



Priorities for the new government

The Academy of Science has welcomed the appointment of Dr Brendan Nelson to the portfolio of Education, Science and Training.

The President of the Academy, Professor Brian Anderson, said, 'Dr Nelson is well known for his involvement in many social issues. He shows every sign of bringing enthusiasm and energy to an Education and Training portfolio that has been revitalised by the addition of Science.'

Professor Anderson paid tribute to the outgoing Minister for Industry, Science and Resources, Senator Nick Minchin, for promoting a high profile for science.

He added that the appointment of a dedicated Minister for Science, Mr Peter McGauran, was welcome, in terms of keeping the government to the promises of the last Howard ministry.

In 2001, the Prime Minister released his innovation statement, *Backing Australia's Ability* and the Labor Party produced its *Knowledge Nation* proposal. At the time the Academy applauded the bipartisan approach to innovation.

During the federal election campaign, the Academy released a paper containing 12 recommendations to improve Australia's performance in science, technology and education. The booklet, *Priorities in research and innovation for the next Australian Government*, was sent to all federal members and senators as well as news organisations.

Professor Anderson said, 'With jitters in the global economy and security questions around the world, Australia needs to invest in something it can be confident will build a better nation. Education means jobs for young people in knowledge-based industries. Science means innovation for those industries.'

There are disturbing signs that the supply of science and mathematics teachers will not meet future demand. At the moment, aspiring teachers studying science pay higher HECS fees than those in the humanities. This deters students from becoming science teachers. One of the 12 recommendations in the booklet suggests HECS-exempt scholarships for students commencing science and maths teacher education.

'Enthusiastic, well-trained science and maths teachers are the essential link between bright young people and science-related careers,' said Professor Anderson. 'They encourage students to take up the enabling sciences at school and continue at university.'

The paper also makes suggestions on:

- building a knowledge economy
- the higher education system
- science and mathematics education and awareness
- private investment in research and development
- major national research facilities
- government research agencies, especially CSIRO
- cooperative research centres
- the roles of state and Commonwealth governments
- national research priorities.

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

Recommendations

1. Policy initiatives in *Backing Australia's Ability* need to be implemented at a much faster rate than under the current arrangements that see most of the funding becoming available after the federal election in 2004.
2. The next Australian Government must encourage a shared vision for Australian higher education, in which government, universities and the private sector work for the common good of Australia. This may be effectively achieved through the establishment of a Higher Education Funding Council.
3. The next Australian Government should restore the balance between private and public contributions to higher education, for example by restoring the 'missing 7 per cent' in funding to universities and put in place indexation arrangements that adequately maintain an agreed level of government funding.
4. The next Australian Government should reassess the possibility of introducing a research assessment exercise to influence the allocation of research-related funding to universities.
5. HECS-exempt scholarships should be provided for students commencing science teacher education and a percentage of the HECS debt of science and mathematics teachers forgiven for each year of teaching service.
6. Any indicative trends of unwelcome outcomes in business investment in R&D must be spotted quickly and responded to promptly. The next Australian Government must state its preparedness to fine-tune taxation incentives in the light of experience.
7. The next Australian Government should consider implementing a formal offset program when giving assistance to major industrial developments.
8. The ad hoc nature of the Major National Research Facilities program must end by inclusion of a one-line budget item in the Science and Technology Budget each year, even if there are competitive rounds on a less frequent basis than annual.
9. There is an opportunity for the next Australian Government to review in 2002 the quantum of

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Federation Fellows

Eight Academy Fellows were among the recipients of the first round of Federation Fellowships. The fellowships are part of the Federal Government's innovation action plan. The aim is to keep researchers of the highest international standing in key positions in Australia.

Each recipient gets a salary of \$225 000 per year for five years. In addition, their university will provide research support of at least matching value, including facilities, technicians, library services and equipment.

The President of the Academy, Professor Brian Anderson, said that the fellowships recognised the people behind the science. 'The Academy has a proud history of supporting and promoting science in Australia and it is very pleasing that Fellows of the Academy have been honoured in this way.'

The recipients who are Academy Fellows are:

Professor Robert Clark, University of New South Wales

Professor Max Coltheart, Macquarie University

Professor Michael Dopita, Australian National University

Professor Graham Goodwin, University of Newcastle

Professor Martin Green, University of New South Wales

Professor Yiu-Wing Mai, University of Sydney

Professor Keith Nugent, University of Melbourne

Professor Mandyam Srinivasan, Australian National University.

Recommendations

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- funding allocated to CSIRO for the next triennium, to capitalise on the multidisciplinary capacity of CSIRO to engage as a coherent partner with the rest of Australia's innovation system.
10. The next Australian Government should work to maintain bipartisan support not only for the Cooperative Research Centre Program, but also for education, research and innovation more broadly.
 11. The next Australian Government should retain the Prime Minister's

Science, Engineering and Innovation Council (PMSEIC) and the position of Chief Scientist. It should also upgrade the Commonwealth, States and Territories Advisory Council on Innovation.

12. The next Australian Government should set broad directions for government research agencies and funding agencies. It should urge that there be put in place robust internal priority-setting mechanisms that include broad consultation with potential users of research.

Forthcoming events

- 7 December 2001, Ian Wark dinner and lecture, in conjunction with the Fellows' dining club, the Shine Dome. Information from ac@science.org.au.

New topics on Nova

- Putting a finger on it – the loops and whorls of biometrics
- Feeding the future – sustainable agriculture
- Astronomy in the deep freeze
- The picture becomes clear for magnetic resonance imaging

www.science.org.au/nova

Basser Library

Anyone wishing to use the Basser Library should contact the librarian, Rosanne Walker, telephone (02) 6247 9024 or email lb@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 Manager, telephone (02) 6247 5777 or email es@science.org.au.



Professor Brian Anderson (left), Dr Brian Schmidt and Professor Erich Weigold at the Oliphant centenary dinner.

Oliphant centenary dinner and conferences

A lecture and dinner marking the centenary of the birth of the Academy's foundation President, Sir Mark Oliphant, was held in the Shine Dome on 8 October 2001. About 60 people attended, including Sir Mark's daughter, Vivien.

Mark Oliphant was born in Adelaide on 8 October 1901. After work at the forefront of nuclear physics in Britain and on atomic weapons during World War II, he returned to Australia as one of the founding professors of the Australian National University in Canberra.

Before the dinner Professor Erich Weigold, Director of the Research School of Physical Sciences and Engineering at the Australian National University, reflected on the life of one of Australia's greatest scientists. Dr Brian Schmidt, an astronomer from the Mount Stromlo and Siding Spring Observatories, delivered a lecture on 'Taking measure of the universe'.

Oliphant conferences

The Commonwealth Department of Industry, Science and Resources made a significant announcement at the event. The head of the innovation and science division, Mr Grahame Cook, announced funding for a new series of conferences to be known as the Sir Mark Oliphant International Frontiers of Science and Technology Conference Series. The conferences will be major

events, bringing together scientists from around the world and cutting across conventional discipline boundaries.

The Academy of Science, the Academy of Technological Sciences and Engineering and the Institution of Engineers, Australia will organise the conferences. There will be seven or eight conferences, each with a budget of about \$100 000.

For more information on Sir Mark's life, visit www.science.org.au/oliphant.htm.

For more on the conferences, email Nancy Pritchard at the Academy, io@science.org.au.

Historical Records to CSIRO

In 2002 CSIRO Publishing will take over the publication and distribution of the Academy's journal, *Historical Records of Australian Science*. The journal publishes, and will continue to publish, historical articles and memoirs of former Fellows.

CSIRO Publishing will be committing new editorial resources to the journal and developing the electronic archive. More information on the journal is available at www.science.org.au/hras/index.htm.

Tax concessions for research

In January 2001 the Federal Government's innovation package, *Backing Australia's Ability*, foreshadowed changes to the tax concessions for research and development. On the last sitting day of Parliament, 27 September 2001, the Taxation Laws Amendment (Research and Development) Bill passed the Senate.

From January to September there had been a great deal of negotiation about eligibility for the concession and the definition of research and development. The Senate Economics Legislation Committee held an inquiry into the Bill, to which the Academy of Science made a submission. Academy representatives – Dr Bob Frater, Professor Martin Green and Professor Sue Serjeantson – also spoke at a public hearing in Sydney in September.

The Academy supported the provisions in the legislation allowing small companies to benefit from the tax deduction. The Academy also discussed the application and interpretation of the conditions of innovation and high technical risk to research and development. The test would be the number of tax concessions successfully claimed. The Academy also noted the need to simplify long-standing administrative arrangements in order to attract investment in research.

Biomedical ethics

The Academy has set up a committee to help develop a position statement on ethical issues in sponsored biomedical research and to consider whether it should have a statement on sponsored research generally. This follows Fellows' concerns about commercial pressures on research and a statement on publication ethics by the International Committee of Medical Journal Editors. The committee will be chaired by the Secretary (Biological Sciences), Professor John Young.

PM's prize to Metcalf

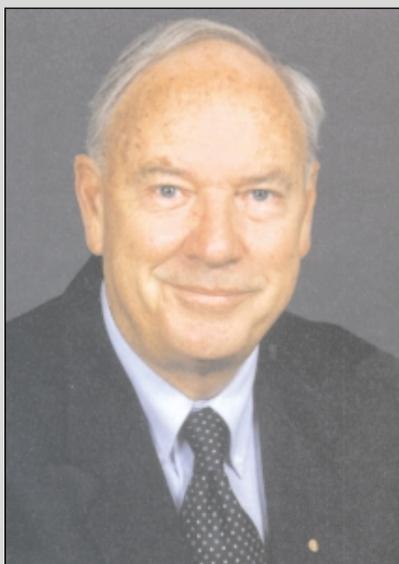
The 2001 Prime Minister's Prize for Science has been awarded to an Academy Fellow, Emeritus Professor Donald Metcalf. The prize was announced in September.

Professor Metcalf, of the Walter and Eliza Hall Institute of Medical Research in Melbourne, won the award for his life-saving white blood cell research that is helping to treat millions of patients with cancer and severe infections.

White blood cells protect the body from infection by bacteria and other micro-organisms. Colony stimulating factors are proteins that help regulate the production of white blood cells.

Beginning in the 1960s, Professor Metcalf discovered and purified colony stimulating factors and explored their use in the treatment of disease. His research revealed four factors that control white blood cell survival, proliferation, maturation and function.

Two of the colony stimulating factors form the basis of a world-wide, billion-dollar biotechnology industry. Used to support the treatment of cancer patients undergoing chemotherapy, the factors accelerate the regeneration of white blood cells and reduce the risk of infection. In support of leukemia treatment, the factors raise the levels of blood-forming stem cells in the blood, thereby making bone marrow transplants obsolete.



Professor Donald Metcalf

The head of the Walter and Eliza Hall Institute, Professor Suzanne Cory, said, 'It is no exaggeration to state that Professor Donald Metcalf is one of the world's most pre-eminent biomedical scientists.'

Further information on colony stimulating factors is on the Academy's *Nova: Science in the news* website, www.science.org.au/nova/013/013key.htm. The edited transcript of an interview with Professor Metcalf, part of the *Video Histories of Australian Scientists* project, is at www.science.org.au/scientists/dm.htm.

Appointments to ARC welcomed

The Academy has welcomed two recent appointments to the Australian Research Council. Professor Vicki Sara, a former Chair of the Council and a Fellow of the Academy, has been appointed Chief Executive Officer. Professor Sara played a significant part in the Federal Government's innovation statement early in 2001.

Mr Peter Wills, who chaired the Federal Government's review of health and medical research in 1999, has been appointed Chair of the Board. He is also Chairman of the Garvan Institute of Medical Research in Sydney.

The President of the Academy, Professor Brian Anderson, said, 'Vicki Sara and Peter Wills are well known in the research community as strong advocates of the national importance of investing in research and development.'

Professor Anderson is also an appointed member of the Board of the Council.

Minchin thanks Academy

The former Minister for Industry, Science and Resources, Senator Nick Minchin, has sent a letter thanking the Academy for its contributions to discussions on a number of subjects. In recent years Academy officers and Fellows have contributed many ideas and much effort to the development of policies on science and education.

Parliamentary report on stem cell research

The Academy has welcomed the report of a parliamentary inquiry into the scientific, ethical and regulatory aspects of human cloning and stem cell research.

The House of Representatives Standing Committee on Legal and Constitutional Affairs has been considering the subject since August 1999. It delivered its report in September 2001.

The Academy's spokesperson for human stem cell research, Professor John White, said that the report was well considered and a positive contribution to public discussion. He

said that the Academy agreed that there should be a ban on cloning for reproductive purposes. But cloning techniques should not be banned. They could help the treatment of degenerative diseases such as Parkinson's and Alzheimer's diseases.

Professor White said, 'The Academy welcomes the majority opinion expressed in the report that critical research on embryos should be permitted, but only on embryos surplus to assisted fertility programs. Such research would be regulated by a national licensing body.'

The Academy is continuing to

monitor developments by state and federal legislative and regulatory authorities. The Council of Australian Governments agreed to work towards nationally consistent approaches to the regulation of assisted reproductive technology and related emerging human technologies. They aim to achieve this by June 2002.

More on the Academy's position on stem cell research is available at www.science.org.au/academy/media/stemcell.pdf. Our media release is at www.science.org.au/academy/media/stemcell2.htm.

Miller wins Copley Medal

The Royal Society has awarded its leading honour, the Copley Medal, to a Fellow of the Academy, Professor Jacques Miller, for his discoveries in the biological sciences. Professor Miller, of the Walter and Eliza Hall Institute of Medical Research in Melbourne, discovered the immunological function of the thymus and of T-cells.

The Copley Medal, first awarded in 1731, is given annually for outstanding achievements in research. Recipients include Benjamin Franklin, Captain James Cook, Charles Darwin, Albert Einstein and another Academy Fellow, Professor Frank Fenner.

Jacques Miller was born in France in 1931 and spent his first 10 years in Shanghai. Then he moved to Sydney where he studied medicine at the University of Sydney. He gained his PhD, on viruses and leukemia, from London University in 1960.

In experiments with mice he removed their thymuses and discovered that that organ was needed for the development of the immune system.

In 1966, he returned to the Hall Institute to head the Experimental Pathology Unit. There he and Graham Mitchell discovered that there were two major types of lymphocytes – white blood cells that fight infections. B-cells



Professor Jacques Miller

come from bone marrow and T-cells are programmed in the thymus.

Professor Miller's discoveries built on the immunological work of the Nobel laureate and former head of the Hall Institute, Sir Macfarlane Burnet, and provided the foundation for later Nobel prize-winning research by another Fellow, Professor Peter Doherty, and Professor Rolf Zinkernagel.

He was elected to the Fellowship of the Academy in 1970 and was the Academy's Burnet Lecturer in 1971.

The edited transcript of an interview with Professor Miller, part of the *Video Histories of Australian Scientists* project, is at www.science.org.au/scientists/jm.htm.

Porter on science education

The ideal picture of quality in science teaching has to incorporate not only scientific literacy for all citizens but also the stimulation of the gifted and talented to gain mastery of science, according to the eminent medical scientist and member of the Academy Council, Professor Bob Porter.

He was addressing an Education Queensland meeting in August on the centres of excellence in technology, maths and science that are being set up in Queensland.

Professor Porter's paper looked at the ideal of science teaching and compared it with the actual state of affairs. He goes on to discuss what can be done to overcome the problems and why it is in the national interest to do so.

The paper is available at www.science.org.au/academy/media/porter.htm.

University science and engineering

An article by the President of the Academy, Professor Brian Anderson, on the development of university science and engineering in Australia, appeared in the 12–18 September 2001 edition of *Campus Review*.

In January 1901 Australia had four universities – Sydney, Melbourne, Adelaide and Tasmania – all teaching science. From 1904, Rhodes scholarships took some of our brightest graduates to Britain. The establishment of the Australian National University in 1946 was one of a series of attempts to get them back.

The article looks at the way that, in spite of modest budgets, Australian researchers have delivered impressive achievements.

The article is available at www.science.org.au/academy/media/campus.htm.

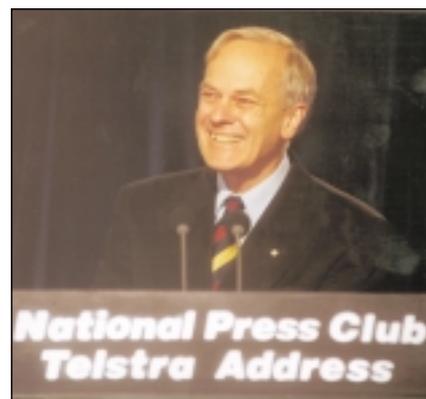
Telstra address widely reported

The President of the Academy, Professor Brian Anderson, delivered the Telstra Address at the National Press Club in Canberra on 25 July 2001. The address was widely reported, with several journals asking to publish the paper.

The topic was 'Australia and the information and communication technology revolution'. Professor Anderson sketched out the past and future of these technologies and their social and economic consequences.

He also pointed out that, while Australia is a leading user of information and communication technologies, it is one of the lowest-ranking producers in the OECD.

The address is available at www.science.org.au/academy/media/npc.htm.



Professor Brian Anderson

Science meets parliament

On 21 and 22 August, scientists from around Australia, including a number of Academy Fellows, went to Parliament House in Canberra to attract the attention of parliamentarians to science and technology. Small groups of scientists attended many different meetings with ministers, members and senators. The event was organised by the Federation of Australian Scientific and Technological Societies (FASTS) and sponsored by peak scientific bodies, including the Academy.

Videos of young Australian scientists

Earlier this year the Australian Research Council funded a project to record video interviews with 15 young researchers.

The project aims to excite young people, especially secondary school students, about careers in science. The researchers interviewed so far have been very suitable for this role: all have conveyed a deep enthusiasm for what they do and say that they would not want to do anything else.

The scientists interviewed so far are:

Dr Natasha Boland, an operations researcher at the University of Melbourne, who is improving cancer radiation treatment and defence applications.

Dr Kristen Bremmell, a chemical engineer from the University of South Australia, who is applying colloid and interface science to the mineral industry, biology and pharmaceuticals.

Miss Natasha Hendrick, a geophysicist at MIM Exploration in Brisbane, who is using seismic data in the oil, gas and coal industries.

Dr Harvey Millar, a biochemist from the Department of Biochemistry at the University of Western Australia, who is exploring the proteomics of plant mitochondria.

Dr Colin Nexhip, a scientist from CSIRO Minerals in Melbourne, who is examining high-temperature foams for metallurgy and container-less melting techniques.

Dr Moira O'Bryan, a medical scientist from the Monash Institute of Reproduction and Development



Dr Colin Nexhip being interviewed by Ms Marian Heard. Rob Walker is the cameraman.

in Melbourne, who is identifying components of the mammalian sperm tail, finding their function and seeing if they are associated with human male infertility.

Dr Sabine Piller, a medical scientist from the Centre for Immunology at St Vincent's Hospital in Sydney, who is doing research into HIV.

Dr Brian Schmidt, an astronomer from Mount Stromlo and Siding Spring Observatories at the Australian National University, who is looking at type I supernovae and trying to find the cause of the universe flying apart faster over time.

Dr Sally Stewart-Wade, a plant pathologist from the School of

Agriculture and Food Systems at the University of Melbourne, who is developing programs for research into diseases of potato and canola.

Mr Gregg Suaning, a neuroscientist in the Graduate School of Biomedical Engineering at the University of New South Wales, who is developing a prosthesis ('bionic eye') for blind people.

The Australian Research Council has recently approved funding for the second stage of this project: another five interviews will be conducted in 2002.

More information on the project is available at www.science.org.au/scientists.

Symposium gets results

Attendance at the Academy's Science at the Shine Dome in May 2001 has led to some good results for Rebecca Hack, a biology teacher at Emerald State High School in Queensland.

Through the Academy's Secretary (Science Policy), Professor Michael Barber, Rebecca made contact with Professor Lesley Rogers, a neuroscientist at the University of New England. With assistance from a nearby coal company, Kestrel Coal, Rebecca set up a videoconference between her class and Professor Rogers and some PhD students. The high school students found the session very rewarding.

In a letter to Professor Barber, Rebecca wrote:

'I just wanted to share with you how one teacher attending the symposium can have a positive impact on many people. I have never applied for an award before. I thought the work we do here is the same as anywhere else. I put in for the award to attend the symposium because it was the last year I would be eligible.

'I was so inspired by going to Canberra that I now have the confidence to promote science and our innovative programs in a range of forums. By the end of October I will have presented at three conferences. I was also selected as the only teacher to participate on an international think-tank to develop a new multi-million-

dollar Questacon program.

'I feel like I am really able to make a difference now. WIN TV have done two stories on our programs at the school, we have had extensive coverage in the local paper, and I have done a couple of science spots on the local radio. I really believe that all of this flowed from my wonderful experience in Canberra in May.

'So thank you to the Academy for extending their annual symposium to a handful of science teachers from around the country. Future scientists are initially inspired in our classrooms. If we don't catch them there we lose great minds to other careers, so it is really worthwhile.'

Fenner Conferences on the Environment

Nature tourism

The managers of national parks and other lands of high conservation value face a conflict between conserving natural and cultural heritage for future generations and allowing the areas to be used and enjoyed by the current generation. They have to manage both the expectations of growing numbers of visitors and the needs of declining species of wildlife.

The social, economic and ecological conflicts raised by tourism in natural areas were discussed from many angles at the Fenner conference, *Nature tourism and the environment*, held at the Academy in Canberra from 3 to 6 September 2001. The conference was convened by Professor Ralf Buckley, the Director of the International Centre for Ecotourism Research at Griffith University.

Speakers included the heads of national park and tourist authorities from around Australia, overseas experts in natural resource management, and Australian experts in tourism, forestry, zoology, environmental sciences, environmental management, economics, law, psychology and other areas. They discussed science in the management of nature tourism, the characteristics of nature tourism, the effects of nature tourism on the physical and biological environment, and techniques for managing visitors and natural resources.

Professor Buckley said that Australian policy and funding for scientific research on ecological impacts of tourism and recreation in fragile environments lag decades behind international counterparts. Individual research is of world class but improved funding through the cooperative research centre program is needed to support relevant research.

The goal of the conference was to produce recommendations for future research and policy, in order to manage nature tourism better.

The Academy conducts the Fenner Conferences on the Environment with the support of Professor Frank Fenner and the late Mrs Bobbie Fenner. The conferences aim to bring together people with scientific, administrative

and policy expertise to consider environmental and conservation problems in Australia.

Biodiversity in freshwaters

The diversity of life in Australia's freshwater ecosystems has suffered collateral damage in the battle for economic prosperity. Rivers have been fragmented by dams, and the water flows reduced. River banks have been cleared, leading to salinity, erosion and sedimentation. And the ecosystems have been invaded by non-native plants and animals.

A Fenner conference on the subject, *Biodiversity conservation in freshwaters*, was held from 5 to 7 July 2001 at the Shine Dome in Canberra. The conference brought together 185 people with relevant scientific, administrative and policy expertise. They aired fresh approaches and perspectives on biodiversity conservation and management.

One of the organisers of the conference, Associate Professor Arthur Georges from the Cooperative Research Centre for Freshwater Ecology in Canberra, said, 'Protecting what biodiversity we have left, and restoring what we have lost, is a complex task, technically, economically and socially. Science alone cannot provide the answers.'

The last session of the conference was a forum on priorities. The top priorities for action by the Commonwealth, states and territories were:

- set up an enduring national series of river reserves
- increase the inventory effort to document the biodiversity that

remains in inland waters

- stem the decline in the capacity of research organisations to undertake taxonomic work
- take immediate action to protect high value systems such as wetlands of national significance and Ramsar sites
- set up a national invasive species action plan.

A document expanding on the recommendations and providing background to them is being prepared by the organisers. This will identify gaps in knowledge and help guide the decisions of policy makers and resource managers. Email Arthur Georges on georges@aerg.canberra.edu.au.

Review of National Committees

The Academy is undertaking a review of its 30 National Committees. Because of limited and declining funding for the committees, Council is looking at the overall committee structure and the effectiveness of individual committees.

National Committees serve two broad functions: to foster a designated branch of the natural sciences in Australia, and to serve as a link between Australian scientists and their overseas counterparts through the Academy's membership of the International Council for Science and its affiliated bodies.

One question being considered by the review is whether to amalgamate some committees. The National Committees for the Environment and Geography are already considering the possibility of an overarching committee on the environmental sciences.

A special meeting of the Chairs of National Committees will be held in Canberra at the time of the Academy's next annual general meeting, 1 to 3 May 2002. This will consider the review of National Committees and seek to improve connections between the Academy and its committees.

Applications increase

Following additional publicity, applications for the Academy's international exchange programs have increased markedly. The number of applications to go to Europe is double the number in each of the three previous years. A list of successful applicants will be published in the next issue of this newsletter.



Dr Petra Fromme

Lemberg Fellow crystallises photosynthesis

Life on Earth is sustained by photosynthesis, the means by which plants and bacteria convert sunlight into chemical energy. Recent research has uncovered the exquisite detail of the process.

The initial conversion of light to chemical energy occurs in specialised membranes of bacteria and the plastids of algae and plants. A major advance was finding the crystal structure for the reaction centre in bacteria. Finding the equivalent structures for algae and plants took another 10 years.

The Academy's Rudi Lemberg Fellow for 2001, Dr Petra Fromme, works at the Max Volmer Institute of the Technical University of Berlin. This year her laboratory published the refined crystal structures for the photosynthetic reaction centres, photosystems I and II, allowing scientists to understand the primary events of photosynthesis in an unparalleled way.

Dr Fromme visited Brisbane, Heron Island, Canberra, Sydney, Wollongong and Katoomba in August and September 2001, delivering lectures on her exciting work.

Haddon King medal

The Academy's Haddon Forrester King dinner and medal presentation were held in Canberra on 12 October 2001.

The medal recognises the work of the late Haddon Forrester King, a former director of exploration of the mining company CRA (now Rio Tinto). He is credited with the discovery and development of ore bodies at Hamersley, Bougainville and Tarong, Queensland. A number of his family members attended the dinner: James King, Mary and Ted Johnson, and Bernard and Amanda Finucane.

The Haddon King medal is awarded to a scientist who has made sustained contributions to the Earth sciences, particularly the discovery and exploitation of mineral or oil deposits. The President of the Academy, Professor Brian Anderson, said at the dinner, 'This is an important event on the Academy's calendar as it demonstrates in a significant way our commitment to the application of science to industry.'

He presented the 2001 medal to Dr John Hunt, who runs his own consulting firm, Hunt Exploration Inc,

in La Jolla, California.

Dr Hunt is a graduate of Cornell University and the University of California at Berkeley.

His name is synonymous with the porphyry coppers, which he began studying in Utah and Chile in the 1950s. Porphyry copper deposits have almost invariably formed beneath volcanoes, when copper-bearing lava has not quite had the opportunity to erupt and has congealed beneath the relevant volcanic cone.

The deposits constitute the world's principal source of copper.

Dr Hunt has guided the exploration programs of one of the world's principal mining companies, the Anaconda Company of New York; has trained a generation of Chilean geologists who have made important contributions to Chile's mineral boom; and has himself been instrumental in the discovery and exploitation of important deposits.

His work on the understanding of porphyry copper geology is the most cited general reference for these deposits.



Dr James King (left), son of Haddon King, and Professor Richard Stanton, a Haddon King medallist.



Dr John Hunt (left), talking to Mrs Mary Johnson, daughter of Haddon King.

Journals present our science to the world

Since 1957 the Academy has been directly engaged with CSIRO in the publication of the *Australian Journals of Scientific Research*. At present there are 11 journals in the series and a further five journals, published by CSIRO for scientific societies, have observer status.

CSIRO Publishing has the full financial responsibility for publishing the journals, which are now all online at www.publish.csiro.au. The role of the Academy is to be a full participant in maintaining academic standards of excellence in the papers published by the 11 journals. This is done through the Board of Standards, which meets annually.

The journals are performing as a major group of international journals, drawing upon the world scientific community for papers, referees and readers, and being cited frequently by colleagues around the world.

- The journals receive submissions from around the world.
- All the journals draw upon a global

pool of scientists in selecting referees.

- Subscribers are equally divided between Australia, North America, Europe and the rest of the world.
- All 11 of the journals are covered by the major abstracting services.

The current agreement for the *Australian Journals of Scientific Research* runs out at the end of 2002 and the immediate question is what form a new agreement should take. Should it encompass all the journals published by CSIRO Publishing and if so what structure should it have? Discussions have begun between the Academy and CSIRO and with the current members of the Board of Standards.

Full details of the publishing agreement and the current members of the several Editorial Advisory Committees can be found in the *Academy Year Book*. For more information contact the Chair of the Board of Standards, Dr Hugh Tyndale-Biscoe, email hughtb@rsbs.anu.edu.au.

Frog research in Queensland

Research supported by the Academy's Fund for the Conservation of Endangered Australian Vertebrate Species may assist in the conservation of endangered frogs.

The research has been carried out in south-east Queensland by Dr Jean-Marc Hero and a team from Griffith University. Using tiny radio transmitters, they have tracked the endangered giant barred river frog, *Mixophyes iteratus*, the common great barred river frog, *Mixophyes fasciolatus*, the green-thighed frog, *Litoria brevipalmata*, and Fleay's barred river frog, *Mixophyes fleayi*.

The tracking has provided important information on how the frogs use their forest habitat and how they move between suitable breeding sites. This provides information on the size of reserves needed to protect these species and whether existing management practices are adequate.

Primary Investigations evaluation

The Commonwealth Department of Education, Training and Youth Affairs has agreed to provide \$15 000 to match the Academy's \$15 000 to undertake an evaluation of the *Primary Investigations* science program for primary schools. The aim of the project is to assess the effectiveness of the program and recommend modifications or enhancements. Professor Neville Fletcher will represent the Academy on the reference committee. The report is due at the end of May 2002.

In early 2002 the Australian Foundation for Science will support training for 30 teachers from Catholic Education in Victoria. The training is for teachers in schools that are using or adopting *Primary Investigations*. This will be followed by a train-the-trainers workshop for new trainers who will then be able to inservice other Victorian Catholic school teachers.

J G Russell awards

The J G Russell awards aim to help young scientists with the costs of their research. The scientists are chosen from the Queen Elizabeth II Fellows of the Australian Research Council.

The 2001 J G Russell awards have been made to:

Dr Sally Ann Poulsen, of Griffith University, who is aiming to develop dynamic combinatorial chemistry as a means to quickly discover and develop new pharmaceuticals. The research could place Australia in a leading position for drug discovery.

Dr John Canning, from the Optical Fibre Technology Centre at the University of Sydney, is examining glass photosensitivity, which allows the fabrication of optical communication components. The research opens up the possibility of using bulk technologies as well as developing new materials and components.

Dr Bronwyn Gillanders, an environmental biologist from Adelaide University, is aiming to find out about the movement of fish between nursery and adult populations, and develop a model of population replenishment. The research has significance for fisheries management and the conservation of fish.

Basser bits

The library has recently had two visitors from New Zealand. Dr Annette Beasley was interested in the history of the Institute of Human Biology in Papua New Guinea, with which the Academy was involved through the International Biological Programme, and in particular in the kuru research that took place there.

She consulted the Academy's files on the International Biological Programme and also took the opportunity to talk to Professor Sue Serjeantson, who spent some time in Papua New Guinea, and Professor Frank Fenner, who also had an interest in kuru research through his connection with Carleton Gajdusek.

Dr Nigel Prickett was interested in the papers of Dr Graeme Caughley. He is planning an article on Dr Caughley's fieldwork in New Zealand and spent several hours examining the diaries from this period.

Fellows turn 90

During 2001 four Fellows of the Academy have turned 90.

Emeritus Professor Samuel Warren Carey was born at Campbelltown, near Sydney, on 1 November 1911.

While exploring for oil in New Guinea in the 1930s, he became interested in the tectonics of the region, on which he wrote his DSc thesis. In 1944 he became Chief Government Geologist of Tasmania and in 1946 he became the founding Chair of the Department of Geology at the University of Tasmania.

Professor Carey's international reputation as a scientist is built on the ideas of continental drift and an expanding Earth. His applied work has covered geological survey, geology in civil engineering works, and oil and mineral exploration.

Emeritus Professor Anton Hales, the founding Director of the Research School of Earth Sciences at the Australian National University, was born in Mossel Bay, South Africa, on 1 March 1911.

Originally trained as a mathematician, he applied quantitative methods to many geological problems. His studies, on land and sea, of the structure of the crust and mantle made a major contribution to knowledge of the Earth's interior.

In 1962 he went from the University of the Witwatersrand to become the first head of the Geoscience Division of the University of Texas in Dallas.

He moved to the Australian National University in 1973. After five years he went back to Texas but later returned to live in Canberra.

Dr Kenneth Key was born on 28 August 1911 in Cape Town. After studying in Cape Town and London he joined the CSIRO Division of Entomology in 1936. He retired in 1976 but continued as honorary fellow until 1992, serving 55 years with the organisation. He was Chief Curator of the Australian National Insect Collection from 1959 to 1970.

Dr Key is distinguished for his work on the ecology and taxonomy of Australian locusts and grasshoppers. His team at CSIRO established the fundamental causes of locust outbreaks in eastern Australia and thus provided the knowledge needed for control. As well as being an authority on physical ecology, he made significant advances in general taxonomy.

Emeritus Professor George Szekeres was born in Budapest on 29 May 1911. After spending the war years in Shanghai, he went to the University of Adelaide in 1948. In 1963 he took up the Chair of Pure Mathematics at the University of New South Wales.

His mathematical work extends over relativity theory, combinatorial problems in geometry, group theory, number theory, abstract algebra and real and complex analysis. He won the Academy's Lyle Medal in 1968.

Selby Fellow explores Antarctic climate

The Academy's Selby Fellow, Dr Jean Jouzel, presented public and scientific lectures on climate change in July and August 2001. His main lecture topics were deuterium and oxygen-18, and the achievements and continuing research of the Vostock ice core project in Antarctica.

Dr Jouzel is head of the French Laboratory of Climate and Environmental Sciences and President of the French Polar Institute.

He is a world leader in the investigation and modelling of global climate change. He has studied ice cores in both Antarctica and Greenland. His work has shown the great variation in carbon dioxide and other greenhouse gases over the last 400 000 years. He is also interested in stable-isotope geoscience and Southern Ocean research.

In the course of the fellowship, Dr Jouzel gave talks in Canberra, Melbourne, Hobart, Sydney, Wollongong and Townsville.

On his return to France he wrote to the sponsor of the Selby Fellowships, Mr Benn Selby, thanking him for the opportunity to visit Australia and its research institutions.

Biographers

The following biographers have been appointed to write memoirs of former Fellows for *Historical Records of Australian Science*. Professor Neil Trudinger, Professor Leon Simon and Dr John van der Hoek will write about **Professor James Michael**. Emeritus Professor P N Joubert and Associate Professor Min Chong will write about **Professor Anthony Perry**. Dr Oliver Mayo, Dr Geoffrey Grigg and Dr Ian Franklin will write about **Professor Jim Rendel**. Emeritus Professor Jim McLeod, Professor Colin Sullivan and Dr Christine Jenkins will write about **Dr Ann Woolcock**. Dr Hal Hatch, Professor Barry Osmond and Professor Joe Wiskich will write about **Sir Rutherford Robertson**.

Honours to Fellows

The US Institute of Electrical and Electronics Engineers has awarded its 2001 James H Mulligan Jr Education Medal to **Professor Brian Anderson**, the Director of the Research School of Information Sciences and Engineering at the Australian National University. The award is for outstanding graduate texts of lasting value and far-reaching international influence, and for outstanding leadership in the development of electrical engineering education in Australia.

Professor Graeme Clark, of the Royal Victorian Eye and Ear Hospital, has been named Senior Australian of the Year 2001 for pioneering the development of the bionic ear for deaf children and adults.

The Georges Lemaitre Foundation at the Catholic University of Louvain in Belgium has awarded its 2001 Prix International Lemaitre to **Professor Kurt Lambeck**, of the Research School of Earth Sciences at the Australian National University. The prize is for his outstanding contributions to the understanding of the Earth's rotation and its internal constitution. Professor Lambeck is the Academy's Foreign Secretary.

Professor Elspeth McLachlan, a medical scientist, research manager and member of the Academy's Council, has been appointed Pro-Vice-Chancellor (Research) of the University of New South Wales.

Deaths

Lou Davies

Louis Walter Davies was born in Sydney on 27 August 1923. He died on 28 September 2001.

Lou Davies began the study of engineering at the University of Sydney in 1941, then joined the Royal Australian Air Force. He served as an aircrew navigator in the Northern Territory, Queensland and the Pacific.

After World War II he returned to engineering, then changed to physics. On graduation in 1948 he won a Rhodes Scholarship. At the Clarendon Laboratory at Oxford University he did research into plasma physics and thermonuclear fusion.

In 1951 he became a research officer in CSIRO's Radiophysics Laboratory in Sydney, which had done pioneering work on radar during the war. In the earliest days of solid-state electronics, Lou Davies began work on semiconductors. In spite of Australia's remoteness, his group at CSIRO built the first junction transistor in Australia within a year of the technology's invention in the USA. He did original work on germanium and silicon purification and processing.

Lou Davies became chief physicist of the new physical laboratory of Amalgamated Wireless (Australia) Ltd in 1960. There he continued his work in electronics and integrated circuits. He invented a solid-state compass, with no moving parts, that used surface acoustic waves to measure magnetic fields. He also discovered a new type of electret.

In 1965, while still at AWA, he became professor of electrical engineering at the University of New South Wales. Two years later he became head of the new Department of Solid-State Electronics. His research there eventually led to solar energy conversion through photovoltaic cells, an area in which the University still leads the world.

Meanwhile at AWA, Lou Davies was promoted to chief scientist in 1972. He worked on optical fibre development, broadcasting planning, hazard analysis and safety engineering. He became a member of the Australian Science and Technology Council, the New South Wales Higher Education Board and other advisory bodies.

In 1984 he became general manager of the AWA Microelectronics Division. After retirement he was a director of AWA and other companies. He also grazed beef cattle at Picton and became interested in soil physics and nature conservation.

Lou Davies was elected a Fellow of the Academy of Science in 1976. He was an active participant in the Academy's National Science and Industry Forum, which attempts to bridge the gap between research and industry. This was fitting as he was one of the few Australian scientists to manage the scientific activities of a large company while undertaking research and teaching at a university.

The edited transcript of a 1999 interview with Lou Davies, part of the *Video Histories of Australian Scientists* project, is at www.science.org.au/scientists/ld.htm.

Nova at Telstra big event

The Academy's *Nova: Science in the news* website had a high profile among the athletes and artists at Telstra's Big Event in Sydney on 4 and 5 October 2001. The free event displayed the activities of organisations supported by Telstra's sponsorship program and offered workshops in art, science, sport and dance. It was held at Fox Studios in Moore Park.

Nova, which is sponsored by Telstra, was on display in one booth while the Academy's Development Manager, Marian Heard, ran workshops on electricity and magnetism nearby.

Visit from Japanese expert on wasps

An entomologist from the Faculty of Agriculture at Gifu University in Japan, Associate Professor Koji Tsuchida, is on a 10-month visit to Australia under the exchange program between the Academy and the Japan Society for the Promotion of Science. He is pictured (right) at the Academy with one of his hosts, Dr John LaSalle, from CSIRO Entomology in Canberra. Associate Professor Tsuchida will undertake a genetic study of the population structure of the Australian paper wasp, *Ropalidia plebeiana*, at CSIRO Entomology and Flinders University.

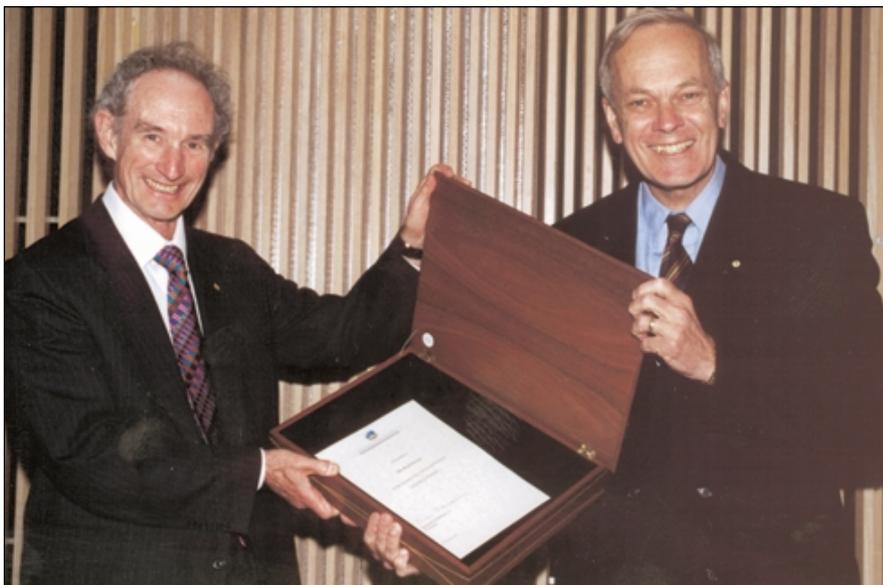


Regional groups

On 23 July the President of the Academy, Professor Brian Anderson, met with more than 40 Fellows from the ACT region.

Professor Anderson talked about internal Academy matters, outreach activities and political developments concerning science and education. In discussion, Fellows talked about thematic priorities and the need to maintain basic research, infrastructure funding, and nuclear energy use.

Exchange of gifts with Royal Society



Professor Anderson (right) handing the jarrah box to Lord May.

On 3 October 2001, the Australian-born President of the British Royal Society, Lord May of Oxford, visited the Academy in Canberra and had lunch with the Academy Council.

That evening there was a reception with ACT Fellows at the Shine Dome where Lord May and the President of the Academy, Professor Brian Anderson, exchanged gifts on behalf of their societies. The Academy gave the

Royal Society a folio box, handmade by a young Australian craftsman, Daniel Gair, from jarrah inlaid with silver ash. The Royal Society presented the Academy with a limited edition print of a painting of *Banksia serrata* by the renowned botanical artist, Celia Rosser.

The gifts reflect a tradition of exchanges between the two scientific bodies. In 1963, Sir Howard Florey, another Australian President of the

Royal Society, visited the Academy and presented an English oak gavel trimmed with silver. In 1969, to mark the bicentenary of the beginning of Captain Cook's first voyage to the Pacific, the Australian Academy presented the Royal Society with the original watercolour of *Banksia serrata*, commissioned from Celia Rosser. The plant was collected by and named after another President of the Royal Society, Sir Joseph Banks. At the same time the Royal Society presented the Academy with a facsimile of the Royal Society minute instructing Captain Cook on the transit of Venus observations.

The historic gifts were displayed in the Council room.

In 1969 the Academy's annual symposium was on the subject of Cook's voyage. Speakers included the Astronomer Royal, Sir Richard Woolley.



The print of Celia Rosser's painting of *Banksia serrata*.

Until recently Lord May was Chief Scientific Adviser to the British Government. He is also a Royal Society Research Professor at Oxford University and Imperial College, London. He is one of the world's leading ecologists, having applied mathematical models to the spread of disease and to the growth and decline of the populations of species. He won the Crafoord prize, which is comparable with the Nobel, for research in population biology, in 1996.

When he was still a physicist at the University of Sydney, in 1967, he won the Academy's first Pawsey medal.

As in 1963, when 'Council discussed at some length with Sir Howard and Dr Martin [the Executive Secretary of the Royal Society] matters of mutual interest, particularly certain questions of national scientific policy,' in 2001 the Council and Lord May compared the science policies of Australia and Britain.



Another Royal Society visit

The incoming Foreign Secretary of the Royal Society, Dame Julia Higgins, visited the Academy on 6 November 2001. Dame Julia is a polymer scientist at Imperial College, London. She is visiting Australia as Solomon Lecturer, sponsored by the Academy of Technological Sciences and Engineering and the Royal Australian Chemical Institute. She is pictured with the Academy's Foreign Secretary, Professor Kurt Lambeck.