

THE ANZAAS Mercury

ANZAAS: Communicating Science to the Public

Issue No. 5, March 2000

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Editor's Edict

This first issue of the ANZAAS Mercury for this year is jam-packed with special features to get your brain cells buzzing about improving science and its social impact. Paul Adam reports on the Murray-Darling Basin's salinity problems: land and environmental policy at the crossroads, in the **ANZAAS Debate**. We also have reports on Innovation: why Australia must act swiftly if it is to survive in the 21st century, and lessons from the Victorian gas crisis. A new feature, **Perrin's Plate**, carries news from the General Secretary and the financial statement for the year ending 30 June 1999. We would like to hear from you, please send any comments on the newsletter or ideas for future articles to the Production Editor at d.rouch@landfood.unimelb.edu.au, or to the postal address in the box below. -*Duncan Rouch*

Adam's Airing

Comment From The Chair by Paul ADAM

1999 In Review

The year in review has seen a continuation of the rebuilding of ANZAAS.

In September 1998 the Tasmanian Division organised a successful Youth ANZAAS and Symposium to mark the International Year of the Ocean, which as well as addressing topics of national importance helped spread the message of our continuing activity. Shortly after the end of the year the NSW

division hosted a Youth ANZAAS in conjunction with the Pacific Science Congress, see News From The Divisions, page 6.

An important innovation has been the development of the newsletter the 'ANZAAS Mercury' which provides a forum for news and comments. I congratulate the editor Dr. Duncan Rouch and look forward to future issues and greater participation from the membership. Another means of maintaining communication between members and providing information about the Association's activities is the Web page, expertly developed by Professor Graham Johnston.

Although the Association no longer has a formal link to 'Australasian Science Incorporating Search' I am sure that members will have been delighted to observe the progress of the magazine, which is now Australia's leading public forum for discussion of scientific innovation and related policy issues. The editor, Guy Nolch, deserves congratulations from the Australian science community.

At the Divisional level a number of Divisions have organised active programs. However, there is much still to be done to develop and strengthen activities across all Divisions. The future of ANZAAS is as a vigorous Federation of Divisions, but we must recognize that building and sustaining local interest is not an easy task.

There is ample evidence that there is still a need for a vigorous national interdisciplinary science body in Australia, both to promote dialogue between scientists and to increase public awareness of science. The debate about genetic engineering and food, which at least in its intensity caught many of us unawares, highlights the pitfalls which await us if there is an inadequate or inappropriate effort to explain science to the community.

We are still coming to grips with the organisational nuts and bolts of the new ANZAAS, and with the practicalities of telephone hookups. Communications between the Executive and the Council are still not as efficient as I would like, but we will continue to work on them. The organisation of ANZAAS would not be possible without the Central office and I would like to express our appreciation to the University of Adelaide for making facilities available to us, and to the Secretary, Robert Perrin, for his ongoing service.

I would welcome any comments and suggestions for issues that could be addressed (e-mail: p.adam@unsw.edu.au,
Tel: (W) 02 9385 2076, (H) 02 9314 2453, FAX: 02 9385 1635)

ANZAAS NEWS

Science Capability Review

By Duncan ROUCH

In September 1999 Industry, Science and Resources Minister Senator Minchin requested the [Chief Scientist, Dr Robin Batterham](#), to conduct a review of the capabilities of Australia's science base (1). This included examination of the existing mechanisms for science funding and support to ensure resources are effectively targeted. Dr Batterham was also to look at what characteristics Australia's science base needs to have if it is to support the development of leading edge industry and what contribution science can and should make to economic development and wealth creation. A preliminary report was to be made available at the National Innovation Summit in Melbourne, February 2000. Other recent commonwealth reports in the higher education and research area include the Green Paper (2) and the Wills Report (3). Here are the highlights of the submission by ANZAAS to the capability review (4).

Government can be seen as part of the problem, not the solution to advancing Australia's science and its social and economic outcomes. For example, on university research, the thrust of the Green Paper (2) is criticized as too eagerly favouring the sacrifice of long-term strategic research for short term, application driven, research. Meanwhile the current university system continues to deteriorate in the face of continued government budget cuts. For the university and other areas of public sector science the government is held to lack long term vision, coupled with deleteriously action, including frequent changes in policy and *ad hoc* budget cuts.

Government may use the phrase 'costs and benefits (of research) to the community and business', in the terms of reference (1), to mean short term costs and products, like a mature commercial operation clocked by the financial year. Fundamental scientific research, however, has the qualities of a high-risk venture, as there is no guarantee that an investment in a particular fundamental research project will lead to direct community or business benefits. Some research may lead to immediate benefits of relatively low value, while other research may build on previous investigations to produce a raft of high-value outcomes. Moreover, analysis of the genesis of breakthrough outcomes of research in the past shows that it is not possible to predict from where major benefits will come.

At the same time the costs of ignoring existing research results may be very high, both to the community and business. For example, the causes of dryland salination are well established, yet major parts of our land resources, such as in the Murray-Darling Basin, continue to deteriorate in agricultural potential, see ANZAAS Debate, page 3.

For the private sector there has been recent decline from investment in research and development from an already low base. The development of venture capital for new biotechnology and information technology companies, however, may promote reversal of the lowering in private investment.

On the question of research funding mechanisms, the private sector requires bipartisan political agreement to provide stability and certainty in business tax arrangements and other financial incentives that support a range of research and development needs. A change in business culture is also needed in many companies, to promote the value of longer-term investment in their future. The mechanism for funding public scientific research are held to be adequate, it is the less than adequate level of financial support provided by these mechanisms that is at issue.

Regarding national scientific literacy, for the nation's science base to most effectively the public must, if they so choose, be able to inform themselves scientifically on the growing array of social issues that involve major scientific content, such as use of genetically modified organisms in food. Underlying this should be an outcome of primary and secondary education for all students that they understand scientific principle and methods. Within the next decade, however, there is likely to be a severe shortage of science teachers, in part due to little attention to science in teacher training. Moreover, over the last several years there has been decline in the numbers of years 11 and 12 students taking science subjects, reducing the science capability of Australia's future.

At the tertiary level current pressure on universities may result in more training, for short term benefit, and less education, for life. The Minister's promotion of shorter degrees seems captive to short term financial considerations.

In regard to the breadth of the science base, Australia cannot be at the forefront of every field of science, due to the small size of our population. While we must choose a limited number of areas to support, we need to maintain sufficient breadth to take advantage of new opportunities as they arise. A number of fields of scientific endeavor give Australia a competitive edge in pure science, as well as contributing to public policy, with potential for considerable social and economic benefit. These fields include; Antarctic science, marine science, meteorology and climatology, biodiversity, geology, agricultural research, environmental science, and astronomy. There is concern that continued attrition of staff levels at most universities, due to the government's financial cuts, is resulting in *ad hoc* decisions on which fields to retain.

References:

1. Capability Review: <http://www.isr.gov.au/science/review>
2. Green Paper on Research and Higher Education: <http://www.detya.gov.au/highered/otherpub/greenpaper>

3. Wills Report: Health and Medical Research Strategic Review;
<http://www.nhmrc.health.gov.au/research/willspag.htm>
4. ANZAAS's Submission, for the full text see; <http://www.anzaas.org.au>

The ANZAAS Debate:

Dryland Salinity: Land and Environmental Policy at the Crossroads

In the last issue John Pigram discussed the general imperatives to better manage water supply and demand. Here Paul Adam, Chair of ANZAAS, addresses a major water-related issue, the dry land salinity problem in the Murray-Darling Basin. What are the scientific and policy solutions?

Late in 1999 the release of the salinity audit of the Murray-Darling Basin provoked a flurry of media interest. It should also give cause for consideration of how scientists can better influence the development and implementation of public policy.

The audit demonstrated that dryland salinity currently affects large areas of the Murray-Darling Basin and that it is inevitable that much larger areas will be affected over the next few decades. Dryland salinity causes substantial losses of crop plant production and consequently economic hardship and social disruption for both individual property holders and the wider community.

Dryland salinity becomes apparent when a rising saline water table intercepts the land surface. The rising water table is due to a reduction in transpiration caused by clearing of the original woody vegetation. Dryland salinity is not just a problem in the Murray-Darling Basin, but also occurs extensively in south west West Australia and elsewhere in southern Australia. Dryland salinity problems can even be observed on the north western fringe of Sydney. Currently about 2.5 million ha across the country are affected by dryland salinity and, in the future as much as 12 million ha could be salinised.

The basic causes and consequences of dryland salinity were elucidated in West Australia more than half a century ago. Nevertheless land clearing likely to promote salinisation continued, and indeed still continues today in some parts of Australia.

Why was the message of science ignored for so long? I can only speculate, but I would suggest that research on the topic is required so that we can avoid such expensive debacles in the future.

Although the causes of salinisation have been known for a long time the message has obviously not reached the right people, most particularly senior bureaucrats in central agencies (the current jargon for treasury and cabinet office) and politicians. Scientists collaborated in producing excellent resources for education of the rural community. Perhaps in the future equal, if not more, effort should go into producing material appropriate for power brokers.

It is perhaps also time that we try to alter deeply engrained behavioural patterns. The interval between pulling the trigger (clearing) and the manifestation of a problem so severe as to destroy agricultural production is in a geological context an instant, but nevertheless is decades, possibly more than one human generation. During that time considerable 'short-term' profit can be made and even if the longer term problem can be recognized it is going to affect someone else in the future (and as was once said 'why should I worry about the future, what good did it ever do me').

Addressing both the causes of, and possible solutions to, dryland salinity will require a co-ordinated strategy at an appropriate spatial scale, in most cases this scale will be the catchment, so that collaboration between neighbours is not only desirable, but essential. The growth of grass root catchment management initiatives was one of the successes of the 1990s, but the impetus needs to be maintained.

Land clearing may also have other predictable, long term consequences, including loss of biodiversity and emissions of greenhouse gases. Again, from the perspective of an individual landholder a decision to clear may provide economic gain, and may seem to be a rationally correct one, even if it conflicts with the views of a wider society. As the recent furore in Queensland demonstrated what may be perceived to be Government "interference" with cherished property rights will be fiercely opposed.

There is much good scientific evidence to demonstrate the adverse long term impacts of inappropriate clearing but we cannot expect that, just because research has been completed and the results published in appropriate peer reviewed journals, the message will then permeate the world. Journal publication and rigorous peer review remains an essential part of science, but more attention must be given to the interpretation and communication of science to the public. This has always been central to ANZAAS's concerns, but it has to be admitted that the success of science communication has, at best, been patchy. If government's are to have the confidence of the electorate as they address many of society's pressing issues then both politicians and the public will need to be better informed about scientific issues. In the last decade there have been a number of issues around the world where such an understanding has demonstrably been lacking (for example, mad cow disease, genetically modified food, the disposal of the Brent Spar oil platform). As scientists one of our major challenges for the future is to be more active and effective in communication. It is hard for we older leopards to change our spots, but science communication in a multimedia world should be one of the skills possessed by new graduates.

In an earlier 'Mercury' I expressed concern that the way the National Heritage Trust fund was being expended, which represented a lost opportunity of gaining a better understanding of environmental rehabilitation. My concerns have been heightened by Senator Hill, who was quoted in the 'Sydney Morning Herald' on February 7 as follows:

"When the program was being designed, the constant complaint was there were too many studies and too much planning.... Not enough was getting done on the ground".

Few would disagree with the need to get things done, and that harnessing the knowledge, energy and enthusiasm of volunteers is vital. However, we do want to improve the situation, and not make it worse. Experts are considered experts because of their knowledge and experience and it seems only prudent to tap into their wisdom. If, as will often be the case, there is uncertainty as to the outcomes of a particular action we need to establish an adaptive management system in which the action is treated as part of a properly planned experiment, with monitoring and feedback to amend the management practice. Without a scientific approach to environmental management we may waste a priceless opportunity to spend a large one-off fund wisely, and importantly we may replace the enthusiasm of volunteers with disillusionment, making it hard to gain support for future projects.

Senator Hill's views, if correctly reported, suggest a bleak future for wise management of the national environment.

Please join the debate,

by sending your response to Prof. Graham Johnston: Email- grahamj@mail.usyd.edu.au; Post- Honorary Editor ANZAAS, Department of Pharmacology, The University of Sydney, NSW 2006. Responses will be posted on the ANZAAS web site.

NEWS Analysis

Innovate or Perish

*In February a National Innovations Summit was held in Melbourne. Innovation is clearly a national priority, but why? Here is an abridged version of the presentation about innovation by **Professor Mark Dodgson**, Executive Director Australia-Asia Management Centre, Australian National University, Canberra, broadcast on Ockham's Razor, Radio National, 13-2-00.*

Last year, The Economist magazine called innovation the industrial religion of the 21st century. Very simply, innovation is what is going to enable Australia to pay her way in the world. Without it many of our firms will go out of business, and those that remain will become second-rate and subservient to international leaders in decision-making and profit-taking. Without innovation, there won't be the new businesses and jobs that are necessary in a modern dynamic economy. There is plenty of research showing the importance of innovation for business success, job creation and higher standards of living.

What is innovation? Many managers and policy-makers have misconceptions about innovation that can lead to all kinds of mistakes being made. The first thing to say is that innovation is not invention. Invention is the creation of a

new idea and its reduction to practice. Innovation is the commercialisation of inventions. Innovation is, furthermore, often mistaken for research and development. R&D is an element of innovation but it is only that, one element.

Innovation is really about economically valuable novelty. Investments for producing innovation are risky because innovations fail more often than not.

Innovation is also risky because it is so unpredictable. Innovations often succeed in unpredictable ways. The sheer speed of changes in technologies and markets adds to the risk of innovation. Innovation is complex, because different forms and different technologies often have to be combined, which may require global alliances to produce. Moreover alliances help minimise the risk to investment ratio for each member company. This networking entails close collaboration between producers and their suppliers, and co-operation with all sorts of industrial or research associations. Other parts include educational institutions, which make important contributions through research and teaching. The legal system protects intellectual property through patents and copyright. Financial institutions provide investment and venture capital. International research shows that it's the strength of the relationships amongst the constituent parts that provides the greatest support to innovative firms.

Technology itself is also more closely integrated in the new innovation process. This takes two forms. The first is technology fusion: closer links between basic research and innovation, and new combinations of fields of technology such as photonics and biosensors. The second is the automation of the innovation process. Boeing designed its 777 entirely by computer. Just as automation revolutionised mass production in factories, the automation of innovation has the potential to revolutionise knowledge production.

Leading-edge industry and services continually innovate, as they face intense, international competition and rapidly changing markets. The competitiveness of these decentralised network-based and highly flexible firms is derived not so much from tangible assets like capital investments, but from intangible assets like skills, creativity and the ability to learn. These are features of what has been called the 'knowledge economy'.

What can firms do to improve their innovation performance? Very simply, they must become cleverer. They need to understand their markets and technologies better. Their managers need to become more sophisticated and urbane in their appreciation of the importance of innovation, its nature and what drives it. As well as greater investment in innovation, a more strategic approach is required that makes it a core component of corporate strategies. Greater skills in managing networks and in the use of the new electronic toolkits are required. Firms need to invest in R&D, not only for the potential technical outcomes, but also for the way it helps them analyse trends, creates networks with researchers, gives them future options through new knowledge and skills, and attracts bright people into the firm. They need continually to consider their organisational structures, making sure there are no barriers between staff in different areas, and that the broad-based teams needed for

successful and speedy innovation are supported. And they need to invest in the creativity and ideas of all their staff.

How can governments encourage innovation? The first thing I believe they need to do is to provide good data on scientific and technological trends, and networking, both nationally and internationally. Government also needs to encourage firms to improve their information on market developments and the innovation strategies of major players. Overall, there needs to be much more research into innovation. It is only on the basis of diverse and rich information that firms can try and overcome some of the problems of the unpredictability of innovation discussed earlier. Although there can be no certainties, as Pasteur put it, 'Fortune favours the prepared mind.'

Second, government policies have to reflect the realities of the new innovation process. It is a networked process, and the priorities of government policies, with limited exceptions, need to be directed away from the support of individual firms towards the creation and maintenance of networks of firms and their links with research organisations. It needs a national innovation systems approach, thinking about filling gaps and how the constituent elements could fit together better.

Third, and how many times does this have to be said? the government has to increase its investment in universities and technical education. You can't have an innovative, knowledge economy without knowledgeable, creative people. Universities are the wellsprings of knowledge.

Fourth, the government has itself to be innovative. Its policies, regulations and laws need continually to be examined from the perspective of whether they support or constrain innovation. The quality of the partnerships between government and business is one of the most important aspects of the national innovation system. Both need to work together more effectively.

Universities and research organisations like CSIRO need to explain their contributions to government and business more clearly. Along with government they need to take a broad national systems approach, identifying various roles to be filled, some focusing on basic research, some on industrially-relevant research and training. Universities also have to support research and teaching in innovation. Entrepreneurship and technology management need to be taught on all science and engineering undergraduate courses, and at a postgraduate level. Business Schools need to make innovation management core elements of MBAs. Students need to be made aware of the social and economic importance of innovation and entrepreneurship.

And what about us, as individuals? How do we fit into this world of innovation? We have to accept that we exist in a world of uncertainty. Our capacity to contribute depends on our knowledge and our ability to network and work across boundaries. Our knowledge requires continuing refreshment, and reinvestment in education and training.

The final question is how are we as a nation doing in innovation. The answer is provided in a report written by Professor Jane Marceau and colleagues for the Australian Business Foundation. It poses the question: Are we heading along the high road of innovation, productivity and high quality jobs, or low road of industrial decline and low-quality jobs? Sadly, we are heading the wrong way in many important areas like innovation rates, R&D personnel and expenditure and management skills.

Yet we have most of the ingredients of an innovative society. We're creative, optimistic, and wonderfully diverse. The importance of innovation is recognised by business and government, and seen most clearly in the National Innovation Summit, organised by the Business Council of Australia and the government in February this year. The challenge is to transform this awareness into effective innovation, using some of the new thinking in areas like national innovation systems and the new generation innovation process.

For the full text see,

<http://www.abc.net.au/rn/science/ockham/stories/s98911.htm>

Gas Crisis Exposes Infrastructure Weakness

by Ann WESTMORE

As all states grapple to develop sustainable energy programs, what can Australians learn from the experience of Victoria which was plunged into a fortnight-long energy crisis in September 1998?

A Winter Energy Summit organised by ANZAAS (Vic) and the University of Melbourne Faculty of Science on the evening of March 24 1999 proved highly successful attracting an audience numbering more than 200 and producing a lively and informative discussion and extensive media coverage.

Four Key points emerge from the meeting. First, Victoria can expect its electricity generating capability to be inadequate within five years despite the introduction of significant efficiencies in Victoria's electricity generating and distribution system during the 1990s and notwithstanding the state's current sale of \$80 million worth of electricity a year to other states, stated Assoc Prof John Price, from Monash University's Mechanical Engineering Department.

Second, Australia's ability to generate sufficient energy to meet its needs during the next decade continues to be questioned. Regardless of this worrying situation, energy efficient building design is practically non-existent. There is an urgent need for the Federal Government to commit to a policy of sourcing significantly more of Australia's energy needs from renewable sources. The current commitment of obtaining 2% of energy needs from renewable sources by 2010 pales beside that of Europe which plans to reach five times this target by the same date, according to Prof Bill Charters, from

Melbourne University's Mechanical and Manufacturing Engineering Department.

Third, Victoria is set to consider a no fault compensation scheme funded by energy producers/providers. This would put in place a mechanism for compensating customers large and small in the event of major energy supply failures. Such a scheme would ensure energy producers and providers had strong incentives for maintaining security of supply as they would face the prospect of escalating contributions to the scheme in the event of energy failures, argued Ian Wilson, General Manager of Victoria's Office of the Regulator-General.

Fourth, Within five years Victorians can expect to see a re-grouping of the currently fragmented electricity, gas, water and telecommunications supply companies. This likelihood, together with the increasing economic viability of wind and solar power and small hydro-electricity generating plants, provides unmatched opportunities for rewarding customers who are energy efficient and who obtain their supplies from renewable sources, said Bill Charters.

ANZAAS Victoria thanks the three speakers, Ian Wilson, John Price, Bill Charters for giving their time and also is grateful to the University of Melbourne Faculty of Science for helping make the evening such a success.

'Sir Gus' is Australian of The Year 2000

ANZAAS warmly congratulates Sir Gustav Nossal AC CBE FAA FRS on becoming Australian of the Year, for his magnificent achievements in science and its popularization, and proving that science is part of the spirit of Australia.

His world-renowned work helped build the foundations of modern immunology. His experimental confirmation of Burnet's theory of antibody formation was a turning point in the understanding of the immune system. In 1977 he was knighted for his ground-breaking work. Sir Gustav has been in the front lines in the global battle against disease through his direct involvement with the World Health Organisation since 1967.

'Sir Gus' has helped shape the scientific affairs of Australia for three decades. As President of the Australian Academy of Science he has provided government with valuable input to policy making. As a public commentator about scientific and medical issues he has inspired continued popular and political interest in science and its application for the betterment of our lives and our country. His engaging lectures, radio and television appearances continue to attract bright young minds to the new frontiers of science.

Retirement has not slowed the pace of life for this energetic polymath. He is Chairman of the Strategic Advisory Council for the Bill and Melinda Gates Children's Vaccine Program, USA, which was developed to help ensure that children in developing countries are immunised against major killer diseases.

Sir Gustav is also involved in many other organisations that allow him to contribute to many areas of the community. These include Chairman of the Centenary of Federation Victoria Committee, Deputy Chairman of the Council for Aboriginal Reconciliation and Deputy Chairman of the Advisory Council of The Global Foundation - the purpose of which is to promote Australia's international interests. In addition to these commitments Sir Gustav is also heavily involved in charitable work and is patron of a number of organisations.

Abridged from <http://www.nadc.com.au/awards/aoty.htm>

ONLINE SCIENCE EVENTS

Australia's first free and online Science Events Calendar has been launched by the Young Scientists of Australia, Sydney Chapter, at; <http://www.ysa.org.au/calendar>. The aim of the calendar is to provide an easily accessible reference for students, teachers and parents. To list your event e-mail; calendar@ysa.org.au

Science Week

Science Week Events are happening in all States and Territories around the first week in May 2000. Contact your local division for details. Here we highlight activities in Victoria. At time of press, no details from other states were available.

Science Week in Victoria

Burning The Earth to The Last Drop

Is the society that invented obsolescence heading helter-skelter to make it self obsolete by consuming the earth's limited energy resources? If you want to take charge of your future come down to the Royal Society, 9 Victoria Street, City for two exciting forums about Energy and The Sustainable Community. Forum 1, "Investing in The Future: Improving The Energy Efficiency of Your Home", Saturday April 29th, 3:30-5:00 pm. Forum 2, "Energy Future and The Sustainable Country", Monday May 1, 6:30-8:00 pm. Format: three top speakers followed by questions from the floor. Free Entry. For enquiries call Camilla on 9663 5259. Presented by The Royal Society and the Australian and New Zealand Association for The Advancement of Science for National Science Week 2000.

ScienceNOW! and GASS

Now in their third year in Melbourne are ScienceNOW! and the Great Australian Science Show (GASS). ScienceNOW! is a forum held in National Science Week to bring together scientists, the media, and the public. It is designed to: enhance reporting of Australian science; highlight and encourage debate on the role of science in Australian society; provide role models for the

next generation of Australian scientists. ScienceNOW! is held at the Melbourne Exhibition Centre with GASS.

GASS: Where else can you study the barrier reef with marine scientists, check fitness with medical researchers, view the latest plastic bionic body parts, examine a space suit, explore the human brain and get scientific feedback on your lottery system under one roof?

The third ScienceNOW! and GASS will be held from 4 to 7 May 2000 at the Melbourne Exhibition Centre (Jeff's Shed). For details see:
<http://www.sciencenow.org.au/> and <http://www.asnevents.net.au/gass.htm>

ScienceNOW! and GASS are sponsored by the Victorian and Federal governments and are backed by Australia's leading science organisations.

Ian Anderson

Ian Anderson, the highly motivational co-organiser of ScienceNOW and GASS, and Australasian Editor of New Scientist, died last month. He will be very missed at Science Week in Victoria by all involved.

NEWS FROM THE DIVISIONS

NSW

Youth ANZAAS 99

By Bob VICKERY

From the 4th July to 7th July 1999, 49 high school students and 14 members of Young Scientist of Australia (YSA) met at St Joseph's College, Hunters Hill. The high school students came from all the states and territories of Australia, most states sent at least four representatives, with the ACT sending the most (12 in all), Queensland which does not have an ANZAAS division sent one student and the Northern Territory sent two.

The students were engaged in a variety of activities and the overall structure of the conference broke the previous approach to Youth ANZAAS. Firstly this conference was not "tied" to an ANZAAS Congress and secondly the activities were more hands on and fewer lectures. The Conference started with the "Welcome" ceremony and proceeded straight to the "getting to know you" activities organised by YSA. By Monday morning most of the students at least knew the names of other students in their group.

Monday was spent at Australian Nuclear Science and Technology Organisation (ANSTO) at Lucas Heights. The tour, lectures and other activities were well received by the students who were particularly excited by seeing Australia's only nuclear reactor. On Monday evening the students listened to a lecture by the Australian Institute of Physics Youth Lecturer

1999, Dr Ray Norris from the Australia Telescope National Facility, on "Black Holes". This was well received.

Tuesday was spent at the Galaringi Bushland, Carlingford. Many students found aspects of this activity fascinating and enjoyed the talks given by the geologist and biologist. The afternoon was spent at Sydney University, attending a lecture by Dr Karl Kruszelnicki on some unusual aspects of science which included his famous video on the terminal velocity of cats. The evening was spent at the Conference Dinner and Disco.

Wednesday saw some very tired teenagers head off to the Botanical Gardens and the Australian Museum. Both activities focused on the "Behind the Scenes" aspects of both institutions, allowing students to see how scientists worked and researched in these public domains. The afternoon was spent at the Pacific Science Congress where students attended one session. Robyn Williams from the Science Show addressed the students in the Farewell event.

TASMANIA

Science Talent Search

By Pat Quilty

Tasmanian Division awards for the Tasmanian Science Talent Search for 1998/99 have been made as follows.

For the best three junior division research investigations:

Joshua Leonard, Dylan Hodge and Lilian Garwood (all from Riverside High School, Launceston), Ling San Lau (Rose Bay High School, Hobart), Alice Colman (St Patrick's College, Launceston).

ANZAAS Teacher Award: Mr Anthony Arthur (Riverside High, Launceston).

The Tasmanian Science Talent Search has been running for many years and has been very well supported by Tasmanian organisations. The TSTS as it is known;

- is an initiative of the Science Teachers Association of Tasmania;
- promotes quality science education in government and non-government schools through the recognition of outstanding work in a variety of fields;
- is open to all Tasmanian students from early childhood classes to Grade 12;
- is to celebrate quality science teaching and learning.

In these objects, the Search has aims similar to those of ANZAAS and thus the Tasmanian Division has supported its activities for many years.

Book Bite 2

AIMS: the First Twenty-Five Years.

Bell, P. (edited C. Veron) 1998. ISBN 0642 32212 0. Available from Science Communications, AIMS, PMB No. 3, Townsville MC, Qld 4810.

In setting out to review this history of the Australian Institute of Marine Science (AIMS) I feel a little like the Walrus. The time has indeed come to talk about 'seas and ships and sealing wax' (or at least pioneering innovative science in the string and sealing wax tradition) 'of cabbages and kings' (or at least politicians and bureaucrats).

Twenty five years is certainly a landmark in the history of an organisation but does it warrant a history? It is a difficult length of time for a historian - many of the characters are (fortunately) still alive so that they can be called upon directly, on the other hand the thirty years rule means that documenting evidence must be already in the public record rather than in cabinet and other restricted papers. To current undergraduates twenty five years ago is more than their lifetime away: I find that in teaching conservation biology students cannot conceive of a time when limestone mining and oil drilling on the Great Barrier Reef were under serious consideration. It is appropriate to document the first twenty five years of AIMS and to remind ourselves of just how many changes have occurred in such a short time interval. It is also timely as the Federal Government has recently released the national Oceans Policy, although the promised companion document on marine science and technology has yet to appear.

Commonwealth involvement in marine science dates from 1908 when Harald Dannevig was appointed Director of Fisheries. Tragically Dannevig perished in 1914 when the Research Vessel 'Endeavour' was lost with all hands in the Southern Ocean. It was not until 1933 that the Commonwealth again engaged in marine research when the Council for Scientific and Industrial Research established a Fisheries Investigation Section, initially in Melbourne but from the Second World War in Cronulla in Sydney. The CSIRO, and subsequently CSIRO, major marine facility remained in Sydney until relocation to Hobart in 1985. The CSIRO Divisions of Fisheries and of Oceanography remain major research enterprises of international significance.

In the 1960s the Great Barrier Reef became one of the battlegrounds on which the modern Australian conservation movement won its spurs. Three separate issues stimulated debate - the first reported crown-of-thorns starfish outbreak, proposals to mine limestone from Ellison Reef, and oil exploration (the specific trigger being the proposal for the MacKay 1 well in Repulse Bay, although four wells had been drilled earlier on the Reef without attracting widespread public comment).

It became clear that there was remarkably little known about the Reef. In 1969, at the height of debate about the MacKay 1 well the Prime Minister, John Gorton, announced, as part of the Liberal Party's election policy speech, that an institute of marine science would be established in Townsville.

The Australian Institute of Marine Science Bill was introduced into the House of Representatives on 4 March, 1970 - coincidentally the day after the oil tanker 'Oceanic Grandeur' went aground in Torres Strait, an event which ensured bipartisan support for the legislation, which received Assent on 17 June, 1970.

For the first few years the new institute was based in the former Army facility at Cape Palleranda, close to Townsville, until the purpose built new institute was eventually constructed at Cape Ferguson, a remote site surrounded by National Park. While the Cape Ferguson facility is outstanding and the site has many advantages the remoteness involves the staff in considerable commuting, and continued sniping from the local media over the use of Commonwealth vehicles.

This history is in two parts; the first an account of the institute and its development and the second a series of reminiscences by long serving staff.

The first section is far from boring, nor does it hide the difficulties the organisation has faced. There have been tensions at times between the roles of the Council and the Director, and between the administrative and scientific staff. Some of the tales recounted suggest that Sir Humphrey is alive and well and living in north Queensland - particularly in relation to the procurement and operation of the research vessels. In regard to the research fleet there is perhaps more to be learnt - the caption to a photograph of the largest vessel, the 'Lady Basten' states that "It is badly designed - narrow gutted and poorly laid-out", but no explanation of these shortcomings appears in the text.

Despite difficulties AIMS has developed into a research institute of world stature. Major research has been carried out in mangrove ecology, small scale oceanography and aquaculture. As would be expected given the events leading to the Institute's founding there has been substantial research on corals - taxonomy, ecology and palaeoclimatology. Of the specific triggers there has been no need for research on the impacts of mining or oil exploration as politically both matters were off the agenda before the Institute was established. Research on crown-of-thorns, at AIMS and elsewhere, continues to raise more questions than it answers. One lost opportunity suggested by the author was the opportunity for greater interaction between AIMS and the Great Barrier Reef Marine Park Authority, but any difficulties

in this regard should not be laid at the feet of the institutions but of governments which have kept the two bodies in different portfolios.

The author claims that "This is not a history of science policy"; the book does, however, tell us a great deal about how policy is put into effect. This book will certainly be of interest to anyone concerned about marine science in Australia, but it has much to engage the attention of a wider audience. That

AIMS was established when it was very much reflects the personal commitment to the importance of science of John Gorton and Malcolm Fraser, who contributes the Foreword to the book. It has been a long time since science has had such a high profile in Federal cabinet. During last year's election campaign the then Minister for Science promised us the Coffs Harbour initiative, which also involved a marine research facility, and the initial funding for the facility has now been made available. In twenty five years time it will be interesting to see how well it has fared. *-Paul Adam.*

Perrin's Plate

News To Members
From The General Secretary

ANNUAL GENERAL MEETING

The Annual General Meeting of ANZAAS took place on Wednesday, 24th November, 2000. A total of twenty-three members were present and voting at Divisional venues thus providing a quorum according to the revised Constitution.

The report of the Chairman of ANZAAS, Associate Professor Paul Adam was adopted unanimously. In the absence of the Treasurer, Mr. Ashley Dunn, as Secretary I reported that the un-audited accounts for the period 1998/99 showed a turn-around from the substantial losses reported from the 1997/98 financial year.

A resolution providing authority for the Council of ANZAAS to approve and adopt the final audited accounts was carried unanimously, with a rider that no qualification of the accounts later surfaced. The summary of the audited accounts is shown on the next page.

Motion 1, of which notice had been given, was carried unanimously after an amendment from Professor P. Quilty, seconded by Dr. A.G. Fenton, had also been carried with one abstention. The amendment had the effect of removing the "under 21" age limitation proposed in the original motion and provided for a Student subscription of \$20 annually for all students in full time education, including post-graduate members. No other motions were proposed.

SUBSCRIPTIONS - Following the decision by Council to provide for a common subscription renewal date of July 1st, renewals of all categories of subscription are due on that date. Members are reminded that ANZAAS provides for subscription renewal by credit card, [not AMEX or Diners!] although this facility does NOT provide for telephone renewals as we would be required to place \$5000 on deposit at the bank to underwrite non-signature transactions. It is hoped that by 1st July we shall have put into place a facility on our upgraded web-site which will allow members to renew via totally electronic means, with new members enrolling via the web-site. I am currently

in discussions with the bank to ensure total security for members funds handled electronically.

Any members still to renew from their **yellow slip** detailing the **pro-rata** renewal subscription amount required to keep them financial until 1st July 2000, are asked to send their monies as soon as possible.

MEMBERSHIP CARDS — Any member not in possession of a current membership card is asked to contact the office as soon as possible. The card is the size of a credit card and has our logo and title on one side and the Member's details on the other.

ANZAAS and MUELLER MEDALS — Nominations are now open for the ANZAAS Mueller Medallists 2000. There are no formal nomination documents and confidential nominations should be made direct to the office.

ANZAAS PUBLICATIONS — I would like to remind Members that a list of all ANZAAS publications still in print is being compiled with a view to improving the income from, and disposal of, any publication. If there are any publications that Members think should be included, please let me have details as soon as possible, and where possible, a specimen of the item. It is intended to provide a facility for the purchase of ANZAAS publications on our upgraded web-site.

DIVISIONAL MEETINGS — Members are urged to support Divisional meetings of all kinds, an to particularly encourage the younger members to organise and participate in Divisional activities. It is crucial to the long-term survival of ANZAAS as a credible entity that the younger members begin to be brought into the management of the Association. Divisional meetings can be good recruiting grounds for new members.

WEB-SITE UPGRADE — If Members were to take a look at the web-sites for the American Association or the British Association they would quickly realise that we are currently not making best use of our facility. Through the good offices of the Hon. Editor, the site is currently hosted by the University of Sydney. The proposed upgrade will see the site solely hosted from our own domain, anzaas.org.au , with "tabs" or "buttons" to take site users to various pages, which will include certain information and discussion pages restricted to members only. For example, the Hon. Editor will be able to post this newsletter to a "Members only" page immediately after publication, making it available to non-members only after 2 months, say. Other facilities will be discussion groups for members, an important youth discussion group and of course membership and subscription facilities as well as pages for an event diary, general news and specific publications. These latter pages would be freely available to site visitors. I am hoping that the draft of the revised site can be put before Council at its next meeting.

**AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE INCORPORATED - CONSOLIDATED
ACCOUNTS**

FINANCIAL STATEMENTS FOR YEAR ENDED 30 JUNE 1999

CONSOLIDATED BALANCE SHEET

	1999	1998
ACCUMULATED FUNDS		
Opening Balance	84,590.00	144,622.00
ADD Surplus/Deficit	20,335.56	(60,032.00)
	104,925.56	84,590.00
CURRENT ASSETS		
Cash at Bank	33,763.01	29,829.00
investment funds	54,400.37	37,419.00
Other	4,634.66	15,000.00
Receivables	10,829.00	2,212.00
Accrued Interest	394.52	-

	104,021.56	84,460.00
LESS CURRENT LIABILITIES	-	-
Net Current Assets	104,021.56	84,460.00
FIXED ASSETS		
Furniture and Office Equipment	3,169.95	2,162.00
Less Depreciation	2,265.95	2,032.00
	904.00	130.00
TOTAL NET ASSETS	104,925.56	84,590.00

Book Bite

Wizards of Oz. Recent Breakthroughs by Australian Scientists.

Peter Spinks. Allen and Unwin, St Leonards, ISBN 1 86448 801 8, 1999, 243 pp., softbound, \$19.95.

This book is most timely. There is much discussion in many media of the present and future of Australian science. High school students seem to be turning away, with consequent effects on recruitment to science, availability of teachers, scientists and researchers for the future. Australia wants to be a clever, innovative country, but at a time when the drivers of that innovation/cleverness, seem to be becoming less available. Funding for science has become a major issue and affects the attractiveness of science to students and, of course their future. The march of economic rationalism and globalisation, with their emphasis on short-term economic gain, threatens long-term employment as a prospect for a career in science. The vision of the obscene salary packages being enjoyed by senior managers draws bright students to this career stream at the expense of the nation's needs. Many

scientific institutions such as the Australian and New Zealand Association for the Advancement of Science (ANZAAS), university staff groups, and even daily newspapers, regularly draw attention to a national problem. Many of these aspects are drawn out by Paul Davies' Foreword and Spinks' own Introduction to this book.

Spinks is science writer for *The Age* and clearly is influenced by contacts (he is good at it) with 'nearby science' but all of Australia gets some coverage. The book reviews discoveries in all fields, beginning with the earth sciences and space. In his employment, Spinks has the advantage of an ability to gain an overview, and while a science communicator (not always admired by scientists), he is also a science graduate (Masters in psychology).

In contrast to the 'doom and gloom' expressed above, Spinks draws attention to part of the myriad scientific discoveries that Australian scientists have made. Fundamental physics is alive but not so well. Funding and students? As one who is a practising scientist, a significant part was new to me. A message that came through to me is that scientists *give* so much to society in contrast to many modern 'stars' in other fields who *take* so much.

Spinks shows not only the discoveries and innovativeness of Australian science but also the value of Australia as a site for particular types of science, such as astronomy (he could have gone further and referred to the Australian Antarctic Territory - another AAT - as the best site on earth) because of its geography.

An all-pervading message from the individual scientists is one of optimism - looking forward and identifying areas of science where major discoveries remain to be made, and where Australia has a chance to play a leading role. Strangely, to me at least, this is expressed by astronomers who have not done so well under the current government.

The volume specifically concentrates on modern results and on issues that are close to solution. It reflects to some extent, on serendipitous (unplanned) discoveries that are the stuff of science, and which have led more to major developments, than have discoveries from science conducted to solve known, short-term problems. This is a good philosophy for future science but a philosophy that is under threat.

The innovation/expertise in Australia clearly is at high level, but the recognition both of this expertise and the role of science, by politicians and the public is not. This needs to be changed and this book provides abundant, but not complete, examples. Somehow, we need to make scientists more visible (true, they have to project themselves), and science a lasting, even more lucrative, career.

The book is one in the Allen and Unwin *Frontiers of Science* series, and I understand that another in this very useful series (Malcolm Walters' *Mars: the Search for Life*) has appeared.

I would like to see this book referred to by career advisers, high school science teachers and discussion groups such as 'Science in the Pub', ANZAAS and state Royal Societies. It should be on the shelves of every high school library. It should be scrutinised by scientists - old and young - for an overview.

The book is paperbound in Australia and represents both value for money and evidence that 'we can do it' in Australia. -*Patrick G. Quilty AM*

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