COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND REGIONAL SERVICES

Reference: Development of high technology industries in regional Australia based on bioprospecting

MONDAY, 2 APRIL 2001

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND REGIONAL SERVICES

Monday, 2 April 2001

Members: Fran Bailey *(Chair)*, Mr Adams, Mr Andren, Mr Horne, Mr Katter, Mr Lawler, Mr Leo McLeay, Mr Nairn, Mr Schultz, Mr Secker, Mr Sidebottom and Mr Cameron Thompson

Supplementary members: Mr Griffin and Dr Washer

Members in attendance: Mr Adams, Fran Bailey, Mr Lawler, Mr Nairn, Mr Secker, Mr Sidebottom, Mr Cameron Thompson and Dr Washer

Terms of reference for the inquiry:

To inquire into and report on the following areas, with particular emphasis on the opportunities in rural and regional Australia:

- the contribution towards the development of high technology knowledge industries based on bioprospecting, bioprocessing and related biotechnologies;
- impediments to growth of these new industries;
- the capacity to maximise benefit through intellectual property rights and other mechanisms to support development of these industries in Australia; and
- the impacts on and benefits to the environment.

WITNESSES

Committee met at 9.32 a.m.

RADKE, Ms Sandra, General Manager, Biotechnology Australia

SWANTON, Dr David John, Manager, Projects, Biotechnology Australia

CHAIR—I declare open this public hearing of the inquiry by the House of Representatives Standing Committee on Primary Industries and Regional Services into the development of high technology industries in regional Australia based on bioprospecting, bioprocessing and related biotechnologies. The inquiry was referred to this committee in October last year by the Minister for Agriculture, Fisheries and Forestry, Warren Truss. Written submissions were called for and 25 have been received to date. The committee is now starting on a program of public hearings and informal discussions. This hearing is the first for the inquiry. This morning we will be hearing from two Commonwealth government agencies, Biotechnology Australia, and the Department of Agriculture, Fisheries and Forestry.

Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House itself. The giving of false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Your submission has been received by the committee. Do you wish to make a brief statement to your submission or make any introductory remarks?

Ms Radke—Yes, I want to have a bit of an introduction, because this submission is really a joint one with five portfolios and it might be useful for the committee to understand our perspective here. Biotechnology Australia was set up to coordinate the development and delivery of a national biotechnology strategy. It represents a whole of government approach to technology responsibilities of the five departments of Industry, Science and Resources, Agriculture, Fisheries and Forestry Australia, Environment Australia, Health and Aged Care and Education, Training and Youth Affairs. I think it is fair to say that that does imply that government places a fairly high importance on the biotechnology sector in Australia. Because we have these five portfolios involved, there are a lot of common issues, and this submission is intended to be a fairly overarching view from the five portfolios. As such, it has to take fairly broad view, and I believe that you will have individual submissions from both AFFA and Environment Australia—

CHAIR—Yes.

Ms Radke—and they will concentrate on specific issues under their portfolios. Our submission is not a definitive treatise. There is probably much analysis that could be done in this area but it is very new: bioprospecting and processing and indeed biotechnology are fairly new features of the Australian industry and even globally, so there is not a great deal of wealth to go on in terms of industry structure and so forth. But it is a view of the potential for this sector to progress. I know your interest is also in regional Australia.

CHAIR—Yes.

Ms Radke—We do have some base information which we can table for you, just to give you some background to the more general biotechnology strategies that we have, because the National Biotechnology Strategy and some of the government programs which support that are, while wider than bioprospecting and bioprocessing, certainly applicable to fostering industries based on those sectors. Would you like me to go through terms of reference and key points or would you just like to ask questions?

CHAIR—Why don't we start with some questions initially, then we might call on you again if we feel that we need to probe a little bit deeper further on. Given that you have responsibility for the overall strategy of developing this, as you say, very new, emerging industry of biotechnology, what do you understand is the definition of bioprospecting?

Ms Radke—We are taking a reasonably broad view but it is the exploration and discovery process of new chemical compounds and genetic material in flora and fauna in any natural environment, which could be applicable to various sectors, such as health, agriculture, food production and so forth. You will have to excuse me: in a previous life I was a geologist, so I tend to make analogies to the mineral and petroleum exploration industry, but it is certainly an exploration research phase to discover material. It is usually conducted by companies or public research institutes, universities and research agencies, who go out and collect samples and analyse them, usually for their genetic material but also for their chemical compounds. They hold that data in databases. They are usually after some sort of target or some sort of research base where they are trying to find solutions to some health or environmental problem.

The initial phase may be just collecting information to see if there is anything of potential interest and, if they find something, they may go back and do some further analysis. For example, they might find some genetic material in a species that is not well known, where maybe they can use some of that genetic material to help develop drought-resistant or salt-resistant species for propagation, as an example. But, having made that discovery, they then have to develop the process, and here is where the line gets a bit fuzzy because actually utilising and commercialising that is the key to whether this is going to be an issue. Certainly, having also worked on the innovation statement, I know that commercialisation in any field is an issue. But once they have discovered something that might be applicable, they have to determine whether or not it is economically feasible to actually harvest it in the wild or propagate it or indeed the third alternative is to synthetically produce it, based on what they have learnt through their field trials.

CHAIR—Before we explore some of those obstacles to that commercial application, I would like to have some clarification from you. In your submission you speak about the National Biotechnology Strategy. You talk about it being a 'dynamic strategy designed to be modified as biotechnologies develop and circumstances change'. Can you flesh this out for us in this committee and tell us how exactly this operates, what progress has been made so far and, when you talk about the dynamic nature of this, how is that managed?

Ms Radke—If we talk first about it being managed, the National Biotechnology Strategy is under the control of the Ministerial Council for Biotechnology, and the five relevant ministers are involved. I think through provision of information to that forum and making decisions that forum really determines future paths, obviously with advice from BIOCOG. We currently have an advisory council called BIOCOG. We are soon to replace that with a new council called the

Australian Biotechnology Advisory Council, which will be more focused. The mechanisms towards providing advice to government are from the five portfolios providing advice and our independent advisory councils to the ministerial council.

CHAIR—Is that advice coming from just within the different departments or is that advice coming from outside departments as well?

Ms Radke—The advisory bodies are external and they comprise the research community and the business community—the main academics. They are external to the government; they provide that external advice for the process.

CHAIR—What progress has been made so far?

Ms Radke—I think BIOCOG were very integral in providing advice to develop the National Biotechnology Strategy. I will come to what the key elements are there. That is a new strategy, so that is a good starting point for you to understand how things might change. But BIOCOG, in partnership with the government departments and other advice, helped to formulate a view on how we should go forward. The National Biotechnology Strategy was launched in July 2000.

Dr Swanton—By Senator Minchin.

Ms Radke—Yes, by Senator Minchin, who is the chair of that ministerial council. In essence, it has a number of elements but, to make it simple, there are three key areas. One of them is that it is important, if we are going to promote biotechnology, that information is widely available on a transparent basis to people—both sides of the coin—and that public debate is well informed, so there is an element of the strategy which promotes public awareness.

There is also an element to the strategy of just coordinating the activities of biotechnology issues throughout government. Biotechnology Australia provides that coordination pivot point for all the departments and any other external input. The strategy identified impediments and opportunities. For example, it identified there were gaps in the commercialisation of research and, to that end, we now have the Biotechnology Innovation Fund, which was initially launched in the 2000 budget with a funding of $20 million over three years. That was supplemented recently in backing Australia's ability with another $20 million. That is for helping companies to develop their proof of concept. It is what we call a pre-seed assistance fund to help with that.

Mr ADAMS—Is any of that in rural and regional Australia?

Ms Radke—It is open anywhere, it is not—

Mr ADAMS—Is any of the money that has been allocated?

Ms Radke—The money is not specifically allocated to any particular area or companies. It is on merit.

Mr ADAMS—I did not ask that; I asked you whether any money has gone into regional or rural Australia.

Ms Radke—Sorry. Nothing has been actually allocated yet. The money becomes available in July and we are going to start the first tranche of applications.

CHAIR—So the total of $40 million becomes available in July?

Ms Radke—Yes, the total $40 million becomes available in July. We have structured it to what we call BIF stage 1, which will be a grants program, and we are taking the first $20 million to use for that. We are hoping to call for applications in late May-June and make some announcements for the first expression of interest in that around August this year. We will, up to four times a year, be calling for applications for that. With the second $20 million, we are considering having that more as an equity based fund. But, because it is very early days—pre-seed—to what extent that would be the best mechanism to deliver that kind of assistance versus a grant is yet undetermined in our minds. So we are looking to see how well the first stage goes and also other things like the recently announced pre-seed—how far that goes.

CHAIR—Who assesses how the first stage goes?

Ms Radke—Firstly, we are going to establish an expert panel of people with expertise in biotechnology and early stage venture capital—that sort of thing. It will be probably under the auspices of the IR&D board. We are in the process of negotiating those things right now. There are several models that we can take. That expert panel will be making assessments and providing advice on that.

CHAIR—That panel would be very difficult to set up, wouldn't it, given that there is not really a great depth of knowledge? In your own submission you talked about how new all this is. When you are looking to establish this panel, how wide are you going to cast your net for members?

Ms Radke—I think probably the main weakness we have is the number of people in Australia who have experience with the early pre-seed stage of funding. There are people who have some experience there, but we also have the dilemma of making sure that there is no conflict of interest, whomever we have on the panel. This is true of a whole range of things. There are number of activities which are looking at pre-seed—not necessarily just in biotechnology—now, and everyone is in that same position. I think there is a learning curve, which is why I think we are a bit reticent to deliver all this as an equity based fund at this stage.

Mr ADAMS—When you say 'equity based', what do you mean by that?

Ms Radke—What we are proposing first is a grants based type of system, but equity based is where we would get private investment. So the government would say, 'Look, we've got $20 million. What we want to do is set up a fund.'

Mr ADAMS—Use it as leverage?

Ms Radke—Absolutely. We would have a private investor managing that fund, so for proposals that go forward, the investors, including government, would earn equity in any profits there.

CHAIR—I would like to back to my original question to you about the progress that has been made so far. You started by saying that one of the key rules was providing information and making that as widely available as possible. What means are you using to disseminate this information?

Ms Radke—Several means. Obviously the Internet is an important component of a lot of these things. We have a web site and actively engage with others in providing information. We have publications and run seminars. One of the programs was a rural forums series. I think the next one is in Tasmania, which will show the bravery of the team!

CHAIR—Are these the ones starting this month? I noticed that in your submission you talked about information and management training courses. Is this the same thing or are we talking about separate ones?

Ms Radke—Is that for IP?

CHAIR—Yes.

Ms Radke—That is another component.

CHAIR—It is a separate one?

Ms Radke—It is a separate one. In other words, there is a fairly broad based range of activities to hit different people. The rural forums were aimed at going out into rural areas, holding public forums with key players and having a facilitator to foster debate on both sides of the coin about things.

Dr Swanton—I do not think the rural and regional forums were that very well attended but, importantly, they were able to gain great media reach in rural and regional areas about gene technology and biotechnology issues. Apparently the media coverage has been rather positive, countering the sensationalist—

CHAIR—We are not talking about gene technology per se. I think with gene technology seminars you will always have a fairly good audience. But what we are talking about here are opportunities for developing biotechnology through bioprospecting and further bioprocessing. The one that you are holding in Tasmania: when is that being held?

Ms Radke—I think it is 26 April, just after Anzac Day.

CHAIR—Is that the first of these seminars?

Ms Radke—No, they have had a series of them. I think there will be an ongoing program there. But you were also referring to the IP seminars. They are obviously focused on IP awareness and training. My understanding is that there has been a series of seminars done on IP but we are about to start a new one. David might give you some details.

Dr Swanton—In May last year we had an intellectual property awareness rating series of seminars around the capital cities of Australia. We got a turnout of 100 or so people in Melbourne and, I think, 40 or 50 in Perth and Adelaide. This year we are having a more expanded version of that. It is an intellectual property management training course aimed at start-up companies and also at academics. We have tendered this out. The successful deliverers of the course are producing a 200-page manual which gives a very good run-down of IP management issues, so they could almost use this as a textbook to make sure they are on top of the issues.

We were sent a few of the submissions to this inquiry on Friday afternoon. I noted that one submission, the submission from the Australian Microbiology Society, indicated they had trouble getting venture capital when the ownership of the IP was not yet confirmed. This training course will, hopefully, cover some of those issues.

CHAIR—That would seem to be a pretty basic issue, wouldn't it?

Dr Swanton—Indeed. We are aware of a few stories where investment has not proceeded because the ownership of the IP had not been determined. In addition, I think they were also worried about the issue of pre-seed funding. With quite a bit of money going to the Biotechnology Innovation Fund, that will certainly help that.

Mr ADAMS—Maybe one of those manuals would be handy for our report.

Dr Swanton—The manual is in the final stages of editing.

Mr ADAMS—But when it is finalised—

Dr Swanton—Yes, we can arrange that.

Mr SIDEBOTTOM—I would like to clarify something. I noticed you used the expression 'show the bravery of the team' about going to Tasmania. I do not know what you mean by that. Are you referring to the biotechs gene technology discussion cum seminar process?

Ms Radke—Only that right now, with the issue of the field trials and the breach of field trials, there is a fairly hot media debate going on. That is all.

Mr SIDEBOTTOM—Right. You do not need courage for that; you just need to do it.

Ms Radke—Yes, and the team is really enthusiastic about going down there.

Mr SIDEBOTTOM—This is relevant to this committee, because in our last report we dealt with gene technology and so forth. You said you had been there before. When was that?

Ms Radke—In Tasmania?

Mr SIDEBOTTOM—Yes.

Ms Radke—I am not sure whether they have been to Tasmania before.

Mr SIDEBOTTOM—You did say you had been there, and I was not quite sure when you were there.

Ms Radke—I do not think the rural forum has been held there. This is the tail end of a series of rural forums which have been held in various areas.

Mr SIDEBOTTOM—I am sure it will be well attended.

CHAIR—I will throw this hearing open to questions from my colleagues.

Dr WASHER—We know about prospecting. I know that if I were a normal mineral prospector, I would need to peg certain territories and put applications in. These various groups get mining permits, ultimately, if they find it. What would be the difference if I were a bioprospector? We have got the Yellowstone National Park example you put in your submission. If I were to go to the Great Barrier Reef to prospect for sponges and corals, bioprospecting, or to some desolate area, what sorts of conditions or prerequisites are there? How would I apply to do that? What sorts of applications would I need? What similarities are there between this and mining?

Ms Radke—I will have to defer the real details to Environment Australia, who are the ones who are actually looking at the national system of how access to Commonwealth areas will be handled under the EPBC Act. My general comment—because I also have that mining background—is that at present there is not really a national system in place yet. The legislation is about to be drafted for an access regime. But there are various state requirements. You are talking about the situation in the Commonwealth area but I am trying to make it a little bit more general for you. My understanding is that each state is approaching this slightly differently. They have their requirements for permits. Another concept in looking at access for bioprospecting is benefit sharing agreements. This comes back to who owns the general material and that, if somebody goes in and there is a potential commercial gain, there needs to be some form of agreement with the people who own the rights so that there is some scope for them to share in the benefits of any commercial discovery.

CHAIR—Are you picking up on some of the overseas models? I am thinking of the St John's wort example over in Germany: how the benefits of that are returned to the region under a licensing system. Is that the sort of model that you are looking at?

Ms Radke—I am not sure. Dr Swanton, do you have an idea?

Dr Swanton—I am not aware of the details of that but I think you are talking about some sort of benefit sharing arrangement.

CHAIR—The benefits in that case in Germany are returned to the region where the St John's wort is grown on a commercial basis.

Dr Swanton—In our paper we gave the example that Dr Washer mentioned regarding the Yellowstone National Park. They found a useful microbe in that park and the benefits did not

return to the park until a later agreement was signed between various parties. This is one of the articles from the Convention on Biological Diversity, which is to ensure that benefits flow to, I think, the owners of the resource. With regard to the Great Barrier Reef, I think the Australian Institute of Marine Science and the Queensland government have a benefit sharing agreement regarding accessing marine organisms, harvesting them, isolating lead compounds and screening for bioactive compounds. So some of that work is out there already.

One of the big problems in bioprospecting in Australia is that there are no nationally consistent regimes. CSIRO's submission details that they need, I think, 40 permits to do bioprospecting in some areas. Senator Hill has indicated that in the Environment Protection and Biodiversity Conservation Act he intends to make regulations under section 301. Those regulations will provide for a permit system and a benefit sharing system. Those regulations, Senator Hill indicated, will be available for public comment at a later date; that is, for benefit sharing in Commonwealth areas. Work still needs to be done with the states, as indicated in our National Biotechnology Strategy, to ensure that we have some sort of national consistency to make it easier for all stakeholders to do their collection and then work out who owns the intellectual property, so that investors can come in and invest in the projects.

CHAIR—What about the situation where the elements are identified and, instead of going back and collecting them from the region where they were originally discovered, they are then synthesised?

Dr Swanton—You can certainly do that. You can either synthesise them in the laboratory—

CHAIR—I know that can be done. What I want to know is: how do you develop the regulation or the legislation? Where do the benefits go then?

Ms Radke—In the benefit sharing arrangements many of them have, for example, a fee for entering the area, plus there is a component where they may share in any royalties, regardless of where they are produced. That is one model that you could have; a percentage of the royalties negotiated for any commercial gain. It would not matter in that case whether it was produced synthetically. If a commercial gain arose from them just having the discovery in some regional area then, depending on how good your lawyers are in setting up your agreement, you can effectively have some return.

Mr SECKER—It just seems to me—and I am not laying the blame at your feet—that we do not seem to have a lot of answers yet, which I think is something for us to consider as a committee. There does not seem to be any background or regulation or direction. We probably have got some direction, but it does not seem to be quantified. As far as impediments are concerned, I do not think we are putting enough emphasis on other impediments that may come up, such as what we have seen in Yellowstone National Park. I have already sat on a committee that looked into biotechnology. I can see this being a great impediment if we do not get our act into gear early enough. I know we have this Biotechnology Innovation Fund—BIF for short; we might need another type of BIF around the place to try to counteract some of the nonsense that has been put out there about biotechnology—but I am wondering what sorts of strategies your group might have in place or be looking to have in place to counteract some of those arguments that have been put up, such as those we heard about in Yellowstone National Park

Ms Radke—You are quite accurate in that right now we do not have a clear access or IP regime considering things. There are a lot of questions out there. That is very characteristic of the fact that it is a very immature industry. I think that is also clear worldwide; it is not just endemic to Australia. Environment Australia are taking a lot of the lead with AFFA on access. In fact, under the Biotechnology Strategy, they are charged with looking at the access issues and they are working on that now.

So, yes, we are not as advanced as we would like but it is well recognised that this is something that needs to be addressed. Senator Hill is now looking at developing guidelines under section 301 of the EPBC Act, which will certainly help with clarification on a national scale in Commonwealth areas. I think once you take that kind of leadership and get something in place, a lot of the states will feel there is an advantage in trying to be compatible with that. But there is a lot of work to be done and Biotechnology Australia certainly does have an element of its funding to look at driving that.

Mr SECKER—Do you see as a problem the fact that the guidelines and regulations might be coming from the environment department rather than from , say, AFFA?

Ms Radke—They are working jointly on the issues. The regulations, as you said, are being developed under the Environment portfolio. I think that is why we have healthy debate with the five portfolios involved in the strategy, to ensure that all the constituencies are taken into account. Hopefully that will come to something. What we want to achieve is certainty of access rights and IP rights, while at the same time protecting the environment, and there are some issues there. I think everyone is in concert with that; it is actually getting the detail right about how that actually works.

CHAIR—Do you feel confident that you will have enough certainty before these funds start to be released in July?

Ms Radke—Those funds are not particularly directed at bioprospecting; they are for any commercialisation of any idea. They were not particularly for the issues of access and so forth; They are more general, although for biotechnology.

CHAIR—But following on from Mr Secker's point, if there is not certainty about the access and, in turn, the benefits coming from that access, surely that will be an impediment to companies which want to develop in this area?

Ms Radke—There might be, but there are other forms of development which can come under BIF. Certainly in some cases they may know what the ownership rights are. In our guidelines for making the money available, the eligibility requirements for applicants will require them to have some clear understanding of the IP ownership. It may be that they need some work on getting patents and everything, but in order to get the money they have to have some clear idea of ownership. In some of these areas it may preclude some of this happening and we will have to work on that other side of it.

Mr SECKER—We understand that mineral rights and water rights belong to the Crown, to the government. But with the micro-organisms that we are looking at in bioprospecting, are we

likely to see that same sort of ownership or is that still to be tested in court? I do not know; do you know?

Ms Radke—I do not know—that is the short answer. Where discovery is held in Commonwealth areas, it is a bit more clear. Even in those areas there are some issues about traditional ownership or pastoral leases. But at least there is a boundary line there. This is an issue that, outside the Commonwealth areas, probably has to be addressed. The marine environment is probably a little less so, because most of the marine environment is under some sort of Commonwealth jurisdiction, so those things can be mainly managed on that level.

Dr Swanton—Senator Hill released the report of the Voumard inquiry into access to biological sources in Commonwealth areas—last year, I think. That covered the issue of ownership, to some extent. I am not sure whether it was in that report or possibly it was in our discussions with Environment Australia officials, but ownership issues are in some way related to the sovereignty over the land. For example, if it is a Commonwealth area, the resource is owned by the Commonwealth. However, if you were to access that resource from somewhere else, that raises another issue.

Mr SECKER—Minerals and water are owned by the Crown, whether it is freehold or not.

Dr Swanton—Yes.

Mr SECKER—So I see two problem areas for ownership; that is, on freehold and less so on leasehold, and then Commonwealth and state. There are also the marine areas outside our marine limits. What happens out in the middle of the ocean? Who owns that? That would have to lead to some sort of international agreement, I would have thought.

Ms Radke—I am sure. I do not know the details and I would not want to mislead you with my lack of information but I looked at the Voumard report and they do talk about the differences between pelagic free-swimming fish and who owns the rights to that genetic material versus material growing on the bottom of a jurisdiction. You raise very pertinent questions that have to be worked out.

Mr LAWLER—In relation to the benefits flowing back to the region of discovery of material, whatever it is. I think what the Chair said is that, with science today, there is a fair chance of being able to synthesise in a lab, in a lot of cases, whatever you find. What CSIRO offices, university departments and such things do we have in non-coastal areas so that if a discovery is made in a rural or regional area some of the development work could be done there rather than just lugging it all straight back to Sydney or Melbourne? That is one question. Secondly, the material that we have read about ethanol indicates that we are still a long way from commercialising ethanol or making a decision on what we can do with it, yet at the weekend BP made an announcement in Brisbane on the use of ethanol, saying that a study of the commercial viability of ethanol production from sugar is being carried out by ABARE et cetera. Can you expand on how old this information may be in light of that announcement at the weekend?

Ms Radke—In relation to your first question on the facilities in regional areas, I do not know the exact answer to your question, except there probably are some smatterings of things from

the university sector and the research sector. But I think the issue is that this is fairly highly specific and they may need infrastructure and equipment that may not be there now. There may be research facilities but whether they have the right equipment for the bioprospecting end I am not certain.

Mr LAWLER—That may be something our committee could take up to give a bit of a boost to that.

Ms Radke—It is. I will throw in another thing: in Backing Australia's Ability there was quite a bit of money for university infrastructure. Potentially, things like that could be used to foster the right sort of equipment. There might be other avenues for that. Probably at this given time there are not a great deal of facilities out there to conduct the analysis or the further downstream processing.

Dr Swanton—I think we mentioned the Cellulose Valley example in our submission, which is based in the Lismore area. They hope to become, according to their web site, the global hub for bioprospecting plant material. That is certainly an encouraging initiative. The most we found out about it was what was available on the web site, and we have tried to contact them.

Mr LAWLER—So that is something being worked on.

Ms Radke—In regard to ethanol—I have picked another area about which, because of my previous life, I have a reasonable amount of knowledge—I think ethanol and biofuels will have a hard time competing with conventional fuels without assistance from governments probably for some time to come, even with oil prices as high as they are. Nevertheless, there is ethanol production going on now. The novelty about this initiative of BP is that this is the first time, to my knowledge, that a refinery is mixing the 10 per cent versus the mixing going on post-refinery gate. And that has a lot more certainty about environmental impacts, because the fuel is under guidelines for specification at the refinery gate where it is not where it is being mixed currently.

Clearly, the technology to produce ethanol is nothing new. It is brewing, basically; it is a fermentation process. It has some potential, but it is the economics that will need some assistance, one way or the other. As far the grant is concerned, my understanding—and I know very little about it—is that a $8.8 million grant was announced to the Ball Island refinery, presumably for them to get their infrastructure right. But ethanol, just like other alternative fuels, enjoys excise exemption and there may be some other funding that it currently gets. I think biofuels have potential there but that there will always be some need for assistance in order to get the economics right on it. I suppose it really comes down to the aim: if there are great spin-offs for regional Australia for that. When I was working on ethanol, one of the exciting things was use of lignose cellulosics or woody plant material, because it had great spin-offs for the forestry industry; maybe even spin-offs for salinity problems and so forth. But the actual process for that is less developed than what is being used for sugar and wheat. They have not cracked that for commercial viability.

Mr NAIRN—You said that it would have trouble competing with fossil fuels. Is it expensive in the refinery process or is it because it is coming from sugar or wheat that could be getting

higher values elsewhere, and therefore the actual raw product is starting at a higher price than you would ideally want to make it competitive?

Ms Radke—It is mostly in the production of it. It is usually for some sort of waste material; the actual production and fermentation process. I think they are getting better and better at doing that but it is energy intensive. The actual economics of producing a litre of ethanol versus a litre of petrol is such that it is an uphill battle.

Mr CAMERON THOMPSON—I am reading through the Yellowstone Park case and trying to work it out. Surely the value that comes out of bioprospecting is just intellectual property. Just the fact that you have a bunch of microbes in your area, what the hell has that got to do with it? Are you advocating, then, that there should be some sort of licensing arrangement that automatically, because the microbes happen to be in your area, flows back to that area? We have been having bioprospecting without the fancy name for centuries. Why is it that we should have a focus like that to return the benefits to where the microbes came from?

Ms Radke—Again, I am treading a little bit outside my area of expertise in terms of IP, but I know that worldwide there have been a lot of international forums through WIPO and even the biodiversity arena where, internationally, people are concerned about IP ownership and rights. The reason is, I think, because more so than ever the potential for commercial return is higher, because of the turn that biotechnology has taken. Potentially, somebody could discover in some plant material a cure or some fairly widespread therapeutic material that has enormous commercial potential. Maybe public awareness and debate internationally has raised this as a concern.

Mr CAMERON THOMPSON—But why should there be difficulty in getting companies to invest if you can identify the intellectual property? That is the part that has the value. It is not the fact that you have a microbe or a sponge or whatever; it is knowing what to do with it. Why is there difficulty getting companies to invest in that intellectual property which you can identify?

Ms Radke—Given that the IP is clear, some companies are investing in it. I think some may not, because it is still considered a very high risk, albeit a potentially high return—situation. There are often very long lead times. It is still very much a research exploration phase, so they need quite a lot of data to ascertain whether they have discovered something. Then they need to put quite a bit of effort into taking that down towards a processing and commercialisation end. They may be looking at 10 years of development in order to reap some benefit from it. There is an impediment there, I suppose, for investment.

Mr CAMERON THOMPSON—But once you can identify that you have got intellectual property or knowledge there, once you have staked out your claim and have had it confirmed there is no danger of claimjumping, is there?

Dr Swanton—But who owns the IP? If I were to walk onto the Great Barrier Reef and grab a few grams of sponge and find some product that could be worth a billion dollars, should that go to me or should it go to the owner of the resource; that is, the Commonwealth?

CHAIR—That is the crux of the issue.

Mr CAMERON THOMPSON—That was my point: the sponge is worth nothing until you figure out what to do with it.

Dr Swanton—Australia has ratified the Convention on Biological Diversity. It has many objectives, but it talks about the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources; that is, to share the genetic resources, share the benefits between those who are developing the product and those who might own it.

CHAIR—That is certainly one of the key issues that we have to grapple with.

Mr SIDEBOTTOM—Thank you for your submission. I notice that a couple of times you refer in your submission—in term of reference No.1 and in your appendix—to this interesting concept growing out of Backing Australia's Ability: $46.5 million for a biotechnology centre of excellence. And then, a little bit later on, more than one centre is mentioned. What is the low-down on this? Can you fill us in? I know there was not a lot of detail, but what can you tell us about this centre of technology or centres thereof?

Ms Radke—We got distracted with some other conversations on BIF, but I was going to come to that. The other money that came forward in the innovation statement was, as you say, $46.5 million for one or more centres of excellence in biotechnology. There is a lot of interest in this. We are not likely to establish anything until, say, mid-2002. The aim of a centre of excellence is to provide a focal point for research and a critical mass of the research efforts that are already going on in Australia and attract international attention, collaboration and investment by companies. Very often it has been linked to the model of a CRC but it is actually a bit broader than that. A centre of excellence should generate more networking, collaborative efforts, and potentially have a clustering effect. It is also aimed at attracting and retaining high-level expertise—our good researchers and our commercialisation skills—and keep them on board. It should also have a spin-off in having a job market for the research end. The centres of excellence obviously are established depending on what sort of research focus it is, and that is quite open at this stage. They have the potential to assist this whole process with bioprospecting and processing.

CHAIR—Is it your opinion that before these can be established we have to have some successes? In your description it seems as if it is not just a showcase of Australia's ability in this area but that it is also fostering research. You mentioned this cluster of developments. Do we need some successes before we can establish these centres?

Ms Radke—Australia has had some successes in biotechnology. There have been a number of therapeutic successes and in agriculture there have been successes already. Most people feel that Australia has very strong research capabilities. Some of these research efforts have been commercialised but the problem is that it tends to go offshore because we do not have the investment internally. A lot of the debate has been around fostering more assistance for commercialisation. Australia has a proven track record that it has the capability there. I think what we have to do in the centres of excellence is find out where we have the best competitive advantage and bring those forces together. The model for a centre of excellence is still reasonably open and it may fuse several types of applications together. It may have a therapeutic base for both agriculture and humans. It may incorporate bioinformatics. It may incorporate a

few key applications together or it may focus heavily on one. That is yet to be determined. But bioprospecting is fairly broad and could probably support whatever application is successful.

Mr NAIRN—You had a couple of examples of biobased products and applications in mining and biofuels. Are there any others that you could highlight?

Ms Radke—Have you got something there at your fingertips, David?

Dr Swanton—We indicated a few examples in a table earlier on in the submission. Table 1 on page 7 has a whole range of applications. That lists a number of biotechnology applications. Not all those necessarily evolve from bioprospecting, bioprocessing or like technologies but many of them do.

Mr NAIRN—You see them as potential?

Dr Swanton—Yes. The list includes: leaching of ores; mine site rehabilitation; higher yields and quality for agriculture; improved pest and disease resistance; and tolerance of water temperature and saline extremes. Probably AFFA, who are to present next, could add a few more to that list.

Mr NAIRN—Within that there is a lot of untapped potential. I suppose that is the bottom line, isn't it?

Dr Swanton—That is a key issue for bioprospecting: there is untapped potential. There is a very serendipitous nature to finding out something from high volume processing of compounds to find bioactive material or other material. You may screen for 10 years and find nothing. You may screen and in one year you might find two $1 billion per year compounds. It is a very chancy process.

Dr WASHER—Ms Radke, in terms of the details of the centres of excellence, is the concept to provide infrastructure like biotech parks or buildings and equipment to attract these people? The reality is I did not quite comprehend what we are doing to attract these people in a concrete way?

Ms Radke—It could. I hate to be vague, but at this stage it is a bit vague. We are about to appoint an expert panel and we have commissioned a scoping paper on possible models of centres of excellence. Worldwide they vary enormously and they can be anything from a fairly virtual centre of excellence where you are using existing facilities, networks and communication to something more centralised and providing infrastructure. The likelihood is that there will be a bit of a combination of this; that some infrastructure will have to be developed, or maybe linked better than it is now. So there is potential for that. But there are other aspects to a centre of excellence where it may not focus entirely on infrastructure.

Dr WASHER—There was $227 million of extra funding that went into CRCs. One of the criticisms I have heard about CRCs is that they are a cheap means of industry utilising them as cheap labour to develop intellectual property that can be taken offshore, bypassing sometimes our privately owned businesses. Do you think that is an unfair comment?

Ms Radke—It is probably unfair in that there are a lot of CRCs with different models. The photonics CRC is quite an innovative different model, for example, from some of the others. It is true that there have been some CRCs where the partners have felt that a fairly major company involvement has overridden some of the intellectual property. But I do not think it is fair comment to say that that is true of all CRCs, because they do differ quite a bit.

The extra funding that was announced for CRCs has a caveat to it, in that the CRC model has to be redesigned to allow a little bit more flexibility for access to small to medium enterprises. The criticism that you have just brought to the fore is one of the issues: that they need to have the flexibility to deal with that to allow smaller concerns to come in, maybe in less than seven years and so forth, and also to allow them to have larger projects. So there is some work to be done there. People are encouraged to contact the CRC committee to put their views, to make sure of that. It is essentially quite a good program, even though it has spun out over a long time. I think it is $1½ for every $1 of government investment.

Dr WASHER—Obviously IP becomes a critical component of bioprospecting. Is that policy of having full cost recovery for IP Australia a good policy?

Ms Radke—It has been going now for a while. I think that the dilemma you have is where you have new industries coming up that have difficulty with regulatory bodies and their capacity to pay. Sometimes that is an issue. I take your point, but IP Australia has been running on cost recovery now for some time. IP generally has quite high costs or potentially high costs, and this has been recognised through a number of assistance programs. In fact, I think AFFA actually have one of their programs for the same thing. ISR has put some like comment and BIF will allow some assistance to help start-up companies to develop their IP, apply for patents and do searches. It has been recognised that, yes, we do have a cost to developing IP, so it is being addressed, particularly for those companies who cannot afford to pay to allow them to have assistance to tackle their IP.

CHAIR—This morning you have been telling us about opportunities and where certainly Biotechnology Australia is moving. But in your submission you mention a UN study which has suggested that the potential contribution of bioprospecting to the biotechnology industry and the communities involved may not be as substantial and certainly not as immediate as was previously believed. Do you want to comment further on that?

Ms Radke—I actually have not seen that study so I cannot comment on the study itself.

CHAIR—It is just that you mentioned it in your submission to us.

Ms Radke—Yes, that is right. It is just that I was not here at the time and had not seen the study. As a general comment, there is an issue here and it goes back to bioprospecting and biotechnology generally being fairly high risk, albeit they may have higher return. I think David made some comment about how many discoveries you can have and, out of that, what percentage will actually net any commercial return. I do not think we have any illusions that just setting up a company to do bioprospecting means there is a goldmine out there at every corner.

CHAIR—Certainly one of the other impediments is—as my colleague Dr Washer has just mentioned—the cost of IP.

Ms Radke—I think that is a valid concern, which is why often it is the multinationals who have had longstanding investment in this; it is integrated in their whole cost structure. There is a bit of a risk for any new company which does go out. They may hit something right away, but they may have to wait a long time. They may even discover something that has potential, but actually getting it further than that still might be a high risk for them.

CHAIR—Earlier you mentioned to us the roles that Biotechnology Australia was designed to fulfil. I will not go back over those. But you did not identify if Biotechnology Australia was seriously addressing these impediments to the development of bioprospecting and bioprocessing. Do you regard identifying and doing something about the impediments to development as part of your role?

Ms Radke—A lot of the activities of BA actually do, in a broader sense. It tends to be a bit broader than bioprospecting, but certainly the access issue has been identified. As I said, it is mainly Environment Australia and AFFA which have been investigating that—it has been highlighted as an issue.

CHAIR—But you are the body with the responsibility for coordinating all this. How seriously are you looking at these impediments?

Ms Radke—When I say that EA and AFFA are doing it, it is under the auspices of the biotechnology strategy. It was identified that those two portfolios had particular interests and would pursue them under the National Biotechnology Strategy. So we bring it to the fore. It comes back to the whole five portfolios to look at as their work progresses, and the recommendations that come to that are incorporated in the decisions.

CHAIR—I guess what I really want to know is how many problems you see. You have told us, for example, that one of your key roles is to provide information. You said that you are the coordinating authority and that you are looking at the gaps and the application of commercialisation of the research, but you did not actually specify or identify the impediments. In your role of coordinating these five other departments to find a way to overcome a number of the impediments, I thought that you would have given prominence to that.

Ms Radke—Maybe David can explain this better. But, yes, the strategy did identify a number of issues. I talked about the commercialisation and early pre-seed but clearly there has been an initiative about IP awareness and training and access issues. There have been a number of areas where some of the impediments generally to the biotechnology arena have been identified. Not everything can be addressed in the resourcing that is available but a number of resources have been put in to identify and look at that.

Dr Swanton—If I could expand briefly: there are six key themes to the National Biotechnology Strategy and a number of objectives for addressing each of those themes, a number of strategies for achieving those objectives. The ministerial council is oversighting the development of the strategy and where money and priorities should be allocated. BIOCOG, the biotechnology consultative group, has advised that the pre-seed gap in commercialisation was a key gap that needed to be filled, and the Biotechnology Innovation Fund is particularly addressing that issue. The other issue—for example, the objective under the strategy—is the development of measures to enhance access to Australian biological resources. There are a

number of strategies for achieving that which various Biotechnology Australia departments are actively pursuing at the moment.

CHAIR—We will leave it there because we are well out of time. Thank you very much for coming along this morning. It was most informative.

[10.38 a.m.]

BLAZEY, Mr Robert George, Policy Officer, Plant Breeders Rights Office, Department of Agriculture, Fisheries and Forestry Australia

HERRMANN, Ms Kristiane Elfriede, Project Manager, Access to Biological and Genetic Resources, Department of Agriculture, Fisheries and Forestry Australia

HULSE, Mr Nikolas Barrie, Senior Examiner and Deputy Registrar, Plant Breeders Rights Office, Department of Agriculture, Fisheries and Forestry Australia

PEARSON, Mr Andrew, Acting General Manager, Science and Economic Policy, Department of Agriculture, Fisheries and Forestry Australia

THOMAS, Ms Sandra, Senior Scientist, Food and Gene Technology Program, Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry Australia

CHAIR—Welcome. Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House itself. The giving of false or misleading evidence is a serious matter and may be regarded as a contempt of the parliament. Do you wish initially to make a brief statement to your submission or would you care to make some introductory remarks?

Mr Pearson—I would like to make just a brief statement on some of the points AFFA raised, In general, AFFA considers that there is potential for industries based on bioprospecting in Australia. However, the potential for these industries to develop in regional Australia is not clear as a number of factors will affect the location of any new industry. These include processing requirements, access to markets, costs of different sites and so on.

In regard to the inquiry's four terms of reference, I would note that under reference 1, the contribution towards the development of high technology knowledge industries, a good deal of sophisticated work is already going on in the area of bioprospecting and related industries, including searching the marine environment. To date, the agriculture and food industries have seen the most products reach the market.

Looking particularly at impediments to growth of these new industries, AFFA would note that bioprospecting involves many different stages and it is not clear where the main impediments to industry growth might lie. A general problem of commercialisation of research and development remains a challenge. AFFA is involved in this area through managing the government's matching dollar for dollar arrangements for the rural R&D corporations. Other programs for which AFFA has responsibility include the New Industries Development Program and the Farm Innovation Program.

Whether industries based on bioprospecting can grow in rural and regional Australia will, we feel, depend to a large extent on downstream processing requirements. Some products discovered by bioprospecting will be able to be synthesised rather than sourced from nature. Even if they must be sourced from living organisms, there is the possibility that those organisms can be grown in places remote from where they were first found or even outside Australia.

Other considerations include market access, transport, availability of a skilled work force and costs of different sites. All of these will come into play when decisions about where to locate a new industry are taken.

In relation to intellectual property rights and other mechanisms, the Commonwealth has in place well developed intellectual property laws and, in the case of plant variety protection, AFFA is responsible for administering the legislation on plant breeders' rights. PBR is a knowledge intensive industry which is undertaken in urban and regional areas in Australia.

Finally, in relation to the impacts on and benefits to the environment, we want to emphasis that it is important that the promise of bioprospecting does not distract from some of the broad environmental problems that Australia faces. Bioprospecting and the industries arising from it could have adverse effects if they are not carried on with due sensitivity but, on the other hand, bioprospecting could benefit the environment, we would suggest, in two key ways. The first is through providing extra economic value in terms of a recognition that the environment is a potential source of useful chemicals or products. The second is that bioprospecting could contribute in terms of remediating damaged environments. Thank you.

CHAIR—Thank you very much. You have outlined a number of the benefits and you have identified already a number of the challenges in developing bioprospecting. Many of the submissions that we have received to this inquiry have commented on the need for a consistent national regime for the regulation of access to biological resources. What would be some of the key elements that you would see underpinning such a national regime?

Mr Pearson—If I may turn to various colleagues here covering a wide-ranging portfolio.

Ms Herrmann—This whole question of having a nationally consistent approach on access to either Australia's biological resources or genetic resources is a very complex one and it reflects the different perspectives of where different stakeholders come from on this issue. On the question of access, you need to distinguish whether you are accessing a biological resource or, through controls on the biological resource, whether you are seeking to exercise a control over the genetic resources that it contains, and therefore leverage in some way through contract law rights to downstream benefits which might occur through intellectual property investment and capital investment. As I say, it is a very complex issue and there are still various opinions. I do not think there is a clear consensus within the Australian community that in fact there is a need for a nationally consistent approach on access, because we still have not identified where the market failure exists and in fact the nature of the controls which might arise.

CHAIR—We know it is a very complex issue, and this inquiry is charged with the responsibility of making inroads into trying to get to terms with some of these issues. Where does AFFA sit on having a national regime?

Ms Herrmann—AFFA—together with Environment Australia—has over the years had responsibility through a Commonwealth-state working group which has been looking at the question of access to Australia's biological resources. Back in October 1996 there was a Commonwealth-state discussion paper which was produced by a Commonwealth-state working group, comprising representatives of all Commonwealth and state jurisdictions. AFFA and Environment Australia represented the Commonwealth on that particular working group. That

group was beavering away until the beginning of 1999 trying to identify where the issues arose. From memory—and I do not have a copy of the report with me today—the specific terms of reference covered a whole host of activities and, in particular, they were trying to identify where the impediments arose and what additional measures might be required to help overcome those impediments.

CHAIR—I would like to pursue this, because I really have not got this fleshed out yet. May we have a copy of that report?

Ms Herrmann—I can get you a copy. There is no problem.

CHAIR—This working party was 1996, was it?

Ms Herrmann—I think it was October—

CHAIR—We can check on that. If it was as far back as 1996, given we are looking at an industry that really is moving at the speed of light and we are all trying to keep up with what is happening, from your own experience do you think the terms of reference—and we will need to look at those—are relevant today, given where the industry has developed to today? And I still have not got out of you where AFFA is sitting on this issue now.

Ms Herrmann—As I said before, the question of access is a complex one in the sense that different industries and different sectors have different requirements. Bioprospecting, as you may have already heard, may involve synthesising material, so you actually go in and access something in one case. The complexity arises because of a concept of benefit sharing. The question for Australia is: how do we generate benefits and what role do benefits have in generating benefits for the country? For example, you may have intellectual property laws which provide a mechanism by which, through your intellectual effort, you leverage benefits through contract law from the intellectual investment that you have made. That is distinct from accessing the resource in its natural environment. So one needs to distinguish between access rights: the rights to own a resource, the rights to access a resource physically from the environment and the rights to control or use the resource. Rights to control access to the resource are often distinct from ownership rights to the resource, and development and use rights may be distinct from ownership of biological resources and rights to access them. You need to distinguish between the different stages as to where you want to exert controls and where you would like the benefits to arise or where you would like to interfere in the market.

CHAIR—I guess what you are saying to me is that it is not possible to have a national, consistent regulatory process for this.

Ms Herrmann—If your focus is purely bioprospecting, I do not think that in Australia we have specifically focused purely on the bioprospecting alone, no. If we take the case of agriculture, for example, and the forestry and perhaps the fishery sectors as well, we need to look at the regimes that we set in place domestically compared with what is in place internationally and what is evolving internationally. For example, our forestry and our agriculture sectors rely to a large extent on biological resources that we derive from overseas countries and perhaps which are in the international public domain, and so we have to blend

that. That was also captured in those terms of reference for that particular committee—the Commonwealth-state working group on access.

CHAIR—We had better have a copy of that, I think.

Ms Herrmann—Yes.

Dr WASHER—I would like to follow that up. Say, hypothetically, I want to explore the possibility of sponge from the Great Barrier Reef. Who would I approach to do that? I have identified a sponge or coral from a particular area and I need to test this out. I just want to explore the possibilities. I do not want to commercially do anything yet, I just want to go and prospect.

Ms Herrmann—And I am assuming you would be an Australian resident as opposed to a foreign national?

Dr WASHER—If I was not, I would get an Australian residency, because I do not want to make it more complicated.

Ms Herrmann—So you are not a foreign research vessel. It would depend how you would want to access that and how you want to get the permit. If you wanted to get it from the Great Barrier Reef, then clearly you would need to approach the relevant authorities involved in the Great Barrier Reef. We are getting into the marine area and I must admit I would need to take some further advice, because this is quite a complex area, whether you are looking for a permit to collect or whatever it is. That may well be covered under fisheries management legislation and the cooperative arrangements between the Commonwealth and the states. I am not an expert in fisheries matters.

Dr WASHER—I will change the question then. Let us say it is Commonwealth land and there is a plant unique to that area of land. What would I have to do then?

Ms Herrmann—If it is Commonwealth land?

Dr WASHER—Yes, and there is a particular plant.

Ms Herrmann—Again, you would need to identify the particular area. First of all, we would need to see who has responsibility for controlling access to that particular piece of land. Then one would need to investigate the extent to which the relevant authorities can grant you a permit to collect on that land. For example, if it is Defence land, I do not think you would want to go into the firing range during the middle of exercises.

Mr SECKER—It might make it fun!

Mr Pearson—A lot of the access, particularly for research, would potentially be picked up in other portfolios, such as Environment Australia. The responsibilities for the portfolio do not extend into that sort of area so that, while we can speak in generalities, it is really beyond the scope of our expertise to be able to answer that as specifically as I think you would wish. I

understand that Environment Australia has also put a submission in. I have not seen the content of that, but that may well have been addressed as part of it. I am sorry. I do not suggest we have that particular expertise.

Dr WASHER—You made a comment which was fascinating—and I agree it is true—about macadamias, eucalyptus oil, timber, wildflowers, barramundi and mud crabs being taken from Australia and the bulk of these exploited and developed overseas. For example, macadamias were grown in Hawaii, et cetera. Why do you think that is so?

Mr Pearson—I could hazard some speculation in terms of a number of things, such as an entrepreneurial culture, that I would suggest Australia has recognised we are lacking. For example, the *Backing Australia's Ability* exercise that we have just embarked on is a reflection perhaps of the need to try to develop a framework which is more encouraging for development in Australia.

We have also tended in many ways to focus on the scientific research. I think Australia has a very strong R&D base, but the movement of that knowledge into commercialisation is, again, something that I do not think we have been strong at traditionally. There are instances—plant breeders' rights, for example—where we are in fact pursuing niche areas. The portfolio identified as another example Cherikoff Pty Ltd, which is the bush foods area. While there has not been necessarily that development at a very high technology end, it is at least a start in terms of identifying the potential that may come from the biological resources in Australia. To date perhaps we have been marked by less commercialisation than I hope we will see in the future. Certainly that is where some of the programs of both the government and the department are now focusing.

Mr NAIRN—From a purely exploration point of view, why wouldn't we look at a model not dissimilar to mining exploration, where you are interested in exploring the prospects of a particular area for a variety of things? With mining exploration licences, you specify the types of minerals that you are looking for. In this case, maybe you would specify the areas of biorelated things you are considering. That is a tried and proven regime of regulation in some sense and also, to some extent, ownership. Is it a stupid suggestion to make that sort of comparison?

Mr Pearson—I would not say it was a stupid suggestion.

Mr NAIRN—We got past square one on that!

Mr Pearson—There are some challenges that are more difficult than looking for gold or copper, as identified in the tail end of the discussion from Biotechnology Australia. I think targeting would be extremely difficult. You go out there and you want to screen, but you may be screening for a whole range of things. You are not really going to make all that effort just for one particular chemical. There may well be others which you accidentally come across. I am not necessarily sure that you would then turn around and perhaps keep that quiet and maybe try to expand your permit. Targeting is going to be one of the real challenges in that sort of approach.

The other challenges are going to be in relation to just how you establish—and I do not think mining has necessarily had an easy time of it of late either—who are the people with whom you

are going to deal and the basis of the access. While I do not rule it out, I would not like to necessarily do another round on the issues surrounding access. We have highlighted it, and that has been thrown up. But the other real challenge from a science point of view—and maybe Sandra might like to comment as well—would be the nature of the targeting.

Mr NAIRN—It may be as simple as saying that you are interested in looking at particular plant species so that, from a commercial point of view, you may not be wanting to highlight the specific chemicals or whatever else you might be looking for. You know that there is a range of species in a particular region that might be of interest in a variety of ways, so the exploration permit, so to speak, might be to explore certain species and take certain sampling. I am just trying to get it down to basics in the first sense of staking out a territory and then working out the ownership and all those other access things from there.

The type of species might dictate if you are going to require approval from Environment Australia or the National Parks and Wildlife Service or whatever, which happens in the mining industry as well. So there are those various levels of responsibility depending upon what you are doing. It seems, in talking of access, that we tend to talk constantly in complexities and issues—that is fair enough, and I understand that—but I think somewhere or other we have to start at the bottom point and then gradually build up. That is what I was trying to do.

Mr CAMERON THOMPSON—Kristiane, you drew a distinction for a moment there between bioprospecting and a lot of other things. In our discussions this morning we moved across a whole range of things. I have heard talk about bush foods and ethanol. Someone mentioned macadamias, and I see things in here about snake venom—

CHAIR—It is snake oil.

Mr CAMERON THOMPSON—I wonder about it sometimes! Anyway, we are getting into such a wide range of things. Look at oil shale or the production of ethanol. These are clearly things that are not bioprospecting or, if they are, they are a different type of pursuit than looking for a cure for cancer, for example. When we are talking specifically about this high level of bioprospecting, what differentiates that from, for example, going out and looking for a new way of producing ethanol or a counter-cyclical crop in the Northern Hemisphere or something like that?

Mr Pearson—We have considered bioprospecting in the very broad sense in terms of access to biological resources and the products that may be derived from them. What we are seeing is perhaps an increase and an expansion in the possibilities that are available because of scientific developments. You still do have a range of bioprospecting in its broad sense, which is perhaps as basic as trying to identify—let us take the Cherikoff example—a range of nuts or seeds that can be turned into a product. Then at the other end of the spectrum, there is extremely high technology work being done to wrestle with snakes for their venom and these sorts of things.

It is very difficult to say where a cut-off in bioprospecting is. We have, from the portfolio point of view, seen it as a very broad area. What we are seeing perhaps in a sense is the start of a differentiation in terms of where money is required and the capacity in terms of the financial backing. That starts to change the nature and some of the requirements that are happening in

relation to bioprospecting. It has been easier, I would suggest, in the past to do more of what I would call that simple bioprospecting, and the constraints have not been as significant.

As we now move into areas where science and a great deal of money and equipment is required to do, for example, analysis of certain chemicals and proteins extracted from a biological resource, there is a whole set of other requirements associated with that. We move into areas like intellectual property because, if you are going to put up that sort of money to set up laboratories, you want to be very sure that what you do discover, if you are lucky enough to discover anything, you are able to gain the financial benefit from that.

Mr CAMERON THOMPSON—Isn't it very important that you be able to draw a distinction—one from the other? Otherwise, if you start applying the kinds of regimes that you might use at the top end to people who are operating at the bottom end, it is going to be entirely unworkable and unsuitable and very retrograde in terms of their activities, isn't it? What is the difference? Where do we come to a point of difference between somebody harvesting bush foods and somebody trying to identify some new cure?

Mr Pearson—There may be some basic principles but, in fact, I would certainly agree that you will not have a one size fits all. It is an observation that was made in relation to the nationally consistent access regime. We have to develop sufficient flexibility so that the various programs and policies that we may want to bring into play are able to help and be appropriately targeted. I would agree that it is not something that is going to lend itself to a simple solution. There are some basic principles that you would find, such as some sort of a basis for negotiating access, and potentially some way of making sure that the regimes that handle intellectual property or plant breeders' rights provide the proponents with an opportunity to take advantage of any discoveries they make.

I do not think there is necessarily a place for the ultimate suggestion of one regime fitting all. It could well be a retrograde step because potentially you are likely to focus in on that very complex top end. That is where the tendency would be to move because that is the one that is going to require the greatest level of protection because of its complexity. If you set that as the base, then this end of the spectrum is going to suffer.

Mr CAMERON THOMPSON—Do you have any clear idea on what kinds of definitions could decide the boundaries? Unless there is a clear distinction, people from this end can start to use precedents from that end to make claims and counterclaims and it gets terribly messy.

CHAIR—It would seem that your definition of bioprospecting is very wide and general, as distinct from other submissions.

Mr Pearson—Yes.

Ms Herrmann—We were talking about the Commonwealth-state working group earlier. That had a series of principles in it which we support. This is specifically answering the question of where we come out on the CSWG. It had some very broad principles but the report in itself also recognised that there was not going to be one size that fits all, and that the regulatory costs of some of these activities, and how you actually target them, are the reason why they did not make progress.

Mr CAMERON THOMPSON—I can see why, yes.

Ms Herrmann—Because you are weighing up these alternatives. You are talking about the capital costs of the investments. You are talking about the rights to access the raw resource. Down the spectrum, how far do you seek to exert controls? Do you do that just by way of the leverage on the original biological resource? You may not have that control just by virtue of controlling access. That is where there is a big difference still within the Australian community and also internationally between countries that are so-called mega diverse in how much they think they can benefit from just controlling access to the biological resource itself. The regulatory costs can be very significant for exactly the reasons that Andrew has outlined.

Mr SIDEBOTTOM—Thank you very much for your submission. Being morning tea time, it draws me to this area you have raised about bush foods, particularly in terms of a test case of it. I am particularly interested in this one in terms of intellectual property rights. You mentioned in your executive summary that there were a number of success stories in this area—I assume you are talking about the Cherikoff example as one—and then missed opportunities. I am interested in your comments on that. Could you take us through the bush foods story, particularly in terms of intellectual property rights on it. Who owns it? What happens when you develop a product from it? Then I want to move on to your comments at reference 4. I was particularly interested in what you said about the benefits to the environment. You state:

> ... the results of bioprospecting could be useful in remediating damaged environments or permitting ecologically sustainable use of difficult or marginal environments, of which there are many in Australia.

I wonder if you can elaborate on those two areas for us. That seems to be a positive that we could well expand on.

Mr Pearson—Perhaps I will make a very general observation. I might also ask those from the Plant Breeders Rights Office to talk a little about what is perhaps not at the high technology end of the spectrum, because I think that might give you some idea on intellectual property. In terms of the Cherikoff example, while I am not familiar with the specific detail of what sort of intellectual property he may control in relation to that, one of the interesting things about that was that it was a development based on an accumulation of knowledge and expertise and a series of ideas in relation to areas that had not previously been brought into the marketplace. It was an example of not so much the high tech end but this idea of why we see bioprospecting so broadly. It was an application of a biological resource to a market area that had not been previously identified in a systematic way.

Mr SIDEBOTTOM—It is very broad, though, isn't it? This is what Cameron was referring to. It strikes me as being right at the bottom end of it.

Mr Pearson—I do not deny that it is not high tech, that it is down this end, but it is providing a return. I do not think that we necessarily should view bioprospecting only at the high tech end. I think that may well be a mistake, in a way, in terms of harnessing the broad range of Australia's biological diversity and also reflecting some of our capabilities. This is where I particularly wanted to turn to plant breeders' rights, because I see it perhaps as a step up from Cherikoff. But it is not right at the far end of extraction and some of the techniques that go with

all of the laboratories, because plant breeders' rights do not necessarily have to involve electron microscopes, et cetera.

CHAIR—I was very surprised to see your example of the bush food in your submission. It would seem that there are a number of definitions of bioprospecting, but in no way could I see how it fitted any definition. What you are really saying to us, in answer to my colleague's question, is that bioprospecting is not this identification and improvement on the element or the compound that has been discovered and then developing the application, protecting the intellectual property of this application, but that it could simply be that someone goes out there and discovers some nuts and berries and decides to value add that into an industry. That is really what the bush food example is about, isn't it? I really do not see how you can justify that as meeting the definition of bioprospecting.

If AFFA is going to tell this committee that bioprospecting includes an example, to continue your analogy, of something right down the bottom part of the chain, I am not sure how we are ever going to get any process of regulation. How on earth is that going to qualify? We have just had Biotechnology Australia telling us about the $40 million that is going to become available in July of this year. What you are really saying to us, by extending your definition of bioprospecting, is that something like bush food could be competing for funding that is coming through Biotechnology Australia because you classify that as part of bioprospecting. Could you justify why you think that fits the definition?

Mr NAIRN—Logging native forests would be bioprospecting on that definition, wouldn't it?

CHAIR—I think, to extend your example, we could go out and identify some berry on a tree and decide that we could sugarcoat it or do some value adding process and that qualifies for bioprospecting.

Mr Pearson—Bioprospecting can have a very tight high end definition, but if we are looking at bioprospecting as a broad definition of taking Australia's biological resources and turning those into some sort of competitive advantage, then I do not think that necessarily—

CHAIR—Can I stop you just there. It would seem to me that what you are saying is that there is a value adding process to the biological resource, not necessarily a development of intellectual property. Is that what you are saying?

Mr Pearson—No, I am not necessarily saying that. Again, there may be intellectual property associated with how that resource is brought to the market in terms of branding. Again, if you only think of intellectual property in terms of a patent or a trademark, you are trying to link that into one area only of intellectual property in terms of knowledge and development of that into a marketable product, and the protection of that through a brand name or something else is also a whole area that has tended not to be as well focused on in Australia. We have tended to miss out on that. The Australian Centre for Intellectual Property in Agriculture, for example, is not simply about trying to educate people to take out a patent. It is about trying to view intellectual property and its management in terms of a variety of manifestations of that so that you are looking perhaps at processes that may have significance, as well as simply just that one particular patent, if you like.

There is a very broad range of approaches. What the portfolio is not trying to do is to rule out any particular area. I am not suggesting that the money for the Biotechnology innovation fund, for example, will have Cherikoff necessarily competing against it. You may have a set of criteria which requires a particular amount of investment, a company, linkages with a scientific body or that sort of thing, so that you can put the emphasis on a particular area, but it is not the intention of the portfolio to disregard a particular area. I think the focus you are suggesting is that your interests are more on the high tech area. We were just observing that, in terms of the opportunities to gain value from Australia's biological resources, there is a tremendous range there. I think that is all we are suggesting.

Mr SIDEBOTTOM—That is something we are going to have to deal with. I think it is very important that this was raised. I notice also you continue on in your executive summary about the realities in terms of, for instance, drug development. You say that Australian companies may not have the large resources required for R&D, but bush foods may be an area that Australian companies may well get involved in. It is definitely in there—there is no doubt about that. The other issue I was interested in, again, was remediating damaged environments as part of the benefits of this very broad issue we are talking about. I am just trying to imagine bush food now—

Mr Pearson—Before we move on to that, it might be interesting to pick up what I think is perhaps away from the far end, not as much at the top end, but it is a very active area.

Mr Hulse—As high tech goes, in terms of plant varieties, I might make the first statement that the Plant Breeders Rights Office does not protect the species. As far as bioprospecting goes, if someone discovers something, it is not a matter of automatically getting rights on that. They have to do something with it. This selective breeding occurs. That is where the high tech can come in. How do you go about doing that?

There are some examples that I can think of, and one of those is the multimillion dollar kangaroo paw export—the cut flower industry exporting kangaroo paws to Japan. In those cases the high tech end comes from the way in which they are cultivated. Sophisticated tissue culture techniques are used. They need to be highly developed. A lot of time and effort has been spent in working out exactly how you cultivate kangaroo paws and what sorts of treatments are required. In that sense, that perfectly fits a high tech industry.

The same goes for bush foods. In some cases it may be that the propagation techniques are high tech. The actual product itself may be low tech in the sense that originally you could have collected material from the wild but, as time goes on, as the intellectual property side of things develops and the varieties are improved, a lot of high tech comes into it. You need the techniques to be able to get your edge in the marketplace because the next person who comes along breeds a larger fruit or a higher quality nut, and you need to know how to go about doing that.

Mr Pearson—On this one, in a lot of ways we are looking more at the potential than what has actually been achieved to date. We do know of various plants that have been utilised. We draw attention to work that has been done in Israel and the US, for example, in our submission. We recognise that there is potential. I do not know that this has necessarily been tapped in a big

way yet. Sandra is our expert from BRS, and she may be able to add a little more detail on that one.

Ms Thomas—Given the vast range of ecological systems we have in Australia and the number of plants and animals that survive in those systems, if we knew what would help plants survive in arid areas, it would actually help drought remediation in other areas. There may be something in plants that tolerate the high salt areas around Lake Eyre that could help us deal with high salt in areas subject to dry land salinity. It is not necessarily what we now know, but because we have that huge range of ecosystems in Australia there may be some things in some of those which will help us deal with problems in other ecosystems.

Mr SIDEBOTTOM—Potential.

Mr Blazey—I want to add a couple of points. The wildflower industry is a good example of conservation at work. Before people were going into the bush and cutting flowers and exporting them, now they propagate them on farms and develop them from there. We say that is conservation at work. We have a potential applicant who has come to us regarding an algae they have developed which they believe absorbs salinity and can then be recycled onto land again for use there. I think that is quite a good example of environment conservation and so on.

Mr SIDEBOTTOM—Where does it absorb the salt—out of water?

Mr Blazey—Out of water, yes.

Mr NAIRN—In relation to the potential growth of these sorts of industries in rural and regional Australia, you made the comment that there are impediments in processing facilities and access to markets, et cetera, which really are no different to any other impediments for industry in regional Australia. They are well documented and well known and talked about a lot. One thing that is on this sort of industry's side is that the base materials in things they are starting with are not necessarily going to be found in downtown George Street in Sydney. They are going to be out in rural and regional areas in the first place. If a company is doing some work in this area and concentrating on particular plant species or something that it might be working with in the middle of Australia, what sorts of incentives or what assistance should the government provide to those companies to establish some of the processing facilities or whatever in rural and regional areas, rather than bring it back into city based areas? I am not saying there should be anything particularly like new funds, but within the existing programs what could be used to encourage that industry to develop?

Mr Pearson—I am not sure that there really are some programs which would fit the case you are describing.

Mr NAIRN—In that case, should there be?

Mr Pearson—If we are looking at biotechnology at more of the high technology end, I think we have a great deal of difficulty in terms of trying to have isolated industries picking up on a particular range of plant species in an area. If we are thinking about, for example, the extraction of a particular chemical, then maybe that could occur once the research, et cetera, has been done. In terms of the initial identification, one of the real problems is going to be where you

have that intellectual firepower, where you have the analytical capacity to undertake some of that work.

There has been, I suppose, an interesting development in the Lismore region. To me, it is interesting because it is still based around university and a knowledge base with the scientific equipment. I have trouble imaging that happening in Alice Springs or other places like that. While we have the opportunity for some sort of diversification away from Sydney or Melbourne, the extent of that diversification I think is limited by the infrastructure that is really required to be associated with the analysis and the synthesis, et cetera. You may start to get perhaps some advances in the stage after that if there was a need for large scale propagation but, again, science can count against you there in terms of having been able to extract the product and give the chemical analysis of it. It may be able to be done purely in a lab, so you do not necessarily even need to have it all growing out in a particular location.

It is very difficult to really highlight that there would be sufficient incentive to get some of these moving beyond some critical core areas. You may be able to pick those up in regional areas, but I am not sure that beyond that, at least in terms of the ideas of the analysis, synthesising and these sorts of areas, you are really going to be able to move away. Townsville represents another move away from perhaps a traditional location, but there is a university and the headquarters of the Great Barrier Reef Marine Park Authority and those elements are coming together to give that criticality of mass and knowledge that is going to be needed. That to a large extent will militate against any further diversification, until you move back into providing inputs once a particular industry may have been developed that requires that.

Mr SECKER—I cannot remember ever being so disappointed as I am from reading this submission and sitting here for the last hour. I think it has been ill-directed, small-minded and negative. Everything I have heard today is 'difficult', 'complex', 'lacking' or 'mitigating'. I have never been so disappointed as I have with the submission we have had here today. It is just so negative. You have come here and said Australia lacks entrepreneurial culture. It is no wonder that happens if we have this sort of negativity coming from our government departments. We are opposed by the greenies and the NIMBYs and now we have government departments that are so negative about this. I am just so disappointed. You have not even mentioned the anti-biotechnology people. Do you have a strategy to counteract them? Do you have a strategy to counteract the expensive intellectual property laws? Do you have a strategy to counteract the lunatics in the environmental movement and in the department itself? Where are you going?

Mr Pearson—That is certainly one point of view. I suggest that bioprospecting does not represent an area that is identifiably within the AFFA portfolio for strategy. We have a whole range of elements, because bioprospecting is this huge, developing, nebulous thing. What the department is doing in relation to GMs, for example, does not necessarily relate to bioprospecting, but there is a concerted project now, which started this year and will continue for the next three years, to have, if we can, an understanding of the costs and benefits of product identification, segregation, the marketing opportunities, et cetera in relation to genetically modified and non-genetically modified products. This is not directly tied to bioprospecting, but it is to our minds a critical element in trying to position Australian agriculture in the debate and the potential—or not, as the case may be—for genetically modified products.

Where we are trying to drive innovation in the department and where we are trying to promote the entrepreneurial culture is not being driven by bioprospecting as such, but is being very broadly pursued by the department through specific programs such as the New Industries Development Program, through the $150 million that goes into the rural R&D corporations. The department works extremely closely with these corporations and has taken the opportunity to have Minister Truss identify priorities for the R&D corporations. They are basically independent operating units, but one of the priorities we have encouraged is biotechnology. So to try to suggest that we are being negative about bioprospecting is not a true reflection of what we are trying to do across the broad agriculture sector. Bioprospecting is not one of our priorities—I have to be quite clear about that.

CHAIR—But you are a member of the group of five with the ministerial council, so you obviously are going to have to react to concepts, ideas and examples that are put up to them. You obviously have some input into that whole process.

Mr Pearson—That is certainly the case, but that was a national biotechnology strategy. It was not, for example, a national bioprospecting strategy. Bioprospecting is one element of this, but to suggest that we are being negative about it I do not think is accurate. Perhaps you are seeing that the priorities we are driving for underpin, in a general sense, through the development and encouragement of R&D—

Mr SECKER—But you have just said bioprospecting is not a priority for you.

Mr Pearson—No; bioprospecting is not a priority. Bioprospecting is on a priority list, but the priority list is as long as the breadth of the definition of bioprospecting. We are trying to place our emphasis at the moment on the biotechnology side with, for example, a great emphasis on the legislative backing to try to have a national framework in place that will ensure that genetically modified products are well overseen by the government, that there is a regulatory regime in place. Bioprospecting does not necessarily drive a lot of this activity, but a lot of our activity would support the development of bioprospecting, particularly in R&D and in encouraging a more innovative approach.

Mr SECKER—Why are you negative about such things as drug development? It is in the first paragraph on page 2.

Mr Pearson—Negative in terms of what, sorry?

Mr SECKER—You are saying that generally you lack the large financial resources necessary. I do not think that applies to the Herrons, the Fauldings or any of the other companies that might go into partnership or as subsidiaries. You are saying, 'We generally lack the financial resources; however, we could go into bush foods.' That is pretty small-minded. Big companies always start from small companies.

Mr Pearson—I do not disagree. I do not read that as negatively as you do. I do not see that that is meant to be a criticism or a limitation. It is an observation, particularly when we are talking about research and development, that there is a great deal of money, financial capacity and research capacity that is beyond Australian companies as they stand at the moment. That is not to say that they cannot do it and that exercises that we are involved in, like the

Biotechnology Innovation Fund, are not things which we are not giving effort to. I do not know, but perhaps we have not made ourselves clear in the submission. It is not that we are against bioprospecting—

Mr SECKER—You do not seem to be terribly positive about it.

Mr Hulse—From PBR's point of view, bioprospecting is the base, the source material, for new plant varieties.

Mr SECKER—With respect, I think the only positive thing I have heard in the hour I have been here was about salinity from PBR. So I agree with what you are saying there, but I have just been gobsmacked by the negativity I have heard over the last hour.

Mr Blazey—Even in PBR most of the bang for the buck does come from mainstream areas. As we have said, probably about 12 per cent of the applications relate to native species. We see that as potentially a big growth area.

Mr SECKER—Hear, hear! A bit of positivity!

Mr Blazey—But the problem is how you actually get that to move along. We are all aware of megadiversity and so on. The issue really is how do you develop that. Let me put that in perspective. I am new to PBR; I have been there 18 months. It is a very small organisation. There are eight people—nothing like IP Australia whatsoever—and the total budget is $1 million per year. The work really is very much focused on daily consideration of issues in relation to registering plant varieties. It is not that we cannot see there is a big potential for that native species area—and other countries are taking advantage of that. The questions you are asking are probably big picture questions—taxation deductions or something like that. That is not the sort of focus that we have in the PBR Office whatsoever.

CHAIR—In your submission you identified a number of industries that we have lost, such as macadamia nuts and eucalypt oil, that are now offshore. You keep mentioning in your submission the megadiversity that Australia has and everyone keeps saying, 'We've got this absolutely fantastic opportunity.' What is AFFA doing to make sure that we do not lose the window of opportunity that we have with our megadiversity for developing a bioprospecting and bioprocessing industry in Australia? In other words, there were impediments obviously when we lost macadamias, eucalypt oil, rock lobster and some of those other industries. What is AFFA doing to make sure that we do not miss this opportunity?

Mr Pearson—I think it comes in a range of things that do not necessarily package up into—

CHAIR—Come on, give me some specifics—

Dr WASHER—It would be nice if we could have a bit of sunshine today.

Mr Blazey—As I said, our focus is very much on PBR. That is where our work goes. We are putting a lot of effort into getting the settings of the legislation right and clarifying breeding—and that applies to everybody. There are people over there who want to invest money in Australia—not necessarily in bioprospecting but in Australia.

CHAIR—Sure. We acknowledge the work you are doing. But you as a collective here today are representing AFFA and we want to know what it is that you are doing to make sure that we do not lose these opportunities.

Mr Pearson—In the broad sense—

CHAIR—No; give me some specifics.

Mr Pearson—All right. The R&D plan for the bush food industry—I am sorry it is bush food—1998 to 2002 is part of the Rural Research and Industry Development Corporation's $150 million that I mentioned.

CHAIR—Can I just stop you right there. I think we have heard enough about the bush food industry. We have it in your submission. I am really looking for the drivers in the department. You have listed the impediments that prevented Australian industry from capitalising on those industries we have lost overseas. Surely you have identified the impediments that can exist and which may prevent Australian industry capitalising on the megadiversity that we have and really getting cracking with this whole new exciting industry. I do not want to hear about bush foods any more. We have that in the submission.

Mr Pearson—All right. AFFA is part of Biotechnology Australia, so that we are driving with them the national—

CHAIR—What is your contribution? We all know that you are part of BA. What is AFFA's contribution?

Mr Pearson—AFFA's contribution in specific programs is very little because we are not one of the implementing departments for the bulk of, for example, the $2.9 billion. We have the New Industries Development Program, which is $27 million or thereabouts. We also have the Farm Innovation Program, which over the next two years is looking to try to drive developments and applications. It is very difficult to answer a question when the portfolio does not have the sorts of very specific program drivers that you are thinking of.

Our input is in relation to the National Biotechnology Strategy and the Backing Australia's Ability funding. Our input is going into trying to ensure that the agriculture, forestry and fishery sectors are able to access to the best of their advantage what the government is putting in place, that the National Biotechnology Strategy takes account of and picks up agriculture and the important parts of it. It is not that I can just point to a $50 million program that has been set up to do bioprospecting; it is a whole range of elements that try to come into promoting. One of the key drivers is R&D. Research and development is critical to this whole idea of providing information and then trying to drive that information in conjunction with, for example, Biotechnology Australia, in programs like the Biotechnology Innovation Fund. That is where we are trying to have the agriculture part in place.

CHAIR—What information does AFFA provide, for example, in the forestry area where the research push is for a much cleaner way of looking at the whole pulp and paper industry? From my reading of bioprospecting, I see this as one of the exciting areas. I thought you would be

coming in here today telling us about all the exciting areas AFFA was getting into, but you are stepping back from this and saying, 'There is R&D and this is all someone else's responsibility.'

You mentioned a little earlier the need for diversification. You identified in your submission how it would be very difficult to develop a lot of this into the regional areas. Do you think the development of these new, exciting industries in regional areas could be better facilitated if some of the expertise within AFFA was located in some of these regional areas? You mentioned earlier closeness to universities. Biotechnology Australia also referred to the importance of cluster development. Do you think some of AFFA's expertise would be better served in developing these exciting industries if it were located in the regional areas near some of the tertiary institutions and near where the action is being developed? Would that aid the facilitation?

Mr Pearson—If we are looking at scientific developments, expertise out of the BRS—

CHAIR—But you have widened the definition of bioprospecting rather than it just meaning 'scientific'. In terms of your own definition of bioprospecting, would the expertise in AFFA be better served and better facilitate the development of these industries if it were in regional areas?

Mr Pearson—I am not trying to be evasive, but I am just not sure what the expertise is that you think AFFA could locate further out. We have been trying to provide the backup in terms of the R&D corporations and—

CHAIR—There is the expertise that you have located here. There is expertise there. Isn't this expertise? Isn't this going to better facilitate the development of these industries regionally?

Mr Pearson—But I am not sure that any of us being located in Alice Springs is going to drive this process.

CHAIR—I did not nominate Alice Springs.

Mr Pearson—No, I do not mean to be—

CHAIR—I accept that you are not meaning to be evasive, but you are actually succeeding very well.

Dr WASHER—On a brighter note, one of the fascinating things you did mention was salt uptake in algae. I thought that was pretty terrific. In the west, as you possibly know, they have got quite a plant going where they extract beta carotene food colouring agents. It is a major development over there. But this sounds absolutely incredible. Can you tell me a bit more about that, because we are sitting on the second driest continent on earth and you have some algae that takes up salt? I guess that means you are trying to develop some freshwater processes out of this.

Mr Hulse—We know very little about it. It is a potential application at the moment. Once we receive the application we will get all the details. Basically, we know only what we have said so far. This algae has always been around but this particular variety, although it has not been

examined as a variety yet, does it a lot better than the existing varieties. It basically absorbs the salt from the water. You presumably scoop it up and use it for recycling.

Dr WASHER—And you are getting relatively fresh water instead of using biomembrane technology?

Mr Hulse—Yes.

Dr WASHER—That is very exciting. Hopefully something will come out of it.

Mr Pearson—That is not a reflection of AFFA expertise in terms of generating that technology. This is where making sure we have a Plant Breeders Rights Office that works effectively is important. We are trying through the new Australian Centre for Intellectual Property in Agriculture to provide for an area we think is lacking and to provide a focus for work. That money is being pushed through to the ANU, along with the money that the Grains Research and Development Corporation is putting in and the ANU is putting in, as an identified area. That is another example of where we are trying to position and pick up particular shortcomings.

Mr LAWLER—We had cast around for a topic to do an inquiry into. My understanding is that the topic for this inquiry would have come from the minister's office, the department or somewhere, because none of us had heard of bioprospecting before. The suggestion was met with, 'Why are we doing that? What is it all about?'

CHAIR—That is not quite true; I knew about bioprospecting.

Mr LAWLER—If bioprospecting as such is not high on that list of priorities, what are we here for? Where did the suggestion that we do this inquiry come from?

Mr Pearson—I think it is fairer that that is directed to the Chair.

Mr LAWLER—I presume that the advice of this sort of thing comes from the department to the minister's office to us.

Mr SIDEBOTTOM—Is the minister sending a message.

CHAIR—Does anyone have any other questions?

Mr Blazey—Can I just add something to what Andrew just said. One of the big impediments is people's lack of understanding. The lack of understanding of the limits and the benefits of the PBR legislation is 'humendous'—it is quite amazing—even amongst those people who are supposed to know. We are doing something about that. Working with ACIPA will help us to do that. There will be a lot more training for those lawyers and so on who people will go to understand the ins and outs of the legislation.

CHAIR—Did I say this committee is well versed in the problem of lack of information getting out to producers especially? It has been a problem that we identified as far back as when

we were inquiring into how Australia was adjusting to international trade. It is an enormous problem, one that obviously has not been solved. I thank you for coming before us today. If at a later time in the inquiry you want to provide us with some additional information, the offer is open. Thank you.

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

That, pursuant to the powers conferred by section (a) of standing order 346, this committee authorises the publication of evidence given before it at public hearing this day.

Committee adjourned at 12.02 p.m.