



Statement on human cloning



The Academy's Secretary (Science Policy), Professor John White, and the cloning project consultant, Professor Sue Serjeantson, face the press.

The Academy released a position statement, *On human cloning*, on 16 March. The statement was a response to the Academy's concern that speculation about human reproductive cloning – the production of a human foetus from a single cell by asexual reproduction – has obscured the challenges and potential benefits of therapeutic cloning: medical and scientific applications of cloning technology which do not result in the production of genetically identical foetuses or babies.

A number of recent biomedical advances suggest that perhaps one day it will be possible to grow self-compatible tissue from human adult cells, such as nerve cells for people with spinal injuries, muscle cells for heart attack victims or other cells for organ repair.

The statement distinguished between *human reproductive cloning* and *therapeutic cloning*. The Academy's Council considers reproductive cloning to produce human foetuses unsafe and unethical and recommends its prohibition.

However, human cells should not be precluded from use in approved research activities. Under the National Health and Medical Research Council's present *Ethical Guidelines on Assisted Reproductive Technology*, production of human embryonic stem cells could only be approved under exceptional circumstances. These guidelines were originally prepared to ensure ethical practices in *in vitro*

fertilisation clinics and, if Australia is to participate in and benefit from advances in cloning, they need to be revised and restrictive legislation in some states needs to be repealed.

The necessary provisions could be made in the framework of the establishment of a national regulatory arrangement.

The Council of the Academy has made the following recommendations with respect to existing regulatory arrangements.

- Reproductive cloning should be prohibited, but human cells should not be precluded from use in approved research.
- The Minister for Health and Aged Care should promote community discussion of cloning techniques.
- A national regulatory two-tier approval process should be adopted for all research involving human embryos and human embryonic stem cell lines.
- Research on therapeutic cloning should not be inhibited by restrictive legislation or the withholding of funds.

There has been a positive national and international response to the statement. As well as being covered on the front, magazine and editorial pages of the major newspapers, it has been the subject of discussion on radio, of a viewer poll on Channel 9's *Sunday* program and of broadcasts around the world by the BBC.

The full text of the position statement is available on the Academy's web site at www.science.org.au/policy/statemen/cloning.htm.

Failure to support innovation

The Federal Government's failure to restore funding to university research infrastructure in the 1999–2000 Federal Budget will undermine Australia's entire innovation strategy, the President of the Academy, Professor Brian Anderson, said following the delivery of the Budget in May.

Professor Anderson welcomed the substantial funding and support for medical research and the biotechnology industry but warned that the future of the biotechnology sector depended on the outcome of the Federal Government's review of business taxation.

Australia must increase its rate of innovation if it is to avoid economic and social impoverishment, but the Budget's abandonment of the START grants for

technology developers left a large gap in the response to the need to innovate.

Professor Anderson said the Budget was not a sufficient measure to ensure Australia's future prosperity through innovation. World-class scientific research would not be possible at the current level of funding and Australia could not have a prosperous and secure future at current levels of innovation, he said. He also highlighted the failure to make an adequate policy response to link a better research base to a more innovative private sector.

In April, Professor Anderson told the Academy's annual general meeting, 'Governments and opinion-makers of the leading economies of the world know

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This newsletter is available on the Academy's web site, www.science.org.au/academy/newslett/newslett.htm.

Published by the Australian Academy of Science, GPO Box 783, Canberra ACT 2601.

Honorary editor: Professor Neville Fletcher FAA; production by Green Words & Images, Canberra. Other assistance: members of Academy committees and Academy staff.

Printed by Inprint, Brisbane.

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ISSN 1031-9204

Print Post Approved PP 255003/00025

Business tax review

The Australian Academy of Science called for increased incentives to encourage innovation in its submission to the Federal Government's review of business taxation.

Noting that the benefits of innovation extend well beyond individual companies to the public as a whole, the submission advised that the tax system should provide a relative advantage to firms willing to invest in research and development.

As Australia is suffering 'chronic underachievement' in technological innovation, the submission called for changes to capital gains tax to remove the deterrents to venture capital, the very fuel of the young companies that create employment and wealth.

The Academy advised that the use of concessional rates of capital gains tax, the indexing of rates, tax credits and privileged access to venture capital funds were vital to the future prosperity of Australia.

At present, the only incentive is the 125 per cent tax deduction for research and development expenditure, which itself is a scaled back version of the 150 per cent scheme available before 1996. This deduction is only of benefit

to established, profitable firms.

The submission warned that government expenditure on incentives for innovation must not be sacrificed in the interests of a lower overall corporate tax rate. The submission to the review concluded that there was a need for 'favourable treatment of investment decisions that support long-term innovation in individual firms and in the economy as a whole'.

The Academy's President, Professor Anderson, said Australia must act quickly to adjust to the 'knowledge economy', labelling the failure to do so a national embarrassment.

Wark dinner

The Ian William Wark Medal presentation and dinner will be held in Melbourne on 25 August 1999.

The winner of the medal is the Director of the Advanced Mineral Products Special Research Centre at the University of Melbourne, Professor Thomas Healy. For more details email ac@science.org.au.

Forthcoming events

- Ian William Wark Medal presentation and dinner, Melbourne, 25 August – see above
- National Academies Forum on intellectual ownership, Canberra, 15–16 July – see page 3

Conferences

The Academy's web site has a conference and events database that lists events occurring in Australia and New Zealand between now and 2001. Events include seminars, exhibitions, science fairs, summer schools, workshops and lectures on the subjects of science, health, information technology, engineering, mathematics and the environment. The database, prepared by the Royal Society of New Zealand, is at www.science.org.au/conf.htm.

New topics on Nova

- When the numbers just don't add up

- Integrated pest management – the good, the bad and the genetically modified
- De-bugging the millennium
- The bitter-sweet taste of toxic substances
- The mammal copiers – advances in cloning
- Calculating the threat of tsunami

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

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.

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.

Treasure under the sea

Australia's marine territory is a huge national resource and precious asset, exploited by a wide range of users whose interests are frequently in conflict. The Australian Government's oceans policy has been formulated to unite regulatory regimes into a single framework based on ecosystem management.

The Academy's annual symposium, *Sunken Treasure? Australian coasts and oceans*, held in Canberra on 30 April 1999, uncovered some of the treasure and analysed some of the conflicts occurring on and under our seas.

The convenor of the symposium, Dr Angus McEwan, the former Chief of CSIRO Oceanography, introduced the subject by describing Australia's oceans policy in practice. Other speakers, from CSIRO, universities and government agencies, informed sessions on coasts, marine resources and the way the oceans control our climate and weather.

The Director of the Cooperative Research Centre for Research on Ecological Impacts of Coastal Cities, Professor A J Underwood, explained how the science of coastal ecology was essential for sustainable development. The Chief of CSIRO Land and Water, Dr Graham Harris, looked at the multiple-use management and multi-disciplinary science required where cities meet the sea. Dr Terry Done, from the Australian Institute of Marine Science, spoke of the quest for sustainable multiple use of the Great Barrier Reef World Heritage Area. The Professor of Environmental Engineering from the University of Western Australia, Professor Jörg Imberger, described the challenges of dispersing human impact, particularly pollution, on the coastal margin.

The Head of the School of Zoology at the University of Tasmania, Professor Craig Johnson, explained why the management of the ocean's living resources had to be based on the dynamics of ecosystems, not species. The leader of the Law of the Sea Project at the Australian Geological Survey Organisation, Dr Philip Symonds, spoke on Australia's seabed jurisdiction and its resource implications. Dr Steve Blaber, from CSIRO Marine Research, asked whether the fisheries of the future would be hunted or farmed. The leader



The convenor, Dr Angus McEwan, left, at the Academy's symposium on coasts and oceans with the President of the Academy, Professor Brian Anderson.

of the Microbiology Research Group at the University of Tasmania, Professor Tom McMeekin, presented case studies of microbial diversity and biotechnology from the Southern Ocean.

Two speakers from CSIRO Marine Research, Dr Sue Wijffels and Dr Steve Rintoul, described how the oceans

circulate heat and gases around the globe, thereby controlling the climate. Dr Neville Smith, from the Bureau of Meteorology Research Centre, explained how advances in satellite observation and computer power had made it possible to monitor the whole ocean.

Award for endangered animals research

With the support of a private benefactor, the Academy is offering an award for research on the conservation of endangered native animals. The aim is to understand the causes of decline of endangered Australian native species of vertebrate animals with a view to improving the management of the conditions necessary for the species' recovery.

Grants of up to a total of \$20 000 will be awarded. Applicants should have a record of relevant research.

Proposals should reach the Executive Secretary at the Academy, GPO Box 783, Canberra ACT 2601, by 30 July 1999. For more information see the Academy's web site at www.science.org.au/awards/conserv.htm or email ac@science.org.au.

Intellectual ownership and the law

The National Academies Forum and the National Library of Australia are holding a symposium on 'Scholarship, Intellectual Ownership and the Law' in Canberra on 15–16 July 1999.

The symposium will address numerous topics including intellectual ownership, access to information, ownership and the biota, and licensing issues.

The draft program and registration form, due by 9 July, are available on the Web at www.naf.org.au/iosymp.htm. Further information can be obtained from Nancy Lane at (02) 6247 5777 or email do@science.org.au.



Two of Australia's most eminent mathematicians, Professor Cheryl Praeger and Professor Bernhard Neumann, at the launch of new mathematics topics for Nova.

New mathematics series for Nova

The Academy has launched a series of mathematics topics on *Nova: Science in the news* (www.science.org.au/nova) in response to requests from mathematics teachers and in recognition of the importance of mathematics in science. New topics will be added at regular intervals. The new mathematics topics, along with a link to university mathematical sciences departments across Australia, can be found on the web at www.science.org.au/nova/maths.htm.

Following the first topic on measurement in sport, another three mathematics topics have been added:

When the numbers just don't add up
Mathematics and statistics play an

important role in today's society, but the numbers can be fudged! This topic is sponsored by Australian university mathematical sciences departments.

De-bugging the millennium

This topic examines the Y2K problem, the potential consequences, measures being taken to address the threat and how to check whether your equipment is Year 2000 compliant. Topic sponsored by the Office for Government Online.

Calculating the threat of tsunami

Scientists have combined mathematics, geology and physics to make important advances in the prediction of tsunami – a series of waves of destructive force.

Other new topics on *Nova* are:
Integrated pest management – the good, the bad and the genetically modified

Integrated pest management is helping revive cotton cultivation in Western Australia's Ord River Valley, 25 years after it was abandoned due to uncontrollable caterpillar infestations. This topic covers pest resistance and integrated pest management strategies. Topic sponsored by AgrEvo Pty Ltd.

The bitter-sweet taste of toxic substances

It is crucial we all safeguard ourselves and the environment from the threat posed by toxic substances, including household items such as bleach, disinfectant and detergent. Topic sponsored by the National Occupational Health and Safety Commission.

The mammal copiers – advances in cloning

The cloning of Dolly the sheep has sparked debate on the ethics and safety of cloning technology.

Several of these new topics are also sponsored jointly by the Science and Technology Awareness Program of the Commonwealth Department of Industry, Science and Resources.

The editors of the *Encyclopaedia Britannica Online* have rated the Academy's *Nova* web site as one of the eight best science news sites on the World Wide Web.

Supported by the Australian Foundation for Science

Access to facilities

The Australian Research Council has agreed to fund an Academy project on major national and international research facilities. It will cover facilities in both the physical and biological sciences. A steering group has been formed and a project consultant will be appointed shortly.

On a related matter, the Academy's Secretary (Science Policy), Professor John White, has been discussing with the Federal Government the eligibility of researchers who are not Australian citizens or permanent residents for funding to support the use of major research facilities overseas. The Academy has set out the case for restrictions which do not inhibit the participation of overseas scientists in Australian research teams.

Failure to support innovation

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that basic research is an essential foundation for innovation and it is innovation which has brought them their leading positions.'

The United States and Britain have both implemented policies to encourage innovation: they have kept critical tax rates low and supported a strong research base, and they are now increasing public expenditure on basic scientific research. In 1998, Britain provided an extra \$3741 million over three years for research grants and infrastructure. Professor Anderson said, 'If Australia were to increase support for basic research at the same rate as Britain, in proportion to the size

of our national economies, we would need to spend an additional \$1 billion over three years.'

The United States is increasing investment in basic research grants at about 7 per cent a year. For Australia to match that rate, it would need to spend an extra \$163 million each year just on research grant programs.

We are under-investing in innovation. We need to take stronger action, in proportion, than the United States or Britain, Professor Anderson said. 'I know our researchers and innovators are up to the challenge. Australia will not be disappointed if their creativity is unshackled.'

The full text of Professor Anderson's statements on the budget and innovation is available on the Academy's web site at www.science.org.au/academy/media/contents.htm.

Award winners

Seven awards for research were presented at the Academy's annual general meeting on 29 April 1999.

Burnet Lecture

Professor Maxwell Bennett

Professor Bennett has a distinguished research career in the field of neurophysiology. He discovered that nerve terminals on muscles release transmitter molecules other than noradrenaline and acetylcholine, that mature muscles have recognition molecules, that nerve cells in the developing brain depend on growth factor molecules from other nerve cells and that molecular mechanisms determine the different transmission capacities of the individual synapses formed by a single nerve terminal.

Professor Bennett is Professor of Physiology at the University of Sydney. His Burnet Lecture was on the individuality of single synapses. He explained research which showed that each of the many synapses of a single terminal of a nerve cell has a different capacity to secrete transmitter substances.

Double funds for medical research

The Academy has strongly endorsed the Wills Committee's strategic review of health and medical research and has encouraged the Federal Government to move quickly on its recommendations. The Academy has highlighted a number of major points that are crucial to the future of health and medical research in Australia.

The Academy supports the doubling of the National Health and Medical Research Council (NHMRC) budget over five years, with further increases linked to outcomes, overseen by a leadership and management group within the NHMRC. The Academy also supports a more general enhancement of the NHMRC management structure.

An overhaul of the capital gains tax regime is essential to encourage investment in new biotechnology enterprises and mechanisms need to be introduced to ensure equitable allocation of infrastructure funding.

A more detailed response to the Wills Committee can be found on the Academy's web site at www.science.org.au/policy/statemen/wills.htm.

The Burnet Lecture, given once every two years, recognises the research of an eminent scientist in the field of biology or medicine.

Lyle Medal

Professor Ernest Tuck

Professor Tuck, Elder Professor of Applied Mathematics at the University of Adelaide, is a leading authority on ship hydrodynamics, with more than 150 research publications to his credit. His published papers include topics ranging from wing aerodynamics to an analysis of gaming.

Most recently, Professor Tuck has worked out how to design multi-hull ships that cancel out bow waves. The discovery has the potential to protect river banks from erosion, save fuel and increase ship speeds.

The Lyle Medal recognises an outstanding research career in mathematics or physics.

Jaeger Medal

Dr John Philip

Dr Philip, Fellow Emeritus at CSIRO Land and Water, provided the key physical ideas for the unified understanding of many important processes of water movement in soil, an especially important subject in a country as dry as Australia. Dr Philip has published more than 300 papers and is regarded as a world leader in hydrology. His other major contributions include the insight that thermodynamics is the key to understanding the energy and water exchanges between vegetation and the total environment.

The Jaeger Medal is awarded for Australian investigations into the solid earth or its oceans.

Hannan Medal

Professor Tony Guttman

Professor Guttman, Professor of Mathematics at the University of Melbourne, has developed analytical and computational techniques to analyse power series expansions in statistical mechanics and fluid dynamics. Recently, his work on the question of solvability in a computational setting has attracted significant attention.

The Hannan Medal is awarded for distinguished research in statistics or pure, applied or computational mathematics.



Professor Maxwell Bennett

Pawsey Medals

The Pawsey Medal is awarded to younger scientists for distinguished research in physics. Two medals were awarded this year.

Dr Martijn de Sterke

Dr de Sterke, a Reader in Physics at the University of Sydney, has made a number of key contributions to the physics of non-linear wave propagation through periodic media. Dr de Sterke's most spectacular prediction was that of pulse propagation at a fraction of the speed of light in uniform glass, which has applications in fibre optics.

Associate Professor Raymond Volkas

Associate Professor Volkas, of the University of Melbourne, has made a number of significant contributions to theoretical particle physics, including, with his colleagues, devising the exact parity model of the solar neutrino anomaly. A number of his predictions will soon be tested by the SuperKamiokande experiment.

Gottschalk Medal

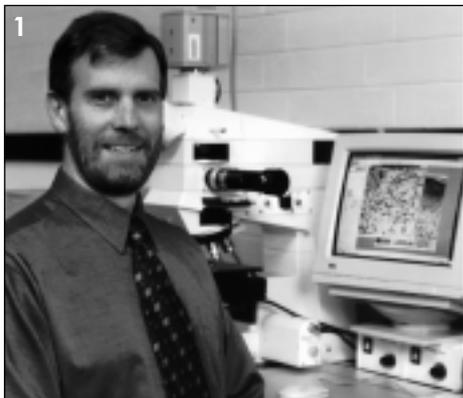
Dr Michael Parker

Dr Parker found the structure of a pore-forming protein toxin which provided an understanding at the molecular level of how water-soluble proteins pass through biological membranes.

Dr Parker is Head of the Protein Crystallography Laboratory at the St Vincent's Institute of Medical Research. The laboratory has worked out the structure of more than 20 proteins.

The Gottschalk Medal recognises the distinguished medical or biological research of a younger scientist.

New Fellows elected



Twelve of the nation's leading scientists were elected to the Fellowship of the Australian Academy of Science at the annual general meeting in Canberra in April. Election to Fellowship of the Academy honours careers that have significantly advanced the world's store of scientific knowledge.

1. Professor Andrew Gleadow, 50, School of Earth Sciences, University of Melbourne, and Australian Geodynamics Cooperative Research Centre.

Professor Gleadow pioneered the use of fission track analysis in geological and thermal dating in Australia. The technique, which measures the accumulation of radiation damage in uranium-bearing minerals, has found widespread use in the reconstruction of the thermal history of rocks. Professor Gleadow's work has established Australia as a world leader in the field and his research group is currently working on a new approach to terrain imaging, which gives an unprecedented ability to reconstruct past configurations of the Earth's surface.



2. Professor Jennifer Graves, 58, Professor of Genetics, La Trobe University.

Professor Graves has made seminal contribution to mammal genetics. Her studies of the genetic diversity of Australia's mammals explained the organisation, function and evolution of their genes. She is recognised for her work on the origin and evolution of human sex chromosomes, the inactivation of X chromosomes and the control of DNA synthesis in mammal cells.



3. Professor John McKenzie, 51, Professor of Genetics and Dean, Faculty of Science, University of Melbourne.

Professor McKenzie is recognised as a world leader for his theoretical and practical contributions to ecological and evolutionary genetics. His study of the genetic response of natural populations to environmental change, using insecticide residues in the Australian sheep blowfly as a model, has provided a sound conceptual base for the management of pesticide resistance.



4. Professor Barry Marshall, 48, Clinical Professor of Medicine, Queen Elizabeth II Medical Centre, Western Australia.

Professor Marshall, in collaboration with Dr J Robin Warren in 1982, discovered that infection of the stomach with unidentified spiral bacteria caused gastritis-associated dyspepsia and ulcers and increased the risk of gastric cancer. The discovery was based on clinical and laboratory observations as well as an experiment in which Professor Marshall infected himself. He described the bacterium as a new species of *Helicobacter pylori* and developed techniques for its diagnosis and eradication. His work has revolutionised the treatment of gastro-duodenal ulcers by enabling an antibiotic cure and will lead to a significant reduction in the prevalence of gastric cancer.

5. Professor Colin Masters, 52, Head, Department of Pathology, University of Melbourne.

Professor Masters has been distinguished for his study of amyloid deposits in the brains of patients with degenerative brain conditions, in particular Alzheimer's disease. He led the study of the processing pathways of the amyloid precursor protein, some mutations of which have been shown to cause some forms of Alzheimer's disease. This has led to the identification of targets for preventing and treating the disease.

6. Professor Gerard Milburn, 41, Head, Department of Physics, University of Queensland.

Professor Milburn has pioneered the study of squeezed states of light and optical quantum measurements and made fundamental theoretical contributions to a range of quantum sciences. He was one of the pioneers of the quantum stochastic treatment of quantum control theory and gave one of the first solvable examples of decoherence in non-linear dynamics.

7. Professor Michael Paddon-Row, 57, School of Chemistry, University of New South Wales.

Professor Paddon-Row is recognised for his interpretation of long-range electron transfer in thermal and photochemical processes. His work has

combined theory, organic chemical synthesis and physical organic chemistry. His major research achievement was the first unambiguous definition of the transfer pathway between donor and acceptor molecules and the demonstration that fast transfer can occur via saturated hydrocarbon bridges at long distances.

8. Professor Nhan Phan-Thien, 46, Professor of Mechanical Engineering, University of Sydney.

Professor Phan-Thien is distinguished for his theoretical research into rheology (the study of the flow of matter) and parallel computing. His work on the stability of torsional flows and cone-and-plate flows has important implications for experimental rheology. His increasing focus on computation has led to a pioneering method of die design. Studies of flagella propulsion, suspension mechanics and bread dough modelling are among his recent achievements.

9. Professor Colin Rogers, 58, Professor of Applied Mathematics, University of New South Wales.

Professor Rogers' research concerns the application of invariance to analyse physically important nonlinear mathematical systems. His research has led, in particular, to the discovery of a new class of soliton equations, including a long-sought higher-dimensional integrable version of the classical sine–Gordon equation.

10. Dr Ken Shortman, 62, Head, Immunology Division, The Walter and Eliza Hall Institute for Medical Research, Melbourne.

Dr Shortman was a pioneer in the development of biophysical procedures

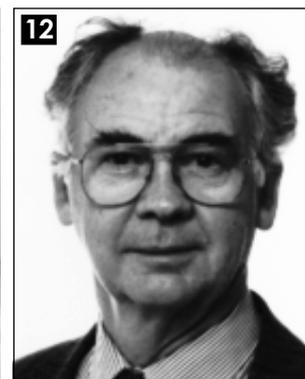
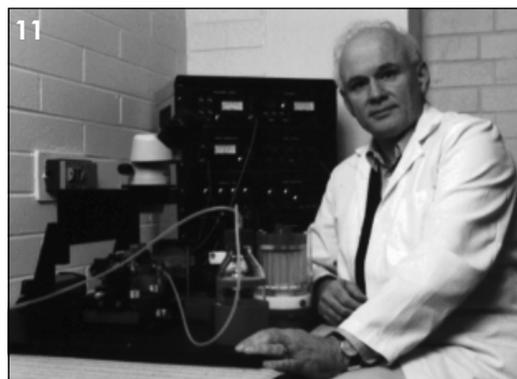
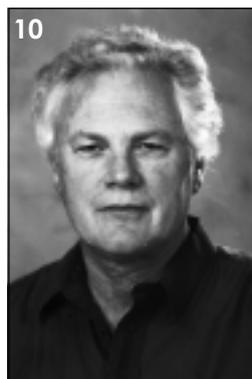
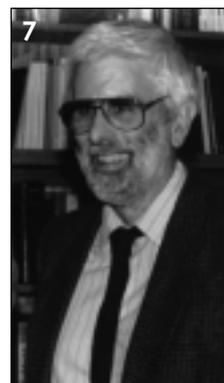
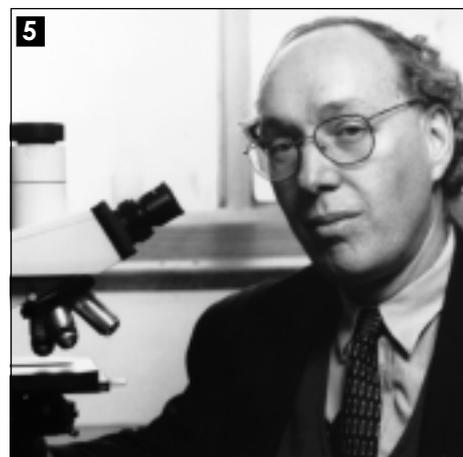
for the purification of lymphoid cells and his laboratory was the first to successfully isolate the earliest progenitor of lymphoid cells in the thymus. His work has provided a clear picture of the birth, proliferation, emigration and death of cells in the thymus. Recently, he has described a new lineage of lymphoid-related dendritic cells.

11. Professor George Stephenson, 54, Department of Zoology, La Trobe University.

Professor Stephenson is recognised as a leading figure in the field of muscle research for his contributions to the understanding of muscle contraction. He has developed techniques that have gained acceptance throughout the world and has given a new explanation for the regulation of muscle contraction that has generated considerable interest in the field. Professor Stephenson's major interest has been the signalling pathway between electrical activation of the surface membrane of a muscle cell and the contractile response.

12. Professor Robert Watts, 58, Chief Scientist, BHP Melbourne.

Professor Watts is a chemical physicist recognised for his contributions to liquid state theory, energy transfer in collisions and sputtering dynamics. He was the first to show that integral equations can describe the gas–liquid transition. He published the first computer simulation of water. Professor Watts has developed the benchmark argon potential models for water, benzene, ammonia and methane which account for the thermodynamic, transport and spectroscopic properties in all three phases.



Fellows admitted

As part of the Academy's 1999 annual general meeting, on 28 April 1999 Fellows being admitted to Fellowship of the Academy described their research. Speakers and their topics are listed below.

Dr Robin Bedding, Chief Research Scientist, CSIRO Entomology
Using nematode worms to control insect pests

Professor Bruce Chappell, Department of Geology, Australian National University
High and low-temperature granites

Professor Graeme Clark, Professor of Otolaryngology, University of Melbourne
Cochlear implants – past, present and future

Professor George Dracoulis, Head, Department of Nuclear Physics, Australian National University
Living longer

Professor Simon Gandevia, NHMRC Senior Principal Research Fellow, Prince of Wales Medical Research Institute, Sydney
The brain and the muscle

Professor Jörg Imberger, Director of the Centre for Environmental Fluid Dynamics, University of Western Australia
Environmental engineering: evolution of a new discipline

Professor John Kerr, Emeritus Professor of the University of Queensland
Apoptosis: the cell death we need to have

Professor Gus Lehrer, Professor of Pure Mathematics, University of Sydney
The geometry and algebra of configurations

Professor Brendan McKay, Department of Computer Science, Australian National University
Making things on the computer

Professor Rodney Tucker, Director, Photonics Research Laboratory, University of Melbourne
Terabits on the internet: telecommunications in the new millennium

Professor Jim Williams, Professor of Physics, University of Western Australia
A state of excitement in electron behaviour

New members of Council

At the annual general meeting in April, three new members were elected to the Council of the Academy to replace three retiring office-holders, Professor Leonard Lindoy, Dr Elizabeth Truswell and Professor Ann Woolcock. The new members are:

Professor David Boger, Professor of Chemical Engineering at the University of Melbourne. Professor Boger was elected as a member in the physical sciences. Professor Boger's work has focused on polymer and particulate fluid mechanics.



Professor David Boger



Professor Elspeth McLachlan



Professor Joseph Wiskich

Professor Elspeth McLachlan, Senior Principal Research Fellow at the Prince of Wales Medical Research Institute in Randwick, New South Wales. Professor McLachlan was elected as a member in the biological sciences. She was awarded the 1998 Ramaciotti Medal for excellence in biomedical research.

Professor Joseph Wiskich, Department of Environmental Biology at the University of Adelaide. Professor Wiskich was elected as a member in the biological sciences. Professor Wiskich's work has focused on plant respiration, photorespiration and bioenergetics.

Report available on marine science

The report of the Joint Australia-Japan Marine Science Workshop, held at the Antarctic Cooperative Research Centre in Hobart in November 1998, is now available at www.science.org.au/internat/internat.htm. The workshop was sponsored by the Academy and the Japan Society for the Promotion of Science to discuss areas of existing and potential future collaboration for work in the Southern Ocean. The workshop drew together a delegation of Japanese scientists from the National Institute of Polar Research and Hokkaido University and scientists from the Australian Antarctic Division, Antarctic CRC and CSIRO Marine Research. A report from the Australia-Japan workshop held in Townsville will be available at the same web address soon.

Science festival

The Academy hosted a number of events during the Australian Science Festival in Canberra in April.

Television presenter Don Burke, of *Burke's Backyard*, presented a public seminar, 'Genetics in the backyard', explaining simply how genetics might revolutionise plant and animal breeding in the next century.

The Australian Skeptics joined the ABC's Paul Willis and Bernie Hobbs to examine paranormal phenomena in 'The Correx Archives'.

An exhibition of Australian frogs, lizards, turtles and snakes was held in conjunction with the ACT Herpetological Society.

The Academy's annual general meeting symposium, *Sunken Treasure? Australian Coasts and Oceans* (see report on page 3), was also part of the festival.

The Academy also offered a science and technology bicycle trail map for self-guided tours of 26 science and technology-related sites in Canberra.

Honours to Fellows

Professor Chris Christiansen, Emeritus Professor of the University of Sydney, has had a minor planet named after him, 'Christiansen', for his contribution to Chinese astronomy. The minor planet was discovered by the Peking Observatory.

Professor Graeme Clark, Professor of Otolaryngology at the University of Melbourne, has been awarded the 1999 Victoria Prize, worth \$50 000, for his work on the cochlear implant.

Professor Derek Denton, Director Emeritus of the Howard Florey Institute of Experimental Physiology and Medicine, and **Professor Barry Marshall**, a new Fellow of the Academy whose work has revolutionised the treatment of gastroduodenal ulcers, have been elected Fellows of the Royal Society.

Professor Denis Evans, Dean of the Research School of Chemistry at the Australian National University, has been awarded the S F Boys–A Rahman Lectureship by the Royal Society of Chemistry, London, in recognition of his contributions to the statistical mechanics of non-equilibrium systems.

Professor Kurt Lambeck, Professor of Geophysics at the Australian National University and Secretary (Physical Sciences) of the Academy, has been elected to the Academia Europaea for his research into the physics of the Earth.

Professor Elspeth McLachlan, a Senior Principal Research Fellow at the Prince of Wales Medical Research Institute, has won the 1998 Ramaciotti Medal for excellence in biomedical research. Professor McLachlan specialises in the autonomic nervous system and peripheral nerve damage.

Sir Gustav Nossal, a former President of the Academy, received a special lifetime contribution award at the Clunies Ross National Science and Technology Award dinner in Melbourne on 30 March. The award was made in recognition of Professor Nossal's contribution to Australian science and technology and to global health and immunology.

Professor James Quirk, Emeritus Professor at the University of Adelaide

and the University of Western Australia, was elected an Honorary Fellow of the International Society of Soil Science at the XVI International Congress of Soil Science at Montpellier.

Professor John White, Professor of Physical and Theoretical Chemistry at the Australian National University and the Secretary (Science Policy) of the Academy, has been elected President of the Royal Australian Chemical Institute.

Queen's Birthday honours

Three Fellows gained Medals in the Order of Australia (AM) in the Queen's Birthday honours list in June 1999. They were **Dr Anthony Klein**, a physicist from the University of Melbourne; **Dr Graeme Pearman**, Chief of CSIRO Atmospheric Research;

and **Professor Cheryl Praeger**, a mathematician from the University of Western Australia.

Australia Prize winners

Professor Martin Green and a colleague from the University of New South Wales, Stuart Wenham, shared the 1999 Australia Prize. The researchers were awarded the prize by the Prime Minister, John Howard, for their work in the design of solar-electric cells.

The President of the Academy, Professor Brian Anderson, said the Fellows of the Academy were 'immensely proud' of the winners' achievements and that they had given Australia several opportunities to be a major player in the production of solar cells for household use.



Haddon King Medal

The Academy President, Professor Brian Anderson, left, presented the Haddon Forrester King Medal to Professor Richard Stanton at a dinner in Canberra on 26 February 1999. The medal is awarded for contributions to the earth sciences of relevance to minerals and hydrocarbons.

The future of journals

The President of the Academy, Professor Brian Anderson, spoke at a workshop on Australia's information future in Canberra in March. At a time when scientific communication is increasingly dominated by the Internet, Professor Anderson called for a new approach to scientific journals.

He said researchers should use their power as copyright owners, editors, reviewers, and writers to become more involved and influential in journal publishing and to ensure the publications met their needs. Any new approach to journal publishing must support experimentation, ensure economies, and enhance the role of researchers in the construction of journals.

International networks report available

The report of a study into the overseas training and career development opportunities available to young researchers (see *AAS Newsletter* number 43) is now available on the Academy's web site at www.science.org.au/policy/statemen/intnet.htm.

The report was conducted by a Fellow of the Academy, Dr Keith Boardman, and Dr Fiona Wood of the University of New England and includes a list of research and fellowship opportunities from the Sponsored Programs Information Network database.

Links with Europe

The Academy of Science and the Academy of Technological Sciences and Engineering presented a seminar, 'Australia and the EU – a marriage of science & technology – the Fifth Framework Programme in Action', in March.

The seminar was addressed by a key architect of the Fifth Framework Programme, Professor Jorma Routti, the Executive Director of the Australian Centre for Innovation and International Competitiveness, Professor Ron Johnston, and the Head of the Science, Technology and Innovation Division of the Department of Industry, Science and Resources, Dr Paul Wellings. The seminar highlighted those areas of research where Australian researchers would be able to cooperate under the Fifth Framework Programme: the quality of life and management of human resources, the user-friendly information society, competitive and sustainable growth, and energy, environment and sustainable development. It also described how international collaboration with the European Union would be encouraged.

Australia-France workshop



A joint Academy of Science-Académie des Sciences workshop on 'Scientific frontiers in molecular biology and their impact on 21st century medicine and agriculture' was held between 27 February and 5 March 1999. Half of the delegation of young French researchers visited the Walter and Eliza Hall Institute for Medical Research in Melbourne for a symposium, while the remainder visited CSIRO Plant Industry in Canberra for a plant molecular biology colloquium. Both groups then joined at Corowa in New South Wales to continue discussions on mutual interests and to identify potential areas of future collaboration.

Malaysian visit

A delegation from the Academy of Sciences Malaysia visited the Academy in Canberra on 22 March 1999 for a workshop entitled, 'Roundtable meeting on science and technology: global and regional perspectives'. The workshop was hosted by the Australian Academy of Science and the Academy of Technological Sciences and Engineering.



Manufacturing in Korea

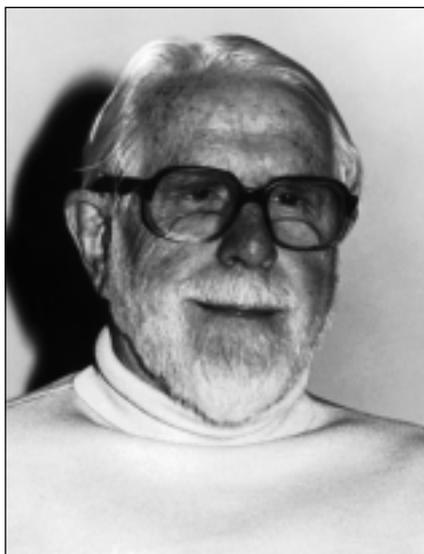
The 2nd Korea-Australia Workshop on Manufacturing Technology and Steel Processing was held at the Pohang University of Technology on 6 and 7 April 1999. The workshop, which followed up another workshop held in Wollongong in November 1995, was sponsored by the Korea Science and Engineering Foundation and the Australian Academies of Science, and of Technological Science and Engineering. Officials from the Korea Science and Engineering Foundation visited the Australian academies in March for the biannual meeting to discuss the exchange program and future collaboration between the two countries.



Oz-Tech 99 in Taiwan

Dr Keith Boardman, left, represented the Academy at the Australia-Taiwan Research Collaboration Symposium held in Taipei on 8 and 9 April. The symposium, which was part of Australian Technology Week (Oz-Tech 99), explored agri-food, environmental management, clean energy, biomedical and information technologies. It was held in conjunction with an exhibition of Australian technology. Leading scientists from Australia and Taiwan, such as two Nobel laureates, Professor Peter Doherty, centre, and Dr Lee Yuan-Tseh, right, spoke at the symposium, which was intended to promote scientific links.

Deaths



Professor Bert Green in 1993

Bert Green

The eminent physicist, Professor Bert Green, died on 16 February 1999, aged 78.

Professor Green was Australia's first Professor of Mathematical Physics, appointed to a special chair at the University of Adelaide in 1951. According to a colleague and former Vice-President of the Academy, Professor Angus Hurst, Green was the ideal appointment, bringing to the position 'a high degree of independence and originality'. In his first year, with the assistance of Harry Messel, he published nine papers and one book.

Herbert Sydney Green was born in 1920 in Ipswich and took his first degree at the Imperial College in 1941. He served as a meteorological officer with the Royal Air Force and then went on to the University of Edinburgh, where he was awarded a PhD and DSc, the latter for seminal work with the Nobel Laureate, Max Born, on the molecular theory of liquids.

Professor Green left Edinburgh in 1949, spent a year at Princeton in the USA, moved to Dublin and then Adelaide to work on the structure of cosmic ray showers.

He spread his interest over the whole of theoretical physics and beyond. His work proved the hazard presented by the manufacture of petrochemicals to the head of the Spencer Gulf and led to the scrapping of a proposed scheme.

He wrote a book, *Sources of*

consciousness, on the physics of the brain. His research also led to the invention of parastatistics, which describes a type of symmetry of particles.

Of Professor Green's hundreds of students, 10 occupy chairs around the world.

Professor Hurst wrote, 'Bert Green, in his conscientious attention to administration, his genuine interest in students, his service to the community as a whole and his wide ranging and highly original research, was a very good example of what a university professor should be.'

Robert Price

A former Chairman of CSIRO, Sir Robert Price, died on 8 March 1999. James Robert Price was born on 25 March 1912 in South Australia, went to school in Adelaide and then studied at the University of Adelaide. After gaining his MSc in 1935 he was awarded an overseas scholarship by the Royal Commissioners for the Exhibition of 1851; he took the scholarship at the University of Oxford. After gaining his DPhil he became Head of the chemistry section of the John Innes Horticultural Institution in 1937. When war broke out he worked on propellants and explosives for the British Ministry of Supply.

He returned to Australia in 1945 and joined the CSIR Division of Industrial Chemistry. There he did research into the chemistry of natural products, including quinones, Australian alkaloids, stock poisons and root exudates. He studied the basis of the inheritance of flower colour and isolated several new classes of alkaloids. His leadership led to the establishment of an effective collecting service in forests and to arrangements for testing the products for medical or veterinary applications.

When the organic chemistry section became a division in 1961, Dr Price was the first Chief. He served on the CSIRO Executive from 1966 to 1970, and was Chairman from 1970 to 1977. He became Knight Commander of the Order of the British Empire in 1976.

Dr Price was elected a Fellow of the Academy in 1959. He served as Chairman of the Academy's National Committee for Chemistry and as a member of the National Science and Industry Forum. He was also active in



Sir Robert Price in 1959

the affairs of the Royal Australian Chemical Institute.

He retired to Red Hill South in Victoria where he pursued his hobby of growing Australian native plants.

Biographers

Biographers have been appointed to write memoirs of former Fellows in *Historical Records of Australian Science*. Dr John Philip and Eric Webb will write about Dr Bill Priestley; Dr Lloyd Evans will write about Sir Otto Frankel.

Closing dates 1999

Japan postdoctoral and short-term fellowships	2 August
Scientific exchanges to Japan, China, Korea and Taiwan	1 September
APEC postdoctoral fellowships, Korea	1 September
Scientific visits to Europe	1 October
Scientific visits to North America	1 November
For further information email io@science.org.au .	

Endangered animals award	30 July
Fenner Medal	31 July
Gottschalk Medal	31 July
Pawsey Medal	31 July
Moran Medal	31 July
Frederick White Prize	31 July
For further information email ac@science.org.au .	



A quick-growing transgenic ram produced by CSIRO Animal Production.

Gene technology and food

In 1983 a hybrid bacterial/plant gene was introduced in working order into a tobacco plant growing in the laboratory. Since then, results from the frontiers of plant science have been applied to agriculture; genetically altered crops are growing now.

Are Australians ready to accept a new era of genetically modified foods? How will consumers react?

At present there is a great lack of understanding of what gene technologies are and how they will affect foods. The public is concerned that the foods may not be safe. Some are worried about long-term environmental risks.

At the same time our food and agriculture industries are under pressure to compete with new techniques and products from overseas.

The Australian Academy of Science brought together some of Australia's leading gene technology experts, food industry and consumer representatives

and government officials to discuss the topic, *Gene technology and food*, at the National Maritime Museum in Sydney on 31 March 1999. It was the 59th meeting of the Academy's National Science and Industry Forum.

Opening the forum, the President of the Academy, Professor Brian Anderson, said, 'Gene technologies are some of the most powerful ever devised by humans. We are just beginning to see their potential.'

The subject matter brought forth lively discussion from those who held differing views on how the technology should be used and regulated. The forum was widely covered in newspapers and on television.

Dr Jim Peacock and Dr T J Higgins, both from CSIRO Plant Industry, initiated the idea for the forum, and Dr Keith Boardman put the program together. A summary report of the forum is available from the Academy's web site at www.science.org.au/industry/reports.htm.

New Corresponding Members

The Academy has elected two eminent overseas scientists as Corresponding Members.

Professor Ernest Ronald Oxburgh, Rector of the Imperial College of Science, Technology and Medicine in London.

Professor Oxburgh has made significant contributions to the understanding of the dynamics of the earth and was responsible for a major reform of earth science research in the UK, developing a broad discipline-based approach to the field. Most recently, Professor Oxburgh has studied helium in the earth's mantle and has written on broader scientific issues. Professor Oxburgh's scientific contributions have been an influence on the direction of research at the Australian National University and other Australian universities.

Professor Bertil Andersson, Chairman of the Department of Biochemistry, Arrhenius Laboratories, Stockholm University.

Professor Andersson is recognised as a leading authority in photosynthesis. His research with two-phase aqueous polymer systems was conducted with Professor Jan Anderson of the Australian National University. Professor Andersson held a postdoctoral fellowship in Australia in 1979–81 and has made many more visits. He has fostered links between scientists in Sweden and Australia, organising exchanges between the two countries.

Oceans attract teachers

The Academy's annual general meeting symposium and marine science workshop (see page 3) attracted 25 science teachers representing state, Catholic and independent school systems from around Australia. Pioneer International sponsored three classroom science teachers to attend; from the left, John Rivas, Darwin; Kate Padman, Perth, and Harry Leather, Melbourne. The education workshop was chaired by Dr Jane Wright, President of the Australian Science Teachers Association. Additional information about the teachers' program is at www.science.org.au/academy/foundation/agm.htm.

Supported by the Australian Foundation for Science

