



Budget backs Australia's ability

The Academy of Science is pleased that the Federal Government has stood by its 29 January commitment to boost funds for research and development in the 2001 Budget in May. The January innovation statement was called *Backing Australia's Ability*.

After the budget the Academy's Secretary (Science Policy), Professor Michael Barber, said, 'The Australian community has sent a strong message to the Federal Government that the nation's future prosperity is vitally dependent on investment in research and innovation. The government has heard the message and has delivered the first stage of the commitment.'

According to Professor Barber, the innovation statement started to change perceptions of Australia as an 'old economy'. But the funding for the initiative is only the start of Australia's transformation to a new economy. The process must be sustained if the message is to be understood internationally.

'This budget has missed an opportunity to ramp up the message of "new economy" because the chance to kick-start universities has been ignored,' he said. 'Of major concern is the continuing erosion of science capacity as universities are forced to switch to courses that are cheap to deliver.'

'Australia has a terrific reputation in innovative research and development. Our scientists have the ability to create innovative industries, as seen by the number of spin-off and start-up companies from cooperative research centres.'

'Given half a chance, Australian scientists and technologists can deliver wealth generation for the nation. It is too bad that only about \$160 million of the \$3 billion expected over five years for *Backing Australia's Ability* has been delivered this year.'

Stem cell developments

The use in research of cells from human embryos continues to excite public interest. In June 2001 the Council of Australian Governments considered banning the cloning of humans.

Earlier the Academy published a discussion paper on human stem cell research that reviewed scientific and regulatory developments over the last year. This is part of the Academy's effort to promote public debate on a sensitive scientific issue. The Academy published a position statement, *On human cloning*, in February 1999 and held a forum on therapeutic cloning for tissue repair in September 1999.

The Academy's spokesperson on human stem cell research, Professor John White, said in June, 'The Academy is opposed to cloning whole human beings. But Australia must not close the door on cloning techniques and research into human stem cells.'

The Academy considers that the science of stem cell therapies could lead to treatments for major degenerative diseases, such as Alzheimer's disease, Parkinson's disease and heart disease, by providing healthy cells to replace diseased tissues and organs. It is appropriate to use legislation to set limits on certain research practices, such as the cloning of human foetuses, but not to regulate the details of research activity.

The UK's Royal Society also supports this position.

Recent advances in molecular biology have increased our knowledge of the regulation of gene expression. The most recent development is the refinement of the techniques necessary to isolate and culture stem cells from human embryos. This opens up the possibility that human stem cells, until now a scarce and limiting factor in biomedical research, may be available in quantities that permit rapid advances in research and medical applications.

Adult stem cells cannot adequately substitute for embryonic cells. However, the Academy believes that research into adult stem cells should be encouraged.

The discussion paper describes other developments in research and their potential use in treating disease. It also looks at regulation to ensure research is safe and ethical, and surveys responses to the issues in other countries.

Professor White said that recent developments in stem cell research showed the scientific importance and therapeutic value of continuing basic research in cellular and developmental biology prior to clinical application.

The paper is available from the Academy's website, www.science.org.au/academy/media/stemcell.pdf, or by email from Trish Nicholls at nr@science.org.au.



Forum on genes

Fellows Peter Doherty, left, and Robyn Williams, second from right, and the Academy's new Executive Secretary, Sue Serjeantson, right, spoke at a forum on the future of genes, 'Scary monsters and bright ideas', which was part of the Australian Science Festival in Canberra in May. The other speaker is Steve Jones, Professor of Genetics at University College, London.

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Universities need new funding model

The Academy of Science has argued in a number of submissions to the Federal Government that the funding of all universities for internationally competitive research across all disciplines is not affordable.

In a submission to the Senate References Committee on Employment, Workplace Relations, Small Business and Education in April 2001, the Academy has pointed out that current funding models, which promote uniformity, do not give the public universities the capacity to meet Australia's higher education needs. For the higher education system to support a broad intake of students, there needs to be greater diversity in university profiles in teaching and research.

Undergraduate enrolment targets need to be changed to minimum enrolment requirements. Research excellence needs to be more concentrated. Funding of research infrastructure needs to be linked to research performance. Universities should be funded at arm's length from the government, through a Higher Education Funding Council, to allow a pluralism of funding sources.

The submission says, 'The almost doubling in the number of universities since 1986, and the large increase in student numbers has strained the

budget for higher education.'

The Academy is concerned that we are mining to exhaustion a finite resource of excellence built by past concentrations of resources. There is a serious question of the sustainability of the higher education system.

The submission is available on the Academy's website at www.science.org.au/academy/media/highedsub.htm.

PhD prizes

Australian graduate students won 4 out of 11 prizes in an international competition for PhDs in science, engineering and the humanities. The competition, run by the US stockbroking firm Merrill Lynch, aims to encourage entrepreneurship in research and highlight the intellectual capital being created in universities.

The Academy's Secretary (Science Policy), Professor Michael Barber, said, 'Australia has traditionally punched above its weight in science, as shown by the number of Nobel laureates in science, and it is encouraging to see that the next generation is following in this tradition.'

For more information see www.science.org.au/academy/media/phdawards.htm.

Forthcoming events

- Professor Brian Anderson will give the Telstra Address at the National Press Club, 25 July 2001. More information is available at www.npc.org.au/speak/future.html.

New topics on Nova

- Which way ahead for hydrogen cars?
- A fair cop! Accurate breath analysis and speed detection

Nova: Science in the news is at www.science.org.au/nova.

Basser Library

Anyone wishing to use the Basser Library should contact the librarian, Rosanne Walker, telephone (02) 6247 9024 or email rosanne.walker@science.org.au.

Deadlines

Nominations for the Academy's 2002 awards close on 30 August 2001. For more information see www.science.org.au/awards/awards.htm.

Exchange programs

Europe 15 September
Asia 1 October
Postdoctoral fellowships 1 October
North America 2 November
More information is at www.science.org.au/internet.

Gifts to the Academy

If you would like to make a gift or a bequest to the Academy of Science or the Australian Foundation for Science, please contact the Executive Secretary or the Development Manager, telephone (02) 6247 5777 or email es@science.org.au.

Symposium cracks the code

The international Human Genome Project emerged from discussions in the USA in the 1980s. It was formally launched in 1991. Since then the human genome has been sequenced, along with the genomes of selected model organisms.

Scientists are now trying to identify genes (the pieces of DNA which control reproduction, growth and bodily functions) in these sequences and work out what they do. The Human Genome Project will not be completed until the roles of all human genes in growth and development, health and disease, are known. This knowledge will radically change medicine, life expectancy, commerce and the structure of society.

As part of Science at the Shine Dome, the Academy held its annual symposium on the Human Genome Project and its applications. The symposium, held on 4 May 2001, was entitled *Cracking the code – using the code*. It was convened by Professor Grant Sutherland, the Academy's 2001 Burnet lecturer (see page 6) and dramatically expanded the horizons of audience members.

Professor Sutherland gave the background on the Human Genome Project and described current research using the genome sequence to find susceptibility genes for common diseases such as asthma, diabetes, arthritis and Alzheimer's disease. Following this, the biotechnology and pharmaceutical industries will find ways to delay and then treat these diseases.

Professor Nick Martin, from the Queensland Institute of Medical Research, described how the analysis of families with complex diseases could be linked with the DNA sequence to find genes that contribute to the disease. Scientists are searching for genes influencing melanoma, anxiety and alcoholism.

Dr Carol Wicking, from the University of Queensland, showed how cancer changes the expression of an array of genes.

In one person, different types of cells have the same genetic information yet are able to perform different functions. Dr David Bowtell, from the Peter MacCallum Cancer Institute in Melbourne, explained how new DNA microarrays, combined with the results



Science teachers from around Australia attended Science at the Shine Dome.

of the Human Genome Project, allow us to get an overall picture of gene activity in normal and diseased tissues.

Professor David Kemp, from the Queensland Institute of Medical Research, talked about the effort to sequence the malaria genome and find weapons to fight malaria, toxoplasmosis and other parasitic diseases.

Professor Bob Williamson, from Murdoch Children's Research Institute in Melbourne, said that gene therapy – introducing genes into cells which do not function properly – will add to existing treatments rather than being revolutionary.

Professor John Hopper, from the University of Melbourne, said that genetic testing is not necessarily of benefit, as has been shown with breast cancer. Translating genetic research into public health requires care to avoid doing damage or raising false hopes.

Professor Christopher Goodnow, from the Australian National University, described a way to test, in mice, thousands of genes at once for their relevance to a particular physiological process. This could reveal targets for new therapies.

The fruit fly, *Drosophila melanogaster*, has been used for genetic research for decades. Professor Rob Saint, from the University of Adelaide, explained how completion of the fly's genome sequence has enabled researchers to explore the many biological processes shared by insects and mammals.

The genome sequence of *Arabidopsis*, a popular plant for research, was released in 2000. Rice will be released

soon. Dr Liz Dennis, from CSIRO Plant Industry, explained how the identification of genes will enable crops to be selected for environmental sustainability, improved yield and new products.

Following the invention of gene cloning in the 1970s, biotechnology has been applied to pharmaceuticals and agriculture. Dr Nick Gough, from the Cooperative Research Centre for Discovery of Genes for Common Human Diseases, discussed the emerging scientific, commercial and ethical challenges and opportunities of the biotechnology industry.

Science at the Shine Dome included a special workshop on teaching strategies related to symposium topics. The Foundation for Young Australians sponsored eight young biology teachers from around Australia to attend the event, and the Victorian Department of Education, Employment and Training sponsored five awards for science teachers from government schools.

The Australian Research Council, the Defence Science and Technology Organisation and the National Health & Medical Research Council sponsored career development awards for 11 young researchers to attend Science at the Shine Dome.

The symposium program, which includes notes on speakers and abstracts of their talks, and other information on Science at the Shine Dome, is available as a PDF file on the Academy's website at www.science.org.au/academy/sats.pdf.

Priorities for the next government

In July the Academy of Science will produce a brief and informative paper setting out its priorities for the next Australian Government. The aim is to inform and influence all political parties as they consider their platforms for the coming federal election.

A working party of Fellows will put together a set of proposals designed to improve the position of Australian science, technology, industry and education.

The proposals will build on the submissions made by the Academy before the Federal Government's innovation statement in January.

If you are interested in taking up the issues with your local candidates, you can order a copy of the paper from Trish Nicholls at the Academy, email nr@science.org.au.

Knowledge nation

Another pre-election Academy activity has been a submission to the knowledge nation taskforce established by the Leader of the Opposition, Mr Kim Beazley. This submission, prepared by the former Secretary (Science Policy), Professor John White, said there was a need to integrate national policies for the whole science system – for schools, higher education and industry.

The best science and mathematics graduates needed to be attracted to school teaching and adequately rewarded. Research and teaching outcomes in higher education needed to be assessed and funded according to quality. The 150 per cent tax concession for industrial research and development needed to be restored.

There was also a need to develop contacts with international science and global companies.

The submission said that a future Labor government should build upon the current government's innovation statement rather than scrap it. This would take advantage of the two years of consultations preceding the statement and the plans that had been made by researchers and institutions.

Science fosters new industries

Bioprospecting

Bioprospecting is searching biological resources in the hope of discovering new chemicals or materials of economic value. Australia has a number of research institutes – with expertise in agriculture, pharmacology and chemistry – involved in bioprospecting. They offer the potential to benefit industries such as aquaculture, agriculture, pharmaceuticals and shipping.

Bioprospecting also contributes to the discovery of new species of plants and animals, adding to knowledge of biodiversity.

The House of Representatives Standing Committee on Primary Industries and Regional Services has been conducting an inquiry into the development of high-technology industries in regional Australia based on bioprospecting. In March 2001, the Academy made a submission to the inquiry, saying that future success in bioprospecting would depend on investment in related university disciplines, infrastructure and staff, particularly talented young researchers. A well resourced collection and repository system for Australia's flora and fauna was needed, as well as national guidelines for collection and research.

The submission outlined the

tremendous scope in Australia for bioprocessing industries based on expertise in agriculture and chemistry. But the research was high risk and long term.

Trade and investment

The parliamentary Joint Standing Committee on Foreign Affairs, Defence and Trade has been conducting an inquiry into ways to increase Australia's trade and foreign investment in Australia.

In March the Academy made a submission which showed how international science and technology collaboration can foster investment in Australia and exports of Australian goods and services. Australia's reputation for research excellence can also help promote overseas perceptions of the country's innovative capacity.

The submission argued that the best way Australian governments could increase export trade and foreign investment was to improve research infrastructure, including education, present a new image of Australia as a science and technology friendly country, and offer a single coordinated set of business incentives for major investors.

Copies of the submissions are available from Trish Nicholls, email nr@science.org.au.

Options for CRCs

Since its establishment in 1990 the Cooperative Research Centre program has set an international benchmark for collaborative research and development between industry, academia and government research organisations. Evaluations have shown that research funded through the program is flowing through to commercialisation and wealth generation.

Academy Fellows have been involved in cooperative research centres in many fields.

In May 2001, the Academy's Secretary (Science Policy), Professor Michael Barber, made a submission to an internal review of the program by the Commonwealth Department of Industry, Science and Resources. He suggested a number of options for

the program in the light of increased funding under the government's innovation action plan:

- reduce leverage levels and increase the size of government grants
- find a simpler and more effective mechanism for the involvement of small and medium enterprises
- increase international collaboration between the Australian program and those in other countries
- devote more funding to commercialisation
- ensure that centres are set up in frontier or emerging industries.

Copies of the submission are available from Trish Nicholls, email nr@science.org.au.

First FEAST fest

The Forum for European-Australian Science and Technology held its inaugural event (FEAST1) at the Academy in Canberra on 30 and 31 May 2001. The theme of the meeting was 'enhancing research through collaboration and linkages'.

The 220 invited delegates represented one of the largest gatherings of European and Australian researchers and research managers. Participants included ministers, ambassadors and senior officials. The Academy sponsored six young researchers to attend the event.

The event recognised and celebrated the importance of research cooperation between Europe and Australia and addressed ways to improve this relationship. The plenary sessions were webcast on the FEAST website, www.france.net.au/feast.

FEAST stakeholders are European embassies in Australia and Australian academies, research bodies and government agencies. They aim to highlight and improve research cooperation between the two continents.

The program was opened by the Australian Minister for Industry, Science and Resources, Senator Nick Minchin, who spoke on future opportunities and challenges for Australian innovation. The French Ambassador, M Pierre Viaux, outlined the objectives of FEAST.

Professor Vicki Sara, the Chair of the Australian Research Council, outlined the strengths of the research relationship between Australia and Europe.

The Australian Chief Scientist, Dr Robin Batterham, described



The Vice-President of the Academy, Professor Bruce McKellar, thanks the Chief Scientist, Dr Robin Batterham, for speaking on Australia's innovation system and international capabilities during the opening session of FEAST1.

Australia's capabilities. The Director-General of Research in the European Commission, Mr Achilleas Mitsos, spoke on new directions in European research and mechanisms for international collaboration.

In the afternoon there were four parallel workshops on developing international exchanges, applied research and innovation, the European framework programmes, and emerging research trends and opportunities.

On the second day speakers presented an overview of the international science and technology strategies of France, Germany and Sweden. There was discussion of workshop reports and plans made for

the future of FEAST.

The Swedish Ambassador, Mr Lars-Erik Wingren made some concluding remarks and the meeting was officially closed by the Australian Minister for Education, Training and Youth Affairs, Dr David Kemp.

Participants agreed that the meeting had stimulated ideas and offered practical opportunities for researchers. One of these is the online database of researchers registered with FEAST. The database can be searched to find potential collaborators in different countries. The database and other information about funding sources, research links and travel information can be found on the FEAST website.

New Executive Secretary

The Academy's new Executive Secretary, Professor Sue Serjeantson, took up her position in April 2001. She replaced Mr Peter Vallee, who retired after 27 years with the Academy.

Professor Serjeantson has had a distinguished career as a genetics researcher, including time as Head of the Human Genetics Group, and then Acting Director of the John Curtin School of Medical Research at the Australian National University. For four years she was Director of the Institute of Advanced Studies and

a Deputy Vice-Chancellor of the university.

More recently she has been a very effective President of the Federation of Australian Scientific and Technological Societies and in that capacity a member of the Prime Minister's Science, Engineering and Innovation Council.

She has already worked closely with the Academy as a consultant on two important projects: the 1999 statement on human cloning and the 2001 review of programs of support for international science collaborations.

The President of the Academy, Professor Brian Anderson, said, 'The Academy knew that it would be hard to fill Peter Vallee's shoes, but we are delighted to have found someone of Sue's talent, experience and personality to keep the Academy moving forward from strength to strength.'

In another departure, the Academy's development and communications officer, Dr Nancy Lane, has taken up a job in Hawaii. She has been replaced by Marian Heard, former Deputy Manager of CSIRO Education.

Academy award winners

Each year the Academy of Science presents awards for research achievement at its annual general meeting. Some are for younger scientists who have already made significant discoveries; others are for senior scientists with outstanding research careers. On 3 May 2001, nine awards were presented.

Nominations for the Academy's 2002 awards close on 30 August 2001. Information about the awards is available at www.science.org.au/awards/awards.htm.

Burnet Medal and Lecture for research in the biological sciences

Professor Grant Sutherland

Professor Sutherland, who is the Director of the Department of Cytogenetics and Molecular Genetics at the Women's and Children's Hospital in North Adelaide, received the Burnet Medal and delivered the Burnet Lecture.

Professor Sutherland is one of the world's leading molecular geneticists. He is distinguished for the analysis of genetic defects which underlie a number of human diseases, including some forms of mental retardation, myotonic dystrophy, Huntington's disease and some types of epilepsy.

His investigation of the nature of fragile sites, unstable regions of human DNA on chromosomes, provided an explanation of the increased severity and earlier age onset in subsequent

generations of genetic disorders. As a consequence of these findings, a number of specific tests now enable diagnosis of genetic defects at an early stage of pregnancy.

As part of the worldwide Human Genome Project, he and his colleagues in Adelaide have focused on chromosome 16.

The Burnet Lecture was called, 'A robust ending from a fragile beginning'. The lecture described the ways that normal genes can be altered (mutated) so that they result in disease.

Perhaps the most recently discovered mechanism of mutation is known as 'repeat expansion', in which a small segment of DNA increases from relatively few copies within a gene to many copies. This can stop the gene from producing protein or cause it to produce a toxic protein.

Repeat expansions were found by studying fragile sites. They are involved in mental retardation and degenerative neurological and muscle diseases.

Craig Medal for research in chemistry

Professor Michael Paddon-Row

Professor Paddon-Row is Scientia Professor in the School of Chemistry at the University of New South Wales. His major research achievements lie in the study of chemical bonds and electron transfer in organic molecules, particularly biological proteins.

Hannan Medal for research in mathematical sciences

Professor Adrian Baddeley

Professor Baddeley is Professor of Mathematics (Probability and Statistics) in the Department of Mathematics at the University of Western Australia. He has done outstanding work in the difficult area of statistical analysis of digital images and spatial data. His technique for measuring surface area from vertical sections has helped measure such things as bone biopsies, skin samples and material fractures.

Jaeger Medal for research in the earth sciences

Dr Bruce Hobbs

Dr Hobbs is Deputy Chief Executive of CSIRO Minerals and Energy in Wembley, Western Australia. His research in structural geology has advanced understanding of the relations between stress and strain-rate in rocks. His computer models of deforming rock masses have helped explain the formation of several commercially important ore bodies and the development of fold-structures in deformed rocks.

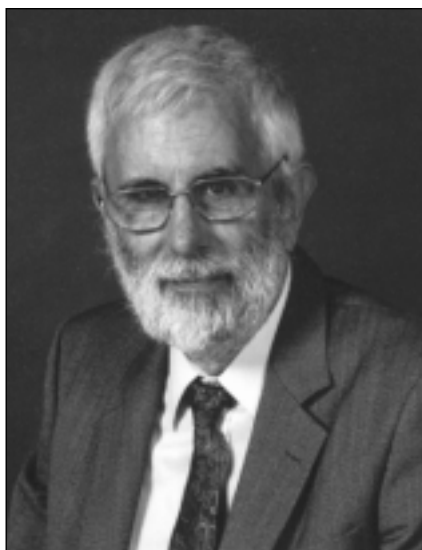
Lyle Medal for research in mathematics or physics

Professor Ian Sloan

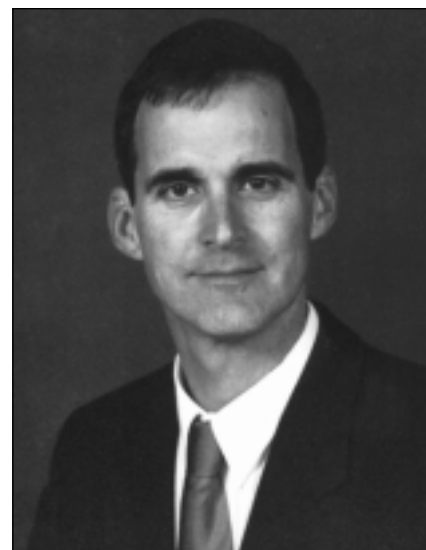
Professor Sloan is Scientia Professor in the School of Mathematics at the University of New South Wales.



Grant Sutherland



Michael Paddon-Row



Adrian Baddeley



Bruce Hobbs

After beginning his research career in theoretical physics, he changed to numerical analysis. He is internationally known for his work on approximation methods for integral equations and differential equations, numerical integration and multivariable approximation.

Fenner Medal for research in plants and non-mammalian animals

Dr Barry Pogson

Dr Pogson is a lecturer in the Division of Biochemistry and Molecular Biology at the Australian National University. He has made discoveries in plant biology concerning carotenoids, essential pigments that help all photosynthetic organisms harvest light while protecting them against damage from excess light.



Christopher Goodnow



Ian Sloan

Gottschalk Medal for research in mammalian animals

Professor Christopher Goodnow

Professor Goodnow is the Director of the Medical Genome Centre, Australian Cancer Research Foundation, in the John Curtin School of Medical Research at the Australian National University. He used mouse molecular genetics to illuminate the mechanism of immunological tolerance to self antigens. This work provides a foundation for understanding and treating autoimmune diseases.

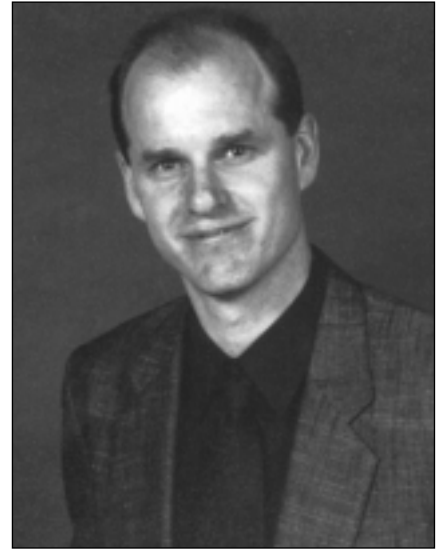
Moran Medal for research in statistics

Dr Aihua Xia

Dr Xia is a senior lecturer in the Department of Mathematics and Statistics at the University of



Aihua Xia



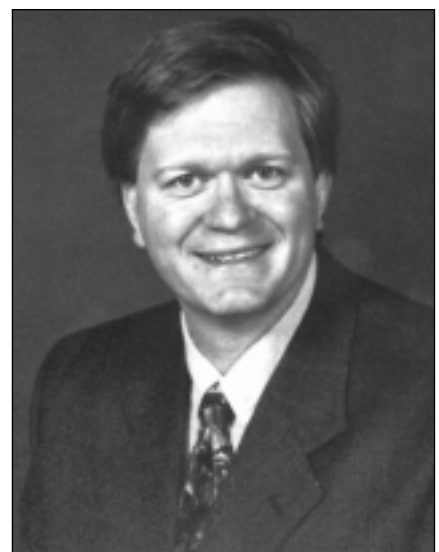
Barry Pogson

Melbourne. He has applied state-of-the-art tools to questions of how to approximate probabilities that are too complex to calculate exactly, and how to calculate bounds on the error in such approximations.

Pawsey Medal for research in physics

Dr Brian Schmidt

Dr Schmidt is a Fellow in the Research School of Astronomy and Astrophysics at the Mount Stromlo Observatory of the Australian National University. His search for distant supernovas combined the talents of 20 astronomers on four continents. They found more than 100 objects, which they used to pose the question, 'How fast has the universe been expanding?' They discovered that the universe is accelerating, rather than decelerating.



Brian Schmidt

New Fellows

Sixteen of Australia's leading scientists were honoured by election to the Academy of Science on 26 March 2001.

There are now 332 Fellows of the Academy. Election to the Fellowship recognises a career that has significantly advanced the world's store of scientific knowledge. The new Fellows are listed below.

Professor Allan Canty, 55, Head, School of Chemistry, University of Tasmania

Professor Canty is an outstanding contributor to the expanding field of organometallic chemistry, which studies and exploits chemical bonds between metal atoms and carbon atoms. This chemistry is ubiquitous in biology and the environment, with important applications in modern chemical synthesis and in industry. His early work was concerned mainly with the interaction of mercury compounds with biologically important molecules, such as amino acids and constituents of DNA, and antidotes for mercury poisoning, and provided information relevant to the action of mercury in the environment and in biology. In the last 12 years he has studied mainly the role of palladium in organic synthesis and catalysis.

Professor Robert Clark, 48, Scientia Professor of Experimental Physics, University of New South Wales

After 10 years as an officer in the Royal Australian Navy, then Lieutenant Clark completed a PhD in physics and became a lecturer at Oxford University and Fellow of Queen's College. He headed a research group at the Clarendon Laboratory investigating quantum effects in semiconductors. In 1991 he returned to the University of New South Wales where he

established two of the country's most advanced research laboratories, the National Pulsed Magnet Laboratory and Semiconductor Nanofabrication Facility. He is endeavouring to construct a silicon-based solid state quantum computer, which will carry out calculations at the atomic level by manipulation of quantum states.

Professor Andrew Cockburn, 47, Dean of Science, Division of Botany and Zoology, Australian National University

Professor Cockburn has an international reputation for his work in behavioural ecology and evolutionary theory. His long-term studies of Australian birds and mammals with idiosyncratic life histories have provided insights into intractable questions in evolution. For instance, he has used the life history of the small marsupial, antechinus, to test theories of sex allocation, litter size and sex-biased dispersal. He has used the extreme level of cuckoldry in fairy wrens to show how genetic variation can persist in the face of strong selection. He has also sought to explain why Australia has proved to be a remarkable cradle for the evolution of social complexity in birds.

Professor Max Coltheart, 62, Professor of Psychology and Director of the Macquarie Centre for Cognitive Science, Macquarie University

Professor Coltheart is a leading authority in cognitive neuropsychology, particularly in the neuropsychology of reading disability (dyslexia) and disorders of memory and language. His experimental research has led to a much clearer understanding of the nature of language and memory disorders and

appropriate means for their treatment. Current research projects at the Macquarie Centre for Cognitive Science are looking at how mental processes are used for understanding and producing spoken or written language, at how seeing the world involves an active process of constructing perceptual representations, rather than passively responding to light input, and at the causes and nature of various forms of delusional belief.

Professor Alan Cowman, 46, Head, Infection and Immunity Division, Walter and Eliza Hall Institute of Medical Research, Melbourne

Professor Cowman has made important contributions to our understanding of *Plasmodium falciparum*, the parasite that causes the most severe form of human malaria. In particular, he and his colleagues have explained how this parasite evades the most important antimalarial agents. This helps the epidemiological analysis of drug resistance genes and the development of new drugs. Additionally, he has studied the structure of the parasite's genome and the factors which determine its virulence.

Professor Max Crossley, 52, Professor of Chemistry (Organic Chemistry), University of Sydney

Porphyrin compounds are essential components of haemoglobin and chlorophyll. Professor Crossley has made vital contributions to the understanding of porphyrin structure and has devised methods for the controlled introduction of substituents into the porphyrin nucleus. He has designed and synthesised large molecular assemblies that exploit the electrical and photochemical properties



Allan Canty



Robert Clark



Andrew Cockburn



Max Coltheart



Alan Cowman



Max Crossley

of the porphyrins with the aim of producing molecular devices – a process referred to as ‘molecular engineering’.

Professor Ross Griffiths, 47, Research School of Earth Sciences, Australian National University

Professor Griffiths has carried out experimental and theoretical research in geophysical fluid dynamics which helps explain the dynamics of ocean circulation, lava flows and convection in the earth’s interior. His work has illuminated the formation and behaviour of ocean eddies, coastal currents and ocean fronts. His laboratory modelling of solidifying fluid flows has established a new understanding of the behaviour of lava flows and lava domes, and his mathematical models of the ascent of hot plumes in the earth’s mantle have provided an explanation for the origin of volcanic hot-spots and continental flood basalts. He is currently engaged in modelling the processes driving the large-scale circulation of the oceans.

Dr Patrick Holt, 55, Deputy Director and Head, Division of Cell Biology, TVW Telethon Institute for Child Health Research, Perth

Dr Holt is recognised internationally for his pioneering studies of immunity in the airways. He discovered the respiratory mucosal dendritic cell network and its gatekeeper function in antigen surveillance. He and his team also demonstrated that the programming of immunological memory against the environmental antigens which trigger allergic disease in adulthood is commonly completed during infancy. His work helps understanding of susceptibility to asthma, immunisation, and early intervention in allergic diseases.

Professor Terry Hughes, 45, Department of Marine Biology, James Cook University, Townsville

Professor Hughes has made outstanding contributions to marine biology and coral reef ecology. His studies of demography and life histories have defined new ways of modelling population dynamics. His models have been applied in both terrestrial and marine systems and appear in many textbooks. His work includes the first detailed account of the mechanisms underlying the long-term degradation of coral reefs. His recent research on the Great Barrier Reef examines regional-scale processes, and will help to predict the effects of global warming on coral reefs.

Professor Paul McCormick, 60, Professor of Materials Engineering, Department of Mechanical and Materials Engineering, University of Western Australia and Chief Executive Officer of Advanced Powder Technology.

Professor McCormick has made distinguished contributions to materials science, industrial innovation and solar energy studies. He has formulated a model which is the basis of time-dependent strain localisation theory in metals. He has used mechanical alloying and mechanochemical processing for metal refining, the destruction of toxic wastes, the preparation of new magnetic materials and the production of nanopowders made of particles as small as one nanometre. He is experimenting with inorganic polymers: new engineering materials which could replace cement and reduce greenhouse gas production.

Professor Yiu-Wing Mai, 55, Director, Centre for Advanced Materials Technology, University of Sydney

The integrity and reliability of engineering structures depend on the fracture characteristics of the materials from which these structures are made. Professor Mai has made fundamental contributions to understanding the processing-microstructure-property relationship and the fracture behaviours of a broad range of advanced materials including polymers and their blends, ceramics, cements, hard surface coatings and fibre composites. His ingenious work on interfaces and crack-bridging has led to the development of new fibre composites with high strength and superior toughness. His basic work on ductile fracture has also made significant impacts on several international standards related to the evaluation of toughness of ductile materials.

Professor Ian Ritchie, 65, former Director, A J Parker Cooperative Research Centre for Hydrometallurgy, Murdoch University

Hydrometallurgy is the extraction from ores of metals and other valuable materials using solutions. Professor Ritchie has made important contributions, in US industry and in Australian universities, to hydrometallurgy and the oxidation of metals. His research has covered the interconnected areas of electrochemistry, physical chemistry, chemical engineering, solid-state physics, mineral processing and electrometallurgy. His recent research on the fundamentals of gold dissolution in cyanide solutions is arguably the most important advance in gold hydrometallurgy in decades.



Ross Griffiths



Patrick Holt



Terry Hughes



Paul McCormick



Yiu-Wing Mai



Ian Ritchie

New Fellows

Professor Sally Smith, 59, Director, Centre for Plant Root Symbioses, University of Adelaide

About 90 per cent of land plants associate with specialised soil fungi to form beneficial underground symbioses, called mycorrhizas. Professor Smith is a world authority on mycorrhizas. In many multidisciplinary collaborations she has made outstanding contributions to our understanding of the molecular processes which form and control the interface between plants and fungi, and the transfer of nutrients across the interface.

Professor Terry Speed, 58, Senior Principal Research Scientist, Walter and Eliza Hall Institute of Medical Research, Melbourne

Professor Speed has made a number of original contributions to statistics and become a world leader in statistical genetics. His most important early work extended and simplified the standard theory of analysis of variance, one of the most widely used statistical methods in science. His papers in genetics used statistical methods to solve practical problems, especially in gene mapping. In bioinformatics, which is likely to play a central role in biomedical science in the future, his work on large-scale DNA microarrays has been very helpful to scientists already, and promises to remain valuable in the future.

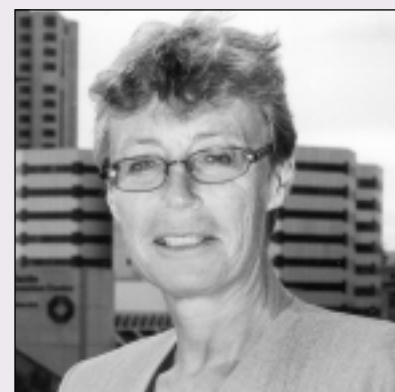
Professor Bob Williamson, 63, Director, Murdoch Children's Research Institute, Melbourne, and Professor of Medical Genetics, University of Melbourne

Professor Williamson is distinguished internationally for his fundamental contributions to human molecular genetics. His early studies helped to establish the existence of messenger RNA in mammalian cells. His group at the University of London cloned the human globin genes, mapped their organisation and found the mutations that cause thalassaemia. This led to gene mapping for muscular dystrophy and cystic fibrosis as well as identifying mutations causing inherited Alzheimer's disease and myotonic dystrophy. He has taken a major interest in gene therapy and the ethical issues posed by the Human Genome Project.

Professor Richard Williamson, 53, Research School of Biological Sciences, Australian National University

Cellulose, a polymer of glucose, is the world's most abundant biopolymer, the main structural element in plants and the basis for the cotton and wood fibre industries. In his recent work Professor Williamson has significantly advanced knowledge of cell wall formation and characterised genes that synthesise and cut cellulose chains. This has been hailed as a breakthrough in one of the longest-standing problems in plant science. Earlier, he co-discovered plant actin, explained how actin and myosin assemble and function, and revealed the mechanism of organelle movement in plant cells.

Videos of the 2001 new Fellows seminar, held on 2 May, are now available for \$60. Email jo.justin@science.org.au.



Vicki Sara

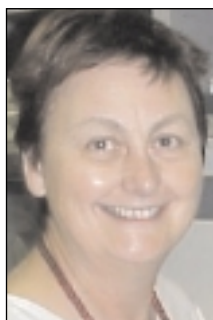
Special election of Vicki Sara

At its annual general meeting in May, the Academy of Science elected Professor Vicki Rubian Sara to fellowship of the Academy. Professor Sara was elected by Special Election, a procedure which allows the Academy to elect a very small number of people who have made distinguished contributions to science in ways other than personal research.

As Australian Research Council Chair since 1997, Professor Sara has been the driving force behind the far-reaching reforms of the council announced in the white paper, *Knowledge and Innovation*, in December 2000. She also won the doubling of its funding announced in the Federal Government's innovation statement, *Backing Australia's Ability*, in January 2001.

Professor Sara is a member of the Prime Minister's Science, Engineering and Innovation Council, the CSIRO board and the Cooperative Research Centres Committee. She was appointed Vice-Chair of the OECD's Global Science Forum in 1999.

In announcing the election, the Academy's President, Professor Brian Anderson, said 'Professor Sara has played a unique role in Australian science policy in the past three years with her unflinching advocacy for the importance of science. Her election will be widely acclaimed for her contribution to the reforms and initiatives announced by the Australian Government this year.'



Sally Smith



Terry Speed



Bob Williamson



Richard Williamson

New members of Council

The annual general meeting of the Academy of Science in May elected six new members to the Council, which governs the Academy's activities.

Professor Michael Barber is the Academy's new Secretary (Science Policy). He is Pro-Vice-Chancellor (Research) at the University of Western Australia, with a research background in statistical mechanics and advanced computation.

Professor Ian McDougall is the Academy's new Treasurer. He is a

geochemist from the Research School of Earth Sciences at the Australian National University.

Professor Jim Angus is a Council member in the biological sciences. He is Head of the Department of Pharmacology at the University of Melbourne.

Professor Lew Mander, from the Research School of Chemistry at the Australian National University, was elected a member in the physical sciences. His research interests are

synthetic organic chemistry and plant bioregulators.

Professor David Pegg is a Council member in the physical sciences. He is a theoretical physicist at Griffith University in Brisbane.

Professor Bob Porter was elected a member in the biological sciences. He is Director of Research Development in the Faculty of Health, Life and Molecular Sciences at James Cook University in Townsville.



Michael Barber



Ian McDougall



Jim Angus



Lew Mander



David Pegg



Bob Porter

Honours to Fellows

The Johns Hopkins Society of Scholars, which honours former postdoctoral fellows of Johns Hopkins University in the USA, has elected **Professor Gordon Ada** to membership. The election recognises his contributions to immunology and the development of vaccines. He is a former Head of the Department of Microbiology at the John Curtin School of Medical Research at the Australian National University.

Professor Max Bennett, from the University of Sydney, was made an Officer of the Order of Australia (AO) in the Queen's Birthday honours in June for service to the biological sciences in the field of neuroscience and as a major contributor to the establishment of organisations aimed at furthering interdisciplinary research in this field, and to education.

The Director of the Walter and Eliza Hall Institute of Medical Research in Melbourne, **Professor Suzanne Cory**, has been awarded one of five L'Oreal-UNESCO Women in Science Awards for 2001. Professor Cory, whose research is into the molecular genetics of certain cancers, is the first Australian to win this award.

The Ian Clunies Ross Memorial Foundation has awarded one of its six national science and technology awards for 2001 to the Professor of Microbiology from the University of Western Australia, **Professor Barry Marshall**. He showed that stomach ulcers are caused by bacteria, not stress. The foundation made lifetime contribution awards to **Professor Ralph Slatyer**, for his contributions to environmental research and to science policy, as the first Chief Scientist, and to **Dr Phillip Law**, for his contribution to Antarctic exploration and research.

The Australian National University has awarded the degree of doctor of science, *honoris causa*, to **Professor Bernhard Neumann**. The award was made for his distinguished creative achievement as a scholar in mathematics. He was the foundation Professor of Mathematics in the university's Institute of Advanced Studies.

Oxford University has bestowed a doctor of science, *honoris causa*, on **Sir Gustav Nossal**, former Director of the Walter and Eliza Hall Institute of Medical Research. At the conferring ceremony in June he shared the

podium with the Secretary-General of the United Nations, Kofi Annan, and the Director-General of the World Health Organization, Gro Harlem Brundtland.

The Royal Society of London has elected **Professor Mandyam Srinivasan** and **Professor Roger Tanner** to its fellowship. Professor Srinivasan is Director of the Centre for Visual Sciences at the Australian National University. Professor Tanner is P N Russell Professor of Mechanical Engineering at the University of Sydney.

Professor Ray Stalker has been elected to fellowship of the American Institute of Aeronautics and Astronautics. He does research into hypervelocity aerodynamics in the Department of Mechanical Engineering at the University of Queensland.

The Memorial University of Newfoundland in May conferred the degree of doctor of science, *honoris causa*, on **Dr Wes Whitten**, a zoologist formerly of the University of Tasmania, in recognition of his 'very significant contributions to the science of reproduction and to the mentoring of new medical faculty'.

Selby Fellow on big science

Synchrotron light sources emit light beams of unprecedented intensity at wavelengths from the very short (X-rays) to the very long (infrared). They are accepted as essential tools for research in disciplines including chemistry, molecular biology, biology, environmental analysis, polymer science, surface science and biophysics.

For some time the Academy has been stimulating discussion on the research benefits and practical applications of building a synchrotron light source in Australia.

In the Academy's recent Selby Lectures, Professor Keith Moffat explored, in non-specialist terms, the reasons why synchrotron light sources have become such powerful accessories for research and technology. The public lecture, 'Big science and little science at synchrotron light sources in the 21st century', also addressed the question of how the allocation of resources to big science can be balanced against the requirements of little science experiments in researchers' laboratories.

Professor Moffat, one of the Academy's two 2001 Selby Fellows, visited Sydney, Canberra, Melbourne, Perth, Adelaide, Hobart, Brisbane and Townsville in May and June.

He is distinguished both as an innovative researcher and as the proponent and director of state-of-

the-art synchrotron research facilities. He is Louis Block Professor of Biochemistry and Molecular Biology at the University of Chicago. Until recently he was also Director of the Consortium for Advanced Radiation Sources at the Advanced Photon Source, Argonne National Laboratory.

He obtained his first degree in physics at the University of Edinburgh and his PhD in protein crystallography at the University of Cambridge.

During the visit, which was organised by Professor Hans Freeman, Professor Moffat also participated in research seminars on ultra-fast macromolecular crystallography. He is one of the pioneers of X-ray diffraction techniques for studying the dynamics of macromolecules. Using synchrotron X-ray beams, the diffraction pattern of proteins can now be recorded so quickly that it is possible to determine the structure of short-lived intermediates in biochemical processes such as enzyme catalysis, ligand binding and release, and the cycles of light-sensitive biological systems.

In addition to his lecturing commitments, Professor Moffat also consulted with federal and state science advisers and non-government organisations which are involved in proposals for an Australian synchrotron.

Deaths



Eric Barnes in 1955

Eric Barnes

Professor Eric Barnes, a mathematician who was part of the first group of Fellows elected to the Academy of Science, died on 16 October 2000.

Eric Stephen Barnes was born in Cardiff, in Wales, on 16 January 1924. He was educated at Canterbury Boys' High School in Sydney and the University of Sydney before going to Cambridge to pursue mathematics. For his early work in the theory of numbers, he was elected a Fellow of Trinity College in 1950.

He became an assistant lecturer at Cambridge in 1951. In 1953 he returned from England to the University of Sydney as a reader in pure mathematics.

In 1954 he was one of the first group elected to Fellowship of the new Australian Academy of Science. His was elected for his 'many fruitful contributions to the geometry of numbers, showing high skill in the use of simple methods to solve problems which lay quite deep in the theory of numbers'. Others elected in that year included Bob Robertson and Doug Waterhouse, see below.

In 1959 Barnes moved to Adelaide as Elder Professor of Mathematics at the University of Adelaide. In 1975 he became Deputy Vice-Chancellor of that university. He left that post in 1981 to become Professor of Pure Mathematics until his retirement.

He was the Academy's Secretary (Physical Sciences) from 1972 to 1976.



Farewell Peter

Academy Fellows, staff and friends gathered in April to farewell the long-serving Executive Secretary, Peter Vallee.



James Michael in 1992

James Michael

One of Australia's leading pure mathematicians, Professor James Michael, died on 17 April 2001.

James Henry Michael was born at Port Augusta on 3 April 1920. His schooling was interrupted by World War II, during which he served with the 2/7 Australian Field Regiment (artillery) in Australia, the Middle East and Tarakan. In 1946 James attended the Commonwealth Reconstruction Training Scheme special school. He then went on to the University of Adelaide, where he was awarded a BSc with first class honours in mathematics in 1950. He was strongly influenced by a university staff member, G Szekeres.

For his master's degree, which he gained in 1953, he carried out research into Cauchy's integral theorem. After a year at Manchester University on a Nuffield Dominion Travelling Fellowship and another year at Glasgow University, he continued research at the University of Adelaide, being awarded a PhD in 1957 for a thesis on integration over parametric surfaces.

As a lecturer and reader at the university, Dr Michael continued work on parametric and non-parametric surfaces until 1966. After that he became interested in variational problems and partial differential equations. He was given a personal chair in 1968 and became Head of the Mathematics Department in 1969.

He relinquished his chair in 1970 to become a reader in the Department of Pure Mathematics. He headed that

department from 1973 until his retirement.

Professor Michael was elected to the Fellowship of the Academy of Science in 1973 as one of the leading world experts on surface integrals and the theory of measure on parametric surfaces. His citation said, 'He is not a prolific writer, but each one of his papers is an important and deep contribution to the subject.'

Anthony Perry

Professor Anthony Perry, a world leader in fluid mechanics, died on 3 January 2001.

Anthony Edward Perry was born in Melbourne on 19 February 1937. He was educated at Royal Melbourne Technical College, gaining a diploma of mechanical engineering in 1959. In 1960 he gained a degree in mechanical engineering from the University of Melbourne, and in 1962 gained a masters degree and a lecturing position at the university. His thesis was on rough surface turbulent boundary layers (as in rough pipes), for which he devised new experiments.

Research for his PhD, which was awarded in 1966, was on turbulent shear flow. After that, Perry rose through positions in the Department of Mechanical Engineering, eventually becoming professor. His laboratory is one of the two or three top laboratories in the world working in this area.

In the laboratory he improved an existing instrument, the hot-wire anemometer, and invented a new instrument, the flying hot-wire



Anthony Perry in 1987

anemometer, for measuring the speed of flows. He also developed new theoretical ideas for interpreting measurements.

The old view of turbulence as a chaotic, completely random flow has been revised to show that very significant elements are organised and coherent structures. Perry has applied ideas of critical points and discrete vortices to describing flow patterns.

He was elected to the Fellowship of the Academy of Science in 1985.



James Rendel in 1961

James Rendel

A distinguished expert on animal breeding, Dr James Rendel, died on 4 February 2001. He was a former Chief of the CSIRO Division of Animal Genetics.

James Meadows Rendel was born in England on 16 May 1915. He attended Rugby School and University College London, gaining a degree in zoology in 1936. He did two years' study of the fly, *Drosophila subobscura*. He then worked on ducks, studying the inheritance of yellow bill colour and discovering the first sex-linked gene in this species. He also published a classic set of data on how the weight of ducks' eggs affects the hatchability and survival of ducklings.

From 1939 to 1942 he worked with J B S Haldane in the Biometry Department of University College London. His research into high-pressure physiology burst his lungs. His work on the mating of *Drosophila subobscura*, according to Haldane, 'gave the first clear and quantitative

experimental evidence for Darwin's theory of sexual selection. Not only did he show that the females of this species prefer males of one colour to those of another, but that this preference is inherited.'

His next assignment was finding ways to defend England with the Operational Research Section of Coastal Command.

After World War II Rendel went to work in the Genetics Section of the Agricultural Research Council, in London first and later in Edinburgh. He continued his work on *Drosophila* and also studied ways to improve the productivity of pigs, sheep and dairy cattle.

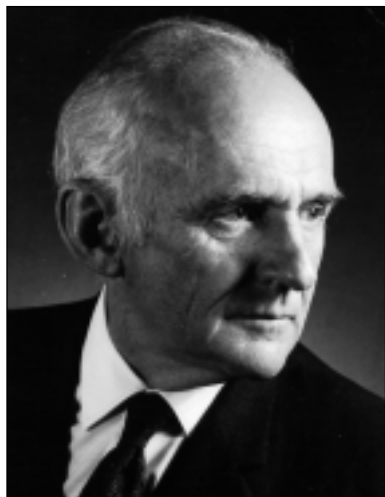
Rendel moved to Australia in 1951, joining CSIRO as officer in charge of the Animal Genetics Unit. There he did research into chromosomes and DNA content of marsupial cells. He also developed a biochemical model of cross-breeding.

He was appointed Assistant Chief of the Division of Animal Health and Production in 1953 and Chief of the Division of Animal Genetics and Chairman of the Animal Research Laboratories in 1959.

Rendel was elected to the Fellowship of the Academy of Science in 1960 for his contribution to our understanding of the theoretical basis of artificial selection. He was Vice-President of the Academy from 1973 to 1974.

Bob Robertson

Sir Rutherford (Bob) Robertson, one of the country's most influential and popular scientific leaders, died on 5 March 2001. He was a plant physiologist, science administrator and



Bob Robertson in 1970

former President of the Academy of Science.

Rutherford Ness Robertson was born in Melbourne on 29 September 1913. After suffering from polio in childhood, Robertson attended school in Melbourne and Christchurch. In 1930, he went to Sydney University, where he studied chemistry and botany.

After graduating he received a Science Research Scholarship and a Linnean Macleay Fellowship which allowed him to continue doing research at the university for three years. He studied the stomata (leaf pores) of plants of the Sydney district, building his own apparatus.

An 1851 Exhibition scholarship allowed him to go to Cambridge University. Under the guidance of G E Briggs, Robertson studied the transport of nutrients around plant cells. Thus began a long interest in the energy cycle and respiration in plants. He gained a PhD in 1939.

While at Cambridge he joined anti-war groups, where he met some influential communists, without becoming one himself. He married Mary Rogerson in Cambridge in 1937.

Back at Sydney University, he became an assistant lecturer in botany. After the start of World War II, which restricted shipping, he collaborated with CSIR (the precursor of CSIRO) on experiments to find better ways of storing apples, pears and wheat.

In 1946 he was invited to head the plant physiology and fruit storage section of CSIR, which then had laboratories in the Homebush abattoirs. There he combined basic research in plant physiology with practical applications relating to the development and ripening of fruit.

Robertson's research was interrupted when the new Chairman of CSIRO, Sir Frederick White, invited him to join the Executive of that body. Of this position he has said, 'You do well at administrative jobs if you take on somebody else's problem and make it yours while you solve it. I found I could do it, but it took a great deal out of me.'

In 1962 he decided to return to his own research problems as Professor of Botany at the University of Adelaide. His spare time for research lasted only until 1965, when he became part-time Chairman of the Australian Research Grants Committee, which allocated research funds.

In 1969 the Australian National

University offered Robertson the position of Master of University House, which gave him the opportunity to pursue his research interests. In 1970 he became President of the Academy of Science, having been elected to the Fellowship soon after the Academy's formation in 1954.

While President, he led an Academy group which discussed with French scientists the atmospheric testing of nuclear weapons in the Pacific. They disagreed on the likely effects.

He became Director of the Australian National University's Research School of Biological Sciences in 1973. As well as running the school, he did research into the movement of energy across membranes. He retired in 1978.

Robertson was knighted in 1972 and became a Companion of the Order of Australia in 1980.

After his retirement he continued as Deputy Chairman of the Australian Science and Technology Council and Pro-Chancellor of the Australian National University. He continued research at the University of Sydney and CSIRO until 1986.

The President of the Academy, Brian Anderson, said of Robertson, 'He played a leading role in the development of Australian science in the post-war period, through his research and personal leadership. He was an inspiring leader and colleague and will be greatly missed.'

A few weeks after Bob Robertson's death, his wife, Lady Robertson, died following a car accident.

Doug Waterhouse

Dr Doug Waterhouse, entomologist and inventor of insect repellents, died on 1 December 2000.

Douglas Frew Waterhouse was born in Sydney on 3 June 1916. His uncle, Dr Athol Waterhouse, was a honorary entomologist at the Australian Museum.

Douglas went to Rosny Preparatory School in Gordon, then Turrumurra College and Shore at North Sydney. A school friend was Max Day, who also became a CSIRO entomologist and Fellow of the Academy.

At the University of Sydney, Waterhouse studied zoology and chemistry, winning the University Medal in 1937. He gained a master of science degree in 1938.

In the same year he began work with CSIR (the precursor of CSIRO)



Doug Waterhouse in 1998

in Canberra. His first challenge was the Australian sheep blowfly, *Lucilia cuprina*, which lays its eggs on the wool or skin of sheep, damaging the wool and, if untreated, killing the sheep.

The work on flystrike was interrupted by World War II, when Waterhouse worked in the Army Medical Corps on the control of mosquitoes. These were spreading malaria amongst soldiers in the tropics. He co-developed a repellent made of dimethyl phthalate which contributed greatly to the health (and military superiority) of the Allied troops.

After the war his main research was basic insect physiology – particularly in the fields of digestion and absorption – and ecology. One of his results was the basis for widespread repellents (such as Aeroguard) against the non-biting Australian bushfly. He became Assistant Chief of the CSIRO Division of Entomology in 1953 and Chief in 1960, a post he held until his retirement in 1981.

During the 1960s and 1970s the division trebled in size and became one of the leading entomological institutions in the world. Realising the limitations of pesticides, Waterhouse placed special emphasis on biological control and integrated pest management. In international forums he promoted the rational use of pesticides and sustainable land management.

Successful biological control programs of this era attacked the *Sirex* wood wasp, skeleton weed, *Salvinia* water weed and the dung pads of cattle (breeding grounds for bushflies). For the last, Waterhouse fostered the introduction of dung beetles from South Africa.

Waterhouse was elected a Fellow of the Academy of Science in 1954. He was Secretary (Biological Sciences) from 1961 to 1966. He was elected a Fellow of the Royal Society of London in 1967.

As well as his research and administration, Waterhouse played a significant role in civic life – on government bodies, in support of primary industry, in conservation and in education. He was co-founder and first Chairman of the Canberra College of Advanced Education (later the University of Canberra) from 1968 to 1984.

Ann Woolcock

Professor Ann Woolcock, a leading international expert in respiratory medicine, especially asthma, died on 17 February 2001.

Ann Janet Woolcock was born in Adelaide on 11 December 1937. She went to Walford Church of England Girls Grammar School and then the University of Adelaide, where she studied medicine.

After working as a resident medical officer in Adelaide and Broken Hill, she became a research fellow in the Page Chest Pavilion of the Royal Prince Alfred Hospital and in the Department of Medicine at the University of Sydney. Her research into the mechanical behaviour of the lungs in asthma led to the award of an MD in 1967. Her thesis showed that hyperinflation of the lungs occurs as airways narrow during attacks of asthma.

During her postdoctoral studies at McGill University in Canada, Woolcock developed a method, first in dogs and then in humans, to demonstrate increased resistance in the small airways. This test is used around the world to identify subjects at risk of severe asthma attacks.

She began work as a medical officer at the Repatriation General Hospital at Concord in Sydney in 1971. She returned to Sydney University as a senior lecturer in 1973 and later added the position of Head of the Department of Thoracic Medicine at the Royal Prince Alfred Hospital.

Woolcock set up a 10-year epidemiological study that demonstrated the effects of smoking on children.

She proposed a new definition of asthma for epidemiological studies; these showed that the disease is



Ann Woolcock in 1993

related to exposure to house dust mites and other domestic allergens in early childhood. She advocated the use of inhaled steroids to decrease airway inflammation and wrote the first formal plan for the management of asthma. These are used in Australia, New Zealand, Canada and other countries.

Woolcock took up a personal chair as Professor of Respiratory Medicine in 1984. In 1985 she also became Director of the Institute of Respiratory Medicine at the hospital, the only centre of excellence in asthma in Australia. She was the leader of a large team of investigators that included physiologists, epidemiologists, biologists and clinical scientists.

In 1992 she was elected to the Fellowship of the Academy of Science.

Basser bits

The Academy's Basser Library regularly acquires publications on the history of science in Australia. Two recent acquisitions are:

- Professor Donald Metcalf's book, *Summon up the blood: In dogged pursuit of the blood cell regulators*. In this book a Fellow of the Academy describes his research and that of others in discovering new blood cell regulators and applying them to medical treatment.
- W J Gibbs' book, *A very special family: Memories of the Bureau of Meteorology 1946 to 1962*. This is part of the history of the bureau by a former director.

To use the library contact the librarian, Rosanne Walker, email rosanne.walker@science.org.au.

Renovated Shine Dome launched



John Shine outside the refurbished Shine Dome.

The Academy's Shine Dome, a Canberra landmark, has been closed for a year for repairs and improvements to fire safety, air conditioning, electrical systems, audiovisual facilities and landscaping. Major contributors to the \$2.2 million cost of the renovations have been Professor John Shine and the Council of the Centenary of Federation.

After a breakfast in the dome on 4 May 2001, the Prime Minister, Mr John Howard, launched the renovated building.

More information about the dome is at www.science.org.au/dome.

Lemberg – his house and his fellowship

Professor Rudi Lemberg was a foundation Fellow of the Australian Academy of Science and was almost simultaneously elected a Fellow of the Royal Society of London. He was on the Council when it approved the imaginative plan for the Academy building in Canberra.

Recently, Dr Cyril Appleby, Mrs Appleby and Professor Jan Anderson were invited to mark the occasion of the refurbishment of the Sanctuary, a beautiful house in a bushland setting in Sydney built in 1953 by Professor Lemberg and his wife, Hanna. The modern design of the Sanctuary, with large windows and a roof garden, was progressive at the time and reflected the influence of Bauhaus design in pre-war Germany.

Now the Sanctuary, which was bequeathed to the Religious Society of Friends (Quakers), is ready for its new role as a sanctuary for people who seek renewal and inspiration from its peaceful surroundings.

The Sanctuary is at 57 Boundary Road, Wahroonga.

Lemberg Fellowship

The Academy's Rudi Lemberg Travelling Fellowship commemorates the contribution of Professor Lemberg

to science in Australia. The Fellowship is awarded to a biologist, especially one working in the fields in which Professor Lemberg had an interest, namely biochemistry, conservation and Australian flora.

The 2000 Rudi Lemberg Travelling Fellow was Dr David Bowman, of the Key Centre for Tropical Wildlife Management at the Northern Territory University. Dr Bowman is an internationally recognised authority on the ecology and biogeography of Australia. He is only the third Australian to be awarded this fellowship.

Dr Bowman's lecture, entitled 'Future eating and country keeping: what role has environmental history in the management of biodiversity?', was delivered to large and enthusiastic audiences in Darwin, Brisbane, Sydney, Canberra, Melbourne, Hobart, Adelaide and Perth in May 2001. The lecture explored the different ways that scientists and environmental historians deal with environmental change.

Dr Bowman said that the popular success of some environmental histories hinged on the fact that they narrate a compelling story of human relationships and human value judgments about landscape change. Ecologists had to learn to harness



Lemberg Fellow, David Bowman

the power of environmental history to bolster land management designed to conserve biological heritage.

Biographers

Biographers have been appointed to write memoirs of former Fellows in *Historical Records of Australian Science*. The biographers of **Professor Eric Barnes** are Professor Tim Wall, Professor Ren Potts and Dr Jane Pitman. The memoir of **Dr Doug Waterhouse** will be written by Dr Max Whitten, Dr Max Day and Dr D P A Sands.