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STANDING COMMITTEE ON SCIENCE AND INNOVATION

Reference: Business commitment to research and development in Australia

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HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON SCIENCE AND INNOVATION
Monday, 16 September 2002

Members: Mr Nairn (*Chair*), Ms Corcoran, Mr Evans, Mr Forrest, Ms Grierson, Mr Hatton, Mr Lindsay, Mr Tony Smith, Mr Ticehurst and Dr Washer

Members in attendance: Ms Corcoran, Mr Evans, Mr Forrest, Ms Grierson, Mr Hatton, Mr Lindsay, Mr Nairn, Mr Tony Smith and Mr Ticehurst

Terms of reference for the inquiry:

To inquire into and report on:

The international comparisons indicate that while the public sector in Australia supports R&D at an impressive level, business investment is less impressive.

With particular consideration of:

the R&D drivers in small and medium sized business;

the needs of fast-growing companies; and

the considerations by which major international corporations site R&D investment,

the committee seeks to address three questions.

What would be the economic benefit for Australia from a greater private sector investment in R&D?;

What are the impediments to business investment in R&D?; and

What steps need to be taken to better demonstrate to business the benefits of higher private sector investment in R & D?

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Committee met at 4.47 p.m.**BARBER, Professor Michael Newton, Secretary, Science Policy, Australian Academy of Science****MATTHEWS, Dr Mark Lawton, Science Policy Adviser, Australian Academy of Science****SERJEANTSON, Professor Susan Wyber, Executive Secretary, Australian Academy of Science**

CHAIR—I declare open the first of the public hearings for the inquiry by the House of Representatives Standing Committee on Science and Innovation into the commitment by business to research and development spending in Australia. I welcome the representatives from the Australian Academy of Science. I should say that, while this is the first of the public hearings for this inquiry, it is also the first public hearing of any sort for this committee, it being a new committee of the parliament. I think it is quite appropriate that our first witnesses are from the Australian Academy of Science, because I know the science community were great proponents of such a committee being formed in the parliament.

I remind witnesses that the proceedings here today are legal proceedings of the parliament and warrant the same respect as proceedings in the House. The deliberate misleading of the committee may be regarded as contempt of the parliament. The committee prefers that all evidence be given in public, but should you at any stage wish to give evidence in private you may ask to do so and the committee will give consideration to your request. I invite you to make an opening statement before we proceed to questions.

Prof. Barber—The Academy of Science welcomes this opportunity to address your committee. We were not aware that it was in fact such an auspicious occasion and we are pleased to have this opportunity. I propose to make some general remarks on the relevant issues and then turn to my colleagues to make some more specific comments that are particularly relevant to SMEs.

Notwithstanding the recent and pleasing upturn in business R&D evident in the latest ABS R&D data, the Academy of Science is concerned that the level and nature of business investment in R&D in Australia remains one of the most serious weaknesses in the Australian innovation system. Australia's relatively low ranking amongst OECD countries in terms of business investment in R&D as a percentage of GDP cannot be allowed to continue if we wish to maintain the sort of economy and society to which Australians should aspire. In our policy document, *Priorities in research and innovation for the next Australian Government*, released last October prior to the election, we said:

This is a serious situation that should have all sides of politics and indeed all Australians very worried. If the policy settings that are now being implemented in the changes to the R&D taxation concession legislation do not provoke a response, then the next Australian Government must move very quickly to change them.

While it might be tempting to address this important issue with broad policy initiatives such as a reversion to the 150 per cent tax concession or to reinvent the syndication scheme of the past, such methods are probably not sufficiently targeted and do have the potential to significantly distort the system. Similarly, while the fostering of strong and effective linkages between the academic research community and industry is important, any such policy should not encourage

researchers to focus excessively on short-term projects of immediate interest to industry or to create an inappropriate subsidy of industry R&D by public funds.

Similar concerns apply to similarly broad drivers applied to the public research agencies such as CSIRO. Thus the academy welcomed the announcement by Minister McGauran last Friday that the abolition of the so-called 30 per cent target on external earnings is applied to CSIRO and the other public research agencies. The academy would concur with the Chief Scientist who introduction to his report said:

... removing the targets will allow CSIRO, ANSTO and AIMS to develop more objective assessments of national and regional priorities for research, and to have a role in their implementation that is not constrained by imperatives to resource other areas of their organisations in the pursuit of external earnings.

Indeed the academy would hope that this policy change will result in a more mature approach to R&D investment by business. Ideally short-term largely technical R&D should be carried out in-house or outsourced at full cost to universities or CSIRO, while more strategic long-term research is fostered by strategic alliances between industry and the R&D providers which both share in any long-term benefits. Policies to encourage the establishment of such alliances, possibly by an enhanced tax concession or tax credit, might be worth exploring.

While the academy recognises the importance of Australia being internationally competitive when seeking international investment, the cost of R&D in Australia is considerably lower than almost all other developed OECD countries. Thus the academy believes it would not be a significant inhibition if an Australian based R&D component, that includes the building of capability, was to be a requirement whenever the government provides assistance to major industrial developments. One example where this has operated satisfactorily in the past is the Pharmaceutical Industry Investment Program to encourage investment by pharmaceutical companies.

Finally, I would like to comment on the relationship between the national research priorities exercise and this inquiry. While industry focused Commonwealth funding schemes such as R&D Start are specifically excluded from the focus of the current exercise, it does seem desirable that the research priorities that are identified articulate with industry policy. How relatively small start-up companies—say in nanotechnology—are nurtured requires a different industry policy than that required for example to encourage major service companies to utilise advances in information and communications technology. More radical ideas, such as the suggestion by the Institution of Engineers that the R&D tax concession might be differentiated, are certainly worth exploring. However, in moving in such a direction, care would need to be given that there was no resulting general discouragement of investment in R&D, thereby exacerbating Australia's performance in this area.

In our written submission we highlighted a particular aspect of R&D investment—namely, the role and management of risk—that perhaps does not receive as much attention as it should. This could be particularly significant in the case of SMEs which may need special assistance to understand, manage, minimise—and hence be comfortable with—the risk associated with R&D. Our policy adviser, Dr Mark Matthews, will make some more specific comments on this aspect in a moment.

Thus, in summary, the academy would say that the low expenditure, by international standards, by the business community on R&D in Australia is one of the most serious weaknesses in the Australian innovation system. Broad, undifferentiated approaches to the stimulus of business R&D, while effective to some extent, do have significant deficiencies and need to be augmented by more targeted policies, programs and incentives aimed at more specific examples of market failure or structural impediments. Thirdly, a major goal of government policies in this area should be the attraction to Australia of major international R&D expenditures and the establishment in Australia of more R&D operations, such as the new Motorola Australia Software Centre which has been established in my home state of Western Australia in partnership with the University of Western Australia, the Western Australian state government and Motorola. Finally, consideration should be given to articulating the current national research priorities exercise with industry policy.

Let me now hand over to Dr Matthews and Professor Serjeantson for a few comments. I look forward to answering any questions you have on the issues I have raised, both here and in our formal report.

Dr Matthews—We have attempted to provide the inquiry with a perspective intended to assist policy makers in their efforts to generate sustainable business commitment to investment in R&D. I will start by emphasising the importance of investment risk management. The survey by the Australian Bureau of Statistics on innovation in manufacturing—the latest edition of which is 1996-97; the series is now discontinued—found that over 30 per cent of the businesses reporting that they undertook technological innovation also reported that they had abandoned innovation projects. There is nothing wrong with abandoning innovation projects—early abandonment can, indeed, be a feature of good management—but the reasons for abandoning the projects do tell a story. The most important reason for companies abandoning innovation projects was that the costs were too high or hard to control, with 70 per cent saying that this was important. Other important reasons for abandoning R&D projects were expected low returns, with 53 per cent saying that this was important, and the payback period being too long, with 49 per cent saying that this was important. These are all factors related to investment risk management and could reasonably be interpreted as suggesting that there is room for improvement in risk management. After all, possible variances in costs, likely payback periods and the consequent probabilities of making different returns on the investment are all key aspects of investment risk appraisal. The more considered the plan, the more likely it is to be successful. These are fairly old statistics, but they are suggestive.

SMEs face severe difficulties investing in R&D, not because they are unaware of the long-term commercial benefits but because they simply do not have the management experience to handle the new types of investment risk involved, and they know this. These are the management capacities: to accurately identify and appraise possible investment risk factors; to develop investment risk mitigation strategies and tactics; to build these investment risk mitigation approaches into R&D project plans; to actually execute R&D projects in a way that allows investment risk to be minimised and learn from this experience in such a way that future R&D projects are more likely to face lower risks than would otherwise be the case. This is by understanding how and why things went wrong in the past and, if you like, retaining this in corporate memory.

It is noteworthy that it is now a requirement that an R&D plan be prepared in order to be eligible for claiming the R&D tax concession, but the recommended content of these R&D plans does not address the very investment risk issues that constrain real business decisions on whether or not to fund R&D and how to carry out this project such that investment risks are minimised. As a result, these R&D plans are unlikely to encourage effective investment risk management relating to R&D, the very thing that is required in order to release business investment. It would therefore be worth considering modifying the required format of R&D plans in order to encourage companies to deal explicitly with the investment risks that they face and how they intend to deal with them.

Finally, on reading the Chief Scientist's recent report on the external earnings target for CSIRO, ANSTO and AIMS, we note that the set of indicators being developed by CSIRO as part of the output pricing review currently addresses reduced business risk as part of the indicators associated with improved competitiveness and innovation. On the basis of the arguments put forward in our submission, this is a welcome emphasis. We would hope that the emphasis on reduced business risk will be retained in the final set of indicators adopted by CSIRO. Indeed, such performance indicators would be of more general use in assessing the delivery of policy.

CHAIR—Thank you, Dr Matthews. Professor Serjeantson, would you like to make a comment?

Prof. Serjeantson—Just a few words, if I may. First of all I would like to say that the academy welcomes some of the modifications that were made to the Taxation Laws Amendment (Research and Development) Act last year. We were particularly interested in seeing that what previously had been permission to claim only for exclusive use of plant was changed to pro rata claims and we think that is going to be very important with small to medium enterprises. The second thing is that R&D is being changed from 'high risk and innovative' activity in the earlier draft legislation to 'high risk or innovative'. That is quite important in the emphasis that we have put on risk in our written and verbal applications.

I will turn briefly to some of the practices in Canada, which have tried to assist SMEs in reducing the risks that are involved in their R&D activities. In Canada, the federal government provides incentives through the taxation system to individuals and to companies that are performing scientific research and experimental development—they call it SR&ED. Where SR&ED is conducted in Canada, the expenditures are deductible as a regular business expense but they also generate substantial tax credits. The tax credits can range from about 20 per cent of the expenditure, in the most favourable circumstances, up to 50 per cent because some of the provinces kick in as well. Often these credits are refundable even if no taxes have been paid, so they offer a critical source of funding for many start-up companies. We started to move to that in our legislation last year. In Canada, the SR&ED term is defined a little bit more liberally under their income tax act. The term is defined to mean a systematic investigation or research carried out in a field of science or technology by means of experiment or analysis. We think that might be really attractive to SMEs because we are not insisting it should be high risk; the work does not have to be high risk. It does not even have to be particularly innovative; eligible work includes incremental improvements to existing technology.

There is one additional feature of the Canadian scheme that I want to point out to the committee because it would not be very expensive to implement and it could be quite useful. It is called the Preclaim Project review, and that operates under the scientific research and development program. What it means is that people who are in small business can get advice from government officers before they start their R&D. The Preclaim Project review was introduced as one means of reducing an important risk associated with undertaking R&D. The government officers discuss in advance which R&D projects will be eligible for SR&ED tax credits. It is important to point out that the Preclaim Project review service is not an advanced tax ruling. The service simply gives an indication of the eligibility of the work and this is one simple, cost-effective way in which government can help encourage business investment in R&D, especially in small businesses.

CHAIR—Thank you very much for your submission and for the additional points that have been made. We have almost a full committee here, which is good. Dr Matthews, the changes to the R&D plans will include a better aspect of ‘risk’. Can you give us an example, even if it were theoretical, of how you see such a modification to the R&D plan would work?

Dr Matthews—It always helps to hang it around particular examples. Let us imagine a small engineering company is developing an improved compressor—that is their technological strategy which will involve some R&D. It would be useful, as part of the process of drawing up the R&D plan—and one has to remember that quite often discussions within the firm which are focused on preparing the plan can be as invaluable as what goes into the plan—to identify, rate and rank in importance the technical risks we are going to face in engineering terms in trying to achieve our R&D objectives. What are the economic risks associated with the costs of achieving those technical objectives? Having identified the relative importance of those technical risks and their commercial implications, the business then has to consider what might be done to alleviate, to mitigate, some of those risks. What I have found in the past talking to SMEs both in Australia and overseas—I was most recently in the United Kingdom—is that they discover nasty surprises once they get halfway through the R&D process and they say, ‘I wish we’d thought of that because we would’ve done it differently.’ It is really to give a bit more foresight to what is going to happen in the R&D process and to plan out what will be done with contingencies to cover against those different things that will go wrong. I hope that clarifies things.

CHAIR—When you are talking about theories of risk management and various things, pulling it back to a practical example really helps people to perceive exactly how things will be implemented.

Mr TICEHURST—The Canadian system of tax credits is probably a very good scheme, particularly for small businesses. When you talk about technological risk assessment, in a small company that is fairly difficult. I have been involved with start-up and small companies. I actually started my own about 12 years ago; before that I was running a much larger company, where you had staff and you could allocate people to put these plans together. A lot of innovation and a lot of development comes out of small companies that started as probably microbusinesses, and I think the idea of a tax credit is probably very reasonable because, when you are faced with a situation of filling out all the information required—export grants is another classic example—you have a pile of stuff that is totally useless in running the business, and some of the R&D requirements would probably be no different from that. It gets to the

stage where you say that if you are going to do the job, you just get on and do it and forget the tax credit. I have made that decision myself and just gone ahead and done it. As a result, you finish up with increased turnover on which you are paying more company tax. But you do not have the impetus to go on and put more effort in; whereas if you could either enlist some assistance from a research organisation or perhaps get a tax credit I think you would achieve a lot more.

Prof. Barber—I agree. It is interesting to link Mark's comments and your comments back to remarks made by Professor Serjeantson with respect to the Canadian system, which has an element of trying to educate. In my substantive job I am Pro Vice Chancellor of Research at the University of Western Australia, and I deal with numbers of small companies. One of the things I am appreciating is just the point you have made: there really is a need to educate. If you are a big company, you have tax advisers and sources of information. If you are a small company, you do not have that. So, if there is some knowledge of what has gone before, how you might actually recognise these issues and particularly manage them, that would be quite important on two sides—that is, encouraging some companies and, from Australia's point of view, actually capturing their innovative activity within our wider statistics.

Perhaps I could use this opportunity to add one postscript. Some tax credits are a part of Backing Australia's Ability, but a group of small companies in Australia are excluded from that. If you are successful enough out of a university to have retained majority ownership of those companies, you are ineligible for those tax credits. Those companies are often in spin-off companies. There is a company out of the University of Western Australia in which the University of Western Australia holds a 70 per cent equity, but that company is unable to access that cash tax credit. They still get the tax credit but not the up-front cash injection, which is very useful for companies at that stage. Given that we are a public organisation, it is not quite the same as being a subsidiary of BHP. So I think there is some scope to both look at the existing tax credit legislation and perhaps tune it to deliver what really was the objective—that is, to give some working capacity to companies at a very important stage. I think your comments, Mr Ticehurst, are very apposite.

Mr MARTYN EVANS—Since we are talking about science and how we might promote research and development in the industrial community, I think it would be very useful to review the paradigm and have a look at what we are doing and test some of the hypotheses here. Without advocating the issue—I think we are just looking at what we are doing here—I sometimes think that we are putting an awful lot of money, hundreds of millions and often billions of dollars, into these areas and we always look at ways of redistributing that tax money; we do not often look at how we direct it. Have you considered some of the issues not just in terms of arguing about how we should position the tax dollars but in terms of whether we should, for example, look at industry assistance as industry assistance, because it seems to me that a lot of the things that we have been discussing here are issues of how we help small business be a more effective small business. We are not discussing how we help business do science but how we help business do business and how we help start-up businesses be start-up businesses, for example. How do we help industry do better science and capture science for commercial purposes?

Victoria, for example, is looking to get a cyclotron started. What if this money went to build cyclotrons, what if this money went to build gene sequencing devices, what if this money went

to build supercomputers, what if this money went to build research vessels for ocean-going fishing research and so on—very large capital and other uses for research purposes in, presumably, public hands? These are things which cost hundreds of millions of dollars, which no-one in this country can afford to do and which previously we have never done but which would capture a large slice of research and would put us in an internationally competitive position for research, which would presumably then generate a large number of commercial opportunities. One assumes that if you have a functional cyclotron one has spin-off projects that arise from it. I know we are always talking about how we could redesign the tax act again—and again and again and again—but should we in fact look at this problem in another way?

Prof. Barber—A couple of remarks come to mind. I would agree that Australia needs to invest in those sorts of infrastructures. In fact, the academy has just put out a discussion paper on research infrastructure which I think you might find interesting—and I will arrange for you to be sent a copy of that paper—which discusses it in a way of identifying global facilities. However, I also believe that your comments about developing business or business assistance in that context are critical issues that would need to be addressed in that framework. I think Australia has had—and still has to some extent but not as much as people tend to regard it—a problem of translating good ideas into commercial outcomes or in the end to benefits to Australia, whether they are wealth generation, economic, social or triple bottom line benefits. I would agree with you that we have tended to look at that rather as broad policy, to try and do it by giving a broad tax concession. Whether one wanted to go as far as the Institute of Engineers, who in their report argued that they wanted to find things of importance to Australia and then specifically do things again with tax, would be worth debating.

The critical issue, though, is that, even if you advocated more investment at the infrastructure or science end of the equation, I still think that, within the nature of the Australian economy, one has to think about what is the most effective way to stimulate business to take up those ideas and put them through the economy. That means, in a sense, what are the most effective drivers for business to do R&D as well as innovation—remember, innovation is not just R&D. The reason for that is particularly in early-stage companies a lot of what you have to do is R&D. One company working out of the University of Western Australia is spending over \$1 million a year in R&D sourced by an investment by Samsung Corning into that company to develop products which Samsung Corning would like. Unfortunately, no Australian funding source was willing to invest in that company, so 50 per cent of the equity is held in that company by Samsung Corning. I would have said that there would have to be smarter ways for the Australian investment community to be seeing that as a gain for Australia. Tax, unfortunately, is probably a bigger driver in this country than perhaps in some other countries.

Mr MARTYN EVANS—But part of the problem is that it is already very cheap to do R&D in this country.

Prof. Barber—It is.

Mr MARTYN EVANS—This country has one of the best educated work forces. It has very well positioned universities, in general terms. I know there are improvements we can make and so on, but generally speaking our universities are well equipped, our students are well qualified, our work force is well qualified. We have a good climate. We have an exceptionally low dollar. You can do science and R&D here for half the price that you can do it for in California and

certainly for less again than you can do it in the UK and so on, and you can do it in much better circumstances here than you could do it in most other countries in the world. So if all of that is true—and we also have this generous tax regime and we speak English and we have connections to the Internet and we have all of those other advantages—then why hasn't tax already driven this solution if it is going to? That is what led me to ask the first question.

We have had this low dollar for quite a period of time and we have had this favourable tax regime for years, because both major political parties have experimented. One group has one preferred method and one group has had different methods, but fundamentally both political parties have agreed on major tax concessions of one kind or another for R&D. It has been on a bipartisan basis. We have each had our own preference, but at the end of the day we have given major tax concessions and the dollar has simply got cheaper and the country has remained very attractive. If this solution was going to deliver those golden eggs, why hasn't it?

Prof. Serjeantson—That is a very good question. What you say is correct, and it is very sad. I think it is very sad that our researchers are paid so poorly on a global scale that we are the cheapest place to do good quality research.

CHAIR—You might like to talk about the example of Singapore that we talked about the other day.

Prof. Serjeantson—Yes, I might talk about that. The CEO of SmithKline Beecham in Singapore, who is an Australian, visited Australia and came down to a 'science in the boardroom' meeting that we had, purely to tell us why his company had decided to base itself in Singapore rather than in Australia. His board had looked around the world and had come up with a shortlist of four countries. They had done the bottom line. They were all looking pretty good. Singapore was offering some particular taxation concessions. It was also offering to pay unlimited numbers of postdoctoral fellows who would be taken up by the company, the idea being that if the company moved on they would still have Singapore nationals who had international experience and international links and had been trained at the highest level.

But over and above all of that, the reason why they went to Singapore rather than going to Sydney was based on perception. There was a perception, according to the CEO—who is Australian, remember—that we were not friendly to immigrants, that we were not friendly in terms of welcoming their children into schools. Some states are charging real fees for schoolchildren. There were little things like that that at the end of the day made them choose Singapore. At the end of the day, all things being equal on the bottom line, it was perception. He said that he was not even convinced that those perceptions were correct; nevertheless, that was the basis on which the board made the decision to establish itself in Singapore.

Mr ANTHONY SMITH—That is interesting. Just on that last point you made about education, that is counter to our experience, isn't it? Our education system at a secondary level and particularly at a university level has high demand from overseas countries.

Prof. Serjeantson—Perhaps that is so. Some states are charging real fees.

Mr ANTHONY SMITH—The states are?

Prof. Serjeantson—Some states are charging very real fees for children of foreign—

Mr ANTHONY SMITH—In secondary school?

Prof. Serjeantson—Yes, in secondary schools.

Prof. Barber—In several states, if you are a foreign employee—that is, in Australia on an appropriate business visa of some sort, a temporary visitor here—then your children do not get into state schools on the same rate as Australians. Conversely, when I have worked in North America, my children were educated in North American high schools without them ever asking whether or not we were American residents.

Prof. Serjeantson—At the ANU, I had a postdoctoral student who was on a visitor visa. His wife was not permitted to work, he was getting slugged for his kids' school fees, he was paying medical expenses but also getting a Medicare levy taken out of his salary, and in the end he had to leave. He could not afford to stay. They are the sorts of things that feed on this perception of being unfriendly.

Mr HATTON—There was a comment made the other night when Martyn and I and a number of others were at the 50th anniversary of Merck Sharp and Dohme in Australia that Singapore had a plan in place. They wanted a pharmaceutical industry on site, so they went out and were not afraid to (1) say they wanted it, (2) work out what they needed to do in order to get it, and (3) implement it. Part of that was to say: 'There are the tax concessions, similar to lots of others. There is the land; it will cost you nothing. Here is the rest of the package. We want to build not just one company but a whole pharmaceutical industry here'—whereas we have had concessions going to some of our companies, which I will come back to in some other questions; we have not generally had that kind of aggressive approach to say that there is a big chunk of research and development that should happen here and that the amount of money that will come back into the economy if we adopt this sort of regulated approach is vital. Has that come into your view in terms of the way Singapore and some of the others are doing it?

Prof. Barber—I would certainly agree with that, from a Singapore point of view. To some extent you are beginning to see some of that in the Australian context, in Queensland. I mentioned the Motorola centre in Western Australia, which was a centre brought into Australia. It was not a matter of sucking it round the states; it was a decision in Asia-Pacific by Motorola. The Western Australian government, supported by the University of Western Australia, were able to land that facility in Western Australia. That will employ 400 engineers in Perth when it is fully operational in two years time. That is a massive investment by Motorola and, from a state government's point of view, partly a strategic decision which has been bipartisan. It started under the Court-Cowan government and has been supported by the Gallop government as a matter for diversifying the Western Australian economy, bringing into the state a major source. That is something which is occurring. But what the Singaporeans have done very well, as you have said, is that they have decided that they want to do this—they want a major flagship entity into it and things that will spin off around it. I think Australia could think through what are the most effective strategies between federal and state to ensure that we do not compete between ourselves and that we somehow decide to put a structure in to say that some area of science and innovative industry is going to be supported at a national priority level.

CHAIR—Do you think that we are getting centres like that because we do well in a particular area, because of the world standing of, in this case, our engineers in telecommunications? It is interesting that Motorola have done that. Ericsson have as well. They are in the same sort of field. Is it the particular field that we are stronger in?

Prof. Barber—I think there are a couple of factors. One, as Martyn Evans said, is that R&D is cheap in Australia. I chair the oversight committee of the UWA's collaboration with Motorola. I am not privy to Motorola's inside financing, but I suspect it is being costed at 62c in the dollar. That is just a surmise of mine. That is about the relativity. What is important is that among the factors that attracted them there was the fact that their Adelaide facility is one of their leading global software centres, on their own internal benchmarks. These are centres which work to Motorola's business units. They have to generate the work from the rest of Motorola. In its midstage period, two to three years out, which is long term in this area—3G, 4G telephony—I believe their Adelaide centre is one of the most productive of all the Motorola software centres, which are in Argentina, Poland, America and India.

They liked Australia from the point of view of quality of graduates. They liked Western Australia because they had recruited quite a few Western Australians into Motorola elsewhere. Lifestyle was a factor. They wanted to be in the Asia-Pacific zone. Western Australia had a bit of an edge because we were in exactly the same time zone. But to get them the state government has had to effectively give them the building tax free. The University of Western Australia is building the building, which will be leased to Motorola on a five-year lease. The state government will effectively be paying their rent. That has led to a significant investment into the state in that way. It is a combination of good quality staff, attractive lifestyles and cost of doing work—and not, in that case, too many expatriates: they are mostly Australians that will be in the plant.

CHAIR—Sorry, I interrupted.

Mr HATTON—This links back to Martyn's question in regard to industry assistance and the things we have been discussing. When we brought the factor (f) scheme into play in pharmaceuticals, for instance, it went from zero to \$400 million worth of exports in Viox, and they have recently done it with another product. We have other pharma companies from overseas doing that in Australia. We have had some changes. But there are some significant difficulties that overseas companies operating here and employing our people have. The core of it, from what I can see, is that in the globalised market they are competing regionally. One of the things we have to look at is whether our R&D funds should be going to support overseas companies operating here in this region but in competition against Belgium, Singapore or elsewhere. They have to very heavily compete in order to be able to produce a product in Australia. Should some of what we are looking at take that into account and take into account the fact that we need to go in completely different directions from what we have been looking at previously?

Prof. Serjeantson—I could perhaps talk about that in terms of the CRC program. The CRCs are also competing internationally, of course, yet there has been a reluctance within the CRC program for there to be any Australian taxpayer subsidy of international firms. Recently we did have a test case where we had two companies and two research teams: one in Australia and one in Oxford. Both groups are looking at endometriosis, and the pay-offs will be huge if they can

find the genes. It looked very much as though one group was going to be the winner and the other one would be the loser. It seemed only sensible to pool the human genome resources—the information that they were gathering—and to work together for the work to come to fruition. The University of Oxford people were working with a little company called Oxagen and in Australia our gene CRC is working with Cerylid. It was quite complicated to put it all together and to actually accept that it was a good thing to have Australian taxpayers' money getting stirred into Oxagen and Oxford university. We were going to be either the winner or the loser and we were not liking the odds. Ultimately the CRC secretariat has agreed to this arrangement. I think they have to be looked at on a case-by-case basis, but if there is a good case and you can see that this is the only way to increase our chances of winning we have to be prepared to do it.

Mr HATTON—Rolling into a further aspect of that, in a previous committee that a number of us were involved in we were looking at other aspects of R&D and particularly, at that stage, the 125 per cent R&D and the question of whether it needed to go to 250 per cent and so on. We know it did not in the end. Ericsson made a submission, and in that they argued that they did not care what the percentage of R&D was, that they were not interested in it. What, they put, was important was the number of engineers our universities were actually producing. If we produced the engineers, they would employ them. At that stage they were 50 short. What they underlined is a fundamental thing that should play into your field, and that is that our money is probably better spent at the broad scientific research level and on support of our universities and centres of excellence rather than running through this. I know this may particularly reflect Ericsson's cultural approach, but how important a question is that in terms of what the balances should be?

Prof. Barber—Probably the critical question to explore is the capacity of Australian industry to absorb technical people in technical capacities. I would agree with your assessment that a company like Ericsson would not be significantly driven by tax considerations, but their requirement for engineers is a requirement within their company. They have a significant R&D capacity going in house. It is the same with Motorola, for example. Part of the Australian question is to what extent Australian companies are taking up graduates who are themselves doing R&D inside companies which then feed back to that sort of model. I suspect that the CRC program—and your next witnesses will talk about things like the ARC programs in that area—is beginning to produce graduates who, hopefully, will be working in companies and therefore generating that view. But up until now we have had to perhaps entice business to see in-house innovation as something that they should be doing and hence needing the sorts of graduates you refer to. That feeds back in that cycle.

Mr HATTON—How important is the fear of failure in the Australian psyche within our companies and industries? There seems to be an inordinate fear of failure in an area where there must be masses of failures. That links to the question: if you look at it comparatively or on a comparative cultural basis, what is the difference between us and them with regard to the question of failure in these innovative activities and, more broadly, can you answer the question of why this is low in Australia but it is high in a number of other places?

Prof. Serjeantson—I find it hard to understand. I once spoke to a bunch of PhD students about this. I asked how many people had a bet on the Melbourne Cup and everybody put their hand up. But who would sell their grandma and their house to invest—no-one. We are not very different from some parts in Europe. Germany is known to be risk averse as well. It is quite difficult for me to understand why we are prepared to spend so much money on gambling, yet

when it comes to seriously good business risk we are so risk averse. So I am sorry, I cannot answer that question.

Prof. Barber—It must be something in our psyche.

Ms GRIERSON—You suggest in your submission that the failure or the weakness in business sector investment in R&D and innovation has a negative effect on public sector investment in R&D as well. Does a converse situation happen? Is part of that the failure of our public sector research bodies to have that entrepreneurial relationship and that relationship with business? Has that been a factor?

Prof. Barber—I think that it certainly has been a factor. There have been programs—such as what is now called the ARC linkage program, previously the collaborative R&D project, and the Australian postgraduate industry awards—which have brought together the business community and the university researchers. I believe that we have had quite a cultural change within universities. In the report on external earnings of CSIRO that was released on Friday, it is interesting to note that that program, which was put in place a decade or more ago, was designed to be a cultural driver. The Chief Scientist says in his report that the cultural change to one of engagement has made a difference et cetera. There is still more that we can do, but I would be the first to say that we have made significant moves in that direction. In fact, you could perhaps argue that in some areas we have actually gone too far—

Ms GRIERSON—Yes, I think that is perhaps the other side of it.

Prof. Barber—and that there is now too much short-termism coming into it again. That is an issue taken up by the Chief Scientist.

Ms GRIERSON—You also say that business would be assisted by more accurate forecasting of the expenditures required for R&D. Sometimes I think that if they knew about it then perhaps they would not go there. But you say in that context that if their forecasting were assisted, they would therefore set themselves up well for entitlements or concessions or whatever and their staging of it. Could you perhaps elaborate on who helps them with that forecasting and how crucial that would be to them?

Dr Matthews—You have hit the nail on the head. It is the expertise of the people who help them that really matters and particularly their own hands-on expertise in business. It is one of these areas where it is just the experience in people's heads that gives them a sense for what to watch out for. In government programs such as COMET we can see that they are trying to do the right thing, but there is a question mark about whether enough people are coming out of the university spin-offs or larger companies with that experience.

Ms GRIERSON—You say that the science based spin-off companies that have experienced this risk are a great resource to us. How do we tap into that? Can you give an example of companies with these experiences that we should be tapping into?

Prof. Barber—Starting that activity is in fact fairly lonely. Some very useful things to develop at regional levels—and it is occurring in places in Australia—are networks and clusters et cetera. There is a very interesting initiative in I think it is Montreal where small companies are

actually supported, encouraged and networked together so that people can in fact cross those lines. I think I made a reference in Mr Ticehurst's question earlier to the fact that knowledge in small companies about fairly arcane tax matters or other regulatory activities is not there. Their bookkeeper may be just somebody who is able to run their financial accounts through. That knowledge is an important part of the process. I think that has to be optimised in a big country like Australia.

Ms GRIERSON—That is usually not their focus at all, is it?

Prof. Barber—No.

Ms GRIERSON—It is an afterthought, and that disadvantages them quite considerably. Have you submitted any submission regarding the national priorities? We are talking about regions and states pitting themselves against each other. One would hope that if we had a national priorities framework that was strategic and supported by our resources and expertise that that could overcome some of these difficulties with states and regions and institutions competing, and duplicating at times as well. Have you submitted it?

Prof. Barber—Yes.

Ms GRIERSON—Is that available to us?

Prof. Serjeantson—In fact, Mr Nairn attended a day we had at the Dome where we brought in mid-career people. We called it the high-fliers workshop. They were about 24 high-flying Australian researchers who were perhaps not yet at the level of dean of their faculty but were running seriously active research groups. We put them together to come up with three submissions in the general areas of healthy, wealthy and wise and also a tool kit. Those submissions are publicly available—they are on the web site.

Ms GRIERSON—Good. Do you have a comment on the role of the action agendas for industry and whether they have supported R&D?

Prof. Barber—That is again one of the interesting aspects of the national research priorities exercise. There is an opportunity to develop a synergy between national action plans and R&D agendas. If you read the stuff that CSIRO have put out about their flagship programs, there is quite an interesting congruency between those flagship priorities and national agendas—for example, the light metals agenda has translated into a light metals flagship program in CSIRO with an opportunity to develop a titanium industry, which again is a long-term investment and comes back to the question of a strategic opportunity for Australia to development a whole new industry. What is the most appropriate support mechanism to achieve that? It is probably not a tax driven one because there is no industry, so how do you foster that industry, how do create investment, how do you pick up the dominance, how do you make use of Australia's reserves in titanium related ores all the way through to a new industry? I think those are challenging issues for us, of which R&D is part but not all of the story.

CHAIR—Thanks for that. We are going to have to call it quits because of time constraints. Before we do finalise, I am not sure who used the words 'incremental improvement'. As far as small and medium sized businesses are concerned, that is what they tend to work on. Do you

think that because that is the way most small businesses carry out their research and development/innovation that contributes to the official statistics of lower investment? Perhaps there should be better understanding, particularly in the small and medium sized business area, of the work they are doing, which is probably strictly more research and development or innovation but is not recorded as such?

Prof. Serjeantson—I think I was the one who mentioned that. It is true that under the Frascati definition of R&D we have high risk and innovative work. In Canada, eligible work includes incremental improvements to existing technology, so that is quite a juxtaposition. It can perhaps mean that there are different methods of counting business investment in R&D.

Dr Matthews—Could I just add that I talked about the abandonment of innovation. The publication I was talking about was this one, and they record for the companies that took part that, of the overall investment in innovation, only 50 per cent was captured in the definition of R&D that is used in the official figures, so there is as much again going on of an incremental nature that is not innovation. It is not R&D but it is part of innovation.

CHAIR—Excellent. Thank very much for the submission and for taking the time to be here today. In particular, I was very pleased that your submission provides some specific recommendations that the government could seriously have a look at as far as changes to the R&D plan, to income tax and definitions go. Thank you for your evidence today.

[5.41 p.m.]

SARA, Professor Vicki, Chief Executive Officer, Australian Research Council

WHITE, Ms Clare, Executive Director, Policy and Planning, Australian Research Council

CHAIR—I welcome representatives from the Australian Research Council. I remind you that proceedings here today are legal proceedings of the parliament and warrant the same respect as proceedings in the House. The deliberate misleading of the committee may be regarded as a contempt of parliament. The committee prefers all evidence to be given in public but should you at any stage wish to give evidence in private, you may ask to do so and the committee will give consideration to your request. Would you like to make an opening statement before we proceed to questions?

Prof. Sara—I would simply like to say that in your deliberations, you need, I believe, to consider the strengths and the weaknesses of Australia's innovation system as a whole. The strength of that system is the strength of our public research sector, and the weakness is the issue that you are addressing—that is, the contribution made by business and industry to national innovation. As stated in our submission, we believe that there are two main options in addressing this weakness. But let me preface those by saying that the solutions that I hope you will recommend will have to be uniquely Australian, because we have a unique system here with unique strengths and weaknesses. On the one hand, I think it would be possible to provide incentives for business to conduct R&D in-house and that is through concepts such as grants or tax concessions. The alternative option—and that is the one we have concentrated on—is to improve the linkages and the interface between the public and private sectors. Through increasing partnerships for the public and private sectors, we will be able to have a flowthrough from ideas to commercialisation.

CHAIR—Ms White, would you like to add anything?

Ms White—No, I will not add anything.

CHAIR—I will start the ball rolling before my colleagues jump in on questions. In your submission you talk about the value of the COMET program and what it is designed to do, but you feel that there is still a gap and you refer to the 'innovation progression gap'. Even though there are things like the COMET program, there still remains a gap, particularly for the very early phase of commercialisation. How do you see, in practical terms, that we can close that gap further? Are you talking about a variation of the COMET program, an expansion of the program, or is it something at the other end of extending the ARC program for instance to get into that gap a bit further?

Prof. Sara—I will take a minute to explain what we mean by that gap. I am quite convinced that successful innovation depends on a flow from the ideas at one end, which is our business—the basic research through to the commercialisation. Every successful innovation system that I know well, such as in Sweden or Finland, has complete flow from idea to commercialisation because they have very strong interface between the public and private sectors. At the moment

in Australia we have strong idea generation at the basic research end and we have commercialisation at the development end, but there is this gap that occurs at the end of the research activity. The ARC funded research is an example of where we fund research through to outcomes of research, but they are not quite ready to be picked up by either venture capital investment or even the pre-seed funds, let alone go through to commercialisation. I think the gap is critical: the gap to develop a proof of principle, the gap to develop a prototype and to build a widget that you can take to somebody and say, 'This is the prototype that we have been developing.'

The government has brought in several programs over the last few years that address pre-seed funding. What has happened is that they have tended, because of their very nature of having commercial input, to shift towards the 'd' end, so we are still left with the gap for the researchers of the type we fund to develop the prototype or the proof of principle that they can take to the pre-seed funds to develop further. One way of addressing that is to provide almost an extension of our current industry linkage programs that would allow the quality researchers we fund to go one step further, which often, in our discussions with researchers, is a matter of \$50,000 or \$100,000. It is not a lot of money that is required for a year to develop the proof of principle concept.

CHAIR—In percentage terms, you are really saying it is not such a huge additional cost.

Prof. Sara—The researchers that we fund—and this is a constant issue that comes up in our discussions with the universities—are really looking for roughly \$100,000 to develop it to the next stage. If we calculate that, it is approximately \$10 million or \$20 million if I recall.

CHAIR—I think you may have said \$30 million.

Prof. Sara—Yes, to be able to fill that gap. That is not a lot of money.

CHAIR—Do you think, if you could fill that little gap, the chances of venture capital jumping in at that point would increase substantially?

Prof. Sara—Yes.

CHAIR—Because that is one of the big problems we have in Australia.

Prof. Sara—Yes, of course it is. But the venture capital situation has improved enormously since three years ago.

CHAIR—That is true.

Prof. Sara—It is this very early phase precommercialisation—the investment-ready phase—that we are talking about.

Mr LINDSAY—You said that successful innovation depends on a flow of information or a flow of ideas in your area through to commercialisation. That is a linear model. What about a

circular model? Why can't ideas come up in industry, then go around to the people you represent and then come back to industry? Tell me what you think about that.

Prof. Sara—Whilst I use that maybe with my hands, obviously innovation is a cycle—and I would never say it was anything else. We are talking about ideas through to commercialisation and the commercialisation fits through. I believe that it is inappropriate to try to distinguish between applied research and basic research because the speed of research has increased so much and the interaction between industry and researchers is so complex that it does not provide any helpful information to separate basic and applied. It is not a linear. I am not implying that innovation is linear. I am sorry if I gave that indication.

Mr LINDSAY—Would it be your evidence that ideas that start everything off can originate both in your area and in industry?

Prof. Sara—Absolutely.

Mr LINDSAY—Do you have any idea of any sort of proportion?

Ms White—I would like to add to that point. With respect to our Linkage program—which is where a researcher from a university and an industry partner come forward together—often the idea for a particular research project has been generated through the industry partner who then seeks a partner in the university and they come forward together and look for funding that will enable them to work together on the particular project. I think that is an example of the sort of circular nature of the phenomenon.

Mr LINDSAY—This may be out of your field of expertise, but what are the factors that generate industry thinking up ideas?

Ms White—I will not have a go at that one.

Prof. Sara—I think it is the experience of the problem and of understanding what the problem is. When I was a researcher I worked very closely with industry—side by side—and whilst their expertise was perhaps more in how you developed a drug to market and mine was in the basic research end of things, by sharing those experiences and that knowledge we would then redefine problems working together. I am not sure if that answers your question.

CHAIR—Can I answer your question, Peter?

Mr LINDSAY—Yes.

CHAIR—It seems to me that often it is in response to the marketplace. The ideas that generate in industry that then get passed on to university occur when a business sees a gap in the marketplace and thinks about how it can adopt what it is doing or about what new products it can develop that can fill a particular need out there and then goes off to the researchers. Is that what you were getting at?

Mr LINDSAY—Yes. I have one final question—and I might be on dangerous ground here. We have heard evidence about government providing incentives of various sorts. What if the government says to people it funds for research that it wants to mandate closer links and cooperation with industry as part of the conditions of funding?

Prof. Sara—I can give you a personal view on that. But, in a sense, the ARC's Linkage program reflects that direction from government. We have two major programs that we fund through the National Competitive Grants Program. One is called Discovery, which is, as it implies, blue-sky research—no known outcome—and 60 per cent of our funding goes into that. The other stream of programs is Linkage, which brings together industry, universities and CSIRO—all of those working together, sharing ideas, sharing students, sharing infrastructure—and that is 40 per cent of our funding. The development of that has come through discussions and recommendations from the government. So, in a sense, that is done.

I will now give you a personal view. I believe it is critical that we have the balance that we have got. The majority of our funding—60 per cent—is still going into blue-sky research, because we and the NHMRC are the only agencies that are funding that type of research. If we do not support those blue-sky ideas, we will not have innovations in 10 years time. I can give you lots of examples. I will draw one out of the hat—Radiata. I am sure the committee knows the success story of Radiata. We traced back the origins of Radiata and it turned out that in 1982 we supported a young researcher, without a PhD yet, called Mr David Skellern. We supported a couple of grants for Mr David Skellern, who became Dr David Skellern and then Professor David Skellern. David Skellern and Neil Weste were the founders of Radiata that was sold to Cisco. It is that kind of retrospective analysis of important outcomes for economic future which makes me totally convinced that we have got to support that blue-sky research.

Mr TICEHURST—Professor Sara, you were saying that the strength in R&D is held largely with the public sector. A lot of innovation comes out of private industry, particularly larger industry. I am very interested in your idea of improving linkages with industry by transferring the people with the skills. I can see a lot of application for that, particularly in smaller companies and those that really cannot afford to put on a full-time researcher when they might have a particular project. Do you have a facility whereby a smaller company can get hold of one of your researchers for a particular project for maybe six months or less or longer? How do you handle that?

Prof. Sara—Let me say first that personnel mobility is very critical to solving that problem. If you look at highly innovative societies and economies, for example Sweden, they have an extremely high level of personnel mobility between public and private sector. Under the Linkage program, we have subsets of activities to attract industry to work together with universities. The smallest program in terms of the contribution industry needs to make is sharing a research student. Industry provides \$5,000 for sharing and cosupervision of a research student on a postgraduate award. We have a collaborative research program between university and industry and postdoctoral fellows who move between industry and universities. This year alone, we have got—Clare could correct me, or we can provide the absolute numbers—736 industry partners in those schemes. There is a lot of industry interest. They put in \$1.50 for every dollar that the Commonwealth puts in, and they tend to progress from the small sharing-a-student scheme up to a collaborative project and then perhaps a postdoctoral fellow.

Where I would like to extend it next is for more senior people, other than postdoctoral fellows, to be able to spend short terms, less than a year, between public and private sectors. For the long-term outcomes, I think moving people who have the knowledge and the skills is the most critical thing we can do. Small to medium size enterprises are very important to these schemes. When this scheme began, we started out with mainly large companies like BHP et cetera; but, with the smaller sharing-a-student scheme, over 50 per cent are now SMEs that have come in over the last couple of years. So I think it is working very well.

Mr TICEHURST—It has more promise than tax credits because they are after the event: you have to wait more than a year to get them. If you are putting in capital expenditure on a certain project, there is no tax benefit until you actually start making a profit, so you have got a lot of dead money. The innovation of transferring people could be a key to improving the output from small companies. They can do research in spite of the systems that are put in place. Providing it is not a great burden of filling out piles and piles of paperwork that is totally useless to a business, I think there is good scope for that.

Prof. Sara—Yes.

Mr FORREST—The little footnote at the end of your submission talks about outcomes. On the Discovery project you say that three per cent deliver a patent by the end of the project. On Linkages you say that 30 per cent deliver a patent. But that is not the question I want answered. How many deliver a commercial outcome? That is the real question. There are millions of patents that never go anywhere.

Prof. Sara—I quite agree with you. The ARC has moved into performance reporting in terms of outputs and outcomes. We are able at this stage to report only patents applied for, pending or that have been successfully or unsuccessfully awarded. We hope to follow that through. We have also been involved in the national survey of commercialisation, which Minister Nelson will release on Friday. We can provide a copy to this committee on Friday. In that we have also looked at, for example, the number of patents, the number of licences and the number of start-up companies across Australia in all the publicly funded research institutions—CSIRO, medical research institutes and universities. In start-ups, for example, we have been able to look at the numbers that are still successfully operating at the end of the year. So we are only in the early days. You have identified a very real problem that we need to address.

CHAIR—A division has been called in the House of Representatives. We will continue with questions when we come back.

Proceedings suspended from 6.01 p.m. to 6.29 p.m.

CHAIR—We will now reconvene. Michael, we are up to your question.

Mr HATTON—Channel 31 have been very innovative recently and they have decided to resurrect themselves or metamorphose into a channel that does very old programs. I have not been watching him, but this is the Paladin question—the *Have Gun, Will Travel* question. As you alluded to in your answer, we do not really have a culture here of people moving from academia through to private industry, to government and then back and forth—and that is one of the things that we really lack. I heard Professor Cullen, who runs the water CRC, argue that one of the critical things we needed—and you alluded to this at the start—was interlocutors between the scientists and the people in industry. Paladin was a figure who had a little card which said ‘Have gun, will travel,’ because he used to go and fix things out in the west. Do we need a flying squad of interlocutors between the CRCs, our scientific research centres, our universities and industry? Or does it need to continue in the same way it is operating now—almost on an ad hoc basis; as you need it and as the questions are asked? Would it be useful to actually build a capacity for people experienced in science who, after they had retired, for instance, could actually use their skills to help try to build this interface and linkage?

Prof. Sara—Yes to all of the above. I do not think there is one single simple answer, but I do agree that it is probably the most critical issue that we could find solutions to. There could be several solutions. All of those things need to be done. We already have successful programs through CRC through ARC linkage that need to be expanded, encouraged and supported. We need to continue to try and bring the SMEs particularly into those programs, and it is very hard to get their attention and time to be involved in it, so we have to find ways around that. We need to encourage senior members of industry and the universities perhaps as they retire to be involved in being a bridge between the two. When I said I think we can expand the ARC linkage program to support more senior people moving for periods, say, up to 12 months, that is the kind of thing I had in mind. There is a lot of talent that we could utilise to build those bridges. So all of the above.

CHAIR—On venture capital and taxation, you comment that some of the changes out of the Ralph review go some of the way to rectifying the problem, particularly with respect to capital gains tax et cetera. Have you got any particular suggestions that government ought to look at? You say that things should be evaluated and how these work out there in the marketplace, but are there any specific things that you think we would be looking at in that area?

Prof. Sara—I will hand that one to Clare.

Ms White—For a long time this was regarded as a critical gap in Australia’s innovation system. As we have acknowledged earlier, quite a lot has been done. I think there is a view that a lot of the problems are being addressed. Vicki has referred to one gap that we still see in that regime. I do not feel myself to be very well qualified to talk about this in detail, but one of the ones we still hear about is the taxation treatment of equity holdings by researchers in start-up companies. I am not 100 per cent sure whether it is actually the subject of some legislation that might be before the parliament, and there will be others who know more about it. But you may in your hearings with other parties wish to pursue the precise ins and outs of that one.

CHAIR—As you mentioned earlier, the venture capital area has improved out of sight in the last three years but it was coming from a very low base in the first place. Anything that can be done to accelerate that even further has got to be positive, particularly in changing the culture. I think Australia still has a different culture as far as venture capital is concerned compared to other countries, and unfortunately I think time often is the only thing that can change that.

Prof. Sara—Yes.

CHAIR—Is the benchmarking report on Australia's performance that you refer to available?

Prof. Sara—It will be on Friday.

CHAIR—Sorry, that is the one you mentioned earlier.

Prof. Sara—Yes. We were talking to Shelley while you were out, and we will provide a dozen copies to the committee early next week.

CHAIR—Okay. I have covered the things that I needed to cover. I apologise that we have lost a couple of people; I know Martin had questions. However, there is nothing stopping us writing to you about any other things that the committee might want to follow up. That may occur, actually, as we progress with the hearings and as other evidence comes before us. If that is the case then we will take the opportunity to come back to you for additional submissions.

Mr HATTON—We have a traditional problem of not just being able to turn ideas into products but also, where companies have successfully been able to do that, they have usually had to do it in the United States or elsewhere. We have seen those Australian inventions go through a fairly interesting process and quite often the Australianness is sucked right out of them. The companies are hammered down into the ground and then all of a sudden there is a revivification of these companies as terrific new American companies that market that product effectively. Do we have a facility to advise people who are in that situation? Where they cannot get support here—and that has been a traditional problem—they have to make the jump to Germany or to somewhere else. Can they get access to advice with regard to what they will be in for from the very smart players who know how to pull to pieces the intellectual property rights that people are taking with them?

Prof. Sara—I would imagine that AusIndustry or Austrade are able to provide some advice, but in reality it is kind of the school of hard knocks—it is experience which teaches. I guess the more important thing is whether they can really connect with individuals who have gone through that and who are able to provide them with advice. Clare may know of a program.

Ms White—I am not aware of a program targeted at that advisory role in particular, but some of the venture capital programs that have been initiated by the government probably have a component of that in them. It is not just about providing venture capital; it is also about providing advice about how to take a particular idea to the market. Again, the R&D Start program may be another source of that sort of advice, but one of the things that we often notice here is that we have a shortage of those sorts of skills in Australia. As Vicki said, part of what we need to do is build up the skill bank in that regard—people who have been there and done

that and know what the trips and traps are. Your idea about having champions who can assist people at particular stages may be one area in which those people could be useful.

Prof. Sara—There are interesting schemes in the United States in that regard, where they have a much stronger alumni tradition than we have in Australia. Alumni act as mentors in some of the schemes I have read about for academics or researchers at the universities. The alumni assist them in the commercialisation because they are people who have come from industry and business, been successful at it and perhaps retire and want to assist the younger researchers to develop their ideas into commercial products. That seems to be a very good scheme, but I do not believe that it would be as successful in Australia as it has been in the United States where there is a tradition of alumni support to the universities that is stronger than here. Ours is growing and we could tap into that as one of the many options to use.

Mr HATTON—I have one last question. There was a brilliant book called *Built to Last*, written by a couple of MIT academics, on the great American companies—those that outperform the stock market by 16 per cent, such as IBM and companies like that. The nugget that they came down to was that what made these companies different and allowed them to outperform all the rest was that they were visionary companies; they had a total understanding of where they were from, the nature of themselves as organisations and when they hit hard times and had to restructure they would peel back to that original vision and rebuild from there. You alluded to the fact that we needed to do our research and development in an Australian way, but most of the comparisons have been with the US and Silicon Valley and the rest. As critical innovators and countries that have been able to take the ideas of others and turn them into products very effectively, do Japan and Germany have a lot to teach us in the area of how we can more successfully intervene?

Prof. Sara—Again, I think we always have something to learn from international comparisons. It is a matter of exactly how much you can gain from that. The German tradition, for example, is very conservative in the government programs that are run and on multiple levels. In those cases it is frequently a matter of the quantity of money that is put in to build from research to the development and commercialisation. I spent a lot of time in Sweden and I think that the Scandinavian countries of Sweden and Finland have a lot to teach us, particularly Finland, which arose from a very poor economic situation at the end of the eighties to become one of the major innovators in the world at this moment. But they were also very fortunate in their choice of mobile telephones.

Mr HATTON—Yes, extremely.

CHAIR—Thank you very much for your submission and time this afternoon.

Resolved (on motion by **Mr Hatton**):

That this committee authorises publication, including publication on the parliamentary database, of the proof transcript of the evidence given before it at public hearing this day.

Committee adjourned at 6.43 p.m.