
# HOUSE OF REPRESENTATIVES

## STANDING COMMITTEE ON INDUSTRY, SCIENCE AND TECHNOLOGY

**Reference: Effects on research and development of certain public policy reforms**

**CANBERRA**

**Monday, 1 June 1998**

**OFFICIAL HANSARD REPORT**

**CANBERRA**

HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON INDUSTRY, SCIENCE AND TECHNOLOGY

Members:

Mr Bruce Reid (Chair)

Mr Beddall (Deputy Chair)

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| Mrs Bailey | Miss Jackie Kelly |
| Mr Martyn Evans | Mr Marek |
| Mr Richard Evans | Mr Allan Morris |
| Ms Gambaro | Mr Nugent |
| Mr Jenkins | Mr O'Connor |
| Mrs Johnston | Mr Zammit |

The committee will inquire into and report on the effect of public policy changes, over the last ten years, in the areas of corporatisation, privatisation, outsourcing and competition policy reform on the matters listed below:

the amount of R&D being carried out in Australia;

the nature of the R&D being undertaken (that is, basic or applied);

the relevance of the R&D to the commercial needs of industry;

the level of investment in research infrastructure and equipment;

the scientific and technological skills base and the demand for scientists, technologists and engineers; and

the education and training opportunities for future research staff.

## WITNESSES

HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON INDUSTRY, SCIENCE AND TECHNOLOGY

*Effects on research and development of certain public policy reforms*

CANBERRA

Monday, 1 June 1998

Present

Mr Reid (Chair)

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| Mr Martyn Evans | Mr Jenkins |
| Mr Richard Evans | Mr Zammit |
| Ms Gambaro | |

Committee met at 10.38 a.m.

Mr Reid took the chair.

[10.38 a.m.]

**GREVILLE, Ms Virginia Jane, Assistant Secretary, Natural Resources and R&D Branch, Corporate Policy Division, Department of Primary Industries and Energy, Edmund Barton Building, Barton, Australian Capital Territory 2601**

**HEARN, Dr Simon Eric, First Assistant Secretary, Corporate Policy Division, Department of Primary Industries and Energy, Edmund Barton Building, Barton, Australian Capital Territory 2601**

**NEWTON, Mr Alan Burton, First Assistant Secretary, Crops Division, Department of Primary Industries and Energy, Edmund Barton Building, Barton, Australian Capital Territory 2601**

**CHAIR**—I declare open this sixth public hearing of the inquiry into the effects on research and development of public policy reform. I welcome the witnesses and others in attendance. We will be taking evidence today from the Department of Primary Industries and Energy, the National Health and Medical Research Council, the Department of Industry, Science and Tourism and the Australian Academy of Science. As we now have a quorum, we will commence taking formal evidence. This session follows a private briefing by witnesses from the Department of Primary Industries and Energy.

**Mr MARTYN EVANS**—You mentioned demand-driven research. particularly in the agricultural and primary industries side. In the context of government support at the state level and to some extent at the Commonwealth level being withdrawn, how does basic research—the blue-sky, long-term research—fare in all of that? I would suspect that the trend we have seen in CSIRO is that, as more of the funding for research has had to come from outside, more of it is demand driven, there is a tightening of resources and the focus is on the immediate return. That is fine, but how does that affect the capacity to do long-term research which may not have an immediate consumer benefit but which in 10 years time could be quite critical to the industry as a whole? How does that long-term, basic research capacity fare in this model of demand-driven research and declining resources?

**Dr Hearn**—Thank you for that. We have emphasised demand-driven research simply because of the commercial partnerships, which we continue to emphasise.

Having said that, I must point out that before 1989 there was perhaps a little bit too much purely science-driven research without an end product in sight, therefore why were we doing it? But I am not aware of any of our boards in the agricultural arena having decided, in the light of the push for and adoption of commercialisation—as important as that is—that basic research is not important. Basic research is still by its very

nature very important; it ultimately leads in many cases to the market level research that we have been referring to.

In practice the various boards, with their responsibilities, do tend to discuss what they think is most appropriate. They seek advice from their management and industry and they talk to the key stakeholders and to the government about what is a reasonable split of industry funding and government funding between basic and applied research. Of course, it varies from industry to industry because there is no one single figure you can put up and say that is a desirable level of basic research.

The boards have a lot of discussions with scientists and other parties to find out what they think would be a reasonable split of their annual and longer term budgets between those two types of research and they then set targets for themselves, as a typical practice, as to how much goes to basic and how much goes to applied. Obviously at times you get a little bit of grey area between those two categories of research, but the boards have certainly not decided that they will totally ignore it.

If you were to look at the figures, I think you would see there has been some decline in the amount of basic research done. That is not necessarily a problem, as long as the right parties are doing the right research. The R&D corporations, apart from funding basic research, also look to organisations such as the universities and some of the state-owned government organisations to do some of that basic research as well.

It is a very interesting point and it is always going to be a point of very valid discussion for your committee and also into the future: what is the right split, where is the best judgment? This is a judgmental decision that has to be made and if you have the right expertise on the boards and the skills base, you have a better chance of making the right judgment than you have if you have purely a one type of person board, which tended to exist before the 1989 reforms.

I make one last comment on that. I think this is also a subject that gets quite wide debate in a number of OECD countries: who should be undertaking basic research, who should be undertaking applied research, what are the best linkages? We have worked very much on that and a lot of countries are looking at how Australia does it, although in financial terms we maybe relatively a much smaller player than a lot of the large European, USA and Japanese entities. Nevertheless, the model does get quite a lot of attention from other OECD countries.

**Mr Newton**—I go back to the comment I made earlier about the role of the R&D corporations as the custodians of the technological future of the industry sectors. There is nothing in the legislation that would preclude the R&D corporations from making a substantial investment in basic research. Indeed, as they look to the long-term needs of their industry sectors, if that was the gap that needed to be filled, they could marshal funds and put them into those sorts of avenues.

The funding of basic research has long been the province of the universities particularly and in Australia also the CSIRO. Recently, of course, the CRCs have made a contribution in that regard as well.

The R&D corporations could look at that totality. They already do a lot of cooperative research with the agencies I have talked about. Some research is funded directly by R&D corporations, for example, by contributions to people development through scholarships and so on. But also, as they put funds into one area of research in a university, that certainly creates a freedom for other funds to go into basic research. So one way or another, either directly or indirectly, the R&D corporations make a substantial contribution I think they will continue to make a very substantial contribution in the future.

**CHAIR**—Thank you for your cooperation this morning under what have been slightly difficult circumstances but I appreciate it. If we need to follow up particular issues at some time in the future, perhaps you would be able to provide us with those in writing that we could take on as evidence. Would that be acceptable to you?

**Dr Hearn**—Certainly, Chairman, on any questions of detail or even broader questions, we are only too happy to cooperate. In fact, we welcome the opportunity because we believe the subject your committee is investigating and the terms of reference are very important to the ongoing attention that we believe must be given to R&D, public and private, to ensure the competitiveness of the industries that we work with.

**CHAIR**—Thank you very much for your attendance, it is appreciated.

For the benefit of the public hearing transcript, I might explain to people who are present today that we started principally as an informal discussion with DPIE before formally opening the proceedings. Everything from this point on, of course, will be on the formal record.

[10.48 a.m.]

**ANDERSON, Professor Warwick, Chairman, NHMRC Research Committee (Public Health and Medical), National Health and Medical Research Council, GPO Box 9848, Canberra, Australian Capital Territory 2601**

**CHESTERMAN, Professor Colin, Advisor, National Health and Medical Research Council, GPO Box 9848, Canberra, Australian Capital Territory 2601**

**NICOLA, Professor Nick, Member, NHMRC Research Committee (Public Health and Medical), National Health and Medical Research Council, GPO Box 9848, Canberra, Australian Capital Territory 2601**

**WELLS, Mr Robert (Bob), Secretary, National Health and Medical Research Council, GPO Box 9848, Canberra, Australian Capital Territory 2601**

**CHAIR**—I welcome you this morning and thank you for your attendance. I remind you that the proceedings 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 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. Would you care to make an opening statement before we proceed to questions?

**Prof. Warwick Anderson**—First of all, the NHMRC thinks that this is an important issue and we are pleased to be able to come and meet with you today. Perhaps the most useful thing I can say by way of background is that the NHMRC funds research into all aspects of health on the basis of the excellence of the proposal. We fund just the direct costs of the research, what it is going to cost specifically for that project. We expect the host institutions for the research to provide everything else to make the research proceed smoothly in the way that it is funded.

Those institutions for us are: universities, where about 46 per cent of our funds are expended; hospitals, mainly public hospitals, around about 20 per cent of our expenditure goes there; and the independent medical research institutes, which are rather a unique part of the Australian scheme. These are institutes set up under an act of parliament or, more commonly, under the Companies Act to conduct medical research.

Those three types of institution need to come up with the extra support required to let the NHMRC-funded research run. Each of those three different sectors—universities, hospitals and institutes—face different issues.

The submission prepared by the chairman of the council of the NHMRC, Professor Richard Larkins—who unfortunately cannot be with us today—has focused on a couple of

different aspects of that. He draws attention, as we do, to the fact that changes in universities are making it difficult for university based researchers. A particular issue for us is the changes happening in the public hospitals sector, which Professor Larkins draws your attention to. These changes are related mainly to the difficulty that researchers in hospitals find as services which previously they could use to support their research—pathology services and so on—are no longer so easily available. They are either outsourced by the hospital or are charged on a full charging basis and so are no longer able to be accessed by researchers unless they pay for them. Our grants on the whole do not pay for those costs.

This means that clinical researchers—those people who are undertaking research in a health care sector, particularly in the public hospitals and involving direct interface with patients or subjects in the hospitals—have been facing an especially difficult time over the last little while. I think that is all I would like to say.

**CHAIR**—Do any of your colleagues wish to make any opening statement at this point?

**Prof. Chesterman**—I would be happy to expand a little bit on what Professor Anderson said. By way of introduction, I am a staff specialist in haematology (blood disorders) at the Prince of Wales Hospital in Sydney and I am conjoint professor in medicine and pathology at the University of New South Wales. Over the years I have been a full-time academic and a practising specialist and I have also spent eight years practising at the University of Melbourne. In a sense I have had a foot in both camps and I have seen a little bit of two of the major research centres in major cities.

The other thing I should say is that at the moment I am in a fortunate situation in that my colleagues and I hold quite a large program grant from the NHMRC, which is one of about 20 such grants in the country. As a result of that, the New South Wales Department of Health has granted us, under a new initiative taken last year, specific targeted infrastructure support. I am not here in any way as a special pleader because I have very little to complain about but it does give me an opportunity to observe fairly objectively what is happening to the vast majority of my colleagues in clinical research. It is the sort of problem that has been referred to in general terms by Professor Anderson. Specifically, the types of infrastructure which have in the past been accepted as part of the hospital service—the integral part to patient care which goes on to research—include pathology testing, radiology testing, animal house facilities, data management, nursing, pharmacy services and so on. As you can see, it is a very wide range.

In the comparatively short period of around about four or five years, in an effort to cut costs, which one could not criticise, most of these services have been corporatised in a quasi-corporate fashion. So, instead those services being provided to the research community for free, the user is now being asked to pay—and the amounts are not inconsiderable.

Pathology testing for the sort of grant that NHMRC is investing in research might this year be nothing and suddenly next year it is $5,000 or $10,000, which is a large component of the grant. Exactly the same thing is happening with pharmacy services. Even the dispensing of drugs will now cost the researcher. All the other components which are essential to clinical research are being costed directly to the researchers, with very little being handed back to them to be able to handle that. These are specific instances that I see daily which are impacting on clinical research.

The one group that can afford to pay, not surprisingly, is the large pharmaceutical companies who support clinical drug trials. Many clinical drug trials are very valuable—do not get my wrong, I am not trying to criticise them in any way—but the truth of the matter is that many of the drug trials in Australia are carried out to enable the company to register the drug in Australia or as a pure marketing exercise. The large pharmaceutical companies can afford to pay for the pathology, radiology and so on which are related to particular trials. But their use of these services means that the scarce resources that we have are being forced into that sort of activity. That sort of activity, as I say, certainly has some value but it will never come up with the sort of research findings that are referred to in Professor Larkins's letter, such as John Cade's discovery of lithium or Marshall and Co.'s discovery of the helicobacter pylori because they are nothing to do with drug trials. You can see the balance is being pushed towards the corporate sector.

I should say one final thing which I think is important because it is looking forward. Over the last few years, as a result of the corporatisation within the public system—in Victoria in particular, which is the pacesetter in this type of activity—the pathology services and radiology services in the major teaching hospitals for the universities are being put out to tender to private pathology companies. I do not think anyone would be surprised to hear that research is not high on the agenda of these private pathology services. So if we are looking down the track, research is going to be hit even harder by this sort of activity.

**CHAIR**—Thank you very much. I wonder if I might ask you about your funding. I understand the funding for your organisation was increased in the last budget and I wondered how you set your priorities for allocation of those funds to, firstly, public health and, secondly, medical research.

**Prof. Warwick Anderson**—We are very pleased that the situation we were facing was attended to in the last budget. Our forward projections were steeply declining and we are very pleased that the government has been able to attend to that. We now have a stable or an indexed increase in our funding for the next four years, so we are able to plan ahead with more security.

Your question is an interesting one. I suppose the first thing I should say is that we fund on the basis of scientific merit as determined by peers in the field. A grant application in public health will be assigned to three assessors in that field for them to rank it,

give it a score and comment on it. Then the applicant is interviewed by a committee consisting primarily of public health researchers—people who are active in public health research. The same is true for biomedical research: the application goes to three experts who know something about the field and the applicant is interviewed by a committee that is competent to judge it.

We have primarily allowed that peer review process to throw up the best research. Australia does 2.5 per cent of the total world research in health and medicine and we believe it is very important that we fund the best Australian researchers so that they can act as the technology transferors of the research, the majority of which is done elsewhere.

In the last year or so we have been working on mechanisms whereby we can link together better people who are clinical researchers, basic researchers and public health researchers. We are about to announce the introduction of a new funding mechanism called a network grant to try to bring together the strengths that are clearly apparent at the basic end of research to help develop public health research in the country. We have also recently introduced a couple of new fellowship post-doctorates in public health research because we recognise that this is an area where Australia, although growing in strength, is not as strong as it should be.

**CHAIR**—One other question I have is about broader research that is conducted for the public good. You said on page 3 of your submission:

> Research conducted in the public hospitals system will certainly be threatened by a system that changes public ownership and running of our hospitals to private or for profit operators.

Who owns the public good research that you do? If it is publicly funded, where does it end up; who has control of that base research?

**Prof. Warwick Anderson**—Until now, it has been the very strong ethos in a lot of science, especially in medical research, that findings are published quickly in the international literature and are therefore available to scientists around the world. Of course, if the research is occurring in a hospital then the particular researchers, such as Professor Chesterman here, can bring very quickly findings of his own and other people to the practice in that particular hospital.

In Australia most research in the health care system has been within the public health system but this is changing. There are plans at some hospitals, including one hospital at the institution where I work, Monash University, for the hospitals to be run by the private sector. The challenge that we have as a council and that medical research has is to make sure that the agreements that are being drawn up between us or the university and these private organisations involves some recognition that the provision of new knowledge to make health care better and cheaper is an important responsibility of the entire system, not just government.

**Mr MARTYN EVANS**—It is clear, in an era of corporatisation and transferring public hospital assets to the private sector, that there is going to be a substantial reduction in the old cross-subsidies between public hospitals and research. Certainly that is true in my state of South Australia. At the Royal Adelaide Hospital, Hanson Research Centre, there are cross-subsidies which have always been in the system and which people have simply accepted.

If we now corporatise things such as pathology services and eventually some public hospitals, as has happened in Victoria, the previous public sector contribution to research which was hidden will become part of the savings which state governments and others can look to as a result of the corporatisation.

Does that therefore mean that we should identify what the level of this previous hidden support has been and seek to transfer that from a previously hidden contribution to a now publicly stated contribution, presumably through organisations like the NHMRC? Has anyone looked at that; and is there any estimate of what the previous cross-subsidies were?

**Prof. Warwick Anderson**—I wish I had said that. I think you have identified what the important issue is now. The situation would be so much easier for the National Health and Medical Research Council if, being selfish for a moment, the wherewithal to conduct the research was entirely provided with the competitively gained research grant. We can guarantee excellence through our rigorous peer review mechanisms but we do, as I said earlier, rely on this rapidly changing sector to provide the rest of it.

If the grant came with enough funding to cover these other costs then it would be a much more transparent system; we would know exactly what that piece of research cost and it would not have to be cross-subsidised—if you want to use that term; infrastructure supported is the term we would use, I suppose—by a different sector.

The previous certainties in the system allowed us to conduct good researches. As they go, and it seems clear that they are going, it is my personal view that we should identify them. If the NHMRC or the ARC on the rest of the university research were fully funded to support that research, everybody would be clearer and it would not be possible to move the support around.

**Mr MARTYN EVANS**—Have you looked at what those levels are?

**Mr Wells**—It is very difficult to quantify. New Zealand has attempted to do that. The concept is called unbundling. It is unbundling all the elements of the health services provision. I think most people regard that attempt as not entirely successful and it resulted in underfunding. They tried to unbundle research and training and I think it is commonly accepted they regard their training and research as now underfunded because of that.

Attempts to identify the costs were undertaken I think about three or four years ago but they were generally regarded as inadequate and they have not been progressed. We do not have a figure which we could put on the costs within the sector of research; so we do not actually have a figure we could give you.

**Prof. Chesterman**—I have a comment on that question, which is very important and one which obviously has been debated a lot. One of the problems in trying to unbundle is the fact that research and training and clinical care almost run in together; they are integral and they are integrated to such an extent that it is genuinely difficult to cost each one. An easy example is if I am doing a ward round and I have students with me and some of the patients are part of the clinical trial, how much of that ward round belongs to service and how much to training? When you try to go into it, that sort of example turns up constantly. Some things you can unbundle but the whole thing is so integrated that it is difficult.

**Prof. Nicola**—The NHMRC and most public funded bodies fund the direct costs of doing research, which is the consumables and the salaries. If you ask what is the average infrastructure cost required to support those grants, there is fairly broad agreement around Australia that the figure is somewhere between 55 and 70 cents in the dollar.

If you were to work out a funding scheme for infrastructure based on, say, competitive grants—I understand that with the hospitals you cannot unbundle things—you are looking at that sort of figure. Of course, a lot of that cost is already being paid through other mechanisms so you would save that through payments by DEETYA to the universities and other grants to the hospitals and so forth. But if you were looking at what it would cost, it would be of that order.

**Mr RICHARD EVANS**—Can I ask you to give me a bit of a picture as to the total medical research budget, both publicly and privately, in Australia; what sort of figures are we looking at?

**Prof. Warwick Anderson**—The NHMRC budget is of the order of $165 million a year. Most of those grants run for either three or five years, so we have around about a quarter of that for new grants each year. There are various estimates of what percentage that is of the total. I think probably, Bob, the best guess is somewhere between 20 and 25 per cent.

**Mr RICHARD EVANS**—Yours is 20 per cent.

**Mr Wells**—Yes, of the total health research effort.

**Mr RICHARD EVANS**—On my quick figures, that is about $800 million a year.

**Mr Wells**—Yes, that is the figure. But you get into definitional issues: do you

regard some of the market end R&D of, say, the drug companies as research or do you regard it as marketing? Most people would regard the figure totally for Australia as around about $800 million currently.

**Mr RICHARD EVANS**—What percentage of that would be spent on cancer research?

**Prof. Warwick Anderson**—I guess that to answer that from NHMRC's point of view, it would be very difficult to get that figure accurately because of the fact that if you take, say, a research institute they might get 30 or 40 per cent of their funding from us but the rest of it from various private donations—the Anti-Cancer Council, the Heart Foundation and so on.

Then you have a further definitional issue—it sounds like typical academics, I know—because more and more the breakthroughs and knowledge that are coming in all areas of health are coming from very fundamental research to do with the gene, how it works, the function of each individual cell in the body, where there is a revolution going on in our knowledge. Some of that research will not identify itself as cancer research at this time but, of course, may be exactly where the next major breakthrough is made.

**Mr RICHARD EVANS**—Could you take that question on notice?

**CHAIR**—I think it would be helpful if you could do that and give us a considered response to that question.

**Mr RICHARD EVANS**—Do you know what sort of people and how many people are involved in medical research in Australia?

**Prof. Warwick Anderson**—No, I do not know. It is true for all our grants that about 70 per cent of the money—perhaps a little more than that—is for salaries. These are not salaries for doctors, they are salaries for young post-doctoral people—technicians, research assistants and so on. So you could take a good punt that two-thirds or three-quarters or so of that total amount of money would go on salaries. Salaries in medical research are not high, so it is a large number of people. To get the detail, we may need to think about that.

**Mr Wells**—It is several thousand.

**Prof. Warwick Anderson**—Just for NHMRC.

**Mr Wells**—Professor Anderson made reference to us referring grants to referees. I think our database of referees is of the order of 4,000 to 5,000, some of whom would be international. We could take that on notice as well.

**Mr RICHARD EVANS**—One final question. Geoffrey Robertson is doing a hypothetical on Thursday, so let me give you a hypothetical. If I were a medical researcher who went out and sought some funds publicly and I raised, say, $800,000 for a medical research project, what responsibility and what sort of reporting of the outcomes would I need to do to justify taking $800,000 out of public donations? Is there any body that is set up to ensure that this money is spent wisely?

**Prof. Warwick Anderson**—If you get it from the NHMRC, we certainly would.

**Mr RICHARD EVANS**—I am sure you would, but in a private situation.

**Prof. Warwick Anderson**—The answer is that it would depend on what the requirements of the individual or the private organisation require. It is very much the usual case that some accountability is required, both on the money and in terms of reporting their results.

**Mr Wells**—If you were to do that and you sought a taxation act exemption for the donation, under that act you would be required to have a properly constituted research advisory committee to handle the money but there would not be a much more specific requirement than that. As Professor Anderson said, it very much depends on how you go about it and with whom you do it. Some bodies like the Heart Foundation or the cancer society provide rigorous accounting requirements, others perhaps not so.

**Mr ZAMMIT**—On page 3 of your submission you state:

It has been shown over and over again that the medical research effort is cost effective.

You also state that Australia has had an outstanding effort in medical research, four Nobel Prize winners, outstanding record of contribution, etc. How do you assess that it is cost effective, other than by these four Nobel Prize winners?

**Prof. Warwick Anderson**—There are a number of different ways you can do this. I think what is generally accepted around the world is a number of quite formal studies that have shown that there is a very large yield overall on the investment in basic medical research. By the way, the US Congress, a fairly hard-nosed bunch, has recently been convinced that they should be doubling the support for medical research in the United States.

I think Professor Larkins has brought up one particular example—and it is said of many other discoveries—that a single discovery, for example penicillin or the discovery that ulcers are formed by a bacterium, not as we previously thought by other things, can alone save all the costs to run medical research by itself.

We are currently undertaking a study of this type in Australia. Mr Peter Wills is

chairing a health and medical research review committee which is expected to report later this year, which is looking into, amongst many other things, this particular issue.

**Prof. Nicola**—I do think there has been a very thorough study in Australia but there certainly has been in the US, where they calculated that the savings per annum were about $66 billion per year in decreased health costs for a total cost of about $33 billion per year in investment in medical research. On top of that, they calculated that between $50 and $100 billion a year is saved from the creation of the biotechnology industry through medical research.

I realise that does not help you with Australia. I guess the broad figure you could use is that Australia contributes about 2.5 per cent of world medical research and it gets about 2.5 per cent of citations. Its impact is about equivalent to what it produces, so you could guess that the figure would be around 2.5 per cent of the world figures, and I just gave you the US figures, so you could get a rough ballpark of what it is worth.

**Prof. Chesterman**—Professor Larkins I think identified two Australian discoveries, the helicobacter pylori for peptic ulcers and lithium for manic depression, as being major cost savers.

There was a review in *Science*, which is probably the top US science journal, about three years ago which was the result of work done by the Harvard Business School and science researchers together. They identified, from memory, about six major advances which had saved vast amounts of moneys for the US health service. In those six the two that Professor Larkins mentioned were numbered. In other words, two of the six that these people identified as being major savers overall for health were identified by Harvard Business School. They did not mention that they were both Australian discoveries. I think those alone are quite striking.

**Mr JENKINS**—The submission quite rightly identifies the changes affecting both the funding of universities and the funding of the public health system which has had a dramatic effect on health and medical research. If you look at the changes that have been made in the funding of the public hospitals system as a continuum, you could identify the effects of outsourcing and you flagged the effects of more fuller types of privatisation. I have the impression that a lot of these decisions about changes in the way the public health system has been funded have not really taken much regard of the effects on research.

The first question is, when did the alarm bells start ringing? Did things such as case mix funding have an effect on access to the type of infrastructure and other support that research needed?

**Prof. Chesterman**—The short answer is that case mix did make an immediate impact on all these things we are discussing. In New South Wales the department has

considered—I don't know how far it has gone down the track—that research and teaching should be a separate case mix item, which would be one way of getting around some of our problems.

When was it signalled? I think it was around about that time when case mix started to come in—we are talking about four or five years ago—that people realised immediately the implications for what had happened and indeed for what was going to happen. Maybe it is a little bit out of turn but perhaps I should also say that not only is it affecting research but it is beginning to affect training of individuals coming through in particular specialities where the cuts have hit. It would be very remiss of us not to be making some quite strong submissions about this problem.

**Mr JENKINS**—Is there an acknowledgment in philosophical terms by the bean counters that researchers should be catered for, that training should be catered for? When I am told that a hospital like the Austin Hospital, which caters for some of my constituents, is to be sold off to public interests but it will still remain as a public hospital and be available for teaching and a lot of the research effort built up will continue, should I be reassured by those comments?

**Prof. Warwick Anderson**—You certainly should ask the question. I would just make the more general point that the provision of health care is a very big industry. It is a very important industry that is mainly focused on the wellbeing of people but it is a big industry which involves a lot of people. It is essential that any industry has a strong R&D component and in the past that has been the public hospitals system.

There are changes occurring—leaving out individual hospitals—perhaps some have regarded the provision of R&D as somebody else's problem, maybe the NHMRC. But I think it would be a very useful exercise for this committee and others to say that no organisation or no business survives for very long without a robust R&D sector, and this has to happen in health as it needs to happen elsewhere.

**CHAIR**—Thank you, Mr Wells, Professor Anderson, Professor Nicola and Professor Chesterman for your attendance here this morning.

[11.32 a.m.]

**BIRCH, Mr Christopher, Acting Manager of Program Coordination Section, Department of Industry, Science and Tourism, GPO Box 9839, Canberra, Australian Capital Territory 2601**

**BROWN, Mrs Vicki Annabelle, General Manager, Business Environment Branch, Industry Policy Division, Department of Industry, Science and Tourism, GPO Box 9839, Canberra, Australian Capital Territory 2601**

**HOLTHUYZEN, Mr Michael Rudolf, Deputy Chief Executive Officer, Department of Industry, Science and Tourism, GPO Box 9839, Canberra, Australian Capital Territory 2601**

**WELLINGS, Dr Paul William, Head, Science and Technology Division, Department of Industry, Science and Tourism, GPO Box 9839, Canberra, Australian Capital Territory 2601**

**CHAIR**—I welcome the Department of Industry, Science and Tourism to give evidence. I remind you that the proceedings here today are legal proceedings of the parliament and warrant the same respect as proceedings in the House. A deliberate misleading of the committee may be regarded as a contempt of 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. We have received a submission from the Department of Industry, Science and Tourism.

Resolved (on motion by **Mr Richard Evans**):

That the submission be authorised for publication.

**CHAIR**—That submission now becomes a public document and can be made available to anyone who requests it. If you would care to make an opening statement, we will then proceed to questions.

**Mr Holthuyzen**—Thank you, Mr Chairman, I would like to make a short opening statement. First of all, thank you very much for allowing the Department of Industry, Science and Tourism to make a presentation to the committee.

The department has broad responsibilities for developing, implementing and administering policies and programs designed to increase the competitiveness and internationalisation of Australian manufacturing and service industries, including tourism. It is designed to develop Australia's science and technology capabilities and infrastructure, including by programs to support research and development in Australia and to promote

balance between consumer and business interests within a fair and competitive marketplace.

The department is therefore charged with promoting both competition and innovation. Consequently, we have a range of direct interests in the committee's reference. Importantly, the department has responsibility for the promotion of industrial research and development and it is the coordinating department for the science agencies CSIRO, the Australian Nuclear Science and Technology Organisation and the Australian Institute of Marine Science.

The department's submission considers the range of efficiency and research and development issues that emerge in the application of competition reforms to Australian public and private sector enterprises. The submission argues that competitive reforms will impact in a range of ways on government business enterprises and utilities and on government research providers. Both positive and negative impacts are conceivable.

Research and development, when viewed as one of a set of activities undertaken in the context of a national science and technology system, is influenced by many factors. Aggregate statistical data does not indicate significant negative impacts arising from competition policy. However, this does not mean that policy reforms cannot have an impact on particular actors within the science and technology system. It is possible that while the total envelope of research and development spending has increased there have been structural shifts and a reallocation of effort within the envelope at the sector or enterprise level.

The department has developed a theme of transformation to aid understanding of the enterprise effects of competition reform. Competition reforms move an organisation through a spectrum of reform processes towards fully commercialised ownership and organisational behaviour. There is a potential for unintended impacts on some types of research and development as a result of the transformation process.

An analysis of the situation of public sector enterprises reveals a spectrum of progressively competitive reform initiatives that are being applied. These include administrative, accountability and transparency reforms. The latter activity includes identification and costing of community service obligations.

Further along the transformation path are pricing reform initiatives, such as competitive neutrality arrangements and privatisation in instances where governments take the decision to withdraw from direct public provision of particular services. The department's best assessment is that the transformation of public sector enterprises by reform processes will lead to a simultaneous transformation in the type of research and development they undertake. Research and development activities in the transformed entity are undertaken in a commercial context to support the core business activity, for example, of providing utility services.

The major risk identified in relation to such transformations is that some public good research and development activities may no longer be undertaken because the incentive and capacity to undertake research and development will be altered. However, the major opportunity coming from these reform processes is the likelihood of a much sharper focus on commercialisation of research and development.

In the case of government research agencies and providers, the department's submission suggests that inadequately considered implementation of competition reform could have negative effects, in particular by the loss of strategic and basic research capabilities. This is in contrast to the situation of public sector enterprises because research and development activities are the principal activity of the research agency and they are funded in large part for their public good research capabilities.

Therefore, competition initiatives may have unintended negative consequences for the national research and development environment if they are inappropriately applied to government research agencies and providers where they undertake significant public good research and development activities.

The extent to which any potential negative consequences become a reality and the impact of any shifts in research and development activity is a matter for assessment by policy makers oversighting each major reform process. For example, as part of the transformation process policy makers could consider at an early point the research and development activities being undertaken by potential public sector competition reform targets.

If significant public good or strategic research activities are performed and decision makers wish to retain them then strategies will need to be implemented to ensure the retention of public good research and development activities. These strategies might include specific budget allocations or adjustments in the priorities of public sector research agencies.

In summary, Mr Chairman, despite the many issues that might be negotiated in the future application of competition reforms, including issues affecting the Australian research and development environment, this supports the view that the rapid adoption of competition reforms will hasten the development of a more sophisticated and profitable research and development environment in Australia. However, in doing this, policy makers will need to be mindful of research and development issues, particularly in instances where competition reforms are applied to public sector research providers. Thank you, Mr Chairman, that is my opening statement.

**CHAIR**—I note in the introduction of your submission—and I have only just received it—one of the matters of relevance to DIST is the enhanced R&D start program. But I noticed in the press recently that almost one-third of the money which has been set aside for that R&D start program has not been spent. I do not know whether DIST has

done any formal evaluation of why that has occurred and why that money has not been taken up by the business sector. Can you elaborate on that?

**Mr Holthuyzen**—I will ask Mr Birch to make a comment. But in broad terms, Mr Chairman, a distinction has to be made between industry and particular companies applying for the funding and those companies actually spending it. The two are different in the sense that the budget allocation that is applied over a four-year period does not necessarily match the actual spending patterns of companies. In other words, a company may come along and seek an application for a grant or a start grant but may not spend it for some time. The difference that you will find in terms of expenditure is due to that particular process.

In particular the $50 million, which I think is what you are referring to, was taken back to consolidated revenue and a new research and development start program was put in place as a result of investing for growth. But that $50 million does not mean that money was never going to be spent. In fact, there were quite a large number of applications in the pipeline. It was because there is a mismatch between when the government says it will provide funding and when the companies actually end up spending it.

**CHAIR**—Could I follow that up with you. Are you saying that firms have applied for the money but it has not been allocated to them?

**Mr Holthuyzen**—Not all the moneys, or applications, were targeted for that $50 million but in many cases there was funding—while the funding was available, there were some companies that applied for funds and they are still in process. But it would not show up as an expenditure in the budget papers until such time as the company actually spends the funds.

**Mr Birch**—Perhaps I could elaborate briefly. Since the introduction of the program in July 1996 the demand for funds has been high. Around $250 million of the total $320 million available has been committed and a further $60 million is expected to be committed over the next three months.

The apparent underspend in the budget of $50 million does largely reflect two things. One is the complexity in engaging contracts for firms under the program—they have to be negotiated and some have been slightly more complex than expected, particularly related to ex-syndicates. Secondly, as Mr Holthuyzen points out, there has been typically a delay in the projects drawing down on the funds allocated to them. Those funds, in accordance with proper accountability requirements, are only paid as they are required by firms.

**CHAIR**—There has been some criticism about the decrease of the tax concession from 150 to 125 per cent. Some of the anecdotal evidence we have had is that it might

lead to a decline in the amount of R&D being undertaken in Australia. Have you got any hard evidence about that trend, or how does it look to you in DIST?

**Mr Holthuyzen**—I think the first point to make—and I will ask Mr Birch to make some more detailed comments—is that we do not have any hard evidence at this stage to indicate what the trend is but I can ask Mr Birch if he has any other information.

**Mr Birch**—The most recent information was published in the science and technology budget statement. That shows a decline of about 20 per cent in the registrations for the tax concession from 3,666 to 2,917 and also a smaller 16 per cent decline in the R&D expenditure of those companies.

**CHAIR**—Can I just interrupt you briefly. Is that 20 per cent drop in registrations of interest or actual applications?

**Mr Birch**—That is the actual registered companies. Those figures in fact are an underestimate of the final number of registrations because, as you point out, there are a number of applications pending, in fact it is 650. So the current estimates in the department in relation to those applications would indicate some decline in overall numbers and expenditure but not as high as that shown in the budget statement.

I also would like to point out that some recent research by the Industry Research and Development Board for its *R&D Scoreboard 98*, which is to be published in the near future, indicates that the number of companies whose R&D expenditure increased in fact outnumbers the number where it declined. Those results will be forthcoming in the near future.

**CHAIR**—Before I ask my colleagues for questions, I want to refer to a statement that we had on evidence from the Australian Institute of Mining and Metallurgy, who claimed that there was a lack of cohesion between the traditional resource based areas of government administration, DPIE and your own department. They were saying that this limits the development of strategies which would facilitate R&D directed at generating activity in the secondary industries sector. Do you have a response to that evidence? They claim that there is a lack of cohesion between Department of Primary Industries and Energy and DIST.

**Mr Holthuyzen**—I really do not have a comment on that, Mr Chairman. I am not aware of the problem, in the sense that the organisation has not come to us with that issue, or at least not to me. I am not aware of any problem of that kind at all. I am certainly willing to follow that up with both the organisation and with my colleagues.

**Dr Wellings**—I think it is surprising. Just off the top of my head, I think about 20 per cent of the investment in the cooperative research centres, which is a program coordinated by DIST, is directed towards the mining area. Many of those individual

centres, of course, are joint activities between universities or CSIRO divisions and either peak industry bodies or individual companies. Looking at the submissions that came in at the recent review of the CRC program, there were a number of submissions from DPIE, which is the responsible department, and from peak industry bodies in relation to mining, who recognised the strength of the program that was being coordinated through DIST.

**Mr RICHARD EVANS**—I am just looking at your report. You say in your introduction that the department is charged with increasing productivity investment in Australia and the department is also charged with maximising the national benefits of research. You go on to talk about the terms of reference of the committee which were supplied by the minister and your department. Most of the people who have come to us have said this is an important inquiry. Could you explain to the committee why your report was given to us only on Friday last week?

**Mr Holthuyzen**—Mr Chairman, I have two points to make. First of all, it took some time putting it together. I think, most importantly, we made some effort to find out what information was available, particularly in relation to the potential impacts of the trend towards privatisation and corporatisation of public enterprises and the impacts that might have on research and development trends through available information. The conclusion we reached, after significant searching, was that there is not a lot of information around. It was that desire to get as fulsome a picture as possible that meant we did delay somewhat in finishing the report to ensure its completeness.

**Mr RICHARD EVANS**—So although you are charged with all this development of research in Australia, there is not much information held by your department and that is the reason why your submission is late?

**Mr Holthuyzen**—I am not sure that the submission is late, Mr Chairman.

**Mr RICHARD EVANS**—Well, you are appearing before us at half past 11 on Monday and we got it on Friday evening. I have not read your submission, yet I am charged with having to ask you questions about it and I cannot do that. So is it late? I would imagine it would be.

**Dr Wellings**—Can I follow that up, Mr Chairman. I think one of the other issues in front of us is that the time series of data in order to draw any conclusions one way or the other about the effect of reform is very short. So that in looking at those enterprises that have been corporatised, we are actually dealing with highly fragmented, almost case by case, data.

The Department of Industry, Science and Tourism clearly has a large amount of data in relation to the science and technology system and the innovation system. They are published on a regular basis, either in the science statement that comes out associated with the budget or indeed in a smaller booklet called *Australian Science and Technology . . . at*

*a glance*, which is a little pocketbook that shows all sorts of trends. But none of these sorts of data that I think your committee is considering are actually disaggregated in order to allow those sorts of trends to be determined.

We are left with a system which tells us the quantum of expenditure, either in the public sector in universities or CSIRO and ANSTO, as Mr Holthuyzen said in his introduction, or we know the tax concessions or outlays or offsets that are associated with various programs; but actually getting into knowing what is happening in, say, the water industry or the electricity industry as a result of the corporatisation policies of the last few years is almost impossible to do.

**CHAIR**—I think the point that Mr Evans is making is the fact that this submission arrived on Friday afternoon after most members of the committee had left the parliament on Thursday evening, and obviously we would want to ask questions about your submission because of your area of responsibility. The matters of relevance to DIST cover a very important part of this inquiry. The fact that members of the committee have not had the time to read this submission may necessitate that you appear again before the committee so that we can read this submission and further direct questions to you about various aspects of the R&D side of it that you have responsibility for on behalf of the government.

**Mr Holthuyzen**—I am happy to do that, Mr Chairman.

**Mr RICHARD EVANS**—Can I just say one thing: the responses that you have given us, in my view, are inadequate. I have been on three inquiries of this committee in this parliament and on each inquiry we have had problems with your department. I do not know whether that is your responsibility, but I would like the message to go back to the department that we are not satisfied with the department in each of the inquiries that we have had. In particular, I am not satisfied with the responses to these questions, but I take the chairman's note that if we have an opportunity again, we would like to ask you some questions about your submission; if not, I will put them on notice.

**Mr Holthuyzen**—Mr Chairman, that's fine. I would like very much right now, if I could, to get a clarification from the member of the problem with the particular submission. That would be very useful for us to follow up.

**CHAIR**—The difficulty is that we have not had time to examine it.

**Mr Holthuyzen**—Sorry, Mr Chairman, I am perhaps mistaken here, but my understanding is that the problem was not about the timing but that the member was not happy with the submission. Those are two quite different issues.

**Mr RICHARD EVANS**—No, you gave it to us on Friday and we are asking you at half past 11 on a Monday about your submission. The inquiry was advertised by us in

November last year; the terms of reference were given to us by your minister in October; and you have given us a submission on Friday.

**Mr Holthuyzen**—That is very useful. What I really wanted to clarify was whether the problem was with the contents of the submission.

**Mr RICHARD EVANS**—Well, I have not looked at it.

**Mr Holthuyzen**—If the timing of our submission was the concern, I think we can answer that by coming back at another time; we are more than happy to do that.

**CHAIR**—There is another option which I would want to discuss this with the other members of the committee. There may be an opportunity for us to write to you as well and you may be able to respond to that with a written response. But if we are going to do that we would want to ensure that we do get a prompt response and it may still be necessary for you to come back and appear before the committee, because none of the members have had a chance to read this submission. I find this unsatisfactory when the inquiry has been progressing for some time and is of immediate interest to and the responsibility of your department. It is very difficult for us to pursue issues that are important to the terms of reference that have been given to us by the minister and we have to go back with some appropriate answers and an appropriate response to him.

**Mr Holthuyzen**—I am most happy to do that, Chairman.

**Mr MARTYN EVANS**—In the last paragraph of your conclusion you say that you are of the view that the competition reforms will hasten the development of a more sophisticated and profitable R&D environment in Australia. I have to say that is a little counter-intuitive to what one would expect, especially given some of the other evidence we have had about many of the savings or anticipated savings from corporatisation or privatisation of public hospitals, public utilities and telecommunications. The objective of that is to actually reduce the cost of the operation to make it more competitive and cost effective.

Many of the research benefits in the past have been derived through cross-subsidies within the organisation where public hospitals make use of their own infrastructure for R&D purposes and that is not charged; whereas now, for example, it will be. The same is true in telecommunications where Telstra is reducing the size of its laboratories at, for example, Clayton in response to privatisation in order to be more immediately competitive, otherwise a lot of these expected savings and benefits will not flow. This runs counter to the idea of long-term basic research being undertaken in those organisations.

Although, as other members have said, we have not looked at the whole submission, I would expect, based on some of the things I have seen in your submission and the other evidence, that we would be heading towards a position where we have more reliance

on the immediate application of research for immediate commercial benefit, we have a reduction of cross-subsidies within organisations and we have a climate of charging out for all services. When you say in your submission 'more sophisticated and profitable', do you mean in fact short term and applied, or do you mean the totality of R&D will be improved in the long run?

**Mr Holthuyzen**—Chairman, there are a number of issues there. I will ask Dr Wellings to give some detailed comments. But in the broad sense, the distinction needs to be made as to the institutional framework in which research and development takes place when the competitive characteristics of a particular corporation are enhanced. For example, the point you made about Telstra reducing its laboratories—that does not mean that the overall research and development effort within Australia, be it in telecommunications or elsewhere, is necessarily reduced; what it means is that different institutional organisations may pursue different types of research and development.

A good example, in our view, is that you now have within Australia, supported by government, the cooperative research centres where you get a strong interface between pure research organisations and commercial organisations. It may be that, while you increase research and development activity within the CRCs, you are reducing the pure public good type research and development in particular corporate bodies. But that does not mean that research and development overall, including the public good area, is reduced.

We do not have the information on that. As I indicated in response to another member's comments about the lateness of the submission, it was our desire to try to find out as much information as possible that delayed the completion of that submission so that we could inform the committee as best we could about what was available out there.

But it is definitely true to say that you cannot just look at an individual organisation's activity in research and development and assume that, because it is becoming privatised and it is reducing its public good component, the public good component is not being undertaken somewhere else, and perhaps better.

**Mr MARTYN EVANS**—We would have to see a long-term trend in the identified R&D increasing to counter the implied reductions in many of these now corporatised or privatised bodies. I am not sure that we are actually seeing that. We are seeing a long-term trend of reduction in CRC funding, for example. The recent budgets have taken not huge amounts but modest amounts from the CRC budgets and the trend is down, not up.

The trend in terms of total government commit through taxation and other sources is down, ARC's long-term funding is down, NHMRC goes up in one year to make up for past cuts but again the future trend for that is stable or down. CSIRO has seen reductions in its funds, not huge but again the trend is down rather than up. If all of those things are occurring in the public sector and we have our privatised and corporatised bodies, as you

say, reducing their public good commitments, which is the intuitive result you would expect—otherwise, where are the savings?—then where is the magic component that is going to increase that?

**Mr Holthuyzen**—I will let Dr Wellings say something in a moment but the point I am making is that one cannot just look at the input side of the equation, be it the cost of it or whether the activity has benefit; one has to look at the outcomes. The outcomes at this stage in terms of measurables are just not there, and that is an important point to make, I think.

**Dr Wellings**—If I could follow on from Mr Holthuyzen, I think there is a whole range of issues that could be teased out in this discussion. One of the things that I think the government is very keen to do at the moment is to focus on the commercialisation of R&D investment. Certainly in terms of the public sector agencies and universities the government has sent out a fairly clear signal that it would like to focus not just on the inputs but on the deliverables that came out of the research. I think that is a philosophy that is worldwide now.

There are some quite good examples of that. I think in this year's budget statement there is a figure in chapter 1 on commercialisation of R&D which shows the long-term relationship between the business expenditure on R&D and the number of patents which have been filed in the Australian system. While there is either a 12-month or an 18-month time lag on those relationships, there is a very strong set of evidence that shows that as the business expenditure on R&D has gone up the number of patents that has been filed by Australian companies has gone up.

I think at the same time, with the commercialisation and the corporatisation of public enterprises, the other thing that you would expect as a set of behaviours of the responsible board members of those institutions is for them to look at the whole of their organisation's budget and ask, what proportion do we want to spend on what activity?

As I was saying to one of the other members earlier, although it is anecdotal—and it is too early to be anything other than anecdotal—there is evidence to say that those boards of managements are now saying we should spend more on certain activities such as marketing, positioning or looking at infrastructure and, at the same time, most probably because it is a zero sum game for them, investing less in R&D.

I think you would expect, as those organisations find their place in the marketplace against other competitors in other states and territories, that they are likely then to start to look at the whole of the portfolio of their activities and to look at their R&D interface and their R&D needs with a portfolio approach.

I suspect what we are looking at is a moment in time when research and development in organisations such as Telstra, the water companies, energy enterprises or what-

ever, will decline for a short number of years and then reposition themselves. The end point of all of that, though, is that they will focus on the relevance of the research that they are actually conducting, that actually adds value for their shareholders because that is what they are now charged to do.

In that process there will be some activities that traditionally you might have expected a public organisation to do that will no longer be done. A classic example would be in the water industry where you might have expected a state authority that was dealing in water to know both the amount of water that was flowing down in a catchment and also the rate of demand that would be tapped off for citizens or industries in that particular state or territory.

That is likely to turn around now where we find the new corporatised entities actually just saying to the state or territory government, 'We would like X megalitres of water in this year' and the onus will be on the state or territory government, because these are state and territory responsibilities, to know what amount of water will be flowing in those catchments to know whether they can deliver that resource to those companies. The question is who will do that work, assuming that the work will be done, because we actually need that information.

The long term view, certainly within DIST, is that the costing and pricing of the activity of how much water is in the catchment will be built in in a transparent way to the cost of the amount of megalitres that the corporation would want to draw off. Whether there are ancillary public goods which are then lost in that process of making transparence, I think it is too early to say.

What I would say is that successive governments have charged CSIRO, AIMS and ANSTO to capture a proportion of their funds from external sources. From memory, CSIRO now captures about 35 cents in the dollar from external sources. At the same time we have the CRC program in place, which is this coalition of universities and industry. So the receptors to actually be able to do public good work exist and sit in the public science system to be able to link on and to do that.

That is a long-winded answer to your question, which was about these trends in data. I think what we are saying is that there will be efficiencies that come out in the science system that actually pull all of these things into alignment, and that may yet take two or three more years before we actually have a reasonable time series of data to be able to say what those efficiencies truly are.

**CHAIR**—Before we go any further, I just wonder if you could explain to us what is happening in DIST with the reorganisation and who actually has the direct responsibility for R&D—where it fits into the organisation as a result of those changes in DIST?

**Mr Holthuyzen**—Mr Chairman, the changes that have been proposed in the

investing for growth statement by the Prime Minister last year are still being put together and have not been finalised. I expect they will be finalised by 30 June but the minister and the government have not finally squared off on those yet. So responsibility for research and development at the present time still sits within a number of divisions. Directly, in terms of program delivery, through AusIndustry—that is the tax concessions, the start and grants programs; and a number of policy initiatives and issues as well as some programs through the science and technology division; and overall policy coordination through industry policy and other aligned divisions of the department.

That is likely to change as a result of a need, as articulated by the Prime Minister, to split program delivery and policy delivery into two different arms of the department, but the organisation of that has not been finalised.

**CHAIR**—I think on that basis we might conclude this particular segment. I would like to discuss with the committee and find out where we progress on this. Because of the late nature of the submission, members have not read it. I would imagine that we will have to correspond with you with some requests but also there would appear to be a need to have you appear before the committee again so that we can properly digest this submission and then put further questions to you.

**Mr Holthuyzen**—We are pleased to help in any way, Mr Chairman.

[12.12 p.m.]

**ANDERSON, Professor Brian David Outram, President, Australian Academy of Science, GPO Box 783, Canberra, Australian Capital Territory 2601**

**CHAIR**—I now call on the Australian Academy of Science, Professor Brian Anderson. Thank you very much for coming and welcome. I remind you 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 a 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. Would you care to make an opening statement before we proceed?

**Prof. Brian Anderson**—I would, if I may, Mr Chairman. I begin by saying I do applaud the activities of the committee. I have read some of the transcripts and I can see from the perceptiveness of the questions that committee members have been doing their homework very thoroughly and are thinking deeply and that is not an easy task. I am aware also that you have talked to a great Australian, Sir Gus Nossal, my predecessor until very recently as the academy president and you have had the benefit of an academy submission. I do not want to traverse all that again, so in a few minutes I would like to make some focused remarks that amplify aspects of what might have been said earlier.

At the broadest level, as a taxpayer and a consumer, I, as I suppose most Australians, would welcome the changes that have been brought about by many of the moves relating to privatisation, corporatisation and so on, because it is now much cheaper to call the United States; the electricity bill of the Australian National University has gone down very substantially; and Commonwealth Serum Laboratories, or CSL, has benefited a great deal from going into the private sector.

I think there has been some collateral damage and that is perhaps what your committee is inquiring into and there are four or five points that I would like to make about that. The first point is that as a result of the corporatisation and privatisation process, the nature of the R&D performed can change. The entities which are now corporatised or privatised that previously were, as it were, closer to the government, used to take a broader view of what they should be doing in the R&D area. That did not just relate to what R&D they might perform in-house but what R&D they might support outside.

For example, in the information technology and communications area there were two boards, the Australian Telecommunications and Electronics Research Board and the Australian Computer Research Board, which did become amalgamated, that were funded by Telstra—or Telecom-OTC when it existed as a separate entity—the Department of Defence and I think the Department of Communications. These boards funded, on the

basis of competitive proposals, a lot of research at universities. In addition, until a few years ago, I believe, Telstra was funding approximately $10 million of contract R&D work in universities.

The Australian Telecommunications and Electronics Research Board and the Australian Computer Research Board no longer exist. I believe most of the funding by Telstra of work in universities has ceased, although undoubtedly some is still going on. I certainly have no sense that Telstra's involvement in CRCs has made up for those reductions and I have the sense that R&D in Telstra itself has been significantly reduced but I do not know the figures. Undoubtedly it has become more business focused.

I suppose, like many people in the room here, I am a shareholder in Telstra and perhaps I should welcome that. One would expect as a result of the commercialisation process that the research does become more relevant to its commercial needs. In some cases, though, that research will be driven by near term commercial needs; and, with Telstra's struggle to retain market share in the new competitive environment and its struggle to reduce staffing costs to the international norms for this industry, I have got no doubt that long-term R&D and perhaps even medium-term R&D are not high priorities for that organisation at the moment.

Senior people who were in Telstra and have now gone to senior positions in the private sector confirm to me that Telstra has deskilled. That is much easier to do than to reverse and if in the future Telstra seeks to re-establish a level of medium- and long-term oriented R&D closer to what it had in the past, that may be quite hard to achieve.

In the electric power industry there was a body, no longer existing, called the Electrical Research Board which was funded by major players in the area and gave funding to people in universities on the basis of competitive proposals. There is now only a small number of significant involvements of power authorities, if I may use that term, with universities. Pacific Power, which was a big player in New South Wales, used to fund a chair at Newcastle University, and that has ceased.

There is a particular technical problem area which is not being addressed as a result of the new arrangements in the power area and it concerns the problem of stability. If you have instability you have blackouts over massive areas, the sort that are reported internationally. With the break-up of the power industry in New South Wales and perhaps across Australia, worries about stability, which is very technically complicated and a subject of research, has become no single entity's responsibility.

Any one generating authority can make more money by running its operations close to the brink of stability and relying on other operators to pull it back from an unstable situation. So the stability dangers have probably increased and at the same time this very important subject, with big economic ramifications behind it, has dropped off the research agenda because no one entity sees it as its particular responsibility to pursue.

Those are examples primarily of the change in R&D that can take place. It becomes much more short-term focused and much more oriented towards the new institution that is created as a result of corporatisation and privatisation.

My second point is that the amount of R&D can change as a result of corporatisation and privatisation for several reasons. There are three reasons which tend to drive it down, and one at least which tends to drive it up. Why might the total level of R&D go down? Well, Australia by international standards has industries which underperform in the R&D area and I believe that means those industries are doing less R&D than is in the interests of their shareholders. That is for a variety of reasons, including a broad failure to deeply understand on the part of boards and CEOs and so on what benefits can flow from doing R&D.

There was a survey conducted by the Arthur D. Little Corporation of some 650 companies from a number of countries, including Australia, which concluded very negative things about the senior people in the Australian companies in terms of their inability to see the importance of innovation to the future success of their company in a global environment. That is an example of the thinking that causes Australian industry to underperform by international standards.

It follows, I think, that if you pass a government entity into the private sector and its CEO and boards are of similar composition to those of other major Australian industries, it will underperform, not just in terms of supporting the universities but in comparison with its international peers, and it will probably perform less than is in the interests of the shareholders.

I read some of the evidence given by someone from BHP, who argued that exploration was like R&D and if you counted the exploration that BHP did then that sort of made up for the apparently low R&D that it was doing. I have seen documents, probably two or three years old, produced by CRA that showed their R&D intensity was way above that of BHP. When Robert Holmes a Court issued takeover documents when he was making his play against BHP, he castigated BHP for the low level of R&D. So there you have one of Australia's icons who apparently is significantly underperforming.

Some of these industries excuse what they are doing by saying that you can just buy the technology, which seems to me to mean you can never be a market leader because someone has got to have developed the technology first and you will probably get last year's technology rather than this year's technology.

A second reason why the R&D performed by industry may be less is that industries recently received some negative signals from the government in relation to the reduction of the concession from 150 to 125 per cent. I am aware of more than one company that complains about compliance costs in justifying their access to that concession and claims that the compliance costs have been driven up through the actions of

public servants in recent times, leading them to query the level of benefit associated with the 125 per cent concession.

I have not yet seen figures which reveal how the level of industrial R&D undertaken in Australia may have responded to the reduction in the concession. The figures may have become available recently, but I was out of the country until late last week. I venture to suggest, with some humility, Mr Chairman, that these may be of interest to your committee.

A third reason why R&D can go down through the corporatisation and privatisation process is that the process may lead to overseas ownership of the organisation, and I believe that is occurring in the water area. I think people would recognise that R&D tends to be done more in the country of domicile of a corporation, even though it is an international corporation, than in other countries where it may have activities. So that is a factor which can drive it down. Quite apart from the job implications of the R&D being done outside of Australia when it had been done inside of Australia, we lose some of the spill-over benefits that come from having R&D done in our community.

It is not all doom and gloom. I think everybody is aware of the great success of CSL. As CSL's turnover grows and its profit grows it can afford more R&D. So it is possible for there to be an increase if a company remains Australian and really does well on the international scene.

My third point relates to the skill base. I have recorded for you the fact that the Australian Telecommunications and Electronics Research Board and two other similar boards have ceased to exist. These boards both supported research and some research training so there has been a withdrawal of the dollars or a reduction from one source of the dollars flowing in to several areas, including the very important information technology and communications area.

There is some offsetting, of course, by CRCs, although I believe in the last two rounds of CRCs there were none in the IT area. Some people queried whether CRCs are an appropriate model to pursue interaction in the IT area between the private sector and universities. Of course there have been some contracts with very short-term focus that universities have won but I think it is true that the funds available for developing the skill base have been reduced.

This is of great concern to me as an Australian in the information technology and communications area. We were given a figure of, I believe, over $40 billion by Goldsworthy in his report last year as the trade deficit of the information industries area—I forget precisely how he defined that—and there was a report of ASTEC in December 1996 which drew very gloomy conclusions about the quality of the university academics in the area of computer science.

There is a report on the web that is the responsibility of the Australian Academy of Technological Sciences and Engineering and I believe the Australian Research Council, yet to be in print, which draws similar very gloomy conclusions about the discipline base in information technology and communications.

So we have had the money for training going down in comparison with, say, biology; a poor set of trainers; we have got universities where the pay for such people is pretty poor in comparison with industry; and foreign universities who suck out our best people; we have had a deterioration in the work done by universities; and we have the huge demands on the ARC funds. So I do have great concerns about the skill base, especially in the information technology and communications area—less so in the electric power area.

My fourth point relates to outsourcing. So far as I can see, outsourcing appears to favour bigger entities. In the IT industry the structure of the industry is such that this means that outsourcing is probably going to boost foreign owned corporations relative to our domestically owned, because the structure of the industry is one where nearly all the big players are foreign domiciled.

My fifth point is more a philosophical one. It seems to me that corporatisation, privatisation, outsourcing and competition policy reform all fit into a theoretical framework that comes from economics; and economics is perhaps not that different from science in relying on theories and models. Theories and models can be beautiful and elegant, capable of simple description, and enable you to forecast some things about the real world. But they are only a guide to reality. Theories are never perfect. They are not often wrong but they are normally somewhat incomplete or a simplification. Whenever we appeal to a theory we need to do it with caution and a willingness to be flexible in the face of what we see as the results.

Now, when I look at what Mortimer did, or nearly did to the CRC program, it seemed to me that he was saying, 'Well, here's the theory, let's make the facts fit the theory.' That is not scientific and I doubt that is what a fully trained economics person would do either.

I do applaud the effort of the committee in trying to understand the difficulties that have arisen from the broad concepts of outsourcing, privatisation, corporatisation and so on. Thank you, Mr Chair.

**CHAIR**—Thank you very much. I note that you are a director of Cochlear Ltd, which manufactures the bionic ear. We had a submission from Cochlear and its view was that the policy thrust towards privatisation and generally improving the competitive environment in which research operates is to be encouraged. After hearing you this morning it would appear to me that you might have a different view to that. Is that your opinion also?

**Prof. Brian Anderson**—It is my opinion that in the broad the Australian community has benefited from corporatisation, privatisation and so on, but it is also my opinion that this has had a number of unfortunate collateral consequences which someone needs to address to redress the negative aspects associated with the broad movement of corporatisation, privatisation, outsourcing and so on. This will be industry dependent also.

**CHAIR**—You referred to one industry which I have more than a passing interest in and that is the electricity industry. We took evidence recently from the Electricity Supply Association of Australia and they told us that in a vigorous competitive market, like we have now in the electricity industry in Australia, it is often no longer acceptable to wait for a university to complete a project of research for them when other alternative organisations can deliver the required product much more quickly. Do you have any response to that?

**Prof. Brian Anderson**—I think it is often the case that short-term issues can be drivers in the commercial world. Universities by their nature tend to look at longer-term research problems rather than short-term research problems so I am not surprised that if there is a short-term problem facing the industry it may have some difficulty getting a university to handle it.

But it does not follow from that that it is not worth while having some long-term research activity going on somewhere in Australia. The universities are one place obviously where we are used to having that going on and that is the right sort of environment for doing that.

**CHAIR**—You also mentioned CSL in your response and your presentation to us. I understand that CSL is doing some very valuable research. We did invite the organisation to appear before the committee but we have not been able to attract them to the committee at this stage. We would encourage them to appear, if they were able to find the time, so we could hear a view from them as to what their level of research has been and whether it is increasing as a result of the privatisation. I do not know whether other members have questions.

**Mr RICHARD EVANS**—We heard evidence from Prof. Nossal earlier on in the inquiry and we have had a lot of evidence from an array of witnesses. The committee has to ponder this evidence and come up with some recommendations. Today you have given us five different points but there has not been much in the way of recommendations that I could get from you.

You identify that there seems to be too much bureaucracy involved with research and you gave me the feeling that there is probably an institutionalisation of research when it should be a bit more free. You gave us the view that companies are not really focused on science and doing research for their own benefit, that we are seeking overseas technology rather than our own technology. How do we turn around that philosophy or culture in

Australia? What government policy do we need to introduce to make that happen?

**Prof. Brian Anderson**—That is a very difficult question. Can I say, first, I would not have used precisely your words to summarise what I said. So if you just understand we might have a slight difference there, I appreciate that was not the thrust of your question. I would like to take the question on notice because it is a very broad question, Mr Chairman.

**CHAIR**—We would be happy for you to put that in writing.

**Prof. Brian Anderson**—I do not know whether that is in order.

**CHAIR**—That is perfectly acceptable.

**Prof. Brian Anderson**—Would you prefer me to say nothing now?

**CHAIR**—If you would like to make a comment, please proceed; that would be helpful. Then if you are able to give us a full and considered response in writing, that would be additional to what you have to say now.

**Prof. Brian Anderson**—I would like to rely on the latter, but if I may make a couple of preliminary comments. There is no single thing required to get things right in Australia.

If I had to identify what I saw as the two greatest problems, one is a failure by many, but not all, companies to truly understand how important R&D is for their future in a global economy. I think CSL does it and I think Cochlear does it but I am sure many do not. So one is looking for recommendations that will reverse that situation. They may involve the sort of seduction of tax concessions and jawboning by the Prime Minister and it is going to be a long process because there is a cultural change required.

The second thing is that our universities have been driven down to the point where they are going to lose from a variety of areas the skill base and competence that has been built up there, the skill base and competence to perform research and to provide research training. I truly think there is a financial problem *in globo* with the universities. I am not saying that means they should all get a five per cent rise or a 10 per cent rise or anything like that, but I believe there is now too little public money going into universities. In my written follow-up, Mr Chairman—

**Mr RICHARD EVANS**—As part of your follow-up, could you make some comment about whether you consider it important that we add science to management training degrees. In other words, we are generating these managers who are very good on accounting but are they any good on the importance of science? I would not mind getting a view on that.

**Prof. Brian Anderson**—I would be very pleased to do that. I will also say something now about that, if I may. I am an engineer; I have a science degree and an engineering degree but I regard myself more as an applied scientist than as a scientist and think of myself as an engineer.

Engineering degrees in this country now require a substantial amount of management training at undergraduate level. I am wholeheartedly in support of that and drove some of those moves at the Australian National University. Secondly, if you look at the backgrounds of some students in MBA programs in Australia, I think you will find something like 50 per cent have earlier training in science and engineering. This strikes me as extremely helpful.

The third thing is I doubt that every manager needs a scientific background. What is important is to have a mix of skills. I think we have had a situation where at the top of the companies there has been an overweighting of law and accounting and so on and an underweighting of these other areas. But I would be very pleased to address that, Mr Evans.

**Ms GAMBARO**—I have two questions; the first one relates to health R&D. Some of the policy reforms that the inquiry has investigated have shown a substantial effect on R&D in the health area. Can you comment on what, in your opinion, has happened to health R&D over the years?

**Prof. Brian Anderson**—I am afraid I am not well briefed on that area. I have only been president for—

**Ms GAMBARO**—Since the end of April.

**Prof. Brian Anderson**—Yes, I have just entered my second month. My nearest contact with that has been through Cochlear Ltd and before that actually Teletronics. I do not think that experience is—

**Ms GAMBARO**—Can I congratulate you on that. I met some people in Brisbane recently who are big users of your particular implant and they had nothing but very favourable things to say. That has been a major world achievement. Are we capable of doing more of those types of things?

**Prof. Brian Anderson**—I would like to think we are capable.

**Ms GAMBARO**—I would like you to comment on my personal perception, from what I have read and from the companies we have talked to, that there seems to be a problem with what universities and public enterprises are doing in research. We have the CRCs in this overlapping area, then we have the companies that are doing the R&D. We have spoken to people who have said, 'Look, it is risk venture that has stopped us from

investing in more R&D.'

Richard Evans spoke about engineers having some marketing training. Are we perhaps not visionary enough to see that if we do invest a certain amount in R&D it will lead to greater commercialisation? Perhaps, being a marketer, I am also looking at the marketing aspect of it. There is a reluctance by financial institutions who will delve more deeply into these particular risk projects. There are very few that do this—Macquarie Bank is one that comes to mind. I would not mind your comments on that.

**Prof. Brian Anderson**—The way I would describe what is happening is the following: many of the potential suppliers of finance in this country have little experience in assessing the risk content of a commercial activity that is highly R&D dependent. It is outside their universe of discourse or universe of experience so they intuitively ascribe a higher level of risk to it than would be ascribed by someone who was used to assessing commercial propositions that were based on R&D, the sort of people you get in Silicon Valley.

So the costs of money to underpin R&D development with a commercial objective will probably be great or simply will not be available because the conditions in terms of securities, collateral and so on will just be overwhelmingly hard for the person seeking the money to meet. I think we probably have banks which are very skilled at assessing real estate developments and the like but they are simply not skilled in this other area. I am aware that both sides of parliament from time to time have attempted to get to grips with this, through various schemes, and that is just great. We are perhaps feeling our way towards an improved understanding on the part of the providers of finance but it is very slow.

Now, I am not sure that those remarks properly addressed your question because I lost the thread of it a little.

**Ms GAMBARO**—You said a lot of engineers go back and do MBAs because they understand that they need to have a marketing focus. Having taught engineers in the past, I agree with that wholeheartedly. But do we need perhaps to have more scientists working in the financial area or do people who work in financial services need to have a core group of maybe one or two people who have a scientific background as well as managerial skills who can bring that focus into risk venture analysis?

**Prof. Brian Anderson**—I think if there were scientifically qualified people with R&D experience playing a significant role in financing decisions being made by banks and the like, that would lead to a more accurate assigning of finance because of a more accurate assessment of the risks. I am not sure how you achieve that, because we are not a sort of command economy where you direct people where they have got to take a job—and we should not be, of course.

**Ms GAMBARO**—Thank you very much.

**CHAIR**—Thank you very much, Professor, for your attendance today and also your willingness to enter into further communication with the committee; that is greatly appreciated. Thank you for your very frank and open responses to our questions today. I appreciate your attendance here and your willingness to assist the committee in what are proving to be very challenging terms of reference that have been given to us by the minister. We greatly appreciate your assistance and thank you for your time.

Resolved (on motion by **Mr Martyn Evans**):

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 12.48 p.m.**