

# 'BEYOND BRAIN DRAIN'

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MOBILITY, COMPETITIVENESS  
&  
SCIENTIFIC EXCELLENCE



Edited by

Fiona Q. Wood

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& SCIENTIFIC EXCELLENCE

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Workshop Report

Edited by

Fiona Q. Wood

2004

Fiona Q. Wood (Editor)

'Beyond Brain Drain'- Mobility, Competitiveness and Scientific Excellence

Report of a Workshop held on 22-23 February 2004.

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# Acknowledgements

The workshop entitled: *'Beyond Brain Drain': Mobility, Competitiveness and Scientific Excellence* was held in February 2004 at the Queensland Bioscience Precinct. The workshop addressed the issues and challenges for Australia in the attraction and retention of highly skilled scientists, engineers and technologists.

The workshop initiative was fortunate in attracting the support and sponsorship of the following organisations: the Department of Education, Science and Training (DEST); the National Health and Medical Research Council (NHMRC); the Rural Industries Research and Development Corporation (RIRDC); the Australasian Research Management Society (ARMS); CSIRO; the Queensland Department of State Development and Innovation; the University of Queensland; and the University of New England.

The patron for the workshop initiative was Professor Peter Doherty AC FAA FRS and winner of the 1996 Nobel Prize for Medicine. Peter's ongoing support is acknowledged with the deepest appreciation.

The workshop was organised by an *ad hoc* committee comprising: Dr Fiona Wood, Centre for Higher Education Management and Policy, The University of New England; Jan Massey, Director, Office of Research & Postgraduate Studies, the University of Queensland; Dr Stella Clark, CEO Bio21 Australia Ltd; Professor Snow Barlow, the University of Melbourne and President of FASTS; & Jeremy Wurm, Brooker Consulting. In addition, assistance in progressing the workshop initiative was provided by Helen Fullgrabe (NHMRC), Janet Dibb-Smith (University of Adelaide), Dr Sianna Panagiotopoulos (Austin Hospital Medical Research Foundation), Felicity Hamilton (NSW Innovation Council), Melanie Gray (Queensland Department of State Development and Innovation), Graeme Rankin (DEST) and Anna Robinson (WISENET).

The workshop attracted an outstanding set of international and national presenters and

almost all were able to provide written contributions for the purpose of these proceedings. A number of people provided background papers for the workshop and several of these have also been included. In this regard I would like to thank Kay Double; Les Field and Bryan Gaensler; Dennis Trewin; Engineers Australia; Alec Hay and Peter Greenwood; and also Suzy Baxter for her post-workshop paper.

Acknowledgement is also given to the diverse and highly talented set of invited registrants who were prepared to commit their time and substantial expertise to progressing the workshop objectives and delivering a meaningful set of outcomes. One of these outcomes was the importance of maintaining effective contact with the many highly skilled Australians working overseas. This issue was discussed at the Prime Minister's Science, Engineering and Innovation Council meeting in June 2004.

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**Dr Fiona Wood**  
**Workshop Convenor**

# Abbreviations and Acronyms

ABET	Accreditation Board for Engineering and Technology	COAG	Council of Australian Governments'
ABS	Australian Bureau of Statistics	CSIRO	Commonwealth Science and Industrial Research Organisation
AEC	Australian Egg Corporation	CRC	Cooperative Research Centres
APEC	Asia Pacific Economic Cooperation	CRC	Canadian Research Chairs
AFFA	(Department of) Agriculture, Fisheries and Forestry Australia	CRDC	Cotton Research and Development Corporation
APEC	Asia-Pacific Economic Cooperation	DA	Dairy Australia
APL	Australian Pork Limited	DEST	Department of Education, Science and Training
APRA	Australian Postgraduate Research Award	DETYA	Department of Education, Training and Youth Affairs
ARC	Australian Research Council	DFAT	Department of Foreign Affairs and Trade
ASIIN	Accreditation Agency for Study Programmes in Engineering and Informatics	DIMIA	Department of Immigration, Multicultural and Indigenous Affairs
ASMR	Australian Society for Medical Research	DIST	Department of Industry, Science and Tourism
AUTM	Association of University Technology Managers	DITR	Department of Industry, Tourism and Resources
AVCC	Australian Vice-Chancellors Committee	EARMA	European Association of Research Managers and Administrators
AWI	Australian Wool Innovation Pty Ltd	EC	European Commission (or Community)
BERD	Business Expenditure on Research and Development	ECSA	Engineering Council of South Africa
BEM	Board of Engineers, Malaysia	EC(UK)	Engineering Council, United Kingdom
BRW	Business Review Weekly	EMF	Engineers Mobility Forum
CEDA	Committee for Economic Development of Australia	ETMF	Engineering Technologists Mobility Forum
CERN	European Organization for Nuclear Research	EU	European Union
CCPE	Canadian Council of Professional Engineers	FASTS	Federation of Australian Scientific and Technological Societies
CCTT	Canadian Council for Technicians and Technologists	FEANI	European Federation of National Engineering Associations
CFI	Canadian Foundation for Innovation	FRDC	Fisheries Research and Development Corporation
CHIR	Canadian Institutes for Research Health	FWPRDC	Forest and Wood Products Research and Development Corporation
CIE	Centre for International Economics		

# Executive Summary

It is well-recognised that to be globally competitive, national economies need ongoing access to highly-skilled labour, particularly in the Science, Engineering and Technology (SET) areas. However, the question of how best to train, recruit and retain these skilled professionals needed for national innovation systems is an ongoing issue for governments throughout the world<sup>1</sup>. Getting the right policy mix to reflect the complexities associated with the demand and supply for these professionals and their mobility is a common challenge.

Although Australia has a well-developed but comparatively small science base it is also a long way from the world's main R&D performers.

In regard to Australia's capacity to meet the demands for skilled-labour, Queensland's Chief Scientist, *Peter Andrews*, has projected a need for an additional 75,000 scientists by 2010 to build biotechnology businesses and other knowledge-based industries for Australia to remain international competitive in areas of strategic advantage. In the case of the EU, for the same period, the demand has been estimated at between 500,000-700,000 more researchers. At the same time the United States continues to compete aggressively for scientific personnel to fuel its economy.

In Australia a number of policy documents provide the rationale for the need to invest in science, technology and innovation. Similarly the States, particularly Queensland, Victoria and New South Wales have committed substantial funding to help realise the knowledge based economy - primarily in the areas of biotechnology and information technology. Underlying these investments has been the implicit assumption that Australia has the capacity to train and/or recruit the necessary highly-skilled personnel to drive the innovation investment.

Initiatives such as the Federation Fellowships Program and the additional science and

technology places provided under *Backing Australia's Ability I* and *II* reflect the importance of having a pool of 'trained innovators' (including scientific researchers). Despite these initiatives, there has been ongoing concern by a number of peak bodies and leading researchers that in the face of intense international competition, Australia's capacity to attract and retain highly skilled Science, Engineering and Technology personnel is being tested.

Significantly, in October 2003 the Senate of the Australian Parliament also initiated an inquiry into 'Australians living overseas: the factors driving them there, their needs and concerns, as well as the economic and social implications for Australia'<sup>2</sup>.

The purpose of the international, high-level workshop which is the focus of this report was to provide a systematic exploration and analysis of a number of the issues identified above by drawing upon input from leading researchers; the most up-to-date studies in Australia; and benchmarking these studies with Canadian and European policies and experiences.

The specific set of objectives are listed below:

1. assess what we know and do not know about brain drain, gain, churn, waste etc issue;
2. identify current impediments to effective recruitment, management and retention strategies;
3. compare ways in which a range of organisations attempt to create value in their capacity to attract personnel (e.g. opportunities for professional and personal development; capacity for profit-sharing and other motivational factors); and
4. consider ways in which Australia can build national capacity regarding its pool of highly-trained SET personnel.

The workshop was targeted at a high-level, diverse list of registrants and the program and related material are contained in Appendices 1-3.

What follows below is an overview of the key issues identified by presenters to the workshop and the key outcomes from the workgroup discussions/debates.

*Peter Doherty* is not only a world-class researcher but a passionate advocate of ‘things Australian’. As a scientist who has worked and lived in a number of countries, Peter is well-placed to comment on the attractions and benefits for researchers of developing at least part of their career profile in overseas organisations.

As Peter observes in his Opening Address, whilst Australian scientists have always looked globally for employment, the ‘relatively minor drain from the scientific and academic communities’ in the past was of little concern to politicians and their advisors. However, the fierce international competition for skilled and talented professionals needed for knowledge-based economies has, as Peter argues, focused attention on the capacity of Australia to grow, attract, recruit and retain a highly-skilled workforce.

In addressing this human resource issue, Peter in turn focuses on Australia’s large diaspora and considers ways in which this ‘massive, under-utilised resource’ could be tapped into for national benefit<sup>3</sup>. The internet is discussed as one way of keeping expat communities linked to and informed about Australia. It also offers a unique means for forging collaborative partnerships and mentoring opportunities.

*Part 1* of this report is concerned with international experiences in attraction and retention of skilled labour.

Having the world’s largest sink hole for brain drain located just across your border has been an ongoing challenge for Canada in retaining and attracting the ‘best and the brightest’. However, a budget surplus in 1997 provided the opportunity to meet this challenge and additionally, for Canada to set a target to be amongst the five most innovative countries by 2010. *David Strangway* explains how the substantial

funding earmarked to stop the brain drain has been used to invigorate the Canadian research enterprise and return national benefits – particularly in relation to research clusters.

Investment in R&D and collaboration between public and private sectors are well recognised as key drivers to economic growth and international market competitiveness. At a regional level such recognition is reflected in the political targets set by the European Union (EU) at its Council meetings in Lisbon 2000 (to become, by 2010, the most competitive and dynamic knowledge-based economy in the world) and Barcelona 2002 (three percent of GDP to R&D by 2010, two-thirds of which is intended to come from the private sector). However, underlying such targets is the question of where the highly-skilled manpower is to be found to perform the additional R&D activity projected.

Whilst acknowledging the complexities of equating R&D spend to industrial prosperity or social welfare *Luke Georghiou* addresses the supply challenge set by the EU targets. A key argument in Luke’s paper is that there needs to be a more systemic approach to addressing the human resource needs of knowledge economies – one that provides a broader perspective from schooling to career management and also one that is integrated with a wider range of innovation policies.

The internationalisation of research training continues to grow along with mechanisms to facilitate such mobility. However, the success of such training can often be influenced by a range of non-scientific issues. These include personal adjustments required in working in a different culture where legal, administrative, social security and taxation systems along with visa requirements and housing availability/affordability and access to superannuation schemes (and portability) can seem daunting for the individual researcher/and family– let alone having to negotiate these in a second language. Also, there is the critical question of how to successfully repatriate these scientists into professional positions in their home countries and indeed whether or not the jobs actually exist for them to return to at the end of their training. In recognition of such concerns,

several schemes have been established in Europe to provide effective support for mobile researchers – these include the Marie Curie Fellowship Association (MCFA)<sup>4</sup>, the Association Bernard Gregory<sup>5</sup> and most recently the ‘Researcher’s Mobility Portal’ launched by the European Commission in June 2004 – ERA – MORE<sup>6</sup>. *Magda Lola’s* presentation concentrates on the MCFA which is a network of more than 3000 scientists from Europe and North America – all of whom are current or previous holders of MCFA Fellowships or similar EC awarded fellowship grant. Magda draws on a range of surveys and studies regarding training, mobility and career development for researchers. Of particular concern are not only issues to do with mobility between countries but also barriers to the effective transfer of skills between public and private sector organisations. Barriers to career development and mobility for women with family commitments; portability of superannuation schemes<sup>7</sup>; and reintegration mechanisms are amongst the issues addressed by Magda along with requests by Early Career Researchers (ECRs) for training in complementary skills such as project and IP management, networking, communication and leadership skills, and the preparation for careers in a variety of organisations.

Shifting from experiences in other countries in meeting the recruitment and training challenges associated with knowledge-based economies *Part 2* of this report focuses on issues for Australia.

According to *Peter Andrews* emerging industries such as biotechnology and nanotechnology offer a significant opportunity for Australia to transform itself into a knowledge-based society. The critical issue though is whether or not there exists a supply of highly-skilled scientists to work in these industries. In considering the supply question, Peter distinguishes between the impact of ‘brain drain’ which results from scientists seeking more attractive work opportunities overseas, and ‘brain loss’ where students are increasingly opting for ‘soft’ rather than the ‘hard’ sciences<sup>8</sup> or see a career in science as not sufficiently attractive compared to those in other areas such as law and finance. As Peter observes, ‘brain’ loss is a world problem but its implications for a small economy such as Australia in

competing for needed trained scientists are proportionally greater. In terms of national needs for scientists Peter projects that Australia will need an additional 75,000 scientists by 2010 –the question is where will they be found. Solutions are proposed in terms of addressing the ‘brain loss’ at the primary, secondary, tertiary and postgraduate levels.

After tracing the development of science and technology in Australia, *Bruce Cornell* proposes that the economic, cultural and strategic justifications for supporting the sector are broadly linked with population size – with the larger populations having the necessary military-industrial complexes needed to link the economic and strategic. However, having a small population and being geographically isolated from the major markets, Bruce comments that Australia is ‘unlikely ever to have the resources to achieve an alliance between the economic and strategic justification for science and technology’. In view of this he advocates a new model which best reflects our strengths and recommends that rather than be concerned about the loss of young talented Australians overseas we actively seek to encourage the internationalisation of their studies and career development - recognising the value of the resulting knowledge and skills networks forged for Australia. Bruce also addresses problems in the way science and technology are currently presented to the public and recommends ways of improving this image.

A number of commentators have observed that brain drain/gain/circulation arguments have often been developed in the absence of meaningful internationally comparative mobility statistics or indicators. This is particularly so for a country such as Australia where manpower statistics are disaggregated and do not capture all information needed to understand immigration flows<sup>9</sup>. We also do not have systematic follow-up of postdocs working overseas or track movement of scientists between public and private sector organisations and even where statistics demonstrate a net inflow of skilled workers to Australia, it is unclear what the match is with those who have left. Nonetheless, as observed at a recent conference in Paris on mobility ‘the quality of information is paramount to ensuring that the right policies

are developed<sup>10</sup>. One important source regarding knowledge-based economy measures is provided by the Australian Bureau of Statistics (ABS). In his contribution, *Dennis Trewin*, provides an overview of some of the key messages regarding skilled labour and mobility. These include that Australia is a net importer of ‘professionals’ and that, in percentage terms, Australia rates low among the OECD countries for graduates with science and engineering degrees – also Australia has a relatively high percentage of foreign PhD students.

*Graeme Hugo’s* presentation examines the growth of emigration of skilled workers from Australia and places this in a context of overall migration changes influencing the nation. The results of a survey of highly-skilled professionals currently living overseas are also presented. Whilst a net increase of skilled workers to Australia is noted Graeme warns against assuming that ‘like is being replaced with like’. As the globalisation phenomenon will see continuous mobility of highly-skilled workers internationally, Graeme argues that Australia needs a national policy that adequately reflects ‘retention, recruitment, and return’ considerations. A more strategic approach to connecting with Australia’s relatively large diaspora (4.3% of the 2001 resident population) is advocated to maximise business, research and cultural links.

*Part 3* considers national capacity issues from several different perspectives – engineering; health and medical research; State; and the rural sector.

*Engineers Australia (EA)* identifies seven barriers to realising a national innovation system and associated pool of trained innovators. These include low levels of business expenditure on R&D; insufficient government incentives; the quality of existing education and training; and a corporate culture that does not readily appreciate innovation. EA proposes strategies for removing these barriers and also points to the fact that despite the importance of engineering to technological innovation, 1995 figures for OECD countries showed that ‘Australia produces the lowest level of engineering graduates and the highest percentage of biological scientists.’ Attention is also directed to the importance of

curriculum changes in primary and secondary schools to more effectively promote engineering.

According to *Alan Pettigrew*, Australia’s track-record in high-level achievement in science and innovation can be attributed to the calibre of its skills base and an environment conducive to high level R&D performance. However, Alan warns that despite these achievements Australia has not necessarily performed up to its ability or capacity. In addressing this concern, Alan considers what is required of researchers and managers in a rapidly changing environment for the conduct of research if we are to realise our potential for national as well as individual benefit. Whilst Alan’s paper focuses on issues in health and medical research, the messages regarding the need to create a vital, attractive and supportive research environment for both new entrants and expats, are generally applicable. Other issues raised include the appropriateness of current terminology regarding mobility of skilled labour; the need to better promote the outcomes of research to politicians and the community to ensure their ongoing support; career development opportunities in health and medical research; and the importance of Australia engaging more actively in the development of a strategic framework for research development in the Asia Pacific region.

Studies of mobility of skilled labour frequently focus on movement between countries and national policy responses to this. However, *Graeme Hugo* draws attention to an equally important challenge posed by the *internal* migration of young skilled people to other States. The focus of Graeme’s paper is on the State of South Australia which not only has a small and ageing population but also has been experiencing a net loss of skilled young people to other States. In recognition of the direct link between future prosperity of the State and the need to enhance its human resources, South Australia is developing a population policy. One of the key aims of this policy is to grow the State’s highly-skilled personnel. Graeme discusses the various population policy strategies including the development of a State expatriate network.

The agricultural science sector in Australia has historically been a significant performer

of the national R&D effort. In their paper, *Roslyn Prinsley and Snow Barlow* focus on the particular role that the Rural Industry Research Corporations (RIRCs) play in contributing to R&D and innovation. In drawing on a range of RIRCs, including the Rural Industries Research and Development Corporation, they discuss the programs which have been developed to build and manage intellectual capacity; develop leadership in the sector; and also maximise linkages with the particular type of scientific diaspora that has developed in relation to agriculture.

*Part 4* is concerned with mobility issues from the perspective of Early Career Researchers, Expatriates, recruitment agencies and the engineering profession.

In shifting to a focus of brain *gain* rather than brain *drain*, *Les Field and Bryan Gaensler* reflect on two options to achieve this. The first relates to schemes to facilitate the return of expats and the second is the effective utilisation of the diaspora. In commenting on the former Bryan and Les refer to the Australian Research Council Federation Fellowships program which while useful is limited in its impact by the small number of individuals who can benefit<sup>11</sup>. However, as with Peter Doherty, Graeme Hugo and others in this report, Les and Bryan believe that strategic connections with the substantial Australian expatriate community offer many benefits for both the expats themselves (a proportion of whom will never return to Australia) and to the nation<sup>12</sup>. Les and Bryan's paper focuses on the NSW Expatriate Return Awards Program and the Network of Expatriate Australian Researchers. They illustrate the value of such initiatives in terms of outreach programs to schools and establishing research linkages that would otherwise have been unlikely to have occurred. For relatively small amounts of funding, Les and Bryan show how connections with leading expat researchers can be realised for the benefit of all.

*Andrew Sinclair* identifies a number of issues and dilemmas associated with recruitment and retention of outstanding scientific talent – both from within Australia and overseas. Andrew focuses particularly on the challenges faced by our young researchers in pursuing a career in biomedicine. Lack of

security in career development and poor remuneration packages when compared to other professions (e.g. law, finance, commerce) or conditions of employment offered by research organisations in, for example, the US, are considered as particular obstacles to attracting the best.

According to Andrew those who do go overseas for training and career development are wary of the sort of environment they can return to in Australia. He draws attention to the need for better facilitation of re-entry for those who wish to return and also identifies problems in affordability of housing, particularly in terms of servicing mortgages<sup>13</sup>, for those who return to Australia's major cities. An additional issue raised by Andrew is that there are simply too few intermediate career development awards. Strategies for addressing the numerous concerns raised by Andrew include the need for more competitive salary packages; greater security in career pathways for biomedical researchers; customised packages to attract the best from overseas; and better support of the scientific diaspora in providing career advice and other information about Australia.

*Kay Double* and her husband typify the highly-skilled and talented young and mobile professionals that are the target of many countries' recruitment drives. Kay is a recipient of the prestigious NHMRC RD Wright Fellowship Award as well as being a 'Young Tall Poppy' and previously a fellow of the Alexander von Humboldt Foundation. In reflecting on the topic of 'brain drain' Kay comments that increasingly many young graduates are not returning from their overseas research training. The reasons for this are the subject of her presentation.

Drawing on personal experience and canvassing the opinion of other young scientists Kay provides an excellent insight into the attractions of working overseas and by corollary the challenges Australia must deal with if it is to retain the 'best and the brightest' in a globally competitive environment. Of the many advantages in working overseas Kay's list includes: access to high level specialised research facilities; a wide range of organisations which can be applied to for funding support; the many opportunities to meet and collaborate with high level scientists; greater earning

capacity; affordable housing in many overseas cities; and a high value placed by other countries on the value of science to the community. According to Kay Australian researchers are considered an asset to overseas organisations. So for Kay, the question is: *'If we wish our fledgling scientists to spread their wings, how do we encourage them to return to the nest?'* She makes a number of suggestions regarding this.

Suzy Baxter provides a human resource perspective regarding the capacity of the Australian biotechnology industry to attract the skilled scientists needed. Suzy identifies a number of major challenges for growing this industry in Australia. These include non-competitive remuneration packages when compared with overseas companies combined with more substantial career development opportunities of major multinational companies in Europe and the US. Opportunities to access top level mentors are also considered greater in the US, than in Australia. Suzy addresses other constraints including the lack of the sort of production facilities needed to be globally competitive or the scientists and engineers needed to operate these.

Jeremy Wurm, commenting on the same industry discusses different personal motives that influence the movement of skilled labour from one country to another. Jeremy argues that an understanding of the 'push/pull' factors can help in developing effective strategies to encourage the return of Australian expats.

Finally, Alec Hay and Peter Greenwood draw attention to a key issue in the mobility of skilled labour internationally – the recognition of qualifications gained in another country. Focusing on engineers, particular attention is directed to the Washington Accord, the Sydney Accord and the Engineers Mobility Forum.

As can be seen from Appendix 3 the workgroups addressed a wide range of issues and questions. Some of the principal issues raised include:

- There is the possibility that government migration policies are more geared to attracting short-term circulators rather than also investing

in a stable pool of national SET personnel.

- There are few political champions for investment in science and recognition of the importance of its knowledge workers in other than a strictly utilitarian sense.
- Universities are not happy places to work – with an overwhelming expectation by government that the higher education sector can be made more efficient and that additional funding will only result as a trade-off with workplace changes.
- Low salaries in Australia, inadequate support for research, reduced access to administrative and technical staff, and excessive teaching loads. There is often insufficient infrastructure and funding to support the sort of research effort needed to be truly internationally competitive.
- Low success rates for applications to the two principal research funding bodies.
- If the leading professionals are leaving Australia this sends messages about where the best facilities and cutting edge research are located.
- Career potentials, particularly for early career researchers are not great.
- Links between public and private sector research agencies are growing but Australia is still well behind the policy commitment, funding and associated mechanisms that exist in countries such as the US and Canada.
- Reduced commitment of foreign companies to Australian R&D evidenced in closure of labs and downsizing of high tech personnel.
- Comparatively low level of Australian business investment in R&D.

- Many of the positives identified about Australia are also present in other countries but those countries are also offering subsidies and other incentives to attract both R&D investment and recruit personnel.
- Lack of mobility statistics which could provide information needed over time about skilled labour circulation.
- The selling of the importance of science needs to start in the primary schools.
- Variability in the quality of transferable skills and knowledge of SET graduates.
- Mobility schemes to enhance public/private sector mobility are limited both nationally and for international development.
- There needs to be more effective ways of connecting with the diaspora through internet portals and the like.
- There have simply been too many reviews, inquiries, taskforces with unrealistic time frames addressing issues of paramount importance to Australia's innovation performance and future. The sector is review weary.

Regarding the establishment of a portal for expatriate researchers, a submission was prepared for the consideration of the Prime Minister's Science, Engineering and Innovation Council and this is provided in Appendix 4.

The overall message from this workshop is that there is no room for complacency by Australia in addressing the issue of the demand and supply of skilled labour for an internationally competitive economy.

## Footnotes

<sup>1</sup> For example: Fuite ou circulation des cerveaux: de nouveaux défis – Brain drain, brain gain: new challenges, Paris, Cité des Sciences et de l'Industrie, 30 Juin/June 2004 [http://www.cite-sciences.fr/francais/ala\\_cite/evenemen/fuite\\_cerveaux/](http://www.cite-sciences.fr/francais/ala_cite/evenemen/fuite_cerveaux/) Dutch EU Presidency. The Netherlands. Issue paper on 'brain-gain.' Brain – gain, the instruments. A conference in The Hague, the Netherlands on September 29-30, 2004. <http://www.braingain-instruments.nl> Euroscience Open Forum (ESOF2004) to take place in Stockholm on 25-28 August (see [www.esof2004.org](http://www.esof2004.org)). Kennedy, Donald; Austin, Jim; Urquhart, Kirstie and Taylor, Crispin 2004 Editorial: Supply without demand, *Science* vol 303 p. 1105. Special Section 2004 Science Careers: Brains and Borders. *Science* vol. 304 pp1278-1288. Romer, Paul M 2000 Should the government subsidize supply or demand in the market for scientists and engineers? National Bureau of Economic Research Working Paper Series 7723 <http://www.stanford.edu/~promer/>

<sup>2</sup> [http://www.aph.gov.au/senate/committee/legcon\\_ctte/expats03/index.htm](http://www.aph.gov.au/senate/committee/legcon_ctte/expats03/index.htm) nb: There are currently just under a million Australians living overseas.

<sup>3</sup> The benefits of the strategic management of diasporas for national benefit are also addressed by: Mahroum, Sami 2003 Brain Gain Brain Drain, an international overview. Background paper for the Austrian Ministry for Transport, Innovation and Technology Brain Gain-Brain Drain, Future Network Austria-United States. Alpbach Technology Dialogue, 22 bis 23. August 2003. Jean-Baptiste Meyer and Mercy Brown 1999 Scientific Diasporas: A New Approach to the Brain Drain Prepared for the World Conference on Science UNESCO - ICSU Budapest, Hungary, 26 June-1 July 1999 <http://www.unesco.org/most/meyer.htm>

<sup>4</sup> Marie Curie Fellowship Association  
<http://www.mariecurie.org/>

<sup>5</sup> Association Bernard Gregory  
Is a French organisation founded in 1980, and provides a mechanism for bringing together business professionals, those concerned with scientific training and the young scientists themselves. It helps promote international mobility, provides mentoring and assistance with job applications and also helps repatriate returning scientists via awareness of job opportunities and the like.  
<http://www.abg.asso.fr/presentation/bref.en.html>

<sup>6</sup> ERA-MORE European Network of Mobility Centers <http://europa.eu.int/eracareers>  
One of several EC measures designed to make it easier for researchers to take up training and working positions in other countries.

<sup>7</sup> An issue being addressed within Australia regarding different sector R&D performers. Australian Government, Department of Education, Science and Training 2004 Review of Closer Collaboration Between Universities and Major Publicly Funded Research Agencies. <http://www.dest.gov.au/Collaboration>

<sup>8</sup> This issue was addressed in a recent report by the Royal Society in June 2004.  
<http://www.royalsoc.ac.uk/education/intro.htm>  
However, whilst it was noted that classes needed livening up to retain student interest the realities of occupational health and safety issues make the more exciting/dramatic experiments less likely to be part of the curriculum.

<sup>9</sup> See for example: Wood, F. and Boardman, KN 1999, *International Networks and the Competitiveness of Australia's Science and Technology*. Australian Academy of Science, Canberra. <http://www.science.org.au/academy/media/intnet.htm>

<sup>10</sup> Fuite ou circulation des cerveaux: de nouveaux défis – Brain drain, brain gain: new challenges, Paris, Cité des Sciences et de l'Industrie, 30 Juin/June 2004  
[http://www.cite-sciences.fr/francais/ala\\_cite/evenemen/fuite\\_cerveaux/](http://www.cite-sciences.fr/francais/ala_cite/evenemen/fuite_cerveaux/)

<sup>11</sup> Twenty five Federation Fellowships were awarded in 2004 – these grants are for approx 1.2 million per year over five years.

<sup>12</sup> Other examples of Australian Expatriate Networks include:

*Advance – Australian Professionals in America*  
<http://www.advance.org/home.do>

*Network for Expatriate Australian Researchers (NEAR)*  
<http://near.chem.usyd.edu.au/>

*The Southern Cross Group – Promoting Mobility in the Global Community*  
<http://www.southern-cross-group.org/general/whoarewe.html>

*Victorian Expatriate Network*  
<http://www.anzatechnet.com/vicgov/index.jsp>

*Victorian Endowment for Science, Knowledge and Innovation (VESKI)*  
<http://www.veski.com.au/>

<sup>13</sup> Cf. Gottliebsen, Robert 2004 'Boomers relegate young to rent role' *The Australian* 26 June p4. Gottliebsen discusses a recent Productivity Commission report which draws attention to the lack of affordable housing for young people partly 'as a result of negatively geared housing investments by the baby boomers'. According to Gottliebsen 'The long-term effect of a generation of young people who don't own houses will make the Australian labour force far more mobile and increase the lure of working abroad'.

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# Opening Address

## The Australian Diaspora

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Australian scientists have long been accustomed to the idea that they must look to the global market place. The limited range of opportunities here ensured that too many of our best research people left and never returned. The attitude within the universities, at least, was that we simply produced too many high quality people for the country to absorb. I remember a senior professor telling bright young graduate students that they were training for a life in exile. In the not too distant past, the reality that we were exporting some of our most talented and hard working people seemed to be of little concern to the politicians and to the bureaucrats who advised them.

The situation has now changed dramatically, as the relatively minor drain from the scientific and academic communities has broadened to a flood of people with a diversity of technical and business expertise. What we are dealing with is, of course, the globalisation of the market place for clever and highly effective people in every area of human endeavour. With the move to knowledge and innovation-based economies in the western democracies, there is an intense, global competition to recruit and retain the best and brightest.

About a million or so Australians now live elsewhere and can be considered in a number of different categories. As was always the case, many are young people travelling for experience and adventure on what may be regarded as extended working holidays. Scientific meetings in the USA are often held in off-peak times at various resort venues. Over the past few years, I have been very conscious of an increase in the number of young Australian waiters, hotel desk clerks and the like. They have a reputation for being pragmatic and hard working, which speaks well to our basic cultural values. Hopefully, we will

be able to benefit from their experience in (at least) the service industries, which represents one sector of the economy that cannot move offshore! We should not underestimate the training value of this broad 'university of life'.

Bringing highly qualified professionals home can be problematic. Returning to the much smaller Australian 'pond' is not always easy, especially as some of the established pond life may not be comfortable with these differently evolved life forms. My perception is that the old 'networks of nepotism' used by established pond creatures that developed in little, protected, ecological niches have been progressively eroding. Globalisation means that the importance of game playing that is essentially local becomes progressively less important. People with substantial international experience are a major asset for this 'new Australia' and will inevitably contribute to changing the rules, though this can be a very threatening process and initiatives will often be defeated. Most of our politicians have not, unlike many in the academic and (increasingly) the business communities, lived anywhere else as independent citizens.

The returnee is also likely to under-estimate how much that he or she, and the society they now encounter, has changed over the intervening years. We sometimes see this in the remarks of high profile expatriates who make brief visits. It seems to me that the general environment here for highly competitive people is much improved, and continues to get better. The Australian cities are culturally varied and marvellous place to live. Even so, it can take about 1-2 years before the inevitable culture shock of moving back wears off completely. Some can't re-integrate, and will leave again after taking 'the expensive cure'.

As many well-known expatriates point out (including recently Germaine Greer), the reason for staying away can often be more economic than anything else. There is the question of market size for knowledge and entertainment workers who perform and/or write for a living. The same can be true for those who develop high technology products and services. While at an international comparison level Australia is not highly taxed, the present income tax schedules (as a result of 'bracket creep') mean that rates are high here for anyone earning beyond a minimum level. People who have decent jobs in the USA will, for example, have the majority of their private medical insurance costs paid by their employers. Most American children attend free public schools, and Australia's public universities are now as expensive as comparable institutions in the USA and Canada. Families may feel they need to pay a lot for a house in a good US school district, but this is generally a sound investment and mortgage interest is fully tax deductible. Expatriates who marry and have children while they are out of the country will often be permanent exports. Such people are often nostalgic for the bush, the beaches and idealised memories, but it is possible to visit.

The economic/social gradients that drive this 'global talent churn' also work to Australia's advantage. Life is much better here than in many countries. We benefit by recruiting expatriates from elsewhere. The progressive internationalisation of our secondary and higher education sectors means that we often have the opportunity to identify highly competent people at an early stage. It makes very good sense to adjust our immigration policy to take advantage of this. I believe strongly that Australia is one of the most, if not the most, successful immigrant countries on earth. This is becoming a very varied and interesting, but cohesive society. Both the contagious accent and the obsession with sport are evidence of some sort of effective 'social glue'.

How can the nation benefit from the insights and input of expatriates who remain away? Some high profile individuals return regularly to serve on company boards and the like. Others act as sporadic advisors for this or that activity. The internet clearly opens intriguing possibilities that will no doubt be explored in a variety of innovative ways. On June 9, I will be involved

in the London launch of an Australian expatriate network ExpatriateConnect. This network is an initiative of the Australian Institute for Commercialisation and the Brussel's-based Southern Cross Group is the founding expatriate organisation partner<sup>1</sup>.

When interacting with people who remain expatriate, it is important to recognise that they will take an international view and will not necessarily share the prejudices that prevail here. An Australian government might, for example think carefully before instituting an internet-based voting system that allows expatriates to participate in the electoral process. All politics is local, and political campaigns often play to local fears and obsessions.

Australians who live in Europe were, I think, generally unimpressed by the bizarre 'Tampa/Pacific solution' strategy, which was given broad, and very negative, coverage in the media there. Similarly, many of those who live in the USA did not have much enthusiasm for the way that the vote on the republic issue was handled. This may be a prejudiced view. How widespread were such reactions? Perhaps the news media could use the new Southern Cross Group network to conduct surveys on issues that are of great political interest. It would make interesting reading, and could provide a source of income to help sustain the network activity.

The experience of returning to Australia, then leaving again for two extended periods, has clearly coloured both my positive and negative perceptions of the way things work here. My wife and I lived in Europe and the USA for more than 25 years. Being Australian of the Year in 1997 made me realize that the country was in a process of dramatic change and, for a life-long experimentalist, was an interesting place to be. Since mid-2002, we have been spending 75% of our time in the great city of Melbourne. Others may have very different perspectives.

Having an established, internet-based network offers an enormous opportunity for generating a rapid, balanced and comprehensive view of expatriate attitudes on any issue of interest. It also provides a mechanism for tapping the unique contributions that many overseas Australians can potentially make. It is great to see this

issue now being taken seriously by responsible Australian organisations. We have the possibility of doing something truly unique that could provide diverse, informed insights into how best this nation can be positioned in the new, globalised economic and information age. Establishing patterns of regular contact may also serve to intrigue skilled expatriates to the extent that they return and develop activities here. The Australian expatriate community represents a massive, under-utilised resource for this country.

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#### Footnotes

<sup>1</sup> See website at <http://www.southern-cross-group.org>

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