

West review misses opportunities

The Academy of Science has said that the West committee's review of higher education, while recognising the need for real change, has not met expectations of recommendations for a comprehensive and sensitive reform of Australia's higher education system. The West committee's report, *Learning for life*, released in April, also failed to recommend extra government finance for research and salaries.

The Academy, through its President and Secretary for Science Policy (Professor John White), argued that the establishment of the unified national system gave Australia a great opportunity to create a knowledge

economy. Although this is recognised by the report, which also perceptively diagnoses serious structural and financial problems in the higher education system, the recipe for the future is narrow in its philosophical base.

The notion of treating undergraduate tertiary education as another industry is simplistic. The report does not adequately address the cultural aspects of university life and creativity, the public good component of tertiary education and the research and funding consequences of this.

The research done in the tertiary

sector is a major contributor to Australia's academic renown and the opportunity to deal with the creation of a necessary diversity has been missed.

The Academy welcomed recommendations such as the strengthening of the Australian Research Council. The Academy has been advocating this for a long time to achieve a separation between policy creation and the distribution of research grants.

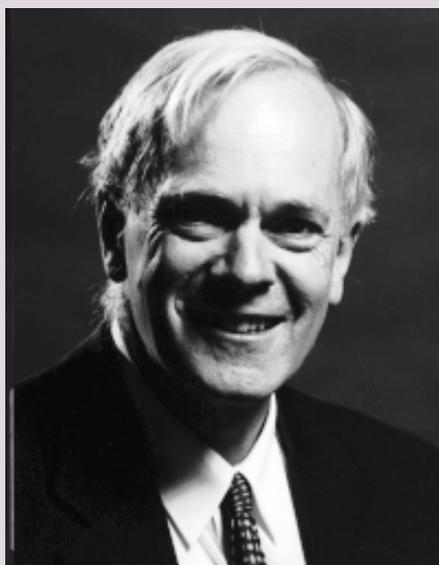
The Academy of Science and other learned academies will establish a working group to produce a detailed response to the report.

Systems engineer is new President

Professor Brian Anderson, Head of the Australian National University Research School of Information Sciences and Engineering, was elected to lead Australia's senior organisation of research scientists and technologists at the Academy's annual general meeting on 30 April. He replaces Sir Gustav Nossal, who completed a four-year term.

Professor Anderson, 57, was elected to Fellowship of the Academy in 1974. Then aged 33, he was one of the youngest researchers to receive the honour. His research has been recognised in Australia and overseas. He is a Fellow of the Royal Society of London (Britain's science academy) and is frequently invited to conferences around the world.

His principal research areas have included electrical networks, communication systems, control systems and signal processing. His current interests include self-adapting control systems, where intelligent controllers are able to change their control strategy by learning something about what they are controlling. He is also studying techniques for the control of systems which include hierarchical and cooperative structures.



Professor Brian Anderson

His other interests include family, wind-surfing, music and reading.

Looking forward to his term as President, Professor Anderson said, 'Like my predecessors in the job of President, I will be reminding our leaders and the community of the vital role that basic research plays in underpinning the economics of prosperity in the 21st century.'

'Unless Australia lifts its game in research and industrial innovation we face the real prospect of relative decline. There are now many more countries working towards greater roles in world trade through innovation, and a bigger presence in world science through long-term investment in research. The strong base we have inherited should not be squandered.'

'I will also be pursuing a personal commitment to building bridges between researchers and innovators in industry.'

Professor Anderson has been involved in innovation through membership of the Board of Cochlear Ltd, the world's largest supplier of the bionic ear developed by Professor Graeme Clark in Melbourne.

In the past, Professor Anderson has served on the Industrial Research and Development Incentives Board, the Australian Research Grants Committee, the Australian Science, Technology and Engineering Council, the supervisory committee of the Cooperative Research Centres program, and the Prime Minister's Science and Engineering Council.

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New Fellows elected

Twelve of Australia's leading scientists were honoured by election to Fellowship of the Australian Academy of Science at its Annual General Meeting on 30 April 1998. The new Fellows are:

Professor John Andrews, 56, from the Research School of Biological Sciences, Australian National University

Professor Bruce Chappell, 61, Department of Geology, Australian National University

Professor Graeme Clark, 62, Professor of Otolaryngology, University of Melbourne

Professor David Doddrell, 53, Professor of Magnetic Resonance, University of Queensland

Professor Simon Gandevia, 44, NHMRC Senior Principal Research Fellow, Prince of Wales Medical Research Institute, Randwick

Professor John Kerr, 64, Professor Emeritus, University of Queensland

Professor Gus Lehrer, 51, Head, School of Mathematics and Statistics,

University of Sydney; Head of the Centre for Mathematics and its Applications, Australian National University

Professor Jack Martin, 61, Professor of Medicine and Chairman, Department of Medicine, University of Melbourne; Director, St Vincent's Institute of Medical Research

Professor Jeremy Mould, 48, Director, Mount Stromlo and Siding Spring Observatories, Australian National University

Dr Roger Summons, 51, Chief Research Scientist, Australian Geological Survey Organisation, Canberra

Professor Rodney Tucker, 50, Professor of Electrical Engineering and Director, Photonics Research Laboratory, University of Melbourne

Professor Jim Williams, 62, Professor of Physics, University of Western Australia.

There will be more on the new Fellows in the next issue of the newsletter.

Forthcoming events

- Biological informatics conference, 6–8 July 1998, see page 3.
- *Scientists Reflect: The Neurosciences* is the second four-part series based on the Academy's *Video Histories of Australian Scientists* project. Programs will be screened on the Optus Vision educational channel 55 in Sydney and Melbourne starting on Friday 1 May at 7.30pm and continuing fortnightly, with replays starting on Sunday 3 May at 5.00pm.
- Nobel Laureate and Academy Fellow, Professor Peter Doherty, will visit Australia for the 1998 Medical Research Week (31 May to 5 June).

The Basser Library

Anyone wishing to use the Basser Library should contact the librarian, Rosanne Walker, telephone (02) 6247 3966 or email Rosanne.Walker@science.org.au

New topics on Nova

- Cochlear implants: wiring for sound
- The Southern Ocean and global climate
- Singing the praises of colony stimulating factors
- Fuelling the 21st century

The address of *Nova: Science in the news* is <http://www.science.org.au/nova/>

Conferences

The Academy's web site has a list of forthcoming conferences in Australia and New Zealand. Press the button on the Academy's home page, <http://www.science.org.au>.

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 Officer, telephone (02) 6247 5777.

Australian science in a global context

The Academy has recently commissioned a project aimed at addressing a number of issues raised in its 1996 discussion paper, *The Impact of Australian Science*. The project, funded by the Australian Research Council, is investigating the resources committed to helping Australian PhD students and postdoctoral researchers to acquire overseas training and experience and to establish international networks. These activities are crucial if Australian science is to prosper internationally.

The project is headed by a Fellow of the Academy, Dr Keith Boardman, with the assistance of Dr Fiona Wood, Research Fellow at the Centre for Higher Education Management and Policy, Department of Administration and Training at the University of New England.

Of particular importance to the project is to investigate the opportunities and resources available to support young researchers from Australia to acquire overseas experience and to establish

international networks. In this regard information will be sought to help improve understanding of the role of universities in supporting overseas training, career development and network opportunities for their graduates and staff.

The industry view of the importance of young researchers acquiring international training and networking opportunities will be canvassed. Career paths in industry for both PhD students and postdoctoral fellows will also be examined.

A further task of the project is to investigate whether or not Australian researchers are finding it more difficult to publish in the top international journals and if so why. In this regard the question of whether foreign and local libraries have policies and practices that may affect the visibility of Australian science will also be addressed.

The project is expected to be completed by the end of October 1998. If you have any comments you would

like to contribute to the project these would be most welcome. In particular it would be helpful to know scientists' views and experiences in relation to the following questions:

- 1 In what ways are international networks important to your research?
- 2 What sorts of resources do you need to establish and sustain international networks?
- 3 Are there any library practices which you consider inhibit the visibility of Australian science?
- 4 Are publishers engaging in practices which could lead to greater isolation of Australian science?

If you would like to contribute to the project, contact Fiona Wood by email: fwood@metz.une.edu.au phone: 02 6773 2582 fax: 02 6773 3363, or mail: Department of Administration and Training, University of New England, Armidale NSW 2351.

Australia to share heavenly twins

The Commonwealth Minister for Education, Dr David Kemp, announced in February that Australia will join the International Gemini Project, which is building two astronomical telescopes for optical and infrared wavelengths in Hawaii and Chile.

In welcoming the news, the President of the Academy, Sir Gustav Nossal, said, 'Astronomers have shown the scientific community a fine example in their ability to set priorities. The Australian Academy of Science is delighted to see the government addressing this long-standing top priority for Australian astronomy. The Academy is particularly pleased that this initiative stems from its 1995 discipline review, *Australian Astronomy: Beyond 2000*.'

Australia will contribute a 5 per cent share, through the Australian Research Council, towards the total cost of \$US193 million. The other partners are the USA, the UK, Canada, Chile, Argentina and Brazil.

Between them, the Gemini twins will be able to see the whole sky, both

north and south. The Hawaii-based one will be completed this year and the one in Chile in 2000. All Australian astronomers will have access to the telescopes, competing for access as they do for local facilities.

Collecting light with mirrors eight metres in diameter, the Gemini telescopes will exceed even the Hubble Space Telescope for studying the faintest and most distant galaxies. They are optimised for working in the infrared part of the spectrum. The telescopes will be able to look back to within a billion years of the Big Bang to see galaxies forming and to peer into the dusty regions of our galaxy to see planetary systems like our own solar system forming.

Professor Jeremy Mould, Chair of the Academy's National Committee for Astronomy, said the telescopes would ensure that Australians keep making world-leading discoveries in astronomy.

The web site for the International Gemini Project is <http://www.gemini.edu>.

Conference on biological informatics

6-8 July 1998

**Becker House,
Australian Academy of Science,
Canberra**

Biological informatics integrates biology, computers and networks in the creation, sharing and analysis of sets of data. It is used in the Human Genome Project, pharmaceutical screening and biodiversity research. Techniques developed for biological informatics will be valuable for advanced information technology, creating knowledge, profits and job opportunities.

Leading international and Australian speakers will present background and recent developments in this rapidly developing field. The conference will benefit scientists and professionals in the information industry, environmental research and medical science.

For more information phone Australian Convention and Travel Services on (02) 6257 3299 or consult the Academy's web site at <http://www.science.org.au/bioinfo.htm>.

Awards to young scientists

Six awards were presented at the Academy's Annual General Meeting on 30 April 1998. Profiles of the winners are on this and the following pages. The Gottschalk and Pawsey Medals and the Frederick White Prize are awarded to young scientists who are not Fellows of the Academy.

When the awards were announced in March, the President of the Academy, Sir Gustav Nossal, said of the young scientists, 'These are some of the most capable young scientists in the world. We are privileged that they call Australia home and are contributing to our strengths in research.'

'Their achievements equal in distinction the stellar performances of our Olympic medal winners and, in my view, are of even greater significance for the future of this country. The Academy is pleased to be able to recognise their work and to encourage them to keep it up.'

Gottschalk Medal

Dr Douglas Hilton

Dr Hilton is distinguished for his purification and characterisation of the blood cell regulator, leukaemia inhibitory factor; for his cloning and identification of the membrane receptors for two other regulators - IL-11 and IL-13 - and for his discovery and cloning of a new family of genes whose products modulate cellular responses to signalling by blood growth factors. Each of these three distinct discoveries required innovative approaches and represent a major advance in our understanding of the control of blood cell formation. His discoveries have aroused intense international interest and research.

Dr Hilton is Director of the Cooperative Research Centre for Cellular Growth Factors at the Walter and Eliza Hall Institute of Medical Research in Melbourne.

The Gottschalk Medal commemorates the work of Alfred Gottschalk, who was a leading authority on glycoproteins. It is awarded annually for distinguished research in either the medical or biological sciences.



The outgoing President of the Academy, Sir Gustav Nossal, centre, with four award winners, from left, Dr Igor Bray, Dr Yuri Kivshar, Dr Douglas Hilton and Dr Geoffrey McFadden.

Pawsey Medal

The Pawsey Medal is awarded each year to a young scientist or scientists for distinguished research in physics. It honours the work of an Australian astrophysicist, Joseph Lade Pawsey. This year two medals were awarded.

Dr Igor Bray

Dr Bray is a world leader in the calculation of reactions involving electrons and atoms or their ions. He and a collaborator developed the convergent close-coupling method, a method so exact that some experimental physicists are re-examining their work to discover why their results do not fit Dr Bray's theory. In physics, the relationship is usually the other way round.

The method's agreement with a wide range of experimental results is almost perfect and the method has become the international standard for data used in many industrial and scientific applications. These include the building of efficient plasma displays, the study of fusion plasmas, and interpretation of the spectra seen by the Hubble Space Telescope.

Dr Bray is an Australian Research Council Senior Research Fellow in the

Electronic Structure of Materials Centre at the Flinders University of South Australia in Adelaide.

Dr Yuri Kivshar

Dr Kivshar has established himself as a world leader in the study of the behaviour of light, particularly in the field of non-linear optics. He has developed the theory of self-trapped beams for light switching devices. This is of central importance to the emerging technology of photonics, where light is used in information processing and communications. He has also advanced the theory of stability of solitary waves. This has been applied by others to many different physical problems. He has worked closely with several experimental groups in verifying many of his predictions. He received the 1995 International Pnevmatikos Award.

Dr Kivshar is a Senior Fellow in the Optical Sciences Centre at the Australian National University and a Key Researcher at the Australian Photonics Cooperative Research Centre.

Flinders Medal and Lecture

Frederick White Prize

Dr Geoffrey McFadden

In collaboration with scientists from the USA and Canada, Dr McFadden has demonstrated that the malaria and *Toxoplasma* parasites contain a chloroplast. In 1996 his findings were published in the journal *Nature* and the research received world-wide media attention. Finding a chloroplast in these parasites revolutionises our understanding of their evolution and opens new avenues for combating them. Since parasites causing malaria and toxoplasmosis are like plants, novel ways can be tried to treat these diseases. Dr McFadden has initiated a program to determine the function of this enigma and to test the potential of the chloroplast as a target for therapeutics to combat these very serious diseases.

Dr McFadden is a Senior Lecturer in the School of Botany at the University of Melbourne.

The Frederick White Prize was established by the distinguished physicist, Sir Frederick White. It is awarded to younger scientists who have contributed to an understanding of natural laws and new concepts.



Visitors from Vietnam

Two officials from the Vietnamese Ministry of Science, Technology and Environment, Dr Thai Van Tan and Mr Dang Vinh Thien, visited the Academy on 18 February to discuss the Academy's activities. The Vietnamese are keen to increase collaboration between Vietnam and Australia.

Emeritus Professor Bill Compston

The 1998 Flinders Lecture was delivered by Professor Bill Compston at the Academy's Annual General Meeting on 30 April 1998. The President of the Academy, Sir Gustav Nossal, also presented Professor Compston with the Flinders Medal. The Matthew Flinders Lecture is one of the Academy's most prestigious awards, made every two years to a scientist of the highest standing.

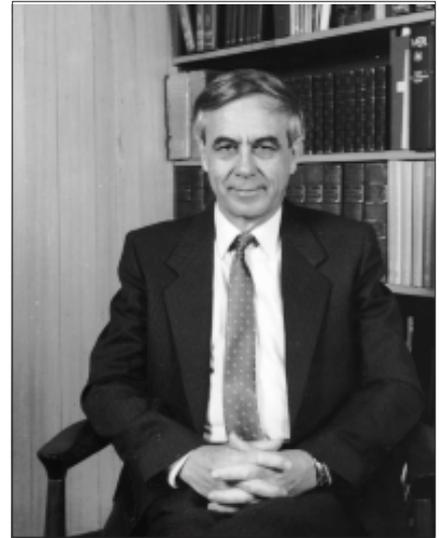
Professor Compston is distinguished for his outstanding contributions in the application of mass spectroscopy to the dating of rocks. He established his leadership in the field through high quality measurements and perceptive investigations, particularly using the uranium-lead and rubidium-strontium radioactive decay series.

He predicted that radiometric geochronology would require in-situ measurement at microscopic scale of the parent and daughter isotopes and led an ambitious project to design and build a mass spectrometer to satisfy these requirements. The resulting instrument, called SHRIMP (Sensitive High Resolution Ion MicroProbe), was first operated successfully in 1980. Further development led to a commercial version of SHRIMP with a sale price in excess of \$2.5 million. The outstanding success of his work and that of his research team is shown by the large number of research papers of which he is author or co-author.

Until his recent retirement, Professor Compston was Professor of Isotope Chemistry in the Research School of Earth Sciences at the Australian National University.

Professor Compston spoke on the topic, *Zircons, SHRIMPS and tales of detection*. The mineral zircon usually contains enough lead, accumulated from radioactive decay of uranium, to allow measurement of its absolute age. Over the past decade, microbeam age determinations and imaging of sectioned grains have shown that zircons often have two or more episodes of crystallisation that may be different in age by many millions of years. Microbeam dating is the only reliable method for such grains.

The preservation of different growth zones within single zircons shows that thermal diffusion of lead and other elements within the crystal lattice is



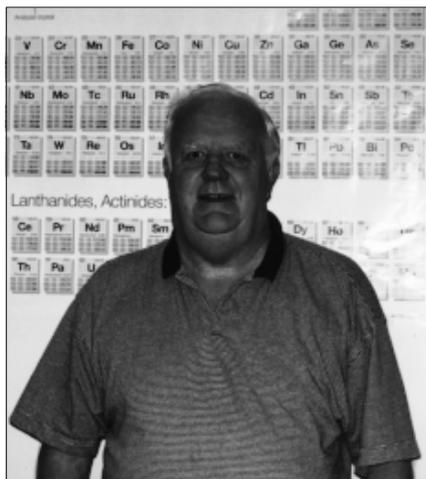
Professor Bill Compston

extremely slow, even at rock-melting temperatures. This has led to the realisation that many zircon ages in igneous rocks that formed by the remelting of older crustal rocks actually refer to the older crust, not to the remelt, which allows us to identify both the time of remelting and the ages of the rock's antecedents.

This type of geochronology requires a large microanalytical instrument that simultaneously delivers both the high mass resolution and the high sensitivity needed for analysis of lead and uranium at low levels. No suitable commercial instrument was available in the early 1970s so the geochronology research group at the ANU took the risk, time and expense to design and build its own.

SHRIMP has been applied from the early 1980s to a variety of geological applications. The multiple ages of lunar zircons show that magmatism on the moon continued after the formation of its initial crust and prior to the 'late heavy bombardment' of the lunar surface 3900 million years ago. Terrestrial zircons of granitic affinity that have ages from 4100 to 4300 million years were found in Archaean sediments from Western Australia.

Their existence shows that felsic crust formed on earth during the otherwise-lost terrestrial record between 4100 and 4500 million years ago. Igneous rocks as old as 4000 million years have been found in Greenland and Canada, and the search continues for older preserved rocks.



Professor Bruce Chappell

Mawson medal

Professor Bruce Chappell has made outstanding contributions in two areas of geoscience. The first relates to our understanding of the origin of granites and the role that those rocks play in the evolution of the earth's crust, the second is his contribution to the field of trace element analysis by x-ray spectrometry.

Early in his career he recognised that many granite magmas do not initially separate as melts from their source rocks deep in the crust, but move bodily away from those sources as a mixture of melt and solid residual material. Consequently, when separation of melt and solid material takes place, there are compositional variations in granite suites. This work has made it possible to infer the composition of the source rocks of many granites from a study of that compositional variation.

One consequence of this *restite* model was the recognition of the fundamental subdivision of granites into two groups, the S and I-types, derived from older sedimentary and igneous rocks, respectively.

Professor Chappell was the first person to measure trace elements accurately and in significant numbers by the technique of x-ray spectrometry on a wide range of rock types, and he played a key role in developing that technique, which provided the crucial data for him to develop his granite models.

The Mawson Medal marks the contribution to the earth sciences of the great geologist and Antarctic explorer, Sir Douglas Mawson.

Fellows share Australia Prize

Two Fellows of the Academy were among the four winners of the 1998 Australia Prize. The Director of the Walter and Eliza Hall Institute of Medical Research in Melbourne, Professor Suzanne Cory, and the Director of the Department of Cytogenetics and Molecular Genetics at the Women's and Children's Hospital in Adelaide, Professor Grant Sutherland, shared the \$300 000 prize.

The other winners were the Chair of the Department of Microbiology and Immunology at the University of California, San Francisco, Professor Elizabeth Blackburn, and the Royal Society Wolfson Research Professor at the University of Leicester in the UK, Sir Alec Jeffreys.

The prize, this year for excellence in the field of molecular genetics, was announced on 1 May.

Professor Cory's research has contributed to understanding the molecular basis of certain cancers. She and her husband, Professor Jerry Adams, tracked down the genetic mutation which leads to Burkitt's lymphoma, a malignancy of antibody-producing cells called B lymphocytes. She also produced a paradigm shift in genetics with her work on Bcl-2, a gene responsible for the most common type of lymphoma, follicular lymphoma.

Professor Sutherland developed methods to allow the reliable observation of fragile sites in chromosomes. His study of these sites culminated in the recognition of fragile X syndrome as the most common familial form of mental retardation. More than a dozen genetic diseases are now recognised as having their molecular basis in this new mutation process.

Professor Blackburn identified an enzyme, telomerase, crucial to the successful replication of chromosomes in cell division, a discovery hailed as one of the most important in molecular genetics. Telomerase adds DNA to the ends of chromosomes.

Sir Alec Jeffreys discovered and then developed DNA fingerprinting and profiling. DNA fingerprinting uses genetic markers to identify an individual. It has been used to identify criminals, to test paternity, to study the evolution of species and in conservation biology. DNA profiling, which produces patterns representing a person's father and mother on x-ray film, is now standard in forensic laboratories.

The 1999 Australia Prize will be awarded in the field of energy science and technology. Nominations close on 31 July 1998.

New members of Council

At its Annual General Meeting the Academy replaced four retiring office-bearers. Those elected were:

Professor Brian Anderson, President, replacing Sir Gustav Nossal. See page 1.

Professor John Young, Secretary (Biological Sciences), replacing Professor Jim Pittard. Professor Young has been a Professor of Physiology at the University Sydney since 1976 and is currently Pro-Vice-Chancellor (Health Sciences).

Dr Dick Manchester, a Member in the physical sciences. Dr Manchester is a Chief Research Scientist at CSIRO's Australia Telescope National Facility in Epping, New South Wales.

Professor Don Melrose, a Member in the physical sciences. Professor

Melrose is Professor of Physics (Theoretical) and Director of the Special Research Centre for Theoretical Astrophysics at the University of Sydney.

Professor Jack Pettigrew, a Member in the biological sciences. Professor Pettigrew is Professor of Physiology, and Director of the Vision, Touch and Hearing Research Centre at the University of Queensland.

Professor John Shine, a Member in the biological sciences. Professor Shine is Executive Director of the Garvan Institute of Medical Research at St Vincent's Hospital in Sydney and Professor of Medicine and Professor of Molecular Biology at the University of New South Wales.

New ways to control old pests

Pests degrade Australia's environment, reduce agricultural production and affect human health. In the past, control has relied on external measures such as predators, pathogens or competitors. In the future, genetic engineering could make some pests, such as mice or starfish, reduce their own numbers through contraception or sterilisation. Other pests could be controlled by the food they eat – for example, cotton plants could be engineered to produce their own insecticides.

The Academy's Annual General Meeting symposium, titled *Pests and people: Prospects for 2020*, was held in Canberra on 1 May 1998. Scientists, teachers and others heard the latest scientific research on dealing with pests in Australia.

The speakers, who came from the CSIRO and universities, are leaders in pest control research programs. The program was in three parts: what pest species are, current ways to control pests, and the 2020 solutions.

Dr Hugh Tyndale-Biscoe, formerly of CSIRO and now at the Australian National University, described pests as organisms that affect people adversely. They may be native species responding to changes in land use, such as fruit bats in Queensland, kangaroos in rangelands or *Heliothis* moths in cotton, or introduced species, such as rabbits, goats and horses. They may arrive by ship, aeroplane or other means. Dr Tyndale-Biscoe described old and new ways of dealing with pests.

Dr Steve Morton, from the CSIRO Division of Wildlife and Ecology in Canberra, discussed the pests of farm and outback. He asked whether Australian ecosystems are peculiarly susceptible to invasion. The answer is partially yes, but in several cases pests can be interpreted as a symptom of unsuccessful land management, indicating that our use of the land has caused decline in native species and provided opportunities for pests. Pests may be a sign that the continent is calling out for help.

Dr Ronald Thresher, from the CSIRO Division of Marine Research, talked about monsters of the sea, the 172 non-endemic species in Australian coastal waters which sometimes dominate their new environments. These include seaweeds, seastars, fanworms and



Participants in the Academy's Annual General Meeting symposium.

large fish. Little can be done to control these species or slow the rate of introductions; biological control is probably the only option.

The Chief of the CSIRO Division of Entomology, Dr Jim Cullen, spoke on whether weeds can be beaten. Biological control programs against skeleton weed, salvinia, *Harrisia* cactus, St John's wort and heliotrope show the complexities of success and failure. Improving knowledge of the weed's ecology and using other control methods in conjunction with biological control may be the best means of success.

Dr Gary Fitt, from the CSIRO Cotton Research Unit at Narrabri, described chemical and biological methods of getting the bugs out of cotton. Transgenic cotton plants have been engineered to produce an insecticidal protein which kills *Heliothis* caterpillars. This offers a chance to reduce the use of pesticides and use other biological control agents.

Dr Brian Cooke, from the CSIRO Division of Wildlife and Ecology, has spent many years considering methods of controlling rabbits: ripping warrens

with bulldozers, using fleas to carry myxomatosis and using rabbit calicivirus disease. In inland areas calicivirus, working alongside myxomatosis, holds rabbit numbers at 10 per cent of their former numbers. However, genetic changes in the virus may reduce its benefits.

Dr Jeff Ellis, from the CSIRO Division of Plant Industry, spoke of the traditional tool of plant breeders, using plant genes to make agricultural plants pest resistant. Cloning and genetic markers have refined this method of non-chemical control.

Professor Geoff Shellam, from the Department of Microbiology at the University of Western Australia, described contraception for feral animals. A virus is engineered to contain genes which infect the target species and induce immune responses which block fertilisation. He has been working on contraception for wild mice.

Professor Ian Lowe, from Griffith University, spoke on the economic imperatives of pest control, suggesting that the problem could be people, not other species.



The winners of the Pioneer Award for Science Teachers and the Queen's Trust for Young Australians, with officers of the Australian Science Teachers Association during the Academy's 1998 Annual General Meeting and symposium.

Emerging diseases and other issues

A number of the Academy's National Committees have been active in their discipline areas over recent months.

The Chair of the National Committee for Microbiology, Professor John Mackenzie, recently commented that, 'One of the most important issues is that of emerging and re-emerging diseases, an issue of very considerable international debate and discussion.' Infectious diseases which are spreading beyond their usual territories include tuberculosis, viral haemorrhagic fevers such as Ebola virus, Japanese encephalitis, malaria and dengue fever.

Professor Mackenzie stated that almost all developed and many developing countries have formulated plans, held meetings and funded research. 'Australia has yet to formulate plans on any international program and, although discussions have been held for emerging diseases surveillance within Australia, there are many gaps with much of the surveillance and monitoring being done by interested groups without Commonwealth funding.'

Regional global change meetings were held at the Academy on 22 and 23 January 1998. The Global Change System for Analysis, Research and Training – the international scientific community's response to the need for regional environmental change research – promotes interdisciplinary research at the regional level by developing research networks. Its Chair is Professor Roland Fuchs.

The Chair of the Academy's National Committee for Climate and Global Change, Dr Graeme Pearman, also chairs the South East Asia Regional Committee which has members from the ASEAN nations. Priorities have centred on capacity building, land use and coastal issues. An Oceania group has been established which will have a regional secretariat on the University of the South Pacific campus in Suva. Dr Kanayathu Koshy has been elected interim Chair.

The Chair of the National Committee for Physics, Professor Eric Weigold, and the President of the Australian Institute of Physics, Professor Jan Oitmaa, have completed a survey of Australian university physics departments. Their greatest



Professor Roland Fuchs at the global change meetings at the Academy in January.

concerns are that funding cuts are having adverse effects on teaching and research. Professor Weigold is concerned that 'people are disappearing in an unplanned and uncoordinated way, leaving physics vulnerable'.

The National Committee for the Environment prepared comments on the Industry Commission (now Productivity Commission) *Inquiry into Ecologically Sustainable Land Management*.

The National Committee for Animal and Veterinary Sciences prepared a response to the review of the Australian Biological Resources Study and Biodiversity Program (see *AAS Newsletter* number 39). It also contributed decisively to the policy debate about quarantine, highlighting the key role of taxonomy (see *AAS Newsletter* number 38).

The National Committee for Nutrition has expressed concern about the abolition of the Nutrition Committee of the National Health and Medical Research Council.

The National Committees for Crystallography and Chemistry have helped prepare Academy responses to government inquiries into the new research reactor and the definition of research and development for taxation purposes, and contributed to the National Science and Industry Forum on endocrine disruption reported on page 12.

Many of the committees worked on the Academy's submission to the West review of higher education.

New population and environment fund

Population and environment: almost every Australian has an opinion on the subject, but these opinions are very rarely backed by solid research from a wide range of scientific disciplines.

The Academy of Science wants this debate to be informed – to be argued on the basis of facts, rather than emotion. To this end, the Academy has established the Population and Environment Fund, a capital fund whose interest will be used to encourage, support and disseminate research about this issue.

In particular, the Population and Environment Fund will support empirical research into how the size, distribution, material aspirations and other characteristics of the human population are likely to affect significant aspects of Australian life, such as the environment, health, the economy, social cohesion and defence. Some of the problems arising in Australia may of course be due to external population pressures, and this will also be part of the research agenda.

The Academy can provide a forum for the discussion of some of these issues – for example, by arranging conferences or public lectures, or by publishing proceedings or scientific reports.

The first donor to the fund has pledged at least \$150 000, partly as a donation and partly as a bequest. The Academy is appealing for additional donations so that this research, which is so vital to Australia's future well-being, can commence as soon as possible. All contributions to the fund are tax deductible.

For more information about the Population and Environment Fund and how you can contribute to it, contact the Academy's Executive Secretary, Mr Peter Vallee, or the Development Officer, Dr Nancy Lane, on phone (02) 6247 5777, fax (02) 6257 4620, or email aas@science.org.au.

Scientific exchanges with Japan

Twelve Australian scientists will visit Japan in 1998 under the Japan Science and Technology Agency Postdoctoral Fellowships scheme.

Mr Jingjing Bi, of the CSIRO's Division of Molecular Science (Chemicals and Polymers), will visit the National Institute of Materials and Chemical Research in Ibaraki from April 1998 to April 2000 to study the synthesis and fabrication of tailored membrane morphology for high separation performance.

Dr Laure Bourgeois, of the University of Melbourne's School of Physics, will visit the National Institute for Research in Inorganic Materials at Ibaraki from April 1998 to April 2000 to examine electron energy loss spectroscopy and high-resolution transmission electron microscopy of boron nitride nanotubes and related materials.

Mr Gordon Cheng, of the Department of Systems Engineering at the Australian National University, will conduct research on the global stability of complex real world interaction systems at the Humanoid Interaction Laboratory of the Agency for Industrial Science and Technology in Ibaraki from July 1998 to June 2000.

Ms Emma Duncan, of the Children's Medical Research Institute in Westmead, NSW, will visit the National Institute of Bioscience and

Human Technology at Ibaraki from May 1998 to May 1999 to study the identification of mortalin-associated proteins in human cells.

Mr Parham Mokhtari, of the School of Computer Science at the Australian Defence Force Academy, will visit the Machine Understanding Division of the Electrotechnical Laboratory at Ibaraki from September 1998 to March 2000 to study multi-speaker speech synthesis.

Mr Ampalavanapillai Nirmalathas, of the Photonics Research Laboratory in the Department of Electrical and Electronics Engineering at the University of Melbourne, will study the optical generation and transport of millimetre-wave signals over fibre-optic networks at the High-Speed Networks Division of the Communications Research Laboratory in Tokyo from July 1998 to December 1999.

Ms Donna Perera, of the School of Chemistry at the University of Sydney, will study the experimental and theoretical characterisation of glass-forming multi-component metallic alloys at the National Research Institute for Metals in Ibaraki from June 1998 to June 1999.

Ms Bronwyn Robertson, of the School of Microbiology and Immunology at the University of New South Wales, will visit the

Environmental Microbiology Laboratory at the National Institute for Environmental Studies at Ibaraki to study the molecular systematics and phylogeny of cyanobacteria as a model for assessing global biodiversity from May 1998 to April 2000.

Dr Jill St John, currently living in Fukushima, will study the ecology of juvenile serranid fish at the Seikai National Fisheries Research Institute in Nagasaki from May 1998 to May 2000.

Dr Lukman Thalib, of the Australian School of Environmental Sciences at Griffith University, will visit the National Institute of Agro-Environmental Science at Ibaraki to study the limitation of statistical application in the analysis of huge data sets from April 1998 to March 1999.

Mr Liejun Wang, of the Research School of Earth Sciences at the Australian National University, will study the electrical conductivity structure of Japan with the Geological Survey of Japan in Ibaraki from July 1998 to July 2000.

Mr Shaobin Wang, of the Department of Chemical Engineering at the University of Queensland, will visit the Department of Surface Chemistry at the National Institute of Materials and Chemical Research, Ibaraki, to study the oxidative coupling of methane over metal oxide catalysts from April 1998 to March 1999.

New video interviews

The Academy is undertaking eight new interviews for its *Video Histories of Australian Scientists* project. These interviews are being funded by the Fenner Fund, the Australian Foundation for Science and Optus Vision.

Dr Max Blythe, from the Video Archive of the Royal College of Physicians and Oxford Brookes University, conducted interviews in Melbourne from 31 March to 2 April with six eminent scientists in the biological and medical fields. They were Professors Derek Denton, Mollie Holman, Priscilla Kincaid-Smith, Donald Metcalf, Sir Gustav Nossal and Alan Wardrop.

Professor Bob Crompton has completed an interview with Professor Bernhard Neumann, and will be

interviewing Professor David Craig in mid-May.

Scientists Reflect: The Neurosciences is the second four-part series based on the video histories. Programs will be screened on the Optus Vision educational channel 55 in Sydney and Melbourne starting on Friday 1 May at 7.30pm and continuing fortnightly, with replays starting on Sunday 3 May at 5.00pm.

In this series, four scientists who work in the neurosciences reflect on their early interests, the people who influenced them, and the highlights of their career. Those featured are Professors Max Bennett, Peter Bishop, David Curtis and Jonathan Stone.

Supported by the Australian Foundation for Science

Indian exchange

There will be an exchange of medical scientists between Australia and India in 1998 under the Academy's agreement with the Indian National Science Academy. The Australia-India Council will fund the exchange.

Doherty to visit

Australian Nobel Laureate and Academy Fellow, Professor Peter Doherty, will visit Australia for the 1998 Medical Research Week (31 May to 5 June). He will deliver lectures and present awards around the country. Medical Research Week is organised by the Australian Society for Medical Research to raise awareness of the value of medical research.

Deaths



Dr Catherine Le Fèvre

Catherine Le Fèvre

Dr Catherine Le Fèvre, a Patron of the Australian Foundation for Science and active promoter of women in science, died on 9 March 1998.

Catherine Gunn Tideman was born in Glasgow on 1 November 1909. She studied science at University College, London, where she met a chemistry tutor, Raymond James Wood Le Fèvre, whom she later married. He described her as 'a hockey player of enthusiasm, a tireless dancer, a rider of horses'.

She held positions as a teacher and microbiologist but later collaborated with her husband in research. Together they pioneered methods for measuring the orientation and polarisability of molecules.

Catherine raised two children during the second world war while her husband served overseas. After the war they moved to Australia, where Raymond took up the position of Professor of Chemistry at the University of Sydney. Together they continued their research.

The University of London awarded her a Doctor of Science degree in 1952. Raymond became a Foundation Fellow of the Australian Academy of Science.

Dr Le Fèvre was the first woman elected to the Council of the Australian Academy of Forensic Sciences. She was in the thick of debates on drug dependence and law enforcement. For many years she was a correspondent for *The Lancet*.

In memory of her husband, who died in 1986, Dr Le Fèvre established a new Academy prize for young researchers in chemistry. She served on the Australian Foundation for Science

Advisors Committee, where she instigated the Academy's involvement in the National Forensic Summit in 1995. She also supported New South Wales primary schools with special needs to take up the *Primary Investigations* science program.

She encouraged women in science through her work for special programs, travelling scholarships and lectures.

Spencer Smith-White

The pioneer of the study of cell physiology in Australian plants, Emeritus Professor Spencer Smith-White, died on 26 March 1998. He was born on 14 April 1909.

Smith-White gained his Bachelor of Science in Agriculture degree in 1932, then went to work as a field assistant at the Griffith Research Station in New South Wales. The next year he became science master at Scotch College in Mitcham, South Australia.

He returned to the New South Wales Department of Agriculture in 1935 as a plant breeder, specialising in species hybridisation in *Nicotiana* and tuberous *Solanum*. There he discovered resistance to blue mould in native *Nicotiana*.

In 1937 he became research officer and botanist at the Museum of Applied Science in Sydney. There he conducted research into essential oils in eucalypts, and began the study of cells in Myrtaceae and other native flora. As a pioneer in a new field of Australian botanical research, he made outstanding contributions to the knowledge of cells, taxonomy and evolutionary history.



Professor Spencer Smith-White

In 1948 he was appointed senior lecturer in the Botany Department at the University of Sydney, where he stayed until his retirement as Professor of Botany. Research initiated by Smith-White and carried out by his postgraduate students extended knowledge of cell physiology in Proteaceae, Casuarinaceae, Goodeniaceae and Ranunculaceae.

In 1956 he was awarded a Doctor of Science in Agriculture degree. In the same year he spent time in the botany and genetics departments at Oxford and other British universities.

In 1958 Smith-White was elected President of the Linnean Society of New South Wales. He was elected to Fellowship of the Academy of Science in 1962.

David Zeidler

The distinguished chemical engineer and industrialist, Sir David Zeidler, died on 12 March 1998.

David Ronald Zeidler was born in Melbourne on 18 March 1918. He went to Scotch College in Melbourne and gained a Master of Science degree from the University of Melbourne.

He then went to work for the Council for Scientific and Industrial Research (the precursor of CSIRO) from 1941 to 1952. He worked in the Division of Industrial Chemistry and soon became leader of the Chemical Engineering Section.

In 1947 he did postgraduate research at the Massachusetts Institute of Technology.

In 1952 he joined Australia's leading chemical manufacturer, ICI Australia, as Research Manager. He progressed through the ranks of Development Manager, Controller of the Dyes and Fabrics Groups to Director in 1963, Managing Director in 1971 and Chairman in 1973. He retired in 1980, when he was created a Knight Bachelor.

While working at ICI he studied business at the Massachusetts Institute of Technology and Harvard Business School.

Under his guidance, ICI grew and prospered. With his research background he consistently supported company research in chemical and related fields. He backed Australian innovation, including CSIRO's Sirotherm and Sirofloc processes.



Sir David Zeidler

He was committed to cooperation between industry, research organisations and universities. While in CSIRO he set up a cooperative high-pressure chemical engineering unit at the University of Sydney.

Sir David served on the boards of a number of other large companies, including BHP, Amatil, the Commercial Bank of Australia and Westpac Banking Corporation. He supported science and technology through his work on the boards of research organisations such as the Walter and Eliza Hall Institute of Medical Research in Melbourne. He was a member of many scientific and professional societies.

Sir David contributed to Australian education, serving on the Commonwealth Advisory Committee on Advanced Education and other committees looking at overseas qualifications, academic salaries, and education and training. He worked on government inquiries into electricity generation and distribution.

He was President of the Australian Academy of Technological Sciences and Engineering and joined the Fellowship of the Academy of Science by special election in 1985.

Biographers

Professor Harry Poulos, of Coffey Partners International, and Professors Roger Tanner and John Carter, both of the University of Sydney, will write a biographical memoir on the late **John Booker** for publication in *Historical records of Australian science*.

Science alliance to boost coverage

Five major science groups have formed a new committee to promote the public understanding of science and technology in Australia.

The committee will be made up of the presidents of the five groups, as well as the President of the National Press Club, Mr Ken Randall, who has been invited to join to ensure events appeal to journalists and reach the widest possible audience. The groups are:

- the Australian Academy of Science
- the Australian Academy of Technological Sciences and Engineering (President Mr Tim Besley)
- the Australian Science Communicators (President Professor Ian Lowe)
- the Federation of Australian Scientific and Technological Societies (President Professor Peter Cullen)
- the Australian and New Zealand Association for the Advancement of Science (President Professor Paul Adam).

Dr Jim Peacock, a member of both science academies and head of the CSIRO Division of Plant Industry, has been elected chair of the committee.

Sir Gustav Nossal, then President of the Academy of Science, said he was delighted Mr Randall has agreed to join the committee. 'The forum is to have a media focus. The perspective of the working journalist will assist us to

reach all Australians and help make them aware of the economic and environmental possibilities of science and technology', he said. 'It's a terribly important issue.'

The first event the committee oversaw was the three-day forum in Melbourne in May called ScienceNOW! This forum included sessions on cloning and emerging diseases, as well as on the way scientists are portrayed in the cinema. A session called 'Fresh science' was presented by 16 younger scientists and engineers specially selected for having the latest and most interesting new science.

Closing dates 1998

Haddon Forrester King Medal	22 June
Jaeger Medal	26 June
Kanagawa Museum Award	14 August
Boden Research Conferences	14 August
Selby Fellowship	30 August

For further information email Faye Nicholas at the Academy on ac@science.org.au.

France exchange	10 June
UK exchange	1 July
Korea exchange	1 July
Taiwan exchange	1 July
Japan postdoctoral and short-term fellowships	1 August
China exchange	1 October
Germany program	1 October

For further information email Thérèse Lewis on io@science.org.au.



Cooperation on journals

On 6 February 1998, the President of the Academy, Sir Gustav Nossal, and the Chief Executive of CSIRO, Dr Malcolm McIntosh, signed a new agreement between the Academy and CSIRO to cooperate in the publication of the *Australian Journals of Scientific Research*.

Is there something in the water?

An Academy of Science forum was told in April that the female hormone, oestrogen, is coming through Australian sewerage outfalls. In inland Australia, this water is later used for irrigation and stock and human drinking water.

The topic of the Academy's 58th National Science and Industry Forum, held in Canberra, was *Endocrine disruption: Australia's role in an international issue*. Oestrogen is one of a group of chemicals called endocrine disrupters. Other disrupters include substances such as DDT, PCBs and some pesticides, which are no longer manufactured in Australia but which can remain in soils and water supplies. There are other chemicals still in use that some laboratory screening techniques have indicated could have endocrine effects.

Such endocrine disrupters could be associated with breast cancer, testicular cancer and male infertility. The oestrogen in the sewers probably comes from plant-derived foods, from the natural secretions of women and from birth-control pills but it is not yet known whether these very low levels of hormone pose a health risk to humans or wildlife.



Participants in a workshop at the National Science and Industry Forum.

Although the United States will soon undertake a massive screening program for endocrine disrupters in food and water and in agricultural and industrial chemicals, the Australian forum agreed that we do not yet know how big the problem is and how much effort should be put into it. More research is needed to work out the risks, the ways that the chemicals affect humans and wildlife, and the levels that are hazardous.

The Secretary (Science Policy) of the Academy, Professor John White,

undertook to pursue ideas for better communication between industry, government and the community. The Academy will act as a clearing house and will offer a web site for disseminating current knowledge and priorities for the future. 'Clear information, and a clear acknowledgment of our ignorance, is very important,' said Professor White. 'While we cannot state the hazards of endocrine disruption at the moment, we can say that there is likely to be a problem unless we do something soon.'

Honours to Fellows

The US Institute of Electrical and Electronics Engineers has awarded its 1997 Control Systems Award to the Director of the Research School of Information Sciences and Engineering, **Professor Brian Anderson**. The award recognises his outstanding contributions in adaptive and optimal control, stability and system identification.

The Director of the CSIRO Biomolecular Research Institute, **Dr Peter Colman**, has been elected to the Australian Academy of Technological Sciences and Engineering.

The former Professor of Isotope Geochemistry at the Australian National University, **Emeritus Professor Bill Compston**, has been elected to the Australian Academy of Technological Sciences and Engineering.

The Royal Society of New Zealand has elected **Professor George Dracoulis**, from the Department of Nuclear Physics at the Australian National University, to Honorary Fellowship of the society. This honour is reserved for overseas scientists who have contributed significantly to New Zealand science.



Visitor from Norway

Professor Helge Tverberg, centre, a distinguished mathematician from the University of Bergen in Norway, who was visiting the Australian National University, met Fellows of the Academy on 3 April 1998.