



***6th International Conference on Public Communication of
Science & Technology : Trends in Science Communication -
Bridging the gap between theory and practice
Geneva, February 2001***

PLENARY PAPER:

**SCIENTISTS AND POLITICIANS –
the need to communicate**

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Introduction

“Science and technology (are) important. But scientists also need to understand that economic prosperity and defence probably rank higher.”

(Australian Politician, January, 2001)¹

These words illustrate dramatically the gulf between science and politics. What the quote actually tells us is that this Australian politician not only believes science and technology are divorced from economic prosperity and defence issues – he or she believes they are in competition with other critical priorities in the field of public policy making. This at a time when there are very clear signs in Australia that in our next election Australia’s capabilities as a “knowledge nation” will be a major issue.

¹Expectations for Science - survey of Federal and State Politicians.
Market Attitude Research Services, Sydney, Australia (Preliminary results) January 2001

This paper will look at some of the work done so far in Australia to try to help politicians better understand the role of science in the development of sound public policy.

Why should scientists and politicians communicate?

Recent scientific controversies such as Mad Cow Disease, Greenhouse, genetically modified food and cloning are all vivid examples of the failure of effective communication between science and politics, as well as between science and society.

Because of this failure, there has been major political fallout, increased public risk, increased public fear, mistrust and scepticism about science and poor public policy making. These outcomes are as undesirable for politicians and scientists as they are for the community at large.

At CSIRO we have a Parliamentary Information Program which uses the message “research is about wealth creation, jobs sustainability and economic opportunities .” This broad message from the scientific community is one that can help politicians to understand the outcomes they can expect from appropriate investment in science and effective use of scientific findings in public policy formation. In the long run, we believe it can help politicians work with the science community to develop better public policy as well as enhance their own political prospects.

The Program aims to help politicians realise, in enough detail to make it useful to them, that science and technology can and do make a big difference to the country’s wealth, health and well being.

The Program may also be viewed as a form of accountability, outside CSIRO’s official annual reports and Ministerial contact. It demonstrates clearly to MPs the value which the nation may expect to derive from its investment in public science.

Obstacles to effective communication with MPs

In bridging the gulf between science and politics there are several hurdles to be overcome:

- ◆ the lack of regular contact between scientists and MPs
- ◆ differing perceptions of budget priorities
- ◆ the mismatch of political and scientific timeframes
- ◆ low levels of science-literacy among MPs and of political literacy among scientists
- ◆ the cultural divide between politics and science
- ◆ the linguistic divide
- ◆ lack of electoral impact by science

Let me comment briefly on each of these.

Lack of regular contact between scientists and MPs

It has significantly been remarked by some MPs that “The only time I ever see a scientist is when he/she wants money.” In preliminary results from one of our recent surveys, MPs described the interaction between scientists and politicians as “unsuccessful”. Reasons included lack of cost/benefit data on science, lack of face-to-face engagement, scientists’ belief that government should fund most research, inadequate communication of scientific issues through the media. Nearly half of the MPs said they had two or fewer briefings from scientists per year.²

Differing perceptions of budget priorities

Increases in support for science must often be found through cuts elsewhere in the budget – a practical issue which science lobbyists sometimes overlook. From the MP’s perspective, the issue is often how and when to trade off political pain against political gain.

The mismatch of political and scientific timeframes

The timeframes of politics are short – the next 24 hours, the next week and the next election are critical punctuation marks. The timeframes of science technology and engineering are long: results are delivered within years, sometimes decades – usually long after the Government which originally funded them has become history. MPs understandably see few immediate political payoffs from a decision to bolster science funding, or even not to cut it. On the other hand, science is seldom professionally equipped to deliver results or information with the immediacy, clarity, simplicity and political relevance demanded by MPs.³

Low levels of science-literacy among MPs and of political literacy among scientists

Of Australia’s Federal politicians, 16.5 per cent have professional qualifications in science, technology, agriculture, engineering or medicine. Only thirteen of the 224 members of the present Parliament – 5.8% -- hold science degrees. The whole there is little familiarity within the Parliament with

² Op.cit MARS January 2001

³ Fisher N.I., Kordupleski R.E., Focus Group Study of Scientific Information Requirements by Federal Politicians, CSIRO November 2000.

how scientific and innovation systems function. This represents a serious challenge in science communication.⁴

The cultural divide between politics and science

A major obstacle is the cultural divide. To politicians, it is perception (what most of the public believes) that constitutes the reality within which they must operate, regardless of personal preference.

Scientists, on the other hand, usually deal in measurable data. Science sometimes finds it hard to accept the apparently irrational forces of popular belief and prejudice which sway democracy. It therefore has a tendency to shun engagement in the public policy debate, often out of a fear of having its findings weighed in the same scale as popular prejudice. To the politician, this reticence can seem like lack of confidence in the science.

The linguistic divide

Scientists often speak a specialised technical language, without realising how pompous, opaque or misleading it can sound to others, including politicians. Politicians too have a language which, to scientific ears, can sound curiously selective and evasive. In a recent survey of 50 federal MP, when asked "How is science travelling at the moment?" 42 (84%) responded "Not well". Asked why, some said lack of funds, but others blamed it on poor public communication by scientists.⁵

Lack of electoral impact by science

Science lacks electoral clout. The number of people employed in R&D in Australia is small, only 91,000 individuals, or some 0.7 per cent of the voting population.⁶ These are distributed fairly evenly across the electorates, meaning that science and technology issues rarely influence the poll outcome in a particular constituency or determine the fate of a particular MP. Science thus lacks immediate and local political 'bite'. Also, science has seldom been adroit enough to recruit the powerful lobbies to its cause.

For all these reasons science, and support for science, are rarely seen by Australian politicians as critical to political success and of the highest national priority. Funding decisions taken in the past 20 years tend to support this view.

⁴ Current Parliamentary Information, The 39th Parliament, Senators and Members, by Levels of Qualification, Parliamentary Library, January 4, 2001

⁵ Gascoyne T., Report on Science Meet Parliament 31/10/00-1/11/00, FASTS, January 4, 2001.

⁶ Human Resources devoted to R&D, by Sector, ABS 1996/7, from Australian Yearbook 2000

What MPs want

Our customer research has explored how MPs obtain information about S&T, and how they use it.⁷

A focus group of federal MPs said their main interest in and use for scientific information lies in the areas of the current political agenda, current public concerns, global developments, new and emerging issues, important scientific advances, and current CSIRO research projects.

They indicated that, at present, they mainly obtain scientific information from the Web, the Parliamentary Library, email, Science Briefings, personal briefings on request, Committee briefings, visits to research sites, newsletters, their advisers and the media.

MPs said they use scientific information for policy development, internal party discussions, speeches in public and in Parliament, to counter incorrect information, to promote investment in science

Their main requirements are that scientific information be timely, relevant, in plain language, re-useable by MPs, accessible out-of-hours, from a credible source, and provided at various levels of detail with executive summaries.

The research identified further key elements in building a partnership between science and MPs who said they wanted -

- ◆ immediate access to the right scientific expert
- ◆ a face-to-face relationship with the experts, based on mutual benefit and not a series of ad hoc contacts
- ◆ R&D information provided in small, regular and digestible items, rather than in lengthy, complicated textbook style
- ◆ use of concrete examples to explain science, instead of abstractions and generalisations
- ◆ use of the “story” technique to describe science, and engage the listener
- ◆ “hands-on” visits to laboratories and scientific sites to generate insight, enthusiasm and personal contact.

⁷ Op cit Fisher et al Nov 2000

What are we doing in Australia?

CSIRO

CSIRO has long maintained strong formal links with the Federal Parliament and Minister for Science through the Chief Executive, the Ministerial Liaison Office and Government Business Office, the Board, Deputy Chief Executives, the 22 research divisions and the Organisation's annual reporting requirements. The main linkages are:

Science Minister's Office (daily liaison), Cabinet Submissions throughout the year, Ministers & senior staff, the Prime Minister's Science Engineering and Innovation Council (CSIRO's Chief Executive is now a member of this Council), Parliamentary committees Ministerial Councils, Individual MPs, the Parliamentary Press Gallery, the Parliamentary Library.

The Organisation has two corporate groups mainly responsible for interaction with Parliament and running complementary programs. One is the Ministerial Liaison unit which handles all communication between CSIRO and the Minister's Office.

The other is the National Awareness group, which operates multi-faceted program of information delivery to MPs. An integral part of the program is regular customer analysis and realignment of the program to meet the changing needs of a dynamic customer group.

CSIRO National Awareness Parliamentary Information Program

The components we have developed are Science Updates for Electorates and Science Briefings.

Science updates for electorates

This targeted service, begun in November 1998, delivers by email individually-tailored information about CSIRO scientific advances direct to all Members of Parliament in their own electorates, according to their personal and electoral interests. These personal and electoral interests are built into an email database of all members of the federal (national) parliament. Each update includes a web address for a more detailed version of the item. A sample package is at Attachment 1.

The information can be, and is, used by the individual Members of Parliament and their staff for:

- ◆ policy development
- ◆ inclusion in speeches delivered locally or in Parliament
- ◆ briefings providing advice on current issues
- ◆ preparing their own media releases to local media

- ◆ responses to individual enquiries from the public

The aim is to give Australian MPs a greater sense of ownership, participation and pride in our scientific accomplishments – as well as a keener appreciation of the benefits our science brings to the industries, communities and jobs within their own electorates, and thus to the national economy and well-being.

In 1999, 80 information packages were delivered by email to politicians at their electorate offices.

In 2000, 52 information packages were delivered. Our deliberate intention in 2000 was to target electorate interests more specifically. In some cases the information went to all politicians on our database, and in others, were specifically targetted to electorates according to the subject matter.

Science updates for electorates reinforce other elements of the program - National Science Briefings for Federal Parliament and CSIRO Science Briefings for State Parliaments (see below).

National Science Briefings, Parliament House, Canberra

Forty-one briefings have been presented in Parliament House, Canberra, since October 1996, when the series began using the slogan “Scientific briefings to help form better public policy”

The Briefings are hosted by the Minister for Science or a nominated parliamentary colleague. They are one hour in length, presented in lunch hour. In each case, there are no more than three speakers, each making a short presentation (10 minutes maximum) leaving at least 30 minutes for discussion.

The message being sent to politicians, their staff and the media through the Briefings is that Australian science and technology can make a big difference to the country’s wealth, health and well being.

Journalists are invited to the Briefings and a media release is issued for each one. (Attachment 2)

The Briefings receive non financial endorsement - public acknowledgement - from some of Australia’s most prestigious science bodies including the Australian Academy of Science, Australian Academy of Technological Sciences and Engineering, Australian Research Council, CRC Association, National Health and Medical Research Council, the Federation of Australian Scientific and Technological Societies, the Academy of the Social Sciences in Australia and the Rural R&D Corporations.

The Briefings held so far have addressed topical issues such as health, marine resources, the environment, and how science can provide solutions to many problems facing Australians and Australian industry. A full list is at

Attachment 3.

They help drive home the importance of maintaining Australia's research and development abilities, and its participation and influence in the international arena.

Wherever possible, the Briefings provide the participants with hands-on experience of the central role science plays in their lives. For example, at a briefing on the latest security technologies, the scientists demonstrated face recognition techniques by recording politicians' faces on video and showing how that visual record is used as a pass key.

CSIRO Science Briefings for Australia's State Parliaments

Since 1998 we have presented science briefings to state politicians. The format is the same as for the National Science Briefings, with a senior state politician hosting the series. The state MPs have become involved in the choice of topics which is a valuable response, since this targets the briefings directly to the interests of the state in which they are presented. The series runs in Western Australia, South Australia, Victoria, New South Wales and Queensland. We hope to introduce them into Tasmania this year.

In two states, the experts addressing the briefings have been used on the same day to talk to policy officers, industry and business leaders in the particular subject area. This spreads the influence of the program well beyond parliament and politicians. We will continue to encourage the use of the experts in this way.

Our media programs support communication with MPs

Politicians don't often admit it, but their perceptions of popular issues are very substantially moulded by what they read in the media. An effective media activity, targetting the quality press read by decision makers, is therefore an important feature of a communication program targetting MPs.

CSIRO operates an extensive and vigorous program to supply good science stories to the Australian media. Well over 300 stories go out via media release each year, and we commission a range of in-depth articles from several experienced writers throughout the year.

FASTS : Science Meets Parliament

In 1999, Australia's Federation of Scientific and Technical Societies (FASTS) - not part of CSIRO but covering many of its scientists - began an annual Science Meets Parliament Day. In this program, based on the US Congressional Visits Day, all Federal politicians are invited to meet a pair of scientists from their electorate; at the same time a similar invitation goes to

the scientific community.

FASTS had four primary aims for this project:

- ... politicians more aware of what science can do for Australia
- ... scientists more knowledgeable about policy formulation
- ... a favourable impact on both the political process and the budget
- ... the development of long-term relationships between individual scientists and MPs

In 2000, one hundred and sixty-five Parliamentarians (three quarters) agreed to meet with 185 scientists who flew into Canberra from all over Australia.

Science Meets Parliament is essentially a two day event. Day one is a briefing session to discuss with the scientists interview techniques and tactics and strategy for the day of meetings. Briefings are by politicians, staffers, media people. Then follows a cocktail reception at Parliament House.

In 2000, the event began with an address by Dr Neal Lane, President Clinton's science adviser, to the National Press Club. This was subsequently televised to national audience of about 100, 000.

Day two consists of meetings with MPs. Scientists are matched with MPs first by the electorates where they live, then by the electorates where they work. Where MPs nominated areas of interest, the organisers tried to include in the meetings those scientists with expertise in the MPs nominated interests.

Support for the 2000 event was widespread, building on the success of the first SmP Day. Eight science organisations were sponsors, and the cocktail reception was jointly hosted by the Speaker of the House, President of the Senate and Minister for Industry, Science and Resources. All three spoke that evening

Participating scientists response was very positive, scoring the overall event at eight and a half out of ten. The scientists were impressed by the general grasp of issues displayed by MPs, and the value they placed on investing in S&T.

The meetings often lasted longer than the scheduled half hour. Science education issues were probably the most popular topic, coming up in nearly half the meetings

How we evaluate our programs

CSIRO

We have used a number of evaluation tools for the program over its four years so far

- phone interviews with politicians and/or their advisers
- personal interviews with politicians and/or their advisers
- focus groups
- email journal entries

In March and October 1999, we evaluated the email-based science updates for electorates project using personal and phone interviews with 44 politicians and their staff. This project had been given a 12-month test period (1998) and the evaluation showed that it was worth establishing as an on-going part of our activities.

In November 1999, we reported our findings to CSIRO management.

The summary of our findings:

“A twelve-month CNA pilot project has revealed strong latent demand among Federal politicians for information about CSIRO science, especially where it benefits the industries in their electorates. Many of them are now using this information in speeches, media publicity and as background for decision making.

Eighty information packages were delivered by email to politicians at their electorate offices. Two surveys were conducted in 1999 by phone and face-to-face interview of 44 politicians and their staff. These surveys showed that:

- 88% of MPs surveyed were aware of the service
- 77% had made use of the information in various ways including media, policy background, electorate newsletters, speeches
- All politicians and their staff expressed very strong interest in a visit to a CSIRO site or a personal briefing on a topic of concern to them
- Some asked if was possible to bring CSIRO scientists to them or to their electorates

In 2000, we monitored the email science updates via the journal entries in the email system itself. This is a system which records responses to the information packages sent out – the name of the responder, the nature of the enquiry and any comments they may make on the service.

During 2000 there was a total of 45 direct responses from thirty politicians (13 %of total) to science update emails. Forty were requests for further information and 5 were comments. The responses came from all political

parties, all states and included both MPs and Senators.

Comments collected during survey interviews in 1999 and 2000 show that many MPs advisers go direct to the web site that has been supplied with the update, to get further information. We believe the number of hits could be in the hundreds, and we are devising a way of recording these in 2001.

MPs information needs

In the second half of 2000, we ran a focus group of 9, comprising 7 MPs and 2 advisers representing the full political spectrum. The aim was to find out their needs for information and how they received and used the information they received.⁸

To devise and run the focus group, we sought help from our scientific colleagues in the CSIRO Division of Mathematical and Information Sciences. They worked with us to develop the questions needed to establish the politicians' information requirements.

The outcome was a "satisfaction matrix" of politicians' information needs and preferences. (Attachment 4)

It is now being used to devise a system which can provide regular evaluation of CNA's Parliamentary Information Program.

The system will be used from 2001 onwards. Its main tool will be a carefully-designed questionnaire based on the outcome of the focus group and other interviews. This will be used four times a year with a random group of 20 – 30 MPs, with a different group for each of the four annual evaluation points.

The outcomes of these four evaluations will be used, in conjunction with responses to the email science updates and comments received in discussion with parliamentarians, their advisers and other relevant people, to evaluate the Program.

We will adjust our Parliamentary Information Program where the evaluation shows we need to.

The Parliamentary Library – a focal point for MPs

A sign of the times for science as a public policy issue is its appearance this year as a "Hot issue" on the Library's web page. In July – December, 2000 the Library received its highest percentage of requests ever - 10% of all requests – for information on issues relating to S&T policy.⁹

⁸ Op cit Fisher et al Nov 2000

⁹ Dr Rod Panter, Director, Science, Technology and Resources Group, Parliament House Library, Canberra, Australia (pers.comm)

The report on the focus group recommended that we set up close links with the Parliamentary Library. The MPs in the focus group stated that the Library was an important first port of call whenever they needed urgent information on issues being discussed in Parliament. Other MPs interviewed confirmed this.

As a result, we have established a working relationship with the Science and Technology section of Parliament House Library. Under this informal arrangement, experienced members of CNA will be available to respond quickly to calls for information. The Library's S&T section now receives immediate email notification of media releases via a Newsflash service on CSIRO's website.

Customer research

In January 2001 CNA commissioned a survey of 50 Federal and State government MPs, mainly in the federal parliament using the 6 questions show below.¹⁰ The survey is being carried out to assess where politicians position science and technology on the political agenda. We believe it is important to know as much as possible about the thinking of probably our most important stakeholders, so that we in turn can establish the most receptive environment for dialogue.

The survey is being carried out in strict confidence, to try to encourage personal opinions. The preliminary results (16 Federal politicians) are :

1. On a scale of 1 to 5 with 1 being "very important" and 5 being "very unimportant" how would you rate the importance of science and technology to Australia's future? Why do you give this rating?

60% believed science and technology was "very important" to Australia's future, 40% believed it was "important".

2. How strongly would you agree or disagree that science and technology are adequately funded in Australia at present? [strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, unsure]

60% disagreed that science and technology are adequately funded, 40% neither agreed nor disagreed.

3. Does science and technology receive sufficient priority in the policy-making process in Australia? [yes – receives sufficient priority, no – does not receive

¹⁰ Op cit MARS, January 2001

sufficient priority, I have never thought about it, I have thought about science and technology issues but am not sure of their appropriate priority]

100% agreed S&T did not receive sufficient priority

4. How often do you receive a policy briefing from a scientist during a typical year? [never, rarely, occasionally – at least 1 or 2 times regularly throughout the year, frequently – more than 2 times regularly throughout the year]

20% rarely received a policy briefing, 20% occasionally, 60 % frequently.

5. How successfully or unsuccessfully does the Australian science community interact with politicians and decisionmakers in Australia? [very successfully, successfully, neither successfully nor unsuccessfully, unsuccessfully, very unsuccessfully, unsure]

20% believed the science community interacted successfully, 80% believed it interacted unsuccessfully

6. What can be done to improve dialogue between science and politics in Australia to help scientists be more helpful or valuable to politicians?

A range of qualitative suggestions emerged from politicians suggesting how dialogue between scientists and politicians could be improved. Specific comments and suggestions were....

“I feel that scientists have to show the practical outcome of science both to the Australian community and politicians, and not just have policy interaction. I mean local scientists living and working in a Member’s electorate should meet their local Member of Parliament to explain useful projects they are working on.”

“The group interviews conducted between scientists and Parliamentarians this year are very valuable. Maintaining dialogue with individual MPs on initiatives in their electorate would also be useful.”

“The science lobby has to become more ruthless and persuasive to convince politicians that science should be backed.”

“To be valuable I feel that scientists have to help their dialogue by not believing that government alone should fund science. Science in Australia should also be supported commercially by the business world.”

“I feel there should be much more personal interaction between scientists and political leaders and supported by more media discussion of key scientific issues.”

7. What is the greatest obstacle to Australia becoming a smart society or clever country?

“It is not only the need for more money for science. The community and politicians should also value scientists as heroes through understanding more what scientists do.”

“A continuing trend towards privately funded undergraduate and post graduate study and research is becoming an obstacle.”

“Public complacency about science and technology in Australia is a major problem.”

“I feel a major problem is the lack of willingness by the science and academic community to engage in meaningful dialogue with the business and commercial community.”

“An important obstacle is the poor quality and lack of focus of the Australian education system and the general anti-intellectualism of the media.”

We will use the final results of the survey to test our current communication programs and will adjust them to meet the needs revealed by the survey. In particular, we will bring them to the attention of CSIRO’s top management, so that programs across the Organisation can take these needs into account.

The FASTS Program: Science Meets Parliament

The FASTS organisers issue feedback forms to all participating scientists and followed up personal and group interviews with MPs.

They assessed feedback from participants and politicians, the fact that the meetings frequently last longer than scheduled, and the follow-up actions they trigger.

A senior political adviser commented that the event is “the single most effective contact between scientists and MPs”.

In the 2000 event, sixteen MPs asked for copies of the cv’s of participating scientists; five for contact points for further information; 15 for more details on the five key issues; and 28 for scientific information on other issues and/or for FASTS to act as a conduit for providing technical information.

Keys to effective dialogue with politicians

In the work so far, we have learnt something about communication with politicians. We have put together some points which may be useful for similar activities in other countries.

Most important is to aim for the electorate and personal interests of the MP. This point has come out strongly in most of our interviews and discussions.

The underlying message should be a demonstration that research is about wealth generation, not just "science" for its own sake. It's about jobs, improved standards of living and a better, cleaner environment.

It is important, when dealing with busy politicians who have hundred of other agendas, to respond quickly, and to keep the dialogue simple, free of jargon, factual and well-substantiated by reputable sources. We need to demonstrate that we can be useful to politicians, that we will not just raise problems, we will offer realistic solutions.

Underpinning this should be the understanding that there are no quick solutions to raising awareness of the impact of science and technology.

We need to be aware of the political cycle and the legislative processes. Talk to all sides of politics – the Opposition of today could be the Government of tomorrow.

Final message

In 2001, science communicators around the world have a great opportunity to work with both scientists and politicians to open up dialogue on vital public issues.

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January 2001

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Requirements by Federal Politicians, CSIRO November 2000.

Human resources devoted to R&D, by Sector, ABS 1996/7, from Australian
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January 4, 2001.

Dr Rod Panter, Director, Science, Technology and Resources Group,
Parliament House Library, Canberra, Australia (pers.comm)

ATTACHMENT 1

Science Updates for Electorates email service to MPs

Sample information package

3 January 2001

To MPs who have notified interest in Aquaculture -Prawns

CSIRO: PEDIGREE PRAWNS

CSIRO scientists plan to give Australia the best-bred prawns in the world.

CSIRO's Food into Asia program is helping develop the better-performing prawns in collaboration with two innovative prawn farms, Rocky Point Prawn Farm and Tomei Australia, both located on the Logan River in southeast Queensland.

CSIRO researchers are using DNA fingerprint technology, to select families, or pedigrees, of domestically bred Kuruma prawns – *Penaeus japonicus* – that grow the fastest.

For more information contact Jason Major, CSIRO National Awareness

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ATTACHMENT 2



Media Release

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CSIRO Media Releases are also available from
Newsline at: <http://www.csiro.au>

December 7, 2000

Ref 00/328

GENE TECHNOLOGY AND THE ENVIRONMENT

New research by CSIRO is exploring the safety of genetically modified crops once they are released commercially into the environment, a National Science Briefing was told in Parliament House Canberra today.

Dr Joanne Daly, CSIRO Entomology, told MPs that the CSIRO research complements Australia's existing advisory and new regulatory processes to ensure that any new GM crop poses only low risk to the environment.

"All human activity carries some risk. New gene technologies that produce GM crops will also carry some risks.

"As a community we need to know what these risks are, how large they might be and, if we choose to accept them, how the risks can be managed.

"Some scientific questions about the impact of GM crops in the environment can only be examined after crops are grown over large areas and under commercial conditions.

"In particular, we need to know if the GM crop changes the number of harmful organisms such as insect pests, weeds or plant diseases, or if there is an impact on helpful insects such as those that eat pests or weeds.

"Our research will test whether GM crops evaluated as 'low environmental risk' by current scientific procedures prior to release, are indeed 'low risk' when commercially released," she says.

"CSIRO scientists at Narrabri (NSW) have evaluated the impact of commercially-released Bt cotton (containing a bacterium gene producing toxins to kill some caterpillars) on a variety of insects, spiders and mites found in cotton fields.

"Overall, the Bt cotton supported a wide range of harmless and helpful insects and this is a plus for biodiversity. Over 400 different species of insects, mites and spiders were observed in the crops. The sprayed conventional cotton had considerably fewer insects in it than the Bt cotton or the unsprayed conventional cotton - this was predictable because insecticides kill many different kinds of arthropods, not only the harmful ones.

Professor Colin Thompson, University of Melbourne, told the Briefing that mathematical models had been developed to carry out risk analysis of the impact of genetically modified crops.

“We have constructed these models to analyse the possible competition and interaction between GM crops and related wild species growing nearby,” he says.

“They are built on concepts of what happens in natural systems. These concepts are developed by a whole range of experts in the field – agricultural scientists, geneticists, molecular biologists, environmentalists, mathematicians. And from these concepts, we produce evolution equations.

“The model equations in effect simulate nature, including environmental fluctuations.

Interestingly, similar methods are used in risk analysis of financial markets.

“We believe these methods can help the gene technology regulators in the decision-making process, for example by estimating the likelihood of regulations not being met.

“We are also developing models to help farmers with benefit-cost analysis of farming gm crops.

Dr Oliver Mayo, CSIRO Livestock Industries, said that gene technology in livestock has five main goals:

- to improve animal welfare and environmental sustainability
- to improve animal product quality and quantity
- to develop new medical and veterinary products
- to study animals as an aid to understanding human disease
- exploring animals as possible organ donors

CSIRO and Adelaide University first developed a transgenic merino sheep 15 years ago. After a decade of careful tests, sheep with enhanced growth rates are now undergoing field trials under GMAC-approved contained on-farm conditions.

“From an environmental perspective, the sheep is a good test animal, because in 200 years sheep have never become feral animals in Australia,” he explained.

“Indeed, sheep which grow more efficiently may well prove to have environmental advantages.”

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ATTACHMENT 3

National Science Briefings

Parliament House, Canberra

10 October 1996

Banquet - How to live to 100 - foods that protect you and extend your life

[Launch of series by the Prime Minister]

Food served at this event has the potential to extend life and fight disease.

Dr Richard Head, CSIRO

Mr Murray Rogers - Australian Food Council

17 October 1996

Our genes - the world's biggest industry?

The Human Genome Project will produce the knowledge to drive the world's next generation of drugs and biotechnology. Is Australia on board?

Dr Grant Sutherland, Adelaide

Dr David Cox, Stamford Uni. USA

Dr Jim Peacock, CSIRO

31 October 1996

Greenhouse : solutions for Australia and Asia

Dr John Wright, CSIRO

Mr Bruce Godfrey, Energy Research & Development Corporation

7 November 1996

Food and drugs from the sea

Mr Brian Jeffriess, National Fishing Industry Council

Dr Peter Young, CSIRO

Dr Nick Gough, AMRAD Pharmaceuticals

5 December 1996

Life on other worlds

Prof Malcolm Walter, Macquarie University

Dr Ray Norris, CSIRO

6 March 1997

Vintage Success - science and technology for Australia's wine industry

Prof Geoff Scollary, National Wine & Grape Industry Centre

Prof Terry Lee, Australian Wine Research Institute

Dr Elizabeth Heij, CSIRO

20 March 1997

The Future of Oz

Prof Ian Lowe, Griffith University

Mr Barney Foran, CSIRO Population-Development-Environment Project

29 May 1997

The Future of the Universe

Dr. Rachel Webster, School of Physics, University of Melbourne
Professor Jeremy Mould, Director, Mount Stromlo and Siding Spring Observatories

19 June 1997

Australia's rivers and the deadly blue-green algae

Dr Richard Davis, CSIRO

Dr John Verhoeven, NSW Dept of Land and Water Conservation

26 June 1997

Sea Monsters - introduced marine pests

Dr Ron Thresher, CSIRO

Mr Bob Hartley, Australian Shipowners Association

Mr Dennis Paterson, AQIS

28 August 1997

Wheels of fortune - Australia's role in the world car industry

Dr Kurt Liedke, Robert Bosch Australia

Mr Malcolm Stewart, Federation of Automotive Product Manufacturers

Mr David Lamb, Australian Automotive Technology Centre

25 September 1997

Back from the brink - the fight to save Australia's endangered species

Dr Denis Saunders, CSIRO

Dr Judy West, CSIRO

Dr Ian Gunn, Animal Gene Storage Resource Centre of Australia

23 October 1997

Oceans of Wealth - Australia's big marine opportunities in energy, engineering and tourism

Mr Peter Cochrane, APPEA

Mr Rob Male, Woodside Petroleum

Dr Chris Crossland, CRC for the Great Barrier Reef

27 November 1997

Sustainable energy - answers to the Greenhouse dilemma

Mr David Hogg, Pacific Solar

Mr Allen Beasley, Australian Gas Association

Dr Graeme Pearman, CSIRO

5 March 1998

21st Century Australian cities

Mr Larry Little, CSIRO

Dr David Ho, CSIRO

Dr Tony Priestley, CSIRO

13 March 1998

Beating the killers (medical imaging)

Dr Laurie Wilson, CSIRO

Prof Bruce Doust, St Vincents

Mr Victor Skladnev, Polartechniques P/L

2 April 1998

Damaged Landscapes

Dr Graham Harris, CSIRO Mr Don Blesing, Agribusiness Consultant

Mr Don Blackmore, Murray Darling Basin Commission

28 May 1998

The Gene Century

Dr T.J. Higgins, CSIRO

Dr John Oakeshott, CSIRO

Dr Bob Seamark, CRC Vertebrate Biocontrol

25 June 1998

Security Technologies

Dr Rob Gill, CSIRO

Mr Alex Gibson, Harrison Systems

Mr Simon Grieg, WESTPAC

2 July 1998

21st Century Australia - Language and National Identity

Australia's Biotechnology Opportunities

Professor Margaret Clunies Ross

Sir Gustav Nossal

12 November 1998

Where There's Muck There's Brass - Australia's waste management technologies hit the world market

Mr Ian Kiernan, Chairman CRC Waste and Clean Up Australia

Dr David Garman, Director, CRC Waste

Dr Phil Hugenholtz, CRC Waste and University of Queensland

3 December 1998

True Blue Satellite - Australia's ARIES satellite

Mr Ted Stapinski, Chairman, ARIES Board

Dr Jon Huntington, CSIRO

Mr Lex Geddes, Macquarie Bank

18 February 1999

Australia's big Internet Opportunities

Dr Phil McCrea, CSIRO

Ms Judith King, Coalition of Australian Service Industries

Mr Justin Milne, OzEmail

11 March 1999

Aussie seafood on the world menu

Mr Bill Widerberg, CRC Aquaculture

Dr Peter Walker, CSIRO

Dr Peter Montague, CRC Aquaculture

25 March 1999

Australia's Minerals and Energy Technologies

Dr Rob Hill, CSIRO

Mr Alan Davies, BHP

Mr Dick Davies, AMIRA

24 June 1999

Salinity Crisis – how big, who pays?

Dr Tom Hatton, CSIRO Land and Water

Mr Alex Campbell, National Dryland Salinity Program

Mrs Doreen Wheelwright, Lachlan Catchment Management Committee

12 August 1999

Australia in the technology millenium – will we survive?

Professor Peter Doherty, Nobel Laureate

Dr Malcolm McIntosh, CSIRO Chief Executive

23 August 1999

Managing the tourists – regional Australia's big opportunity

Prof Philip Pearce, James Cook University

Mr Paul Walker, CSIRO Tourism Research

Sir Frank Moore, CRC Sustainable Tourism

3 September 1999

Gene Technology – 3 viewpoints

Dr Annabelle Duncan, CSIRO Molecular Science

Fran Bailey, MP

Mr Don Burke, Burke's Backyard

23 September 1999

Jobs for the future – where will they come from?

Lindley Edwards, Managing Director, Venture Bank Ltd

Colin Adam, Acting Chief Executive

Michelle Grattan, Sydney Morning Herald

21 October 1999

The Bush in the 21st Century – new industries, new jobs.

Dr Elizabeth Heij, Chief, CSIRO Tropical Agriculture

Dr Nan Bray, Chief, CSIRO Marine Research

Dr Sandra Eady, Research Scientist, CSIRO Animal Production

9 December 1999

Privatisation – can it help preserve Australia's biodiversity?

Dr Denis Saunders, Assistant Chief, CSIRO Wildlife and Ecology

Mr Carl Binning, CSIRO Wildlife and Ecology

Dr Jan Gilmour, Earthwatch Australia

17 February 2000

The Winning Edge – science & technology for Australian sport

Dr Barry Holcombe, CSIRO

Mr Pat Farmer, Ultra-Marathon runner

Prof Martin Thompson, University of Sydney

16 March 2000

Rat race! - solutions to the problems of 21st century urban living

Mr Larry Little, CSIRO

Dr Chris Davis, Australian Water Association

Dr John Smith, CSIRO

13 April 2000

Eco-dollars! How smart Australians are using the environment to their advantage

Prof Gretchen Daily, Stanford University

Dr Steve Cork, CSIRO

Mr Bill O'Kane, Goulburn-Broken Catchment

9 June 2000

The Mighty Murray – and the Murray-Darling Basin

Dr John Williams, CSIRO

Mr Don Blackmore, Murray-Darling Basin Commission

22 June 2000

Virus busters! Protecting Australia's \$13billion livestock industries

Dr Mike Rickard, Chief, CSIRO Animal Health

Dr Mike Nunn, Acting Director, Office of Chief Veterinary Officer

Mr Jeff Fairbrother, Executive Officer, Australian Chicken Meat Federation

17 August 2000

Weed Invasion! Australia's \$3billion problem

Mr Dale Baker, Grains R&D Corporation

Dr Mark Lonsdale, CSIRO Entomology

Assoc Prof Rick Roush, CRC Weeds

5 October 2000

Out of the woods : jobs, dollars & new industries for regional australia

Dr Glen Kile, Chief, CSIRO Forestry & Forest Products

Mr Jim Witham, Managing Director, Treecorp P/L

Mr Peter Francis, General Manager Marketing, QDPI Forestry

12 October 2000

Global warming – the opportunities for Australia

Dr Graeme Pearman, Chief, CSIRO Atmospheric Research

Mr Keith Orchison, Managing Director, Electricity Supply Association of Australia

Mr Les Hosking, CEO, Axiss Australia

7 December 2000

Gene Technology – what about the environment?

Professor Colin Thompson, University of Melbourne

Dr Oliver Mayo, CSIRO Livestock Industries

Dr Joanne Daly, CSIRO Entomology

ATTACHMENT 4

Focus Group Study of Scientific Information Requirements by Federal Politicians

Report prepared for Mr Julian Cribb and Mr Jason Major,
CSIRO National Awareness Program

N.I. Fisher³ and R.E. Kordupleski⁴

Executive Summary

A Focus Group discussion was held at Parliament House, Canberra, to ascertain the needs of politicians for scientific information, their preferred modes of acquiring such information, and their most important considerations in the process of acquiring it.

- The most important areas in which information was required were identified as topics of current public concern, and topics on the current political agenda.
- The most important uses of the information included Policy Development, internal Party discussions, speeches to general audiences and to specific interest groups, to promote spending on Science, and to counter incorrect statements.
- The most important ways of obtaining the information included the Parliamentary Library, electronic mail, and the Web.
- The most important requirements in gaining this information included its timeliness, relevance, and useability

Some specific follow-up actions are recommended based on the outcomes of the Focus Group. These relate to development of CSIRO's relationship with the Parliamentary Library, clarification of the relative importance of the factors identified as drivers of satisfaction with CSIRO's products and services, and how the results could be used to form the basis of an ongoing satisfaction survey.

³ CSIRO Mathematical & Information Sciences; Nick.Fisher@cmis.csiro.au

⁴ Customer Value Management, Inc., New Jersey; cvmrk@aol.com

The Task and the Process Used

On Wednesday 4th October, 2000, we conducted a Focus Group discussion at Parliament House, Canberra, to ascertain the needs of politicians for scientific information, their preferred modes of acquiring such information, and their most important considerations in the process of acquiring it. In preliminary discussions with Mr Jason Major and Mr Julian Cribb, we had developed an initial structure for the Focus Group questions, as shown in Figure 1. During the Focus Group, each of the attributes of Products and Services was discussed in turn, followed by the attributes of Time, Cost & Usefulness. The relative importance of the sets of attributes was also discussed, briefly.

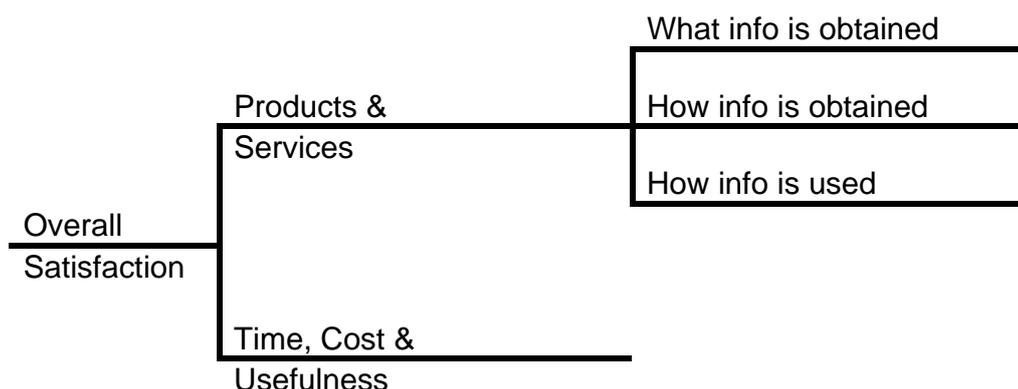


Figure 1: General structure of information to be obtained from Focus Group, based on preliminary discussions with Julian Cribb and Jason Boland.

Discussion and Recommendations

The outcomes of this discussion are shown in Figure 2. (In one case a further level of elaboration was obtained.)

Additional information about the relative importance of the various attributes was also provided indirectly in the discussions. This is contained in the appended reports generated from CV Manager⁵. (Note that the Time, Cost and Usefulness component has been re-structured in Table 2, as it seems more sensible to group some of the attributes as sub-attributes of an overall Useability attribute. The values appearing in the column CSIRO Score will be explained below.

Recommendation 1. The Parliamentary Library appears to be an important first port of call. A similar discussion with the librarians would appear to be a useful first step in helping the Library to respond to the needs of parliamentarians as best possible, as far as CSIRO is concerned.

Recommendation 2. A randomly selected group of parliamentarians could be asked to decide which of the attributes and sub-attributes are the most important (e.g. by presenting them with a version of Figure 2 and asking them to split 100 points between each group of attributes at each level (that is, doing this for each group, in each column).

⁵ Software for analysing and summarising Customer Value data, licensed to CSIRO for internal use

Recommendation 3. Given the priorities identified in Recommendation 2, a satisfaction survey instrument is readily designed to allow data to be collected on a regular basis about parliamentarians' views of CSIRO's performance, based on the most important drivers of satisfaction in this regard. A 10-point scale is recommended for the scoring system, with the results entered in the CSIRO Score column. Some information about the performance of competitive sources of such information may be obtainable at the same time; alternative, target values can be defined.

The results of the survey can then be analysed using CV Manager, with the relative weights and satisfaction ratings being used to help identify the highest priorities for improvement. This work would also provide the basis for on-going dialogue between CSIRO National Awareness and parliamentarians about their needs.

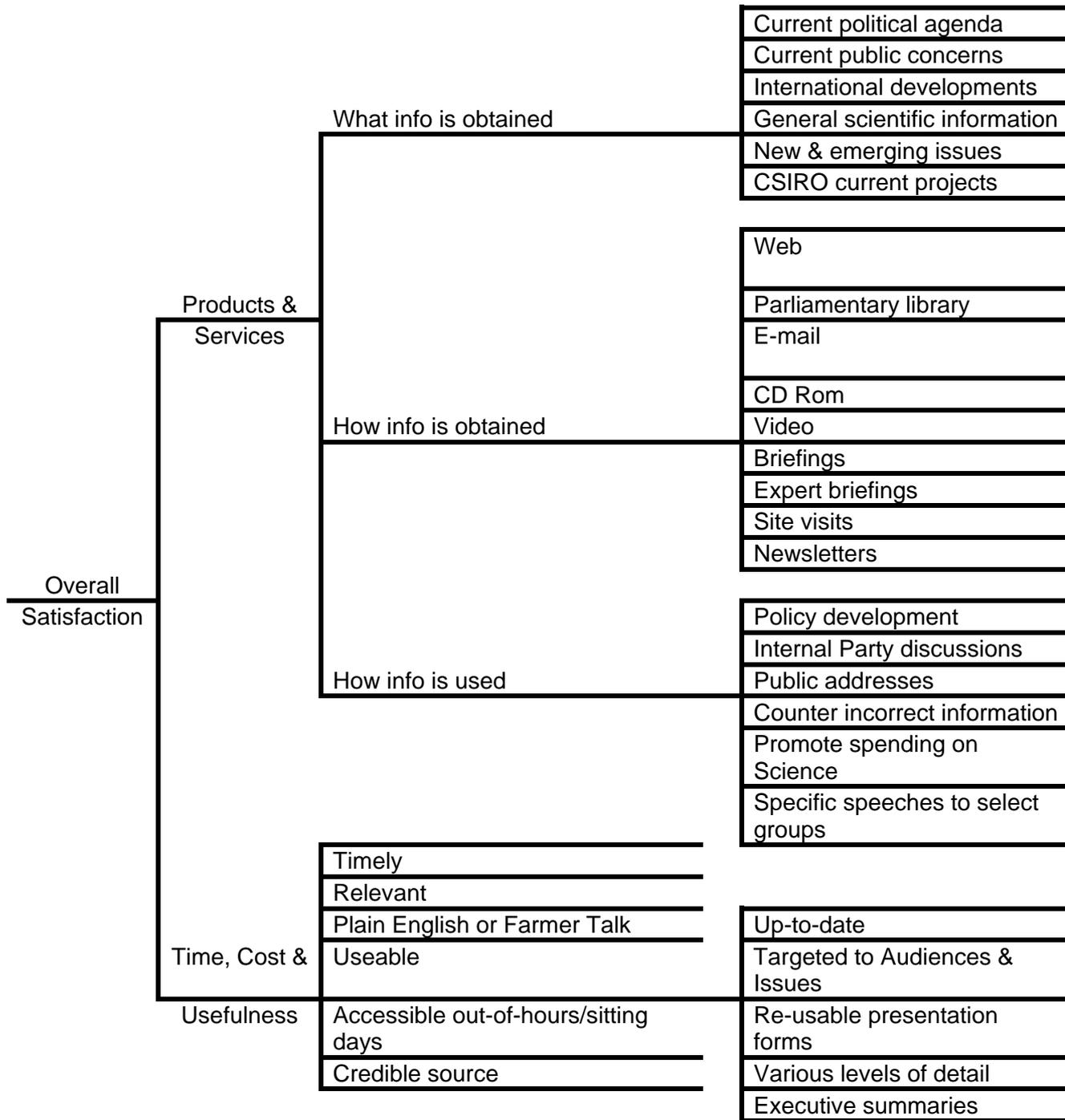


Figure 2: Outcomes of the discussion in the Focus Group.