

## PART 4

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# EARLY CAREER RESEARCHER, EXPATRIATE AND HUMAN RESOURCE PERSPECTIVES

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# Recruiting & Retaining Scientists: Issues, Dilemmas, Diaspora & Strategies

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## Abstract

*Problems with recruiting and retaining our best scientists start at the beginning. We are not seeing the top graduates stay on in science. Bright young students enter the course, do brilliantly, receive awards and a PhD scholarship only to turn it all down. If students go on to a PhD they often leave science altogether at its completion. This appears to be happening more frequently. In subsequent de-briefings the reasons most often given by students are: (1) biomedical research in Australia does not offer a viable career path ; (2) remuneration is poor for the effort required; and (3) funding is normally short- term and uncertain. These students often end up in Law, Commerce and Medicine.*

*One of the dilemmas faced is that we want our best Postdoctoral Fellows to gain experience in overseas positions overseas but also want them to come back. What would attract them back? What would they come back to - an uncertain career path, low incomes, fewer options? For a returning Postdoctoral Fellow the ability to enter the various Senior Fellowship schemes is now very limited. Many do not attempt it and, of those that do, many fail and become demoralised. What about bringing home the senior scientists? Federation Fellowships were aimed at doing this, but they are now being awarded to senior Australian scientists. Does this mean that top-flight overseas researchers*

*do not see even a Federation Fellowship as sufficient incentive to return? What can be done? Potential strategies and solutions will be discussed in this paper.*

## Introduction

There are a number of key issues and dilemmas that need to be addressed if Australia wishes to recruit and retain top-flight scientific talent. This will be discussed at several key career transition points and then it is proposed to suggest some strategies to deal with these problems. As my own background is in biomedical research I will concentrate on issues affecting researchers in this field.

## The Undergraduate to PhD Transition

Some of the key transition points that ought to be focused on are those in the early stages of a career. One such transition point is from undergraduate to PhD degree. As a supervisor and course co-ordinator at The University of Melbourne of both Honours and PhD programs I meet excellent to outstanding students. However, in the last five years there has been a decline in the number of really outstanding students who elect to continue with a career in research. These are the very top 1% or 2% of students who are likely to receive the Dean's award for consistent outstanding academic achievement. In discussions with other co-ordinators around the country the

story appears to be very similar. Although only anecdotal, there appears to be a consistent trend for the very top biomedical science students to decline offers to undertake a PhD and embark on a research career.

The reasons offered to me by the outstanding students are well founded. Primarily, these students do not see a career in research as a viable option. They base this on their observation of postdoctoral fellows and other researchers who receive low salaries relative to the years of study, who are often on three-year project grants and every two and half years need to consider their next career move. This is a stressful, financially unrewarding and precarious career path. In order to partake in this unenviable research career you need to complete a PhD and ideally have several successful postdoctoral positions. In short, the 'effort to return' ratio is very skewed towards lots of effort for little return. In our society, the level of remuneration is taken as a measure of how we value that career. Perhaps this says something about Australian society given the high incomes and adulation accorded sportsmen and women. The low salaries we give researchers tends to reinforce a sense of low self esteem in this group. By contrast, these bright students see their peers in other careers such as: law, medicine and commerce that are considerably better paid and only require an undergraduate degree. Consequently, many of the top students who in the past would have undertaken a research career are now undertaking alternate careers that offer a better effort-for-return ratio. Research in Australia will suffer if our very best and brightest do not see a career in biomedical research as a viable career option.

## Postdoctoral Dilemma

Another critical career transition point is at the postdoctoral level. Postdoctoral Fellows play a crucial role in driving biomedical research in this country and yet they are one of the most poorly treated groups within the research sector. There is a dilemma with the whole post-doctoral experience. We want the best post-doctoral fellows to have overseas experience. However, many will not return and will probably want to stay working in the USA or Europe where there is generally better funding and greater opportunities in biomedical research.

What sort of things are they looking for if they come back to Australia? They want to come back to a viable career in biomedical research. They want to enjoy the Australian lifestyle, particularly if they have children, but they also want to be doing excellent and exciting science. What would they come back to now? In fact, at the moment it's not particularly attractive for them to come back. Since the doubling of NHMRC funding in 1999 there has been significant investment and improvement in career development for younger researchers. However, the reality is that there is a severe problem for talented 'senior postdoctoral researchers who find themselves in limbo – the intermediate Career Development Awards are too scarce and the requirements for a Senior Research Fellowship are beyond reach.' (Editorial, 2004, p. 231).

The postdoctoral fellows who return to Australia struggle on many fronts – but the symptoms of the 'Re-entry Syndrome' are familiar to all who make the transition. Returning to Australia after an exciting postdoctoral experience in a top research group in Europe or the USA can often be a very depressing experience. Funding is not at the same level and there tend to be fewer postdoctoral fellows around who could offer support and stimulation. There is a sense of isolation and little information on the different schemes and career options available. It is still very much up to the individual to chart his or her own way. In Australia's larger cities housing is beyond the reach of most postdoctoral fellows trying to raise families on minimal incomes. Most are unable to secure a mortgage as they are on short-term contracts. By contrast, their peers in other professions are climbing a career ladder and being well remunerated. Although some survive 'Re-entry syndrome', for others it all becomes too much and they either leave research because they cannot see a way forward in Australia, or they return overseas.

## NHMRC Fellowship Scheme

If a postdoctoral fellow survives 're-entry syndrome' and is successful in setting up a research group in Australia, at about 8 years

post PhD, they may consider applying for the NHMRC Fellowship Scheme. This offers a full-time research-only salaried position for five years with the option of renewal at the end of that period. Entry to this scheme is highly competitive. In 2003, there were a total of 275 fellows in this scheme, covering four levels of seniority. Unfortunately, most senior postdoctoral fellows, even those ranked internationally excellent cannot make the jump into the bottom rungs of this scheme because the selection criteria are too strict. Consequently, these excellent young researchers are left dangling at a critical juncture in a career limbo. The other major problem with this scheme is that few people are leaving, so that it is top heavy with the most senior researchers. Currently, there are few other career options for these people so the system is becoming more congested, making it harder still for younger researchers to enter. This problem can partially be overcome by an injection of funds but we also need to think of viable exit strategies for our most senior researchers in order to free up the system.

## Australian Society for Medical Research (ASMR): Workplace Survey

In 1999 ASMR conducted a survey of researchers and workplace movement. (For details see: <http://www.asmr.org.au/news/Wkplc/wkplce.html>). This survey involved 266 respondents, ranging in age from 20 to 64, of whom 12% were based overseas. They held a range of degrees from PhD to MD with the majority completing their degrees in Australia. The respondents held a range of positions from tenure-track to fixed-term appointments and fellowships. The majority, 94% were in biomedical science and only 6% were from clinical and public health. The survey examined salaries and showed in almost all cases that Australian researchers were being paid, particularly in that post-doctoral range, considerably less than their overseas counterparts. In attempting to attract the top people to Australia we have to try and match the salary range they are being offered overseas. This is important, given the rising cost of living (particularly housing) in Australia's major cities.

For researchers working within Australia, 35% of the people surveyed were planning to change their research positions either locally or overseas. The reasons they gave for that were as follows: employment stability, research funding, broadening their scientific experience and increased salary (from highest priority down to medium priority).

What about our research diaspora? Here the reasons are similar: they wanted to broaden their scientific experience, find a career path and acquire new techniques and collaborations. About 85 per cent of those who were working overseas said they wanted to return to Australia, but they were very concerned about available research funds, poor job security, lack of a career structure and potential opportunities within Australia.

## Strategies: Increasing Funds for Health & Medical Research

So what can we do to address these issues? One of the most obvious things is to increase funding for health and medical research. The Australian Society for Medical Research recently commissioned the Access Economics report entitled: *Exceptional Returns: the Value of Investing in Health R&D in Australia* (see <http://www.asmr.org.au/general/Except.pdf>). This independent economic analysis of health & medical research in Australia showed the extraordinary returns that are derived from investment in health R&D. On average every dollar invested in Australian health R&D has delivered \$5 in national economic benefit as a consequence of improved lifespan and quality of life. The report also shows the decline in public sector funding for Australian health and medical research, and that overall we lag behind our OECD competitor countries. We now look to the Federal government to take a lead on this and increase funding to this sector to ensure it is viable into the future. Obviously an injection of funds will help enormously and allow us to address some of the critical issues for recruiting and retaining

Australia's top health and medical research talent.

## Strategies: Recruiting and Retaining Our Best Postdoctoral fellows

We need to make better use of our existing networks to track the careers of our postdoctoral fellows, particularly those who choose to work overseas. Our institutes and alumni associations need to set up a process to follow the careers of these researchers. Importantly, a formal mentoring scheme should be put in place for those people who would like to return to Australia. These mentors should advise on career options in Australia and ideally assist in the difficult transition period. I believe this would make an enormous difference to successful recruitment and retention of top-level researchers.

## Strategies: NHMRC Scheme

What about the NHMRC fellowship system? At present there is no room at the top and little opportunity for younger researchers to enter the scheme. One proposal is to provide exit strategies for those already at the top people to free up funds to create more opportunities. For example, an NHMRC Fellow's salary package attracts 48 cents in the dollar from the Federal government that is directed to the host institution as infrastructure funds. For a senior fellow that amounts to approximately \$60,000 a year and over a 17-year career this amounts to almost a million dollars. If those funds could be quarantined this would extend the life of that fellowship for another eight years. Alternately, those quarantined funds could be used to leverage state, private, federal monies to create an endowed Professorial chair. Either way this would provide exit strategies for people at the top of the scheme. In doing so it would free up funds to support younger NHMRC fellows.

## Strategies: Recruiting Top Scientists from Overseas

How do we recruit top scientists to Australia? The most useful strategy is to minimise the difference in research environments between Australia and our OECD competitors. As the environments alter with new government policy we must constantly monitor our relative position as an attractive destination for the best researchers. Many expatriate researchers want to return to Australia to raise families or for lifestyle reasons. I also believe we have to offer flexible customised packages to the very best international researchers and move away from the 'one-size fits all' approach.

In summary, to recruit and manage our best health and medical researchers we need to address their concerns. Consistently these are: research funding levels, general research environment, job security and a career structure with opportunities. We must address these issues because Australia cannot afford to continue to lose its best scientific talent.

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### Footnotes

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# Encouraging the Return of Young Biomedical Scientists to Australia: A Personal Perspective

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## Abstract

*The 'brain drain', the loss of trained young minds overseas on a permanent or semi-permanent basis, is not an exclusively Australian phenomenon. Australians from many academic and professional fields are attracted overseas where they gain experience, skills and contacts highly beneficial to this country. However, our intellectual culture and geographical isolation create particular problems in attracting Australian expatriates home. As biomedical scientists, the major problem perceived by overseas colleagues is the lack of attractive positions in Australia available at a postdoctoral level or higher, and the difficulty of becoming aware of such positions while overseas. This problem is compounded by the attractions of working overseas where facilities and salaries are often superior and researchers have easy access to the world-wide academic community.*

*Australian scientists have a high reputation that leads to being actively encouraged to pursue careers elsewhere. One solution may be to establish a scheme whereby scientists working overseas can be kept informed about positions available at home. In addition, we must encourage an Australian culture where academic achievement is valued and rewarded in the same way as sporting excellence, as well as promoting the advantages of working in Australia.*

## Introduction

The 'brain drain', the loss of trained young minds overseas on a permanent or semi-permanent basis, is not an exclusively Australian phenomenon. Our intellectual culture and geographical isolation, however, are associated with particular problems in overcoming this loss. Like many countries, Australian scientists are trained in an environment that encourages and rewards young scientists who leave our shores at the completion of their higher degrees to work for a time in an overseas institution. This in itself is not part of the 'brain drain' and should not be regarded as being negative. Experience in a foreign work environment brings clear advantages not only to the new graduate, but also to Australia. As well as the obvious advantages of acquiring novel techniques, inherent to most new positions, the graduate also has the opportunity to see how other cultures view scientific research, as well as learning valuable new approaches which can be taken back to Australia. Further, most young Australian graduates gravitate towards post-doctoral research in America and Europe, where they have much greater opportunity to attend the large international meetings that are held almost exclusively on these continents. Participation at these meetings and the relative geographical proximity of research groups with interests related to their own, allow them to

meet similar-minded investigators and to form research collaborations and personal relationships from which both they and Australia can only benefit.

The problem, however, is that many of our young graduates are not returning from temporary positions overseas, but rather decide to continue where they are or to take up another position overseas. The question is thus: *If we wish our fledgling scientists to spread their wings, how do we encourage them to return to the nest?* Together with my husband, a Medical Historian, I have spent nearly five of the past seven years working as a medical researcher in Europe. I have worked with researchers from many countries (at one point, I was working with 14 different nationalities in my host laboratory in Germany), but, with few exceptions, nearly all my European, Asian and American colleagues returned to their homelands at the completion of their work contracts. It was not only my husband and I who willingly chose to stay much longer than we had initially planned; e-mail contacts with friends and classmates from university who had also left Australia to take up positions overseas made us aware that few were returning to Australia, or, having done so temporarily, were leaving again to take up a position elsewhere.

## Opinions of Other Researchers

In writing this Opinion Piece, I canvassed opinions from other young Australian scientists as well as drawing on my own experiences and those of my husband. The most common reason quoted by expatriates for not returning to Australia was the perceived dearth of available academic and research positions at post-doctoral and senior levels in Australia, and the fierce competition for the few positions available. The National Health and Medical Research Council's (NHMRC) Training (Postdoctoral) Fellowships allow the recipient to work either in Australia for four years or alternatively for two years overseas, followed by two years back in Australia. In 2004, a total of 83 Training Awards were granted, including both those scientists wishing to remain purely in Australia and those intending to pursue the option of working overseas for two years. Compared to the number of PhD students graduating in the

biomedical sciences every year, this number is small and academic positions within the university system are few and becoming scarcer as universities adjust to the economic constraints that have forced such a reliance on fee-paying students.

While only 203 applications were received for the awards this year, this number reflects less a low demand for such positions than the reluctance by many new graduates to apply for these extremely competitive awards, with the perception that the chances of success did not justify the commitment of time and effort required by such a submission. Consequently, many graduates apply directly for an overseas position, usually via a contact made at a conference or through a recommendation made by a more senior colleague or supervisor. Once the graduate is working overseas, it is perceived as more difficult to secure a consecutive postdoctoral position, let alone a more senior post, back in Australia.

## NHMRC Awards

The Career Development Award scheme was instituted by the NHMRC as a step on the NHMRC postdoctoral research career ladder, but the pyramid of NHMRC-funded research positions narrow further at this level, with only 39 successful new applicants across Australia in 2004. There is even further narrowing of opportunity at the next level of Research Fellow (the point at which one is finally considered an independent researcher, usually at least 9 years post-doctoral), with the number of new Fellowships offered in 2004 being only 35.

NHMRC-funded Fellowship positions, of course, are only one option for a career in research - apart from teaching or clinical positions that include a research component, it is also possible to work as a Research Officer within an established research group - but the NHMRC path is certainly the most prestigious. Despite the power of the internet, our overseas-based young scientists also experience difficulties in learning about new positions as they become available in Australia. Moreover, they are rarely in a position to attend Australian national and local conferences, where the few available positions are often advertised and recommendations regarding young scientists are exchanged by senior colleagues. In contrast, many expatriates recount that

during their time overseas they were actively approached regarding other positions in their host laboratory or in another laboratory in that country. This is also my experience and that of my husband. It must be remembered that scientists who gain a position overseas have usually already earned a Fellowship, whether Australian or awarded by the host country, or have successfully competed with the local graduates for a position. These individuals have thus already proved their competitiveness in both the national and international arenas. It is my experience that Australian scientists enjoy a reputation overseas as well-educated, hard-working and extremely capable researchers; they are regarded as a bonus to any laboratory in which they work, and are encouraged to extend their stay in their host laboratory or to accept another position in the same country.

A real attraction for many expatriates is the fact that specialised research facilities are more readily available in the US and Europe, no doubt as a result of their larger populations. In addition, major grants provided, for example, by the NIH or the European Union tend to be significantly larger than those usually provided by the NHMRC and ARC, allowing for more ambitious projects and perhaps more job security. Sources of research funding are much more restricted in Australia than in Europe or America where there is both significant investment by industry in biomedical research (almost absent in Australia) and, especially in the US, a greater culture of philanthropy for research. During my time in Germany, I became aware of and was involved in applications for major and accessory research funding to various federal and state (Bavarian) government bodies, European Community institutions, pharmaceutical firms and professional and special interest bodies. As new research ideas and plans evolved, it was often possible to raise funds for a pilot project or even a major piece of work from these alternative sources, whereas in Australia long-term funding is provided primarily by the NHMRC and ARC. The fact that centralised federal funding in Australia plays the almost exclusive major funding role in Australia clearly intensifies the significance of this source, both financially and psychologically.

Another reason Australians remain abroad is the fact that their earning capacity is higher overseas. Because of the difficulties in

comparing levels of different positions between, and even within countries, it is difficult to directly compare salaries, but the following figures illustrate my point. The NHMRC provides a salary package that includes the Fellow's salary, University 'on-costs' (currently about 27%), a travel component and funds to support the Fellow's research (the proportion of which is decided by the university administering the award). The salary for what was until recently called a 'Career Development Award' (usually 3 to 9 years post-doctoral) at UNSW is thus A\$65,000. By way of comparison, a researcher at a similar level in Germany earns approximately 50,000 (A\$ 83,000) and in America (where wages are often negotiable) can earn from US\$ 60,000 to as much as US\$ 110,000 (about A\$ 77,000-141,000).

The standard of living allowed by any wage will obviously vary according to the local cost of living and taxation levels, but comparison of the salaries and living costs - such as rent, health insurance and other essentials - with those of colleagues at a similar level in Germany and the US indicates that my overseas colleagues have more in the hand at the end of the month. This discrepancy reflects, in my opinion, a fundamental difference between Australia and many other countries with respect to how scientists are valued. In Europe, scientists and academics are highly regarded as significant contributors to their societies. In contrast, scientists in Australia tend to be overlooked in a culture that neglects academic achievements in favour of exalting achievements on the sporting field. The salaries paid to scientists also reflect this situation: after 3-4 years undergraduate study, 3-4 years postgraduate study/research and overseas experience, a young researcher typically receives similar remuneration to friends of the same age who hold a Bachelor's degree (for example a secondary teacher), but usually have less job security and work longer hours. An NHMRC Fellow is by definition one of Australia's most promising biomedical researchers, but the fact that our leading national funding body (and our society in general) rewards the work of our best and brightest researchers relatively poorly is sending the dangerous message to young expatriates that they cannot expect to be highly valued in their homeland.

Another perceived disadvantage of Australian science is that the academic community is rather small and geographically isolated, both from one another and the rest of the world. During my time as a C.J. Martin Postdoctoral Fellow, I felt quite cut off from the Australia research community. There is certainly an NHMRC mentoring scheme that can be accessed by Fellows who experience problems during the tenure of their award but, following my letter of offer of the Fellowship, I actually had little further contact with the NHMRC.

I might not even have been conscious of the deficiencies of the Australian situation had I not spent the year prior to my assuming the C.J. Martin Fellowship as an Alexander von Humboldt Research Fellow in the same laboratory. This internationally competitive postdoctoral fellowship is awarded by the Alexander von Humboldt Foundation, which in turn is partly funded by the German government. In contrast to the NHMRC, the Humboldt Foundation maintains a close and personal relationship with all its Fellows, whether foreign scholars coming to work in Germany or German scholars being funded to work overseas, both during and after the tenure of the fellowship. For example, workshops are organised so that new and ex-Fellows - from all possible countries and research areas - can meet and discuss their work, while social events such as dinners were organised throughout Germany and regular mail contact is maintained. These events made me feel a part of the Humboldt family, and thus part of the German academic community, and this contact continues today, nine years later. I suggest that the establishment of a similar organisation in Australia to maintain contact with researchers leaving our shores should be considered. This which would improve communication with overseas scientists about opportunities and the benefits of returning to Australia and assist scientists here who are seeking to fill an available position.

## Other reasons for overseas preferences

While there is no doubt that Australian science is of international standard, several expatriates have mentioned the difficulty for Australian scientists attracting international collaborators of a high calibre to Australia,

and the fact that those laboratories that are successful in doing so often subsequently gain significant funding from international funding bodies, vital to their research programs. Again the distance between Australian and many other academic communities is seen as a problem when it comes to the promotion of one's work. International meetings, where academic relationships and collaborative research are initiated and strengthened, are almost always held in the northern hemisphere. Participation in these meetings is acknowledged to be very important, especially for young scientists presenting their own work and meeting other researchers in their area to discuss research developments. Given that the distances are usually too great for a short visit and travel funds, if available at all, are extremely limited, most Australian scientists will struggle to attend one international meeting per year, and often cover a proportion of the costs for doing so from their own pockets. Travel funds are rightly considered an important part of our most prestigious Fellowships, but many other researchers do not have access to such funds as part of their position, and there are only limited possibilities for applying for travel funds via, for example, charity foundations. In contrast, scientists in Europe and America can attend several international meetings each year without losing a significant amount of research time.

Other reasons contributing to the failure of researchers to return to Australia are personal. Scientists who take up positions overseas are almost by definition somewhat more adventurous in spirit than their colleagues; certainly, of those whom I have met, many had previously travelled or worked overseas, and were thus less tied to the idea of living permanently in Australia than those who choose not to seek overseas positions. Further, many are single when they leave Australia as young postdocs but find a partner while working overseas, so that it is not only the Australian who must be attracted home, but also their partner and perhaps a new family. For these reasons, offers of practical assistance in their re-establishing themselves in Australia might be persuasive.

When weighing up the choices of working in Australia or Europe, my husband and I considered many different factors that may not be generally regarded as important by

those who have not undertaken such a step. For example, although no furniture was involved, even the costs of moving our personal items from Germany to Australia was not insignificant, especially as removal costs in Germany are two to three times higher than those in Australia and a shipping time of at least three months must be accepted. The offer from our research institute to cover those moving costs, while not the decisive factor in our decision, helped us to feel as if we were valued members of our institute.

On the other hand but in a similar vein, another colleague was swayed by the subsidised housing scheme and health plan offered by her American university to attract scientists there. Unlike the US or many European countries, health insurance is not a major cost in Australia, but housing costs are significantly higher in Sydney and Melbourne than in other Australian cities or cities overseas, and a similar scheme might also be considered here. It must be remembered the major universities and research centres in Europe are often based in small or medium-sized towns, which can offer reasonably-priced housing and a quality of living superior to our major urban centres where the majority of our universities are located. Returning to Sydney, we reluctantly exchanged a pleasant fifteen minute stroll to our laboratory through a small medieval town in Germany for a one-hour drive through Sydney's peak-hour traffic to our Institute in one of Sydney's most expensive areas. Other 'extras' that might attract young post-doctoral researchers, who are often at a point where a family is for the first time an economic possibility, might be the promotion of paid parental leave entitlements often available at Australian universities and improvements to the availability of child-care facilities.

## Concluding Comments

In essence, the major reasons why young researchers do not return to Australia are a lack of suitable positions to which they can return, better research and funding opportunities elsewhere, insufficiency of financial rewards for returning and the distance from the world's academic community dictated by our geographical isolation. While we can't row Australia closer to the northern hemisphere, we can develop a culture where scientific achievement is

encouraged and valued in line with the rest of the world. Australia has proved that we can train and retain world-class sportsmen and women, surely it is time to do the same for those of us who seek to push the boundaries in the field of science? In 2003, my husband and I chose to return to Australia from Europe for the second time to pursue our research. Will we be staying? We are maintaining open minds on that question.



# The New South Wales Expatriate Return Awards Program and the Network of Expatriate Australian Researchers

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The Australian Government is now successfully attracting some high-achieving expatriate researchers back home through the Federation Fellowship program; however this scheme can draw in only a few individuals under quite specific guidelines. There are many more expatriate Australian researchers who have not returned (and will not return) home for personal or professional reasons. The enormous wealth of expertise and knowledge that resides with our expatriate Australian researchers is a considerable and valuable resource.

For a great variety of reasons, our expatriate researchers have chosen to live abroad temporarily or permanently and, despite their skills and experience, Australia has lost contact with much of its diaspora scattered throughout the world. For many researchers, working overseas temporarily is an essential part of their professional and personal development and many Australians have risen to fill very significant, high-profile positions across the globe in their chosen fields of endeavour. Given the high level of global mobility now prevalent in research, it is outdated for us to consider our 'intellectual pool' to be comprised only of those who live in Australia. There needs to be a new paradigm that recognises that the future of Australian leadership in R&D activities will come through identifying Australian-born or Australian-trained researchers (who understand the Australian system and Australian ethos), but who are well-

connected to and comfortable with research activities on a global scale.

For many of Australia's expatriate researchers, despite their strong desire to establish or to re-invigorate research linkages with their colleagues and would-be collaborators in Australia, there are at present only very limited avenues available to make this happen.

The New South Wales Expatriate Return Awards are a joint initiative of The University of Sydney, the NSW Department of Education and Training and initially the CSIRO. The program was originally conceived as a vehicle enabling expatriate researchers to establish and re-establish links to researchers in Australia, to provide expertise and develop longer term collaborative linkages. The awards are available for periods of 3-6 months and provide sufficient funding to cover temporary relocation for the researcher (and his/her spouse and immediate family) to Sydney as well as a living allowance to cover local costs, health insurance etc during the stay in Australia. The approximate cost of the program is about \$40 000 per researcher.

The Expatriate Return researchers have also been heavily involved in an Outreach and Schools Program involving the students and staff in NSW Schools as well as establishing productive research alliances.

The schools program has been coordinated by the NSW Department of Education and the researchers provide 'real-life' examples of successful Australian scientists who are outstanding achievers in many different disciplines. Because school outreach is an integral part of the project, the expatriate researchers have been selected to be excellent communicators and their enthusiasm is inspirational. A review of the Outreach and Schools Program in 2003 was exceptionally positive and indicated that the program provides an excellent means to engage students in sciences and technology by providing real examples of successful Australians who are obviously successful even in the international arena.

The first awards were made in 2003 to Professor Paul Franzon (who is an expert in molecular electronics and developing high-density computer memory based at North Carolina State University) and to Dr Theo ten Brummelaar (who is an astrophysicist and Associate Director of the Centre for High Angular Resolution Astronomy [CHARA] at Georgia State University based at the Mt Wilson Observatory in California). Both visits were enormously successful, not just in the new linkages and research ideas which emerged, but in the very positive impact that these two scientists had on the thousands of school children and teachers who they spoke to and interacted with in the outreach program.

The program continues into 2004, with awards to Professor Ian Gardner (who is Professor of Epidemiology at the University of California, Davis and an expert in animal health and the spread of animal diseases) and to Professor Ken Waldron (who is from Stanford University and an expert in robotics and in particular the development of legged robotic vehicles suited to challenging terrains). Both of these visits will happen in the second half of 2004.

Thinking more broadly, we have proposed a Network of Expatriate Australian Researchers (NEAR) for support by the Federal Government under the ARC Networks Scheme to bring together all Australian researchers living abroad. For additional information visit the website<sup>1</sup>. NEAR will provide opportunities for Australian researchers overseas to engage and re-connect with researchers and research groups in Australia and for Australia to benefit from the talent and expertise of its expatriate researchers. NEAR will significantly extend the

program beyond Sydney University to be an Australia-wide enterprise with a longer time horizon permitting multiple visits (perhaps 3 months in each of 2 or 3 successive years). NEAR would also encompass not just the Sciences and Technology disciplines but also medical researchers and researchers in the Social Sciences, Humanities and Performing Arts. The success of the New South Wales Expatriate Return Awards Program suggests that the key to harnessing the resources of the Australian diaspora is to identify opportunities which emphasise mobility and flexibility. To some extent, NEAR will go some way to reversing the 'brain-drain' by providing mechanisms to draw back a real contribution from our very skilled expatriate workforce in a mutually beneficial fashion.

The opportunities offered by the NSW Expatriate Return Awards Program and by NEAR raise the exciting prospect of bringing the best Australian researchers back home, of creating and enhancing connections to the world's top institutions, and providing outstanding educational possibilities for the next generation of Australian researchers. The costs associated with such a program are considerably smaller than what is needed to entice our best researchers to move home permanently.

The expatriate research community does represent a unique portal on the global research scene. Expatriate Australians are well-connected and networked in their own right and forming closer links with our expatriate research community will naturally open up new international linkages for Australian researchers.

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Footnote

<sup>1</sup> <http://near.chem.usyd.edu.au>

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# Challenges to Reversing the Brain Drain so as to Grow and Develop the Australian Biotechnology Industry: A Human Resource Perspective

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DAVIDSON GROUP

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There exists a limited talent pool of individuals having specific technical skills to take a therapeutic good through the various stages of commercialisation. More specifically, in the past two years, many Queensland based companies have requested Davidson Group to identify and select clinical research and development, regulatory affairs, validation and quality assurance personnel with at least three to five years relevant industry experience pertaining to the development and manufacture of drugs, diagnostics, vaccines and medical devices. Additionally, synthetic organic chemists, qualified to PhD level and often holding post-doctoral experience from an international institute or university, are regularly sought by emerging Australian biotech companies. Unfortunately, these highly sought after Australian scientists, who play a key role in drug discovery and design programs, often do not return home to Australian start-up companies due to the poor remuneration packages on offer and the enticement of globally-recognised multinationals in Europe and the US that can offer more significant career opportunities and greater financial security. Joining such a global organisation enables an Australian scientist to build a well-branded CV that could not be developed in Australia due to the lack of multinational head offices located in our country.

Another major drawback for the Australian Biotechnology industry is the deficiency in the number of mentors from the upper echelon of science and technology disciplines residing in Australia. Our budding talent are drawn to, for example, the San Francisco Bay Area in California where, expatriate candidates tell me, they attend seminars and symposia alongside Nobel Prize winners with whom they are able to discuss their research and career ambitions and from whom that can obtain guidance and advice.

There is also some aversion displayed by Australian companies to wait for three to four months for a high quality, suitably experienced individual to see out their relevant notice period with their overseas employer before relocating and being able to commence employment in Australia. Australian start-up companies often approach Davidson Recruitment with an 'immediate need' for an expert to join their team so as to achieve an important commercialisation milestone. This often reflects a lack of forward planning and forecasting of human resource needs on the part of Australian biotechnology firms and their management teams.

It is not unknown that a limited talent pool of individuals exists at the senior management, executive and Board levels, possessing adequate management skills required by high-growth start-up companies (refer PMSEIC Working group report - 2002).

Remuneration packages and their inclusions are an issue, as is the size and global significance of the Australian Biotechnology industry compared with the industry and its companies in the northern hemisphere. It would be advisable for Australian start-up companies to offer Chief Executives a significant equity stake in the company that they are to lead, together with a moderate, yet competitive base salary and other typical CEO remuneration inclusions. Lifestyle, high quality education and a great climate are some of the advantages that Australia can leverage to attract first-class executives and managers to our shores. Such issues as taxation on existing assets held by foreign workers immigrating to Australia have been addressed in previous PMSEIC working group reports. Professor Michael Vitale, Australian Graduate School of Management at the University of NSW, has also undertaken some valuable research into this aspect of the Biotechnology industry.

Another problem for the industry is the lack of production facilities with large-scale biological manufacturing capabilities that are globally competitive, cost-effective, and hold relevant regulatory compliance for producing clinical grade goods. Furthermore, there exists a limited pool of scientists and engineers with the associated large-scale fermentation and protein purification skills to operate these manufacturing facilities. This talent pool resides overseas in North America, UK and Europe, and many of my colleagues from university have gained employment with large contract-manufacturing organisations since graduating. Dr Damian Hine, University of Queensland, could provide further information on this topic.

Other key issues associated with attracting local and foreign investment to the Australian Biotechnology industry have also been addressed by PMSEIC working groups and Dr Mike Hirshorn, (CEO St George Innovation Fund) has substantial expertise in this area.

## Reference

The Prime Minister's Science, Engineering and Innovation Council (2002), Ninth Meeting, 5 December, 'Management Skills for High Growth Start-Up Companies: Unleashing Australia's Entrepreneurial Potential'.

At website - <http://www.dest.gov.au/science/pmseic/publications.htm>

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### Footnotes

<sup>1</sup> Member of the Prime Minister's Science, Engineering and Innovation Council (PMSEIC) 2003.

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# Senior Executive Recruitment - A Biotechnology Perspective

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Jeremy Wurm  
Managing Director  
Brooker Consulting

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## Abstract

*This paper presents the perspective of a specialist recruitment consultant. It can be argued that recruitment consultants and human resources practitioners are in the best possible position to comment on trends in expatriate migration, since they are dealing with the 'human factors' in the appointment of science, engineering and technical staff on a daily basis, and their livelihood depends to a greater or lesser extent on their ability to attract expatriates or offshore-based staff to jobs in this country.*

## Introduction

This paper concentrates on an exploration of the very important human factors that affect the decisions of expatriates to move from one country to another – issues that involve family, financial and cultural considerations bounded by personal time horizons, as well as the more recent safety concerns that have arisen as a result of global terrorism.

## Role of Uncertainty

The role played by uncertainty in decisions of scientific, engineering and technical staff to leave Australia or to return revolve around timing issues. On the one hand, individuals are reluctant to leave Australia, fearing that their 'place in the queue' may be lost if they disappear off the local scene for any appreciable period of time. There is also an innate uncertainty revolving around security issues. For those leaving Australia, the fear is that they will be moving from the known into

the unknown, and many people are not accustomed to having to deal with such ambiguity. On the other hand, many expatriates have voiced their fears of living overseas, compared with the relative safety that Australasia offers. Such concerns have been exacerbated by perceived increases of terrorism, and there are anecdotal reports of surges in repatriation of expatriates following the September 11 attacks in the United States, with the Bali bombings contributing to the belief that Australia is a relatively safe country in which to live.

## Role of Financial Considerations

When we explore the role played by financial considerations, it is clear that salary alone is by no means a key motivator for science, engineering and technical personnel. On the contrary, they are typically motivated by such factors as kudos, power, the availability of funding support for their research, and the accessibility of researchers to specialised equipment. While all of these motivators can be attributed to finance in its most fundamental form, many speakers at this workshop have underlined the fact that research personnel are the last ones to be motivated by financial rewards alone.

## Role of the Family

When it comes to family issues, there are key roles played by parents, spouses and children in the decisions of individuals regarding whether to become expatriates in the

first place, and at what stage they should return to Australia. Parents can be a powerful factor in this equation, especially as they suffer illness with advancing years, and this emotional pressure is often keenly felt by expatriates who are sometimes made to feel that their parents (or parents-in-law) are languishing back in Australia with minimal support for them in their old age.

Spouses feel this isolation acutely too, and the problem can be exacerbated by the fact that some spouses are prevented from working in the country where their partner has chosen to base themselves. The appearance of children on the scene brings with it a completely new set of motivating factors, reinforcing the view that family is indeed a powerful driver for expatriates. However, the experience of recruitment consultants and Human Resources (HR) practitioners alike is that spouse pressure is an extremely powerful influence in the decisions taken by expatriates, particularly those relating to the timing of repatriation.

## Time Horizons

As with so many things in life, timing is the key, and there are several well-defined decision points in the life of any individual seeking fame and fortune outside Australia. The first of these is the time when the recent graduate takes advantage of the fact that they have yet to put down roots in Australia by undertaking what has been described as 'the compulsory lap', where young people go overseas for anything between three and 18 months, typically taking a working holiday and 'seeing the world'. For those who marry non-Australians at this point in their career, the issues of timing and spouse pressure combine to influence that person's career for good. For those who have gone overseas at the conclusion of a doctorate to undertake post-doctoral studies, there often comes a time when they consider the pros and cons of continuing their international experience with the promise of ample funding and access to the international scientific mainstream, rather than returning to Australia - in many cases a return to no prospect whatsoever of a tenured position.

While there are many science, education and technical personnel who relocate during their career, it is very often the case with couples who have children that they face a decision

point as their progeny reach secondary school age. This is termed by some 'the Year 8 syndrome', at which time parents may take the view that they want to re-establish themselves back in Australia to enable their children to undertake schooling in the Australian system.

Again, there are many who are courted for positions back in Australia at various stages of their career, although the final key decision point will often occur when the person has either taken a package or has reached retiring age. By that stage, many are too ensconced in their offshore surroundings to countenance a move back to Australia, while for others they have always harboured the desire to retire in Australia.

## Specialisation in Staff Relocation

The reality is that the decision points, motivators and issues are different for each person, and it is therefore essential that anyone involved in attempting to woo expatriates back to Australia needs to ascertain very clearly what the drivers are for each individual and their family unit. This is best achieved by specific, targeted questioning, which can elicit the real issues behind the decision-making processes of that person. While recruitment consultants and human resources practitioners are skilled in teasing out these motivating factors through such questioning, the role of specialist relocation consultants needs to be acknowledged.

This new industry specialises in professional handling of relocations, whether they be local, interstate or international. The relocation consultant begins with the same kind of questioning approach as used by recruitment and other human resources specialists. This questioning identifies the drivers for the person and their family unit, and the success of any ensuing relocation is very much dependent upon the quality of the original fact finding undertaken by the relocation consultant.

Some relocation consultants are so thorough as to pick up the person (ideally accompanied by their spouse) from the airport and take them straight to their hotel at the time of their initial visit, ensuring a positive and stress free introduction to their potential new living

environment. While the executive being wooed by their prospective employer will be expected to attend formal interviews, their spouse will spend at least a day with the relocation consultant, who will expose them to the key aspects of the new surroundings that are important to that family. For some it is educational facilities, others the availability of sporting, recreational, religious or cultural amenities, and the goal of the relocation consultant is to present their potential new environment in the best possible light. While this represents an additional cost to the prospective employer, there is no doubt that the input from a professionally-trained specialist can expedite the process and reduce the risk of a sub-optimal outcome.

In pondering the decision to return, whether or not they have been courted by a consultant, many may well discover on returning that the salary is greatly reduced and their personal tax is higher. Their reintroduction to Australia may not necessarily be all they had hoped for.

## Income and Cultural Factors

It is important to differentiate between the income levels paid to local employees and the compensation packages enjoyed by employees of multinational organisations who have been expatriated at the behest of their employers. Local employees by definition are subject to local taxation, income and quality of life factors, while employees of multinationals are sometimes the recipients of extraordinary income provisions. These may include costs of private education in offshore locations plus a whole range of benefits that can never be replicated in Australia. While it is true that only a minority of science, engineering and technical personnel are employed by multinationals and have the perceived benefits of being on this ‘circuit’, it is also true that these organisations have tended to reduce the numbers of such employees, due to the escalating costs of maintaining them in offshore locations, especially those sent to ‘hardship posts’.

The culture shock experienced by such privileged employees on returning to Australia can be profound, and even for those who are relocating from local employment conditions overseas to local employment conditions in Australia, there are many reports of Australians

returning home and encountering far worse than simply a reduction in income levels.

The cultural isolation experienced by some returning expatriates is significant, and they are forced to realise very quickly that their colleagues will rapidly tire of glowing descriptions of the lifestyle they formerly enjoyed in Oxford or San Diego. This has been referred to as ‘the yawn factor’ and has contributed to the observation that some Australians are indeed threatened by the prospect of competing for jobs with internationally experienced and upwardly mobile expatriates returning to Australia. To make matters even worse, many discover that the ‘tall poppy syndrome’ is not the only form of discrimination which applies in Australia. Sexism and ageism are alive and well, despite the stipulations of equal opportunity legislation, and these factors can also make life difficult for Australians returning home.

## Concluding Comments

With reportedly 900,000 Australians currently living and/or working overseas, the future prosperity of this country is directly dependent on our ability to attract people of international standing to this country. This is especially true since there are so many specific areas of endeavour in which there are well-described shortages of suitably-trained and experienced scientific, engineering and technical staff.

The issues related to brain drain finally have drawn a response from one level of government with the recent setting up of a Senate Enquiry. While the results of this Enquiry are likely to prove illuminating, and may perhaps offer some suggestions to both government and industry as to how ‘brain drain’ issues may be ameliorated, there is no guarantee that any policy implications will be implemented.



# International Mutual Recognition of Engineers

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Alec J. Hay, Chair of the Engineers Mobility Forum  
in collaboration with  
Peter Greenwood, Chair of the Washington Accord

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## General Background

*The recognition of engineering qualifications on an international basis is a subject with a long history. As far back as the turn of the last century, there was some form of acceptance of certain types of professional qualifications. But in general the recognition issue was not pursued with any vigour by the profession.*

*In the early sixties, with more movement of professionally qualified people from one country to another, it became quite common for bilateral agreements to be signed between two professional institutions from different countries, where some form of mutual recognition was covered.*

*Although this did not apply to all countries, in attempting to improve the status of engineers, the process of registering or licensing of engineers became more prevalent also in the early sixties, where engineers were held accountable for their actions and the focus was put on public health and safety.*

*Apart therefore from restrictions to mobility placed by governments through immigration controls, the mobility of engineers has always been fairly restricted by the profession itself. This is understandable as standards vary enormously worldwide.*

## Introduction to Current Initiatives for the Mutual Recognition of Engineers

Over the last decade, with the international discussions that have taken place for the recognition of practitioners in the engineering profession, generally it is evident that the

majority of countries divide the development of an engineering professional into two stages:

- Programme for an Academic Qualification; and
- Professional Development and Registration

Two major groupings have emerged from the above, each handling one of the phases.

## Agreements Developed for Recognition of the Academic Phase

### Washington Accord

- Background to the Establishment of the Washington Accord

The existence of many bilateral agreements prompted six countries in 1988 to meet and to develop the original Washington Accord, known then as the Six Nation Accord, which was signed in 1989.

This was effectively the first major attempt to establish a benchmark for not only the level and content of the degree for engineers but also the accreditation process. A new version of the Washington Accord agreement was concluded in 1997 in further support of these latter issues.

- The Agreement

The purpose of the Accord is recognition of the equivalence of accredited engineering education programs leading to the engineering

degree and is applicable only to engineers. It is essentially a quality assurance process and is based on world best practice.

Briefly, the Accord has the following basic terms of agreement:

The signatories:

- Accept that accreditation procedures are comparable;
- Accept one another's accredited degrees from the date of admission as a Full Member;
- Agree to identify and encourage implementation of best practice;
- Accept mutual monitoring;
- Accept that it applies to accreditations in home jurisdictions only; and
- Accept the need to encourage licensing and registration authorities to apply the agreement.
- Membership

The Full Members are:

Australia – The Institution of Engineers, Australia (IEAust) - 1989

Canada – The Canadian Council of Professional Engineers (CCPE) - 1989

Ireland - The Institution of Engineers of Ireland (IEI) - 1989

New Zealand - The Institution of Professional Engineers, New Zealand (IPENZ) - 1989

United Kingdom - The Engineering Council, United Kingdom (EC(UK)) - 1989

United States of America - The Accreditation Board for Engineering and Technology (ABET) - 1989

South Africa - The Engineering Council of South Africa (ECSA) – 1993/99

Hong Kong, China - The Hong Kong Institution of Engineers (HKIE) - 1995

The current Provisional Members are:

Japan - Japan Accreditation Board for Engineering Education (JABEE) - 2001

Malaysia - Board of Engineers  
Malaysia (BEM) - 2003

Singapore - The Institution of Engineers, Singapore (IES) - 2003

Germany - Accreditation Agency for Study Programmes in Engineering and Informatics (ASIIN) - 2003

The present Chair is provided by IEAust, Dr Peter Greenwood, and the Secretariat provided by ABET.

## Academic Agreements for Recognition of other Members of the Engineering Team

Flowing from the Washington Accord, a similar agreement was developed for Engineering Technologists or Incorporated Engineers, called the Sydney Accord, which was signed in 2001. The signatories to this agreement are:

Australia – The Institution of Engineers, Australia (IEAust)

Canada – The Canadian Council for Technicians and Technologists (CCTT)

Ireland - The Institution of Engineers of Ireland (IEI)

New Zealand - The Institution of Professional Engineers, New Zealand (IPENZ)

United Kingdom - The Engineering Council, United Kingdom (EC(UK))

South Africa - The Engineering Council of South Africa (ECSA)

Hong Kong, China - The Hong Kong Institution of Engineers (HKIE)

The present chair is provided by EC(UK), Mr Barry Dobson, and the Secretariat provided by ECSA.

An agreement has also been developed for Engineering Technicians, called the **Dublin Accord**. This Accord was signed in May 2002 and its signatories are:

Canada – The Canadian Council for Technicians and Technologists (CCTT)

Ireland - The Institution of Engineers of Ireland (IEI)

United Kingdom - The Engineering Council, United Kingdom (EC(UK))

South Africa - The Engineering Council of South Africa (ECSA)

The present chair is also provided by EC(UK), Mr Barry Dobson, and the Secretariat provided by IEI.

## Agreements Developed for Recognition at the Full Professional Level

- Engineers Mobility Forum (EMF)
- Background to the Establishment of the EMF

At the Washington Accord meeting in 1995, a working group was set up to explore mutual recognition for experienced engineers. This group, known as the Hong Kong Working Group, met in March 1996, together with observers nominated by the European Federation of National Engineering Associations (FEANI), and, with the addition of observers from the Japan Consulting Engineers Association, in January 1997.

Following the report of this group, at the meeting of the Washington Accord signatories in October 1997, it was agreed to establish an independent forum to be known as the Engineers Mobility Forum (EMF).

At a meeting held in London in July 1998, the participants agreed to recommend that the organisations that they represented consider becoming signatories to a draft Agreement to Establish and Maintain an International Register of Engineers. Following periods of consultation in each economy, and further discussions at meetings held in Sydney, Australia in November 1999 and Vancouver, Canada in June 2000, the participants further agreed to amend the original Memorandum of Understanding, which restricted membership of the EMF to Washington Accord economies. This permitted a wider range of organisations to become Members of the Engineers Mobility Forum. It

should be noted that the Washington Accord only accepts degrees from the date of admission of a signatory as a Full Member and hence would often not be applicable to current practicing engineers. In essence, however, the academic standard remains similar to that set for a Washington Accord accredited degree.

In terms of the total package presented by an economy, the EMF may recognize degrees:

- a) delivered and accredited in accordance with the best practice guidelines developed by the Federation of Engineering Institutions of South East Asia and the Pacific; or
- b) listed in the Index compiled by the Federation Europeenne d'Associations Nationales d'Ingenieurs (FEANI); or
- c) an appropriate engineering degree programme validated by –
  - (i) the *Engineer-in-Training* examination set by the Japan Consulting Engineers Association; or
  - (ii) the combined *Fundamentals of Engineering and Principles and Practices of Engineering* examinations set by the United States National Council of Examiners in Engineering and Surveying; or
- d) a structured programme of engineering education accredited by an agency independent of the education provider, and/or one or more written examinations set by an authorised body within an economy, provided that the accreditation procedures and criteria and/or the examination standards have been endorsed by all current signatories.

The participants further agreed that the revised Memorandum of Understanding, and the revised draft of an Agreement to Establish and Maintain an International Register of Professional Engineers should be submitted to the organisations which they represented with a recommendation that those organisations become signatories to the Agreement.

These two agreements, having been ratified

by the governing bodies of all the organizations involved, were finally signed in June 2001 at Thornybush Game Reserve in South Africa. As both these agreements were formed through a process of development, it was agreed that they be consolidated in a single document, called the Constitution of the EMF, which was approved by the members at the meeting held in June 2003 in Rotorua, New Zealand.

In the area of independent professional practice, the establishment of the EMF and all that it represents is a major attempt to establish a benchmark for the level of development, competence and professionalism required of a practitioner, who should be acceptable internationally.

- The Agreement

The purpose of the EMF is to establish and maintain an International Register of Professional Engineers.

The objectives of the EMF are as follows:

- Facilitate international mobility of professional engineers
- Establish a de-centralised International Register of Professional Engineers
- Promote best practice
- Continue mutual monitoring
- Understand existing barriers to mobility and develop strategies to assist governments and licensing authorities to manage the barriers.
- Encourage governments and licensing authorities to adopt the EMF agreement

## Membership

The Full Members of the EMF are:

Australia - The Institution of Engineers, Australia (October 1997)

Canada - The Canadian Council of Professional Engineers (October 1997)

Hong Kong, China - The Hong Kong Institution of Engineers (October 1997)

Ireland - The Institution of Engineers of Ireland (October 1997)

New Zealand - The Institution of Professional Engineers, New Zealand (October 1997)

*South Africa - The Engineering Council of South Africa (October 1997)*

*UK - The Engineering Council, United Kingdom (October 1997)*

USA - The United States Council for International Engineering Practice (October 1997)

*Japan - The Institution of Professional Engineers, Japan (November 1999)*

Malaysia - The Institution of Engineers, Malaysia (November 1999)

Korea - The Korean Professional Engineers Association (June 2000)

The current Provisional Members are:

Bangladesh - The Bangladesh Professional Engineers Registration Board (June 2003)

India - The Institution of Engineers (India) (June 2003)

Observers are:

The Federation of European National Engineering Associations (October 1997)

The APEC Engineer Coordinating Committee (June 2000)

The present Chair is provided by ECSA, Mr Alec Hay, and the Secretariat provided by EC (UK) through Mr Chris Simpson.

- The International Register

The EMF International Register of Professional Engineers is intended to provide a framework for the recognition of experienced professional engineers by responsible bodies in each of the Member organisation's economies. In particular, such bodies will be encouraged to use the Register as a secure benchmark for arrangements, which provide mutual recognition or exemption and/or streamline

access by professional engineers to licensing or registration in economies other than that in which they first gained recognition.

The register is a decentralised one and the committee of the EMF responsible for this register is the International Register Coordinating Committee, which consists of representatives of all Provisional and Full Members.

Only signatories with an approved Assessment Statement are Full Members and they have a vote on this Committee.

The Committee is responsible for:

- approving Assessment Statements;
- authorising a signatory to have a decentralised register; and
- controlling the monitoring process.

The chair and secretariat are the same as for the EMF.

The entry requirements for individuals to the International Register are as follows:

Candidates must:

- have reached an overall academic level substantially equivalent to a WA degree;
- have been assessed in their own economy as eligible for independent practice;
- have had seven years practical experience since graduation;
- have spent at least two years in responsible charge of significant engineering work; and
- have maintained their Continuing Professional Development (CPD) at a satisfactory level.

## Progress and Challenges Facing the EMF

An issue raised at the last set of International Engineering Meetings in New Zealand was the question of 'branding'. It was accepted in the EMF that this was desirable and the signatories agreed to recommend to their governing bodies that the EMF should adopt the use of a post nominal, IntPE, for engineers who are

registered on the International Register. This matter has been ratified by most signatories and should be in use shortly.

The main challenge facing the EMF is the question of 'Granting Right of Practice'. Discussions at the last meeting indicated that of the eleven Full Members, five were fairly open, two have residency requirements and four have major statutory restrictions. These statutory difficulties constitute barriers to mobility and in the future the EMF will need to focus attention on this matter. At this stage, any networking to assist in getting closer to resolving the issue would be welcome. In this context, both the World Federation of Engineering Organizations and its connections to the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Trade Organization (WTO) could be of value.

A vision in the EMF is that regional registers like that of APEC, FEANI, NAFTA and others could with time, effort and collaboration be incorporated as regional registers of the EMF.

## Other Mobility Initiatives

- FEANI

The European Federation of National Engineering Associations was established in 1951 and is one of the older organizations seeking recognition of engineering practitioners for purposes of mobility. With some 27 member countries, variations exist in level and content of degrees within FEANI. Accreditation and the operation of a national register are further matters that vary from one member country to another. FEANI is an official observer on the EMF and their interaction with the EMF member countries assures close cooperation.

- NAFTA

A relatively recent initiative also has been the development of the recognition of engineering qualifications of the North American Free Trade Association. Although the writers are not very conversant with the exact details of the agreement, it is understood that it has had positive influences in that region.

- The APEC Engineering Register

This initiative was started at a similar time to that of the EMF. Their development process

towards a register was facilitated through the APEC Economic Leaders and the APEC Human Resource Development Ministers. Generally, the standards required for being on this register and that of the EMF are the same. The current members of the APEC Coordinating Committee are: Malaysia (Chair), Australia (Secretariat), Canada, Hong Kong China, Indonesia, Japan, Korea, New Zealand, Philippines, Thailand and the United States.

As the standards are the same and the methods of operation are similar, both the EMF and APEC are working towards closer collaboration.

- ETMF

The Engineering Technologists Mobility Forum emerged from the Sydney Accord and has been structured in a similar manner to the EMF. The Agreement to Establish an International Register of Engineering Technologists was signed in June 2003. The signatories to this agreement are:

Canada – The Canadian Council for Technicians and Technologists (CCTT)

Ireland - The Institution of Engineers of Ireland (IEI)

New Zealand - The Institution of Professional Engineers, New Zealand (IPENZ)

United Kingdom - The Engineering Council, United Kingdom (EC(UK))

South Africa - The Engineering Council of South Africa (ECSA)

Hong Kong, China - The Hong Kong Institution of Engineers (HKIE)

The present Chair is provided by ECSA, Mr Terry Stidworthy, and the Secretariat provided by EC(UK) through Mr Chris Simpson.

## Conclusions

Through these discussions it is apparent that in many countries one can generally say that the profession can be divided into two spheres; the voluntary side covering learned society and vocational issues and the regulatory side covering accreditation, registration, licensing and discipline. The former is focused inwards on the profession and is usually controlled and organised by the profession itself. The latter,

often through statutory means in addition to the involvement of the profession, is focused on public health and safety, and may have some form of government control. Generally, all the participants in the discussions groups covered in this article are from the latter group covering the regulatory side.

Real and meaningful international recognition only comes from fairly rigorous processes built into agreements. It should also be apparent from the time taken to actually achieve acceptance by the parties involved in many of these agreements, that they do take time. They are not like 'club' agreements, which focus on cooperation, and which can be reasonably easily negotiated. If critical issues such as benchmarked standards, quality assurance, competency, risk management and accountability are not covered, then such agreements will not get off the starting blocks, and mobility will remain a dream.

The Washington Accord, the Sydney Accord, the Dublin Accord, the APEC Engineer Coordinating Committee, the Engineers Mobility Forum and the Engineering Technologists Mobility Forum groups collectively have chosen when meeting together to be known as the International Engineering Meetings (IEM). There is general consensus that all need to move towards having a group which covers the academic side and a second group to cover mobility to ensure economic use of available resources.

Although an applicant country needs to meet extensive requirements to become signatories to these agreements, some key issues need to be in place before such a step can be contemplated. Essentially for a country to start the process of obtaining provisional membership, there are some basic requirements to be met. For the academic side, namely the Washington Accord, the Sydney Accord and the Dublin Accord, an accreditation system, independent of the educational institutions being accredited, is required. For the professional practice side, namely the Engineers Mobility Forum, the APEC Engineer Coordinating Committee and the Engineering Technologists Mobility Forum, the country needs to have a national register in place.

Interest is growing internationally in these initiatives. At the last set of International Engineering Meetings in New Zealand in June

2003, 22 countries were present. More are expected to attend the next set of IEM meetings to be held in Hong Kong in 2005 as visitors.

Countries not yet involved are welcome to make contact with any of the persons listed in the attached Annexure A, which gives contact details for each of the groups involved. The Secretariats in conjunction with their Chairs can make the necessary arrangements for an organization to attend the meetings for the first time as visitors.

# Annexure A

## Contact List IEM - November 2003

### ACADEMIC

#### Washington Accord (Engineers)

Chair:	Australia	(IEAust)	Dr Peter Greenwood	<a href="mailto:peterg@tpg.com.au">peterg@tpg.com.au</a>
			Mr Maurice Allen	<a href="mailto:mallen@ieaust.org.au">mallen@ieaust.org.au</a>
Secretariat:	USA	(ABET)	Dr George Peterson	<a href="mailto:gpeterson@abet.org">gpeterson@abet.org</a>
			Ms Kate Aberle	<a href="mailto:kaberle@abet.org">kaberle@abet.org</a>

#### Sydney Accord (Technologists)

Chair:	UK	(EC(UK))	Mr Barry Dobson	<a href="mailto:bmdobson@aol.com">bmdobson@aol.com</a>
			Ms Katy Turff	<a href="mailto:katy.turff@iie.org.uk">katy.turff@iie.org.uk</a>
Secretariat:	SA	(ECSA)	Mr Terry Stidworthy	<a href="mailto:stidworthyt@absamail.co.za">stidworthyt@absamail.co.za</a>
			Mr Paul Roux	<a href="mailto:paulroux@ecsa.co.za">paulroux@ecsa.co.za</a>

#### Dublin Accord (Technicians)

Chair:	UK	(EC(UK))	Mr Barry Dobson	<a href="mailto:bmdobson@aol.com">bmdobson@aol.com</a>
			Ms Katy Turff	<a href="mailto:katy.turff@iie.org.uk">katy.turff@iie.org.uk</a>
Secretariat:	Ireland	(IEI)	Mr Paddy Pursell	<a href="mailto:paddypurcell@iei.ie">paddypurcell@iei.ie</a>
			Mr Denis McGrath	<a href="mailto:denismcgrath@iei.ie">denismcgrath@iei.ie</a>

### PROFESSIONAL LEVEL

#### Engineers Mobility Forum

Chair:	SA	(ECSA)	Mr Alec Hay	<a href="mailto:ahay@randwater.co.za">ahay@randwater.co.za</a>
				<a href="mailto:alechay@ecsa.co.za">alechay@ecsa.co.za</a>
Secretariat:	UK	(EC(UK))	Mr Paul Roux	<a href="mailto:paulroux@ecsa.co.za">paulroux@ecsa.co.za</a>
			Mr Chris Simpson	<a href="mailto:csimpson@engc.org.uk">csimpson@engc.org.uk</a>
			Dr Jim Birch	<a href="mailto:jbirch@engc.org.uk">jbirch@engc.org.uk</a>

#### Engineering Technologists Mobility Forum

Chair:	SA	(ECSA)	Mr Terry Stidworthy	<a href="mailto:stidworthyt@absamail.co.za">stidworthyt@absamail.co.za</a>
			Mr Paul Roux	<a href="mailto:paulroux@ecsa.co.za">paulroux@ecsa.co.za</a>
Secretariat:	UK	(EC(UK))	Mr Chris Simpson	<a href="mailto:csimpson@engc.org.uk">csimpson@engc.org.uk</a>
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