of compounds that have so many different actions with such tremendous medical potential.

# Institute Awards

## H. G. Smith Memorial Medal

Dr Martin A. Bennett *(A)* has been awarded the H. G. Smith Memorial Medal for 1977. The Medal was presented and his Lecture delivered at a meeting at the University of NSW on Thursday 19 October; the title is Activation of organic and inorganic molecules by organotransition metal complexes.

Dr Bennett has developed new kinds of metal complexes that can: (a) promote the formation of metal-carbon and metal-hydrogen bonds, and cause isomerization of alkyl groups; (b) stabilize intermediates that promote the addition of water to nitriles and carbon monoxide; (c) catalyse the hydrogenation of olefins and aromatics in homogeneous solution. Overall, a set of new reagents and reactions has become available as a result of research in this area.

Dr Bennett is a Senior Fellow at the ANU Research School of Chemistry.

## 1978 Rennie Medal

The 1978 Rennie Medal has been awarded to Dr Leo Radom *(A)*, of the Research School of Chemistry at the Australian National University.

A graduate of Sydney University (B Sc, HI, University Medal, 1965; M Sc, 1966; Ph D 1969), Dr Radom went to USA on a Fulbright award to carry out postdoctoral work with Professor J. A. Pople at Carnegie-Mellon University from 1969-72. He returned to Australia as a Queen Elizabeth II Fellow.

His research interests are concerned with the organic chemical applications of *ab initio* molecular orbital theory and the use of theory to strengthen chemical intuition. He is particularly interested in structures and stabilities of reactive intermediates (cations, anions and radicals), gas-phase ion chemistry with special emphasis on acidities and basicities in the gas phase, mechanisms of molecular rearrangements and organic conformational analysis.

He is co-author of a book (with J. A. Pople, W. J. Hehre and P. V. R. Schleyer) entitled "A Chemist's Guide to *ab initio* Molecular Orbital Calculations", now in its final stages and scheduled to be published by Academic Press in 1979.

# Medal to RMC man

## CHEMISTRY AWARD

A lecturer in chemistry at the RMC, Duntroon, Dr Greg Jackson, has been awarded the Rennie Memorial Medal.

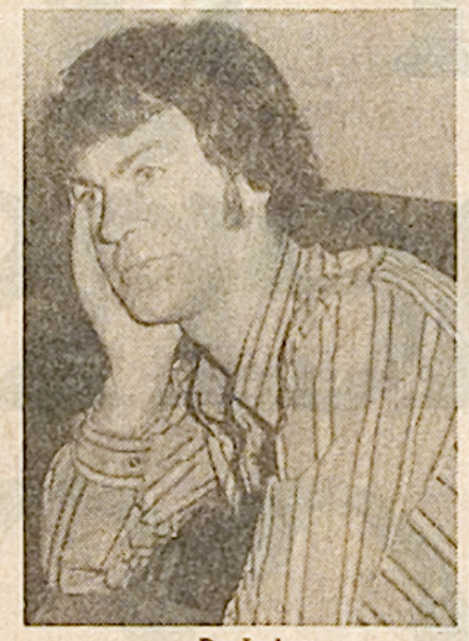
The medal is presented to young chemists on the basis of research they have carried out over 10 years.

Dr Jackson, who received his doctorate in Melbourne in 1971, said last night that he was feeling "pretty happy and privileged" to have been awarded the medal.

"The main thing to me is the recognition by your colleagues of your own ability. . . it's pretty nice, but it is really a medal for the college, as well as for me", he said.

The medal is presented to chemists under 33 who are regarded by the Royal Australian Chemical Institute as outstanding in their field of chemistry.

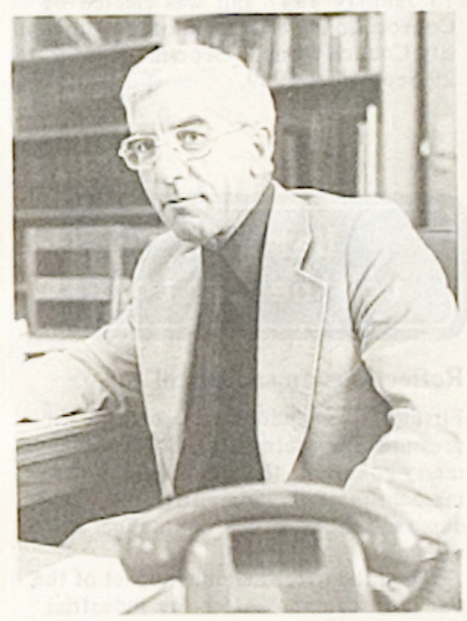
Dr Jackson will officially receive the medal at an institute meeting on Wednesday.



Dr Jackson

CANBERRA TIMES 28 MAY 1979

## Professor Hyde



Mike Finn

*Professor Bruce Godfrey Hyde recently took up his position as Professor of Inorganic Chemistry in ANU's Research School of Chemistry. His speciality is solid state chemistry which involves a study of non-molecular crystal structures. It is a study essentially of why certain crystals have certain structures. This field developed in the last 15 years or so as better techniques have become available. Professor Hyde has held positions in several Australian and American universities and has visited universities in Japan and Sweden. Before coming to ANU, he was with the University of Western Australia which he joined as a Senior Lecturer in 1965 and became Reader in Chemistry in 1970.*

ANU Reporter 11 May 1979

# Twenty eight years with ANU

*Mr Tys*



Bvam Wight

Bill Tys was one of the very first occupants of the Cockcroft Building in 1951. This month he retires after 28 years service with the University. And he plans to take courses in motor mechanics and gourmet cooking to keep himself busy.

A master glassblower, Mr Tys started work in the Research School of Physical Sciences and later transferred to the Research School of Chemistry where he has been in-charge of the glassblowing workshop. He leaves with many pleasant memories but one regret. He was not able to fulfill his original ambition of starting a training class in glassblowing, particularly as there is not an adequate training scheme in Australia for professional glassblowing.

ANU Reporter 8 June 1979

# ANU Reporter

Vol. 10 No. 16 12 October 1979

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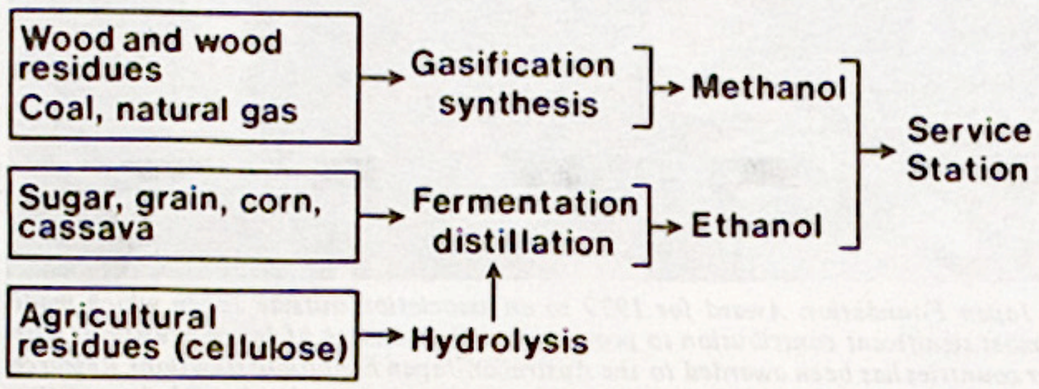
# Research needed to develop new catalytic systems to produce alternate fuels




**Research into the chemistry of coal and development of new catalytic systems for better utilisation of natural resources for the production of liquid fuels could help to reduce Australia's dependence on imported oil in the coming years, according to Dr Trevor Matheson, Research Fellow in ANU's Research School of Chemistry.**

A better understanding of the nature of coal is required; better catalysts (more selective and capable of operating at lower temperatures and pressures) are needed. The only way these can be achieved is by basic research into the chemistry of coal and the mechanisms that operate in the liquefaction processes, Dr Matheson says. 'To ensure that the maximum benefit is obtained from our dwindling resources time and money should be invested in this research now'.

The problem of energy shortage is worldwide, Dr Matheson points out. It is forecast that at current levels of consumption world demand for oil will exceed supply by the mid-1980s, although the inevitable price rises will make the development of as yet untapped resources economic (such as resources in difficult environments like deep sea, shale oil, tar sands and so on).

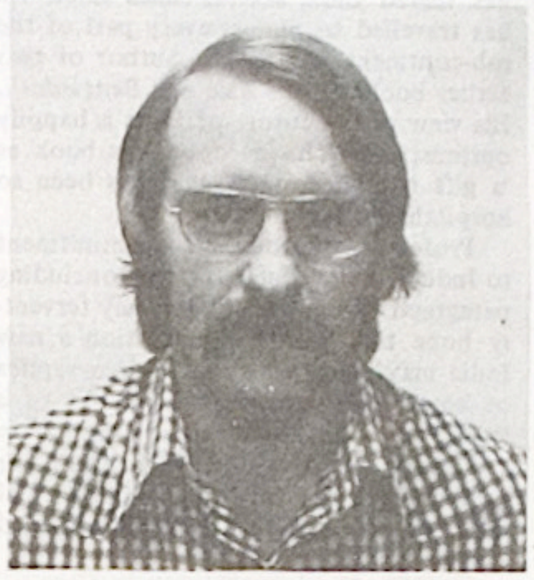
'Over this period Australia's degree of self-sufficiency (at present about 70 percent) will rapidly decrease and because of its dependence on transport fuels and limited financial capacity the country will be in a vulnerable position if this gap has to be filled by imported oil', Dr Matheson says. 'One means of stretching Australia's transport fuel supply is to blend with alcohol – to make "gasohol".'

Studies by groups in New Zealand, Volkswagen in West Germany and the Brazilian Government have shown that blends of 10-15 percent of methanol (MeOH) or ethanol (EtOH) in petrol have minimal effect on the driveability and performance of petrol engines. Some minor modifications are required – adjustment of the carburettor (at present illegal in Australia) to allow for the 'leaning' effect of alcohol and the replacement of elastomer components (e.g. pump diaphragms, fuel lines) which react with alcohols.

None of the expected problems of phase separation (caused by water absorption by the alcohol), engine wear, corrosion, vapour lack, driveability (cold start, warm up, warm start and so on), and fuel economy arose. Volkswagen and the Brazilians are also investigating pure alcohol fuels and have found that by modifying petrol engines (mainly by increasing the compression ratio and altering the carburation and ignition systems) satisfactory running conditions are obtained.

Dr Matheson explains that there are two main sources of alcohol – fossil fuels (coal, natural gas) and the renewable source of plant biomass.

The first requirement in obtaining MeOH is to produce synthesis gas (CO + $H_2$): this comes from coal and wood on treatment under pressure with steam and oxygen, and from natural gas by 'reforming' with steam over a catalyst. Synthesis gas is then converted to MeOH over a copper oxide/zinc oxide catalyst which enables low temperatures (approximately 200°C) and pressures (50 bars) to be used.



*Dr Matheson*

Ethanol is produced by fermentation of sugar, grains and cassava, and from cellulose (wood, agricultural residues) after hydrolysis. Traditionally cellulose hydrolysis has been achieved chemically with acids but recent research has indicated the possibility of commercial application of biochemical enzymatic hydrolysis. The alcohols are finally purified by distillation and are then ready for use.

'Gasohol could extend Australia's fuel resources but it would only be a short term measure. Different energy sources (e.g. fuel cells, hydrogen) will probably become commercially viable in the future, but such is the dominance of coal as an energy resource in Australia it seems inevitable that the conversion of coal to liquid fuels will be the method used to maintain some self-sufficiency as oil sources run dry', Dr Matheson says.

'There are three main conversion processes: production of synthesis gas and then liquid fuels (via the Fischer-Tropsch process to oil, or to methanol as described above); direct hydrogenation at high temperature and pressure; and pyrolysis of coal to tar and heavy oils which can be further hydrogenated. All of these methods are well established, all use catalysts of one sort or another and all are expensive. The need for basic research is urgent if the gap between supply and demand in the coming years has to be bridged economically'.

1979

A.N.U. Reporter.

17th October, 1980.

DIED APRIL 1999

# Know your poisons

by Brian Fenning

Mr Fenning works as a Technician Officer in the Research School of Chemistry. He has been in the School since its inception. Most of his spare time is spent in hunting and fishing both around Canberra and in other parts of Australia.

Man is one of the few mammals that is omnivorous. Some omnivores are hunters and as one who is instinctively a hunter I have sought to obtain much of my domestic supply of meat and fish by this means. As flesh is the principal source of food poisoning in humans, it is useful to have an understanding of the bacteria and parasites that infect meat in order to prevent problems arising from wild food sources.

## *Bacterial food poisoning*

The toxin forming bacteria which produce the symptoms we broadly call 'food poisoning' can be divided into two types: staphylococcal food poisoning and botulism are the result of eating food which contains the toxins produced by these bacteria; and gastroenteritis, on the other hand, is the result of ingesting bacteria, such as the Salmonella species and Clostridium perfringens, which then multiply in the intestinal tract. In preventing food poisoning, therefore, one must always consider both aspects — killing the bacteria and/or destroying the toxin.

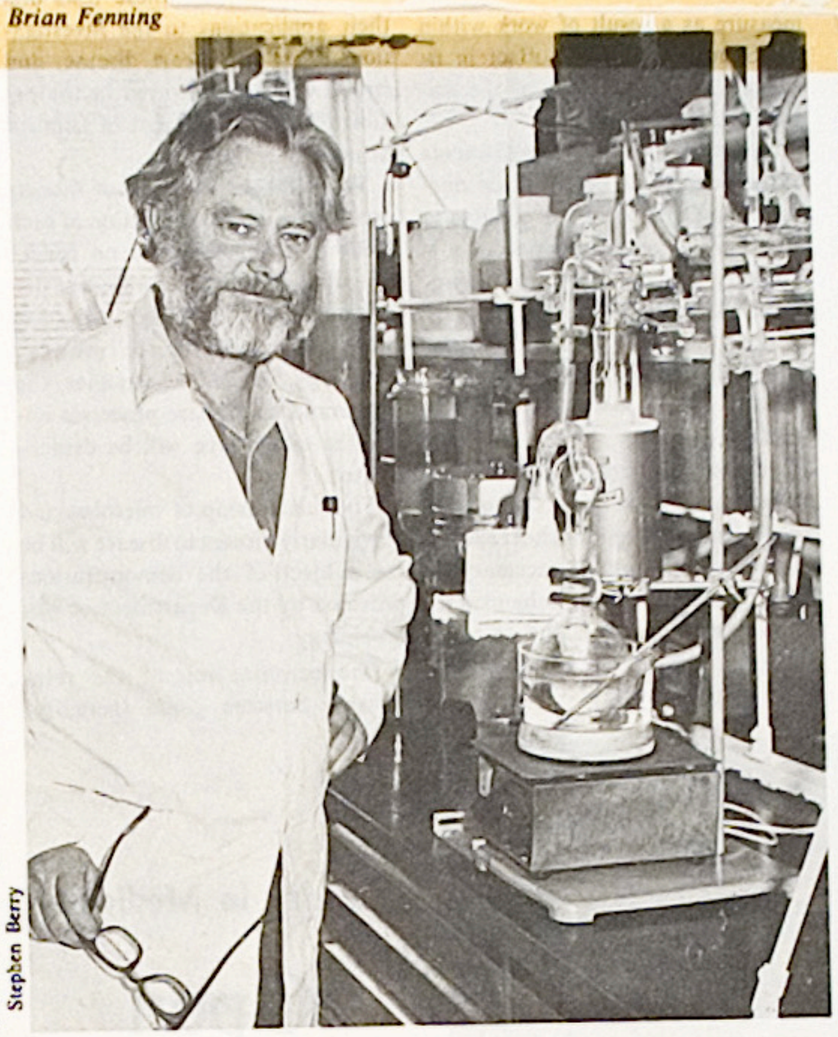
The foods that are most susceptible to bacterial infection are meat and dairy products — both cooked and uncooked. It is generally realised that high standards of personal and kitchen hygiene are essential in the handling of all types of foods. Thorough cooking, together with refrigeration and deep-freezing of perishables are also techniques that people are commonly aware of. However, a quick reading of my son's lecture notes (he is training to be a chef) made me realise that there are several aspects of bacterial food poisoning that are not so widely known.

**Staphylococcus:** The food poisoning strains of these bacteria grow well at temperatures greater than 18°C and produce toxin in both aerobic and anaerobic conditions. These toxins are not killed by heating and can withstand boiling for over half an hour. Thorough cooking is of no avail in this case! Perishable foods must be promptly refrigerated.

**Clostridium botulinum:** These bacilli produce spores which germinate in oxygen free environments. On germination these organisms produce an extremely potent toxin. Although this toxin is destroyed in acid conditions and by boiling for ten minutes, killing the spore form of this bacteria is difficult. It can be done in a pressure cooker or during canning or bottling. However, if the canning or preservation has not been carried out properly, a perfect, air-free environment has been provided for the germination of the spores. Great care must be taken when home bottling any non-acid foods such as vegetable because ingestion of these toxins proves fatal in 30-65 per cent of cases.

**Clostridium perfingens:** A normal inhabitant of the intestinal tract. If this bacteria multiples above the normal levels due to the ingestion of contaminated food (in particular meat), food poisoning results. The bacteria multiples in warm anaerobic conditions. However, it is destroyed by heating above 60°C, and storage below 7°C inhibits its growth. To prevent this bacteria contaminating food, cooking should be thorough and slow cooling should be allowed. Keeping uneaten food warm by storing it in a slowly cooling oven is inviting trouble as is leaving pots of stew or soup to cool slowly before putting them in the refrigerator.

Brian Fenning



Stephen Berry

## *Points on parasites*

In man, infestation by helminths (worms) is generally the result of eating meat which contains the eggs, larvae or adult form of these parasites, or by penetration through the skin by larvae. Due to the high levels of health control that exist in Australia, no commercially sold meat products are likely to contain parasites. However, care should be exercised by anyone killing their own meat or fish, be it wild animals or domestic. The two main types of helminths, the roundworms or nematodes, and the flatworms (tapeworms and flukes) are briefly discussed below.

**Intestinal Nematodes:** Hookworm disease and trichinosis are the two roundworm infections of interest in Australia. The first of these is easily dealt with — wear shoes! The larvae of hookworms enter man by penetrating the skin of the feet.

Swine are the primary hosts of trichinosis; therefore as a hunter of wild pigs I am particulary interested in this type of infestation. Three simple precautions, however, will make wild pigs fit to eat — prolonged salting or smoking; freezing for more than three days; and thorough cooking.

**Tapeworms:** Cattle, swine and fish are all hosts to species of tapeworm that can infest man. Of these, only wild pig and fish are of any concern. Tapeworms are usually found in the internal organs of these animals. For this reason offal should be thoroughly cooked in order to kill any parasites before consuming the meat.

Most tapeworms have a life cycle that involves more than one host so it is important to break the reproductive chain. In cases where the human intestinal tract is infected by adult worms then the hygenic disposal of human excrement will minimise propagation of these parasites.

Another important tapeworm disease found in Australia, and in the Canberra and surrounding area particulary, is hydatids. In this case, man together with sheep, are the intermediate host. The worms exist in adult form in the intestines of dogs. Eggs can be passed from the dogs to humans and, if ingested, they hatch in the small intestine and penetrate into such organs as the liver where they form cysts. This infection can now be cured by drugs but if dogs are prevented from eating the offal of infected sheep the whole cycle can be broken. By this method the disease can be totally eliminated as has happened in New Zealand and Tasmania.

In conclusion, a high standard of personal hygiene is essential if most food poisoning and parasitic infestation are to be avoided. In the hunting situation the main sources of problems arise from the careless inspection of carcases and neglect in cooking meat thoroughly; also lack of facilities for rapidly refrigerating slaughtered animals together with the tendency to relax personal hygiene standards.

Personally I have found that the use of nail brush and soap before and after and even during the cleaning of meat or fish, is a most effective precaution. These measures and care in cooking meat thoroughly have allowed my family to eat many animals and fish found in Australia without a case of upset stomach or internal parasitic infestation for the past 30 years.

Courtesy: RSC Newsletter

THE ROYAL AUSTRALIAN CHEMICAL INSTITUTE

Presentation of the

# A.E. LEIGHTON MEMORIAL MEDAL

BRUCE HALL, AUSTRALIAN NATIONAL UNIVERSITY

TUESDAY, 17 FEBRUARY, 1981

LEIGHTON MEDALLIST

ARTHUR JOHN BIRCH, C.M.G., F.R.A.C.I., F.A.A., F.R.S.

Professor A.J. Birch is a graduate of the University of Sydney. He graduated D. Phil. in Oxford (1940) and was a Research Fellow there until 1949 when he went to Cambridge as Smithson Fellow of the Royal Society. He was successively Professor of Organic Chemistry in Sydney (1952-55), Manchester (1955-67) and the Australian National University (1967-80). In 1965 he was invited, with David Craig, to found the Research School of Chemistry, ANU, and was Foundation Dean (1967-70).

His research interests are wide, and the Birch reduction is of very broad synthetic use, including the first synthesis of 19-norsteroids to which the oral contraceptive pill belongs. His polyketide hypothesis has wide applications in biochemistry, including his correct suggestion of the origin of the petal pigments of flowers, as well as of a number of antibiotics. His more recent work has explored the concept of lateral control of synthesis by attachment of metal atoms and coordinating groups to olefinic systems.

Apart from research, Professor Birch has broad interests in the industrial, social and political implications of science. He has been a consultant over the last 25 years to a wide range of industrial firms, and is at present a member of the Board of the Institute of Drug Technology (Victorian College of Pharmacy). He has been an adviser to Government, including membership of the Advisory Committee on Science and Technology, Chairman of the Independent Inquiry into the CSIRO, and is Chairman of the Australian Marine Sciences and Technologies Advisory Committee and of the Marine Funding Advisory Panel.

He has received many international scientific distinctions in the UK, USA, Czechoslovakia, Belgium and the USSR, including the Davy Medal of the Royal Society. He is a Fellow of the Australian Academy of Science, the Royal Society and the USSR Academy of Science. He has an Honorary Doctorate of the University of Sydney, and was recently elected as an Honorary Fellow of the new Royal Society of Chemistry.

On his retirement in 1980 Professor Birch was appointed the first occupant of the Newton-Abraham Chair in Oxford for 1981, with a Professorial Fellowship at Lincoln College.

## PROGRAMME

**TOAST**

*Her Majesty the Queen*

**WELCOME TO GUESTS**

*Dr Bruce Middleton,* F.R.A.C.I.

*President of the Canberra Branch,*
*Royal Australian Chemical Institute*

**READING OF THE CITATION**

*Mr Hugh Grayson,* F.R.A.C.I.

*President of the Royal Australian*
*Chemical Institute*

**PRESENTATION OF THE LEIGHTON MEMORIAL MEDAL**

*His Excellency The Right Honourable*
*Sir Zelman Cowen*
A.K., G.C.M.G., G.C.V.O., K.St.J., Q.C.

*Governor General of the Commonwealth of Australia*

**THE LEIGHTON ADDRESS**

*"Accountable and Creative Research"*

*Professor Arthur Birch*
C.M.G., F.R.A.C.I., F.A.A., F.R.S.

**RESPONSE**

*Mr Hugh Grayson,* F.R.A.C.I.

WEDNESDAY 18 FEBRUARY - MORNING

9.00 - 10.15 *Recent Advances in the Chemistry of Hydroporphinoids*
A. Eschenmoser (ETH, Zürich)

Chairman - A.L.J. Beckwith

10.15 - 10.45 Morning tea

10.45 - 11.35 *Remote Orbital Interactions, Ion Pairing Effects, and the Birch Reduction*
M.N. Paddon-Row (N.S.W. Institute of Technology)

11.35 - 12.25 *Reductive Alkylations : New Developments and Applications to Carbocyclic Synthesis*
L.N. Mander (Australian National University)

Chairman - S. Sternhell

WEDNESDAY 18 FEBRUARY - AFTERNOON

2.00 - 2.50 *Birch Type Chemistry at Monash*
W.R. Jackson (Monash University)

2.50 - 3.40 *Recent Developments in the Biosynthesis of Ansamycin, Maytansinoid, and Mitomycin Antibiotics*
R.W. Rickards (Australian National University)

Chairman - A.J. Birch

3.40 - 4.00 Afternoon tea

EXPERIMENTAL

To "birch" no longer means to thrash,
No dictionary would be so rash
To put this meaning in first place
Its newer sense now sets the pace.
The kindly hand of Papa Birch
No benzene ring leaves in the lurch.
So a toast to Birch and his reaction
May it always give full satisfaction,
And may he never pull a boner
With sodium and proton donor.[2]

ACKNOWLEDGMENTS

The Organising Committee gratefully acknowledges financial support from the following sources:

Research School of Chemistry, A.N.U.
Division of Organic Chemistry, R.A.C.I.
Canberra Branch, R.A.C.I.
Ansett Airlines of Australia

and thanks the Australian Academy of Science for the use of Becker Hall.

The Committee is also indebted to

Syntex (U.S.A.) Inc., Palo Alto, California

for enabling Dr J.M. Muchowski to participate in the Symposium.

REFERENCES

1. J.W. Cornforth, unpublished work.

2. R.A. Raphael, private communication.

J.K. MacLeod
L.N. Mander
L. Radom
R.W. Rickards

Research School of Chemistry
Australian National University
Canberra, A.C.T. 2600

RESEARCH SCHOOL OF CHEMISTRY
AUSTRALIAN NATIONAL UNIVERSITY
CANBERRA

# ORGANIC SYNTHESIS

A Symposium in Recognition of
the Contributions to Science of

**PROFESSOR ARTHUR J. BIRCH**
**CMG, FRACI, FAA, FRS**

CANBERRA

15 - 18 FEBRUARY, 1981

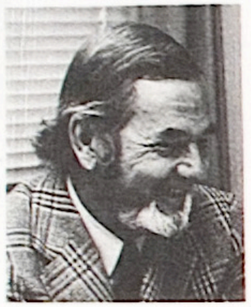
**PROGRAMME**

# ORGANIC SYNTHESIS

SUMMARY

A programme of lectures and discussion concerned mainly with synthesis in organic chemistry will be held at the ANU, 15-18 February, 1981, in recognition of the contributions to science of Professor A.J. Birch.

## INTRODUCTION



That outpost of Empire, Australia,
Produces some curious mammalia,
The kangaroo rat,
The blood-sucking bat,
And Arthur J. Birch, *inter alia*.[1]

## DISCUSSION

LECTURES will be held in *Chemistry Theatre No. 1*, Department of Chemistry, The Faculties, ANU, except for the Birch Lecture, which will be presented in *Becker Hall* of the Australian Academy of Science.

## MONDAY 16 FEBRUARY - MORNING

| | |
|---|---|
| 9.00 | *Opening Remarks*<br>R.W. Rickards |
| 9.05 - 10.20 | *Recent Developments in the Chemistry and Biosynthesis of β-Lactam Antibiotics*<br>J.E. Baldwin (University of Oxford)<br>Chairman - R.W. Rickards |
| 10.20 - 10.45 | Morning tea |
| 10.45 - 11.35 | *Synthetic Approaches to Polycyclic Polyketides*<br>D.W. Cameron (University of Melbourne) |
| 11.35 - 12.25 | *New Routes to Anthracyclines in which Regiospecific Anionic and Cycloaddition Reactions play Pivotal Rôles*<br>R.N. Warrener (Australian National University)<br>Chairman - R.F.C. Brown |

## MONDAY 16 FEBRUARY - AFTERNOON

| | |
|---|---|
| 2.00 - 3.15 | *Recent Synthetic and Mechanistic Studies on Cyclic Phosphonium Ylids and Pyrroles*<br>J.M. Muchowski (Syntex Research)<br>Chairman - J.M. Swan |
| 3.15 - 3.45 | Afternoon tea |
| 3.45 - 4.35 | *Some Reactions of Oxygen Heterocycles - Furans and Butenolides*<br>R.A. Massy-Westropp (University of Adelaide) |
| 4.35 - 5.25 | *Invertase Inspired Syntheses: New Derivatives of Sucrose and Fructose*<br>R.D. Guthrie (Griffith University)<br>Chairman - P.R. Jefferies |

## MONDAY 16 FEBRUARY - EVENING

| | |
|---|---|
| 8.00 | *Inaugural A.J. Birch Lecture*<br>*Organic Synthesis and the Origin of Natural Products*<br>A. Eschenmoser (ETH, Zürich)<br>Chairman - L.N. Mander |

## TUESDAY 17 FEBRUARY - MORNING

| | |
|---|---|
| 9.00 - 10.15 | *Arene Metal Complexes in Organic Synthesis*<br>M.F. Semmelhack (Princeton University)<br>Chairman - M.A. Bennett |
| 10.15 - 10.45 | Morning tea |
| 10.45 - 11.35 | *Aryllead Triacetates - Versatile New Arylating Agents*<br>J.T. Pinhey (University of Sydney) |
| 11.35 - 12.25 | *Modification of Organic Reactivity by Metal Ions*<br>A.M. Sargeson (Australian National University)<br>Chairman - S.F. Dyke |

## TUESDAY 17 FEBRUARY - AFTERNOON

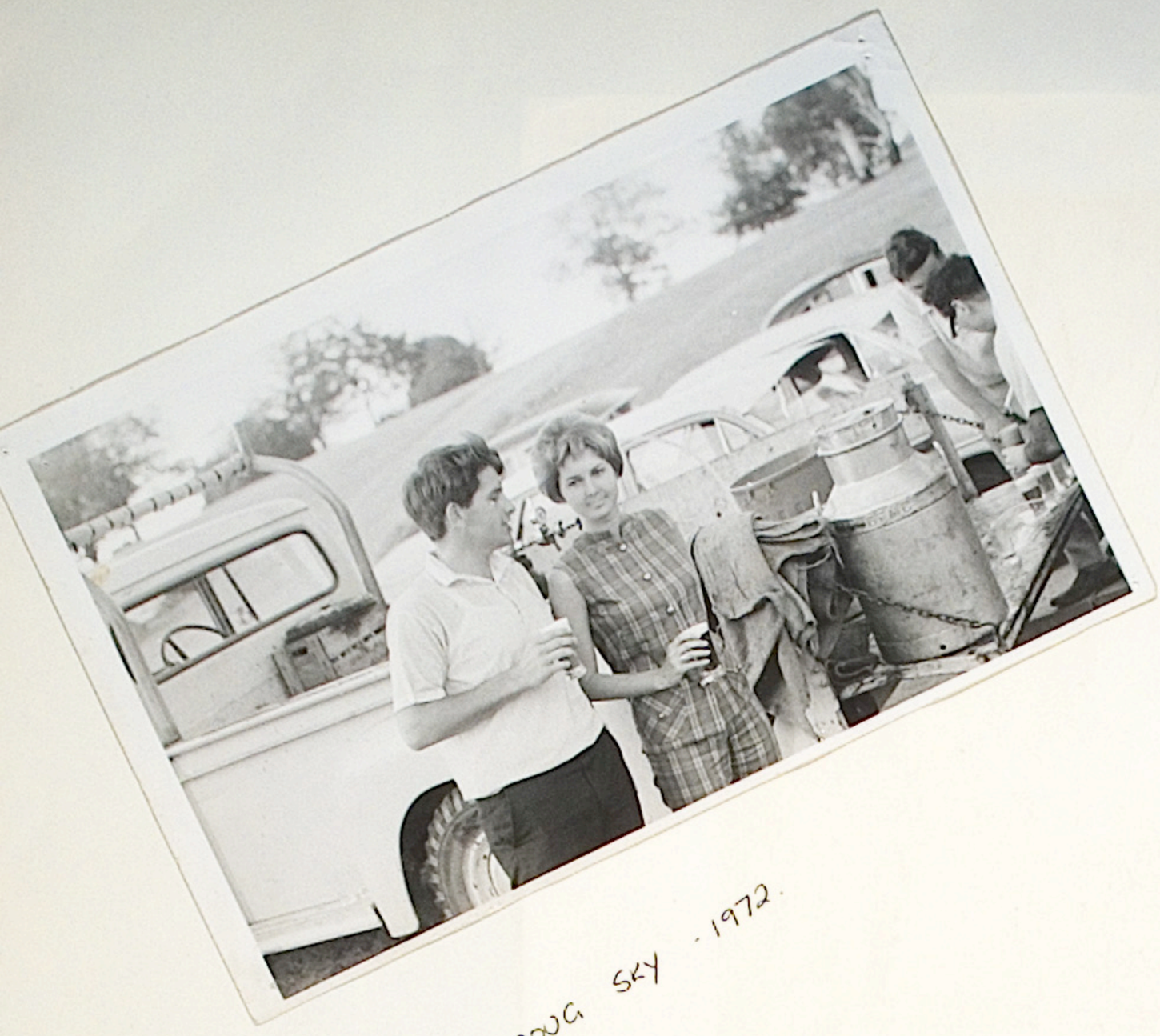
| | |
|---|---|
| | *Sightseeing Tours*<br>Tours of Canberra and district are available for those interested. For details see brochure provided.<br>Coordinator - J.A. Bromilow |
| 2.00 | *Informal Discussion Session*<br>An informal discussion session touching upon applications of the Birch reduction, development of synthetic equivalents, organometallic chemistry, and *any other topics you like to introduce*, will be held in Seminar Room 134, Research School of Chemistry. Come and go as you like.<br>Coordinator - J.V. Turner |
| 4.00 - 4.30 | *Afternoon Tea*<br>Available in the Common Room, First Floor, Research School of Chemistry. |

## TUESDAY 17 FEBRUARY - EVENING

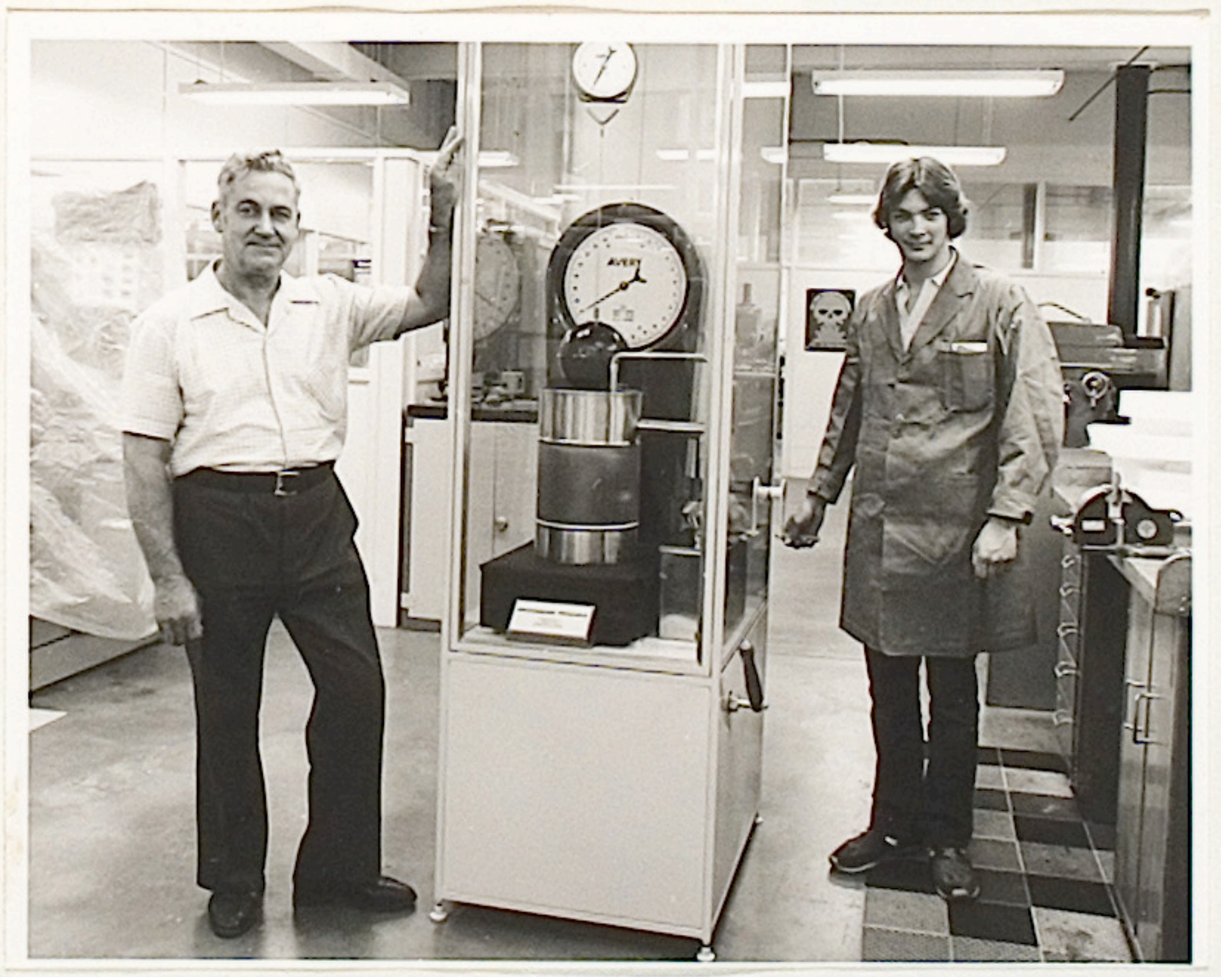
| | |
|---|---|
| 7.00 - 11.00 | *Leighton Award Dinner*<br>*Presentation of the Leighton Medal of the R.A.C.I.* by the Governor-General of the Commonwealth of Australia<br>*The Leighton Address: Accountable and Creative Research*<br>A.J. Birch |

*of Medical Research.* **Below:** *A number of former colleagues and students of Professor Arthur J. Birch, including some 200 chemists from Australia and overseas, attended an international conference this month to mark his contributions to science. A highlight of the conference was the presentation to Professor Birch of the Leighton Memorial Medal, the highest honour of the Royal Australian Chemical Institute, by the Governor-General, Sir Zelman Cowen. Professor Birch, who retired as Professor or Organic Chemistry in ANU's Research School of Chemistry at the end of last year, has achieved a distinguished reputation as an organic chemist, particularly for his work on the synthesis of organic compounds. A synthesis process he discovered, known as the 'Birch reduction', enabled mass production of the oral contraceptive pill. Apart from his research interests, he has been involved in the industrial, social and political implications of science. Recently he was chairman of the independent inquiry into CSIRO, and is Chairman of the Australian Marine Sciences and Technologies Advisory Committee and of the Marine Funding Advisory Panel. On his retirement, Professor Birch was appointed first occupant of the Newton-Abraham Professorship at Oxford University for 1981.*

ANU REPORTER 2-3-81.



MARC & DOUG SKY - 1972.



Malcom Best & Ross Benge ~1977

# Professor Birch to lead science body

C. Times 5/5/82

A professor of chemistry who recently retired from the chair of organic chemistry at the ANU's Research School of Chemistry, Professor Arthur John Birch, has been elected president of the Australian Academy of Science.

A Fellow of the Royal Society, Professor Birch was elected for a four-year term at the academy's annual meeting last Thursday.

A statement issued by the academy said Professor Birch was well known for his work on organic chemistry which contributed to the development of the contraceptive pill.

Professor B. W. Holloway, of the department of genetics at Monash University, Melbourne, was elected secretary (biological sciences) of the academy.

The meeting also anounced the award of medals to five Australian scientists.

The Matthew Flinders Medal was presented to Professor Robert Hanbury Brown, of the School of Physics (Astronomy), University of Sydney.

Professor Hanbury Brown, a pioneer in radar research before World War II and in radioastronomy after it, was also awarded the Matthew Flinders Lecture, one of the most prestigious awards of the academy, which he delivered on Thursday on the theme of 'Measuring the Size of Stars'.

The academy's statement said, "The Narrabri interferometer which he built was used to measure the angular size of 32 stars, making a major contribution to astronomy."

Professor D. W. Robinson, of the department of mathematics in the ANU's Research School of Physical Sciences, was awarded the 1981 Thomas Ranken Lyle Medal for distinguished research in mathematics and physics.

Professor Birch

The Gottschalk Medal for distinguished research in the medical or biological sciences by a scientist under the age of 36 was won by Dr John Shine, of the department of genetics in the ANU's Research School of Biological Sciences.

The statement said Dr Shine had made major contributions in molecular biology and in gene cloning.

The 1981 Pawsey Medal was awarded to Dr M. A. Green, of the school of electrical engineering and computer science at the University of NSW.

The 1982 Pawsey Medal was awarded to Professor J. A. Piper, of the department of physics in the School of Mathematics and Physics at Macquarie University.

Ten Australian scientists were elected fellows of the academy.

# Long standing problem

When Professor J. S. Anderson first visited Canberra, in January 1939, he was attending the 25th anniversary meeting of ANZAAS. 'My recollection of the Canberra of those days is of Burley Griffin's roads, open paddocks and the town ringed by bush fires', he says.

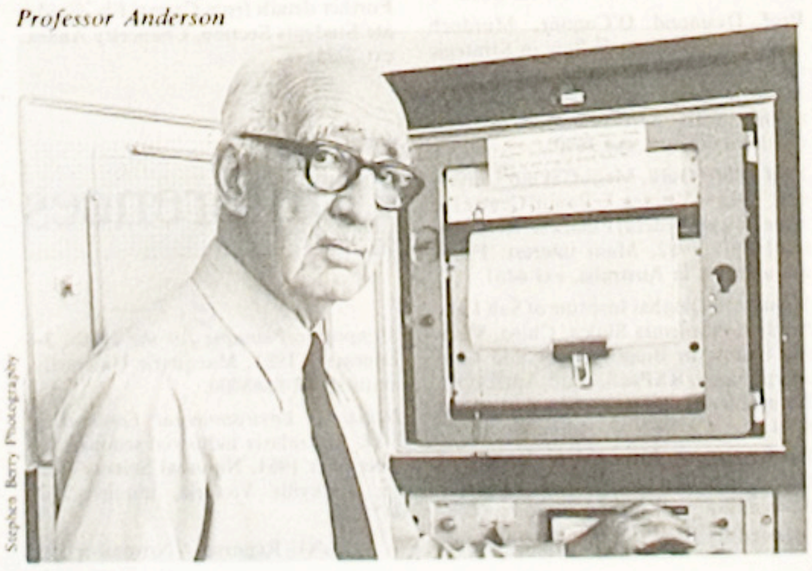
Professor Anderson is presently in Professor Hyde's research group as a Visiting Fellow in the Research School of Chemistry. He retired a few years ago from Oxford, where he was Professor of Inorganic Chemistry. Before coming to Canberra he was at the University of Wales, Aberystwyth.

Professor Anderson is working at ANU to clear up a problem with which he has been concerned for 30 years, since his days at Harwell—a problem of uranium chemistry.

Of the group of compounds concerned, he says 'Although these substances were first prepared over a century and a half ago, we still do not know just what compounds exist, nor what is their structure'. A few months work may clear up the problem, but he adds that in chemistry no problem is ever completely finished.

Professor Anderson is well known as a solid state chemist with a wide range of interests, including electron microscopy, solid state reaction mechanisms and structure-composition relationships.

*Professor Anderson*



Stephen Berry Photography

Professor A.J. Parker

Funeral at 2.45 p.m. today (Perth time) Wednesday 1st September 1982

Funeral Directors - Donald J. Chipper & Son
385 Rockeby Road
Subiaco

# OBITUARY

Members of the University and the Research School of Chemistry were saddened to hear of the death of Professor A. J. (Jim) Parker in Perth recently.

Professor Parker was inaugural Professor of Chemistry in 1973 at Murdoch University and Head of the Mineral Chemistry Research Unit until his death at 48.

Before joining Murdoch Professor Parker was Professorial Fellow in the Research School of Chemistry at ANU, under the Directorship of Professor Arthur Birch.

Professor Parker was dux of Wesley College, Perth, in 1950, and later gained a first-class honours degree in organic and physical chemistry and a doctoral degree.

After leaving Perth he worked with Sir Christopher Ingold at University College, London.

He worked as Senior Lecturer and Reader at the University of Western Australia from 1962 to 1966, moving to ANU in 1968.

At ANU he worked as a physical organic chemist and pioneered work on the effects of non-aqueous polar solvents. His work on copper solvents led to the formation of ANUMIN, an ANU company, which later transferred to Murdoch University, and the granting of many patents.

While at ANU Professor Parker played A-grade cricket for the ANU Cricket Club, and grade hockey. He was a keen fisherman and a member of the Federal and Royal Canberra Golf Clubs.

Professor Parker won the Rennie Medal in 1963, the H. G. Smith Medal in 1970, and was a Fellow of the Royal Australian Chemical Institute. He was also a Fellow of the Australian Academy of Science.

He leaves a wife, Lesley, and four sons.

Following his return to the University of Western Australia as a senior lecturer in 1962 and later as Reader, 1966, he worked on developing thermodynamic measures of solute-solvent interaction which could be used in the interpretation of rate data. He made outstanding practical advances in applying separate thermodynamic functions to ions. His contributions broadened to the total range of electrochemical and thermodynamic techniques and the quantitative understanding of rate determination in solution. This development can be traced through significant review articles[2, 3, 4].

mineral extraction, metal purification and recovery, battery development and new methods for the production of solar cells[7, 8, 9]. This work produced over 20 patents or provisional applications to add to an unfinished list of over 120 publications. His work on copper extraction and purification has been evaluated for pilot plant development. In all this work with the Mineral Chemistry Research Unit, his capacity for leadership was clearly evident, as was his ability to recognize and develop the talents of others in his team. The significant contributions by Dr David Muir, who is named with him in nine of these

never limited by his own academic and research interests. He served on the Council of Wesley College and participated actively in science education at the secondary schoo level. He also worked on many Sta Government Advisory Committe such as the Solar Energy Resea Institute of Western Australia the Western Australian Mining Petroleum Research Institute served the Royal Australian Che Institute as Chairman of the El chemistry Division and, at the t his death, was President Western Australian Branch.

# *Obituary*

## ALAN JAMES PARKER
## 1933-1982

On the morning of 30 August 1982, Australian chemistry lost one of its most distinguished scholars, the University of Western Australia one of its most distinguished graduates, Murdoch University a shining light in research and teaching achievement and many of us, who had been privileged, lost a friend who lived by the highest standards of professional ethics and human concern.

Jim Parker died suddenly at his home following only the briefest period of concern about his health. One of the most prestigious and active research units in Australia has lost an inspirational leader at the peak of his creative productivity. His wife Lesley, herself a prize winning graduate in organic chemistry, and four sons aged from twenty-two to fourteen, lost a father committed to his family and their future.

After being dux of Wesley College in 1950, Jim entered the University of Western Australia, graduated with distinctions in both organic and physical chemistry, gained first class honours in 1954 and his doctoral thesis '*The Mechanism of Aromatic Nucleophilic Substitution Reactions*', submitted in 1957, was praised highly and led to five publications. After a year at the University of Southern California, where Professor Norman Kharash gave significant advice and introduced him to sulfur chemistry, he moved, with many other Australians, to the University College London to work with Sir Christopher Ingold. It was here that his insight into non-aqueous chemistry developed. His review publication in *Quarterly Reviews*[1] was a significant qualitative explanation of solvent effects on the rate of organic substitution reactions.

Following his return to the University of Western Australia as a senior lecturer in 1962 and later as Reader, 1966, he worked on developing thermodynamic measures of solute-solvent interaction which could be used in the interpretation of rate data. He made outstanding practical advances in applying separate thermodynamic functions to ions. His contributions broadened to the total range of electrochemical and thermodynamic techniques and the quantitative understanding of rate determination in solution. This development can be traced through significant review articles[2,3,4].

In 1968, Jim Parker moved to a position as Professorial Fellow in the Research School of Chemistry at the Australian National University in Canberra. The increasing quantity and accuracy of his work, providing a range of enthalpy and entropy data to add to the existing free energy values, logically led him to the consideration of models of the structure of solutions[5,6]. During all this time he grew from a specialist in organic reaction mechanisms to a scientist of international status covering most areas of solution chemistry. His own predisposition to applying his knowledge, clearly a legacy from his father, Sir John Parker, a distinguished Western Australian engineer, gradually produced a conviction that applied chemistry in all areas was retarded by our preoccupation with water as a solvent. Professor Arthur Birch, as the Head of the Research School of Chemistry, gave him great encouragement in pursuing research on industrial and commercial applications of non-aqueous chemistry.

His latter years in Canberra and at Murdoch University where he was appointed as inaugural Professor of Chemistry in 1973 and Director of his own Mineral Chemistry Research Unit, were absorbed in practical applications of non-aqueous solvent chemistry to areas as diverse as mineral extraction, metal purification and recovery, battery development and new methods for the production of solar cells[7,8,9]. This work produced over 20 patents or provisional applications to add to an unfinished list of over 120 publications. His work on copper extraction and purification has been evaluated for pilot plant development. In all this work with the Mineral Chemistry Research Unit, his capacity for leadership was clearly evident, as was his ability to recognize and develop the talents of others in his team. The significant contributions by Dr David Muir, who is named with him in nine of these

patent applications, exemplify this[10].

In his 27 years of research and teaching, Jim made distinguished contributions as a visiting scientist to the University of Bergen, the University of California, Los Angeles, where Professor Saul Winstein played an important role in his development, the Technical University of Vienna and the National Institute for Metallurgy, Johannesburg. His research awards were many and numbered among them the Rennie Medal, 1963, the H. G. Smith Medal, 1970, and Fellowship of the Royal Australian Chemical Institute, 1967. He was a Senior Fulbright Scholar in 1965, having previously held a Hackett Studentship of the University of Western Australia, 1957, a CSIRO Overseas Studentship, 1958, a Royal Norwegian Research Council Fellowship, 1960, and an ICI Fellowship, 1961. He was elected to Fellowship of the Australian Academy of Science in 1979.

Jim's service to the community was never limited by his own academic and research interests. He served on the Council of Wesley College and participated actively in science education at the secondary school level. He also worked on many State Government Advisory Committees such as the Solar Energy Research Institute of Western Australia and the Western Australian Mining and Petroleum Research Institute. He served the Royal Australian Chemical Institute as Chairman of the Electrochemistry Division and, at the time of his death, was President of the Western Australian Branch.

One person provided an element of academic continuity throughout all of this. Sir Noel Bayliss was there at the start in 1951 as Professor of Chemistry at the University of Western Australia and remained committed as a member of the Senate of Murdoch University in 1982.

Sport played an important part in Jim's life and provided an understanding of the community outside academe. His participation in first grade cricket, golf, hockey, squash and table tennis in earlier years and his continued competitive interest in hockey and golf formed the basis of many friendships. In sport he was unorthodox and inventive, relished intense competition and showed a flair for leadership that made him a formidable cricket captain.

Few chemists have contributed so widely to theory, practice and application in a career which was short and still at its productive peak. Even fewer have combined this with such open friendship and concern for colleagues and students, thus providing others around him with the benefits of wisdom, knowledge, inspiration and good common sense.

All this was at a cost and for this we express our sympathy to Lesley and the boys, Ian, Geoffrey, Christopher and David.

*Associate 1963; Fellow 1967.*

D. W. WATTS, *Fellow* and friend.

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4. "Rates of Reactions in Protic and Dipolar Aprotic Solvents", A. J. Parker, *Chem. Rev.* **69** (1969) 1.
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7. "Hydrometallurgy of Copper and Silver in Solvent Mixtures", A. J. Parker, *Search* **4**, (1973) 426.
8. "Solvation of Ions, Application to Minerals and Energy", A. J. Parker, *Rev. Pure and App. Chem.*, **53**, (1981) 1437.
9. "The Electrochemistry of the Oxidative Leaching of Copper through Chalcopyrite", A. J. Parker, R. L. Paul, G. P. Power, *J. Electroanal. Chem.*, **118**, (1981) 305.
10. It is important that in March, 1983, a paper will be presented drawing together the recent work of the Mineral Chemistry Research Unit in hydrometallurgy. The paper, by D. M. Muir and A. J. Parker, entitled "Applications of Non-Aqueous and Mixed Aqueous Organic Solvents to Chloride Hydrometallurgy", will be published in the Proceedings of the Decennial International Symposium of Hydrometallurgy, Atlanta, USA.


## ALAN LEIGH ARKINSTALL
## 1915-1982

Jack Arkinstall, born in Ardlethan, NSW moved with his family to Auckland, New Zealand in 1920. He was educated at Auckland Grammar School, and the University of Auckland where he graduated as a Bachelor of Science.

For a number of years he worked with Kempthorne Prosser Ltd in Auckland, and earned great respect for his contribution to the fertilizer industry.

After the outbreak of war, Jack came to Australia, and during the years 1940-45 was employed by the Commonwealth Government at the Explosives Factory, Maribyrnong, Melbourne, and at the Guncotton Factory, Ballarat. His speciality was acid production, and later in 1945 he joined the staff of Commonwealth Fertilizers at Yarraville, Melbourne. He remained with them until 1955, when he moved to South Australia to take up his appointment as Chief Chemist, Sulphuric Acid Ltd, eventually being transferred to the staff of Adelaide & Wallaroo Fertilizers Ltd. Jack established a reputation of being one of the best 'acid men' in the country.

His high integrity, honesty and willingness to help others endeared him to all who worked with him, and his constant attendance at RACI meetings indicated a dedication which served as an example to other members.

He died at his home on 17 May 1982, survived by his wife, three daughters and a son.

*Associate 1945; Fellow 1971.*

P. P. POWER [illegible]

## ASSIA — 83

The 2nd Australasian Symposium on [illegible] about mature age study, telephone 493661.

## Conference and School on X-ray Analysis

AXAA 1983 (sponsored by the Aus-

# OBITUARY

Members of the University and the Research School of Chemistry were saddened to hear of the death of Professor A. J. (Jim) Parker in Perth recently.

Professor Parker was inaugural Professor of Chemistry in 1973 at Murdoch University and Head of the Mineral Chemistry Research Unit until his death at 48.

Before joining Murdoch Professor Parker was Professorial Fellow in the Research School of Chemistry at ANU, under the Directorship of Professor Arthur Birch.

Professor Parker was dux of Wesley College, Perth, in 1950, and later gained a first-class honours degree in organic and physical chemistry and a doctoral degree.

After leaving Perth he worked with Sir Christopher Ingold at University College, London.

He worked as Senior Lecturer and Reader at the University of Western Australia from 1962 to 1966, moving to ANU in 1968.

At ANU he worked as a physical organic chemist and pioneered work on the effects of non-aqueous polar solvents. His work on copper solvents led to the formation of ANUMIN, an ANU company, which later transferred to Murdoch University, and the granting of many patents.

While at ANU Professor Parker played A-grade cricket for the ANU Cricket Club, and grade hockey. He was a keen fisherman and a member of the Federal and Royal Canberra Golf Clubs.

Professor Parker won the Rennie Medal in 1963, the H. G. Smith Medal in 1970, and was a Fellow of the Royal Australian Chemical Institute. He was also a Fellow of the Australian Academy of Science.

He leaves a wife, Lesley, and four sons.

# Academy of Science awards

Dr John Norris, of the ANU's astronomy department, has won the Pawsey Medal for distinguished research in experimental physics by a scientist under the age of 36.

The award was presented to Dr Norris yesterday at the annual meeting of the Academy of Science, for his work in stellar astrophysics.

Sir Alan Walsh, formerly of the CSIRO division of chemical physics, and inventor of the atomic-absorption spectrometer, received the Matthew Flinders Medal, one of the most prestigious awards of the academy. He delivered the Flinders Lecture on the application of atomic-absorption spectrometry to chemical analysis.

The Gottschalk Medal for distinguished research in the medical or biological sciences by a scientist under the age of 36 was presented to Dr Marilyn Renfree, of the School of Environmental and Life Sciences, Murdoch University, Western Australia, for her work on marsupial reproduction.

Ten Australian scientists were elected to fellowship of the academy for distinguished research contributions to the advancement of the natural sciences: Dr Martin Bennett, Dr Alec Costin, Professor Edward Davis, Professor James Lance, Sir Ian McLennan, Dr Garth Paltridge, Professor John Pate, Professor Derek Robinson, Dr John Sanders and Professor Geoffrey Sharman.

CANBERRA TIMES FRIDAY 2nd May 1980

# Birch awarded Oxford visiting professorship

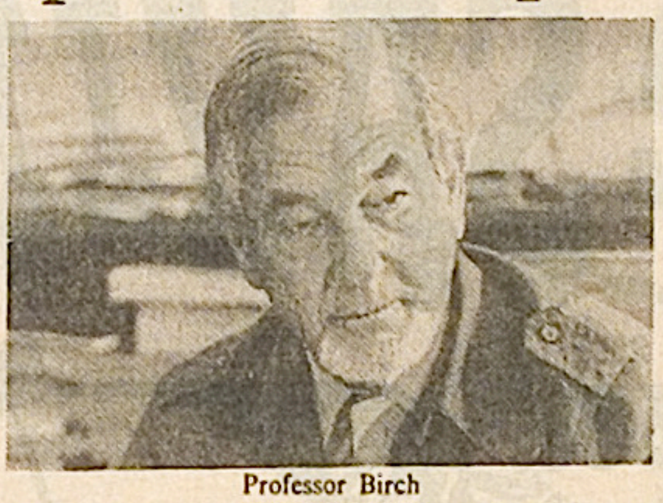
One of Australia's most distinguished scientists, Professor Arthur Birch, will take up a one-year visiting professorship at Oxford University when he retires as Professor of Organic Chemistry at the ANU at the end of the year.

Professor Birch, who will be 65 early next month, will be the first Newton-Abraham Visiting Professor in medical, biological and chemical sciences at Oxford, from which he holds a doctorate of philosophy.

When doing research at Oxford on hormones for the RAF in 1943, Professor Birch discovered the chemical reaction which now bears his name — the Birch reduction. His work was later applied in the development of oral contraceptives.

"People are astounded to find that I'm still alive", he said yesterday.

In 1972, he was the first Australian resident to receive the Royal Society's most prestigious award for chemistry, the Davy Medal, and in 1976 was the first



Professor Birch

Australian to be made a member of the USSR Academy of Sciences.

His most recent honour is the Royal Australian Chemical Institute's top award, the Leighton Medal, for his public service to chemistry. Last year he was made a Companion of the Order of St Michael and St George.

Professor Birch, who has written more than 300 papers (he has lost count), hopes to do research and work on a book while at Oxford.

His award carries a Professorial Fellowship of Lincoln College, where he will live.

He will be leaving for Oxford some time in December, but would return to the ANU briefly in February for an international symposium and annual lecture to be inaugurated in his honour by the Research School of Chemistry.

He plans to return to Australia after his year at Oxford.

Canberra Times Wednesday July, 23rd '80.