



Science Communication Conference, 24-25 May 2004

jointly organised by The British Association and The Royal Society

This report provides details of each session at the science communication conference. A separate document detailing the Strategy Recommendations formulated at the conference can be downloaded from www.the-ba.net/scicomm.

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Executive Summary and Strategic Priorities

Science is a valuable part of our culture. Its application through technology can contribute to improved quality of life, sustainable development and to economic performance. Through science we explore how our world works, and the knowledge gained helps contribute solutions to the problems we face every day. Science communication has an important role to play in ensuring that scientists work within and respond to the broader social framework and in encouraging the supply of future scientists.

A culture change within scientific institutions, government and industry—working with the science communication community—is needed to rebuild the declining trust and respect for scientists, politicians and industry leaders. If this culture change is successful, we will live in a society that supports scientific enterprise because people trust it and have input into its direction. If unsuccessful, this trust, and hence our licence to operate, will be lost.

The time is right for change. The science communication community has had 4 years to embrace the messages of the House of Lords Science in Society report; the government is consulting on a '10 year Investment Framework for Science and Innovation'; and the remit of the next Research Assessment Exercise (RAE) will be determined over the next 18 to 24 months. The science communication community needs to be ambitious, but realistic, in its outlook, because consensus is impossible to achieve when working with diverse publics¹.

With all of this in mind, the conference agreed on six strategic priorities, listed below, for improving the impact of the science communication community on the relationship between science and society. Discussions focused on achieving change in the two main areas of science communication, namely:

- providing input to research agendas and science policy through public engagement activities; and
- informing publics and inspiring young people to participate in science.

Priority 1 - ensuring formal recognition and reward for scientists involved in science communication

The science communication community must work towards a situation where academic scientists can devote quality time to engagement and receive recognition for their involvement. Recognition includes valuing their work, improving status and career development, and ensuring access to earmarked funding. Recognition could also be made available to groups, departments and universities.

This culture change will require prioritisation in higher education policy and funding. The Department for Education and Skills (DfES) must recognise that the RAE should not be the sole indicator of academic performance in higher education. University Vice

Chancellors and heads of research institutions require support to make this culture change happen.

Action: arrange with Professor Glynis Breakwell, Vice Chancellor of Bath University, to take forward a case first to Universities UK (UUK) and ultimately to DfES through the funding councils and provide her with support. Work in partnership with the Office of Science and Technology (OST) and other relevant organisations.

Priority 2 – ensuring adequate funding for public engagement

High quality, deliberative engagement processes are expensive. Professor John Lawton said that, in his view, the Natural Environment Research Council (NERC) should triple or quadruple its expenditure on engagement. But this may not be enough. The amount that science and education budgets should contribute to engagement needs to be calculated realistically. Industry, too, should calculate its costs. Conference called for a specified percentage of science and education budgets to be devoted to public engagement.

Action: work with OST, the Research Councils and Research Councils UK (RCUK) on an analysis of the scale of funding needed, based on OST's needs analysis and the quantifying of a critical mass of activity. Make a case to relevant government departments for realistic levels of funding.

Priority 3 – valuing public contributions

Policy making in science needs to be balanced and to include the public's views and opinions. In order to create a sense of joint ownership and trust, the public's influence on policy making should be demonstrable. Policymakers must commit to showing members of the public taking part in dialogue that their contribution was valued and acted on.

Action: work with government, regulatory agencies, research councils, industry and other policy making bodies on the development of policies and procedures to demonstrate that influence flows from dialogue.

Priority 4 – Industry's role: equipping graduates

Students entering industry from university must be properly prepared for a life of entrepreneurship and leadership. They must understand public views and attitudes, particularly if they are employed in industries where lack of trust has had a negative impact. Students need training in these skills.

Action: engage with industrial representatives over a strategic approach to public involvement, based on good business cases, and with industry and UUK over training.

Priority 5 – Achievement of intellectual convergence

An agreement is needed between the science community and social scientists, philosophers and ethicists on the intellectual basis of deliberation and the best methods for delivering deliberative processes. Bringing the different groups together presents a huge challenge, but offers an opportunity for new understandings and knowledge.

Action: set up an exploratory workshop to prepare the ground for a series of interactions involving all the relevant disciplines in discussing and determining the best ways to proceed. It was recommended by some that members of the public, experienced in dialogue, should also be involved as they would make a valuable input.

Scientists are well aware that a great deal of uncertainty surrounds much of science and that there are challenges in conveying scientific uncertainties to the public. The ways and extent to which those uncertainties are currently conveyed need to be examined.

Action: encourage a small group of scientists, science communicators and social scientists to address how best to communicate uncertainty and make recommendations for action.

Priority 6 – Key contribution by mass media

Broadcast media, especially television, offer the science communication community ways of reaching and interesting mass audiences. New and creative methods of dialogue, including interactive methods, are needed. An important element of this approach will be to encourage substantial numbers of scientists to do media skills training to remove their sense that working with the media is a chore or threat.

Action: involve Lord Winston in plans to approach and work with the broadcast media seeking to work in particular with some of the younger producers, and with natural and social scientists.

A separate document that provides further details on the six strategic priorities can be found at www.the-ba.net/scicomm.

Report structure

This summary combines comments made by the speakers in their presentations with those of the audience during discussions. Audience comments were too numerous to credit individually. About ten delegates joined the speakers for lunch on the first day of the conference; comments made over lunch largely referred to topics raised during the remainder of the conference and have been included in the relevant sections of the report.

Science in Society: its key role in maintaining the UK's position at the forefront of international science and technology

Lord Whitty of Camberwell, Minister for Farming, Food and Sustainable Energy

We need a new era of public engagement with science. Engagement must promote an understanding of risk, uncertainty and probability and the relationship between fundamental research and technological development. On the other hand, engagement must ensure that social intelligence is better integrated into decision making. This intelligence is not a constraint on policy and can be a high quality contribution.

The Department for the Environment, Food and Rural Affairs (DEFRA) is committed to building public confidence and public trust through the process of engagement. This does not mean that DEFRA wants to run science policy on the basis of opinion polls. It means recognising where there are public concerns and where DEFRA needs to engage the public more. The department's policies are shifting towards a more environmentally based agenda in line with the need for science to tackle global environmental problems, such as air pollution, climate change and depletion of national resources, but also to express society's values in conservation. Alongside this the department is working to ensure that science is robust and of a consistently high quality. DEFRA is setting up effective programmes within the scientific community and wants to make peer review more effective.

The GM Nation debate was a high profile example of public engagement. Criticisms levelled at the debate included its timing and whether or not it had any influence over policy decisions (for discussion of the latter see the Political Realities session). The timing of engagement with the public on controversial issues is crucial, but is very difficult to get right. For example, attempts up to 20 years ago to engage government and publics in the GM debate were ignored; people were not interested because there was no background to the debate. Those in a position to influence public engagement must have access to resources that allow them to react quickly to 'catch a wave' of interest and public opinion. DEFRA is looking forward to identify areas of public concern now and in the future so that it can engage publics at the right time.

Another issue highlighted by the GM debate was one of commercial interests undermining trust in science and scientists and creating scepticism about the motivations for research. Perceived government support for these commercial interests was also problematic. Lord Whitty commented that policies need commercial input and that companies should be engaged even though they will sometimes 'overplay their hands'. Adequate regulation of forthcoming technologies can avoid this situation. With nanotechnology we have the opportunity to develop a suitable regulatory framework before commercial interest is too strong.

DEFRA's experience with the 'Are you doing your bit?' campaign, which aimed to communicate elements of sustainable development, shows that it is easier to create

awareness of issues than to change behaviour. DEFRA must be able to support changes in behaviour but realises that this requires new activities and new ways of communicating. The science communication community will be important since it is better trusted than scientists working for government.

Transforming culture within academia and research institutions

Professor Glynis Breakwell, University of Bath

Professor John Lawton, Natural Environment Research Council

The public's attitudes to science are generally supportive, but issues remain around the involvement of industry, regulation and above all lack of trust in politicians and scientists related to government. Presentations and discussion in this session focused on what can be done to change the cultures of academia and research institutions to improve how they consider the relationship between science and society.

One of the biggest issues facing universities is rewarding and training scientists for communicating to lay audiences. Many would agree that research scientists working in the relevant field are best placed to communicate new scientific advances, but they lack time and expertise, peer pressure stops those who want to get involved, and the RAE adds a further barrier. How can these issues be addressed? The RAE, or something similar, could legitimise science communication activities, giving scientists time to participate and recognising their work, without making science communication compulsory. SETPOINTS, a support network for training scientists in science communication, already exists. Professor Breakwell commented that culture change is essential, but will only occur if resource is allocated and the issues are given a higher priority in Higher Education policy. She added that universities must form alliances with each other and with other research institutions to make change happen.

Universities should disseminate the scientific method and build knowledge of science among lay publics. This may deal with inaccurate reporting in the media where evidence is often neglected and which John Lawton felt should be managed forcefully. Time should also be spent examining, maintaining and explaining peer review. These aspects of science communication are discussed in more detail in the Political Realities section.

Two of the major issues for Research Councils are prioritisation in science agenda setting, and defending the independence of science from political and industrial interests. Research Councils should maintain their independence through their Royal Charters; government should not set the Research Councils' agendas. Glynis Breakwell commented that the independence of university research will be difficult to prove as long as joint Research Council/industry grants are available. John Lawton welcomed joint funding as long as its results are open and publishable. Research Councils have a duty to the public, whose money they spend, and they all have public engagement budgets to address these issues. The NERC now uses open meetings and debates to consult publics about scientific priorities. A key to the success of these consultations will be to show people where their input has made a difference. (Professor John Lawton said that, in his view, NERC should at least triple its expenditure on engagement activities.)

Transforming culture within industry

Sir John Egan, Confederation of British Industry

John Randle, BASF

Science, innovation and commercial markets influence almost everything in our society. This influence makes business powerful and sometimes arrogant, but causes the public to show a deep scepticism and fear for business, its motivations and its science. Business, government and the country's science base are all dependent on each other and must work together to develop strategies to earn the public's trust and respect. This session also dealt with the issue of supply and demand for scientists.

In 2002, the chemical industry's reputation was at an all time low, and a government report stated that it was out of line with societal values. Nevertheless, it communicated facts without engaging the public and the messages it wanted to get across were not being received. So what should the chemical industry, in particular, and industry as a whole do to change the situation? Industry now recognises the need for high quality engagement. It must be accountable for its actions and should tell the public more about its programmes of social responsibility (eg the BASF funded 'Children Challenging Industry', which aims to improve the reputation of industry in primary school children). Industry also wants to build better working relationships with non-governmental organisations (NGOs).

Another aspect of building industry's reputation is to reassure public that engagement with industry is more than a PR exercise. Companies must listen to public, act on what they say when appropriate and then advertise the fact that their opinions have made a difference. The latter point is most important for building trust, but is often not well done. John Egan used the example of public engagement in the Heathrow Terminal 5 debate to illustrate this point. After initial meetings, it became clear to BAA that the public's concerns were not related to Terminal 5 itself. They put in place a successful communications programme to explain what was planned and what they were going to do to address any problems. John Randle added that the Chemistry Leadership Council uses an external company to run its dialogue meetings and feedback showed that these meetings were not seen as a PR exercise.

The chemical industry in this country, used as an example in this session, now lacks a substantial manufacturing element. Although a demand for chemists in small start-up companies remains, the supply of chemists is falling for two main reasons. First, insufficient chemists are entering teaching and so those who do teach chemistry are unable to inspire and enthuse about the subject. Secondly, those advising on careers in chemistry are poorly informed and are unable to persuade students that they can prosper with a career in chemistry. Industry is challenged with creating a demand for students and putting effort into creating the supply of these students.

Industry also challenges universities to teach all students ethics, communication and entrepreneurship to equip them for the employment market. Large corporations were able to train students after graduation; the small companies of the future do not have the capacity to do this.

Workshops

The workshops addressed the question of how to facilitate culture change within non-governmental organisations (NGOs), industry, academia, government and the media.

NGOs

Charlie Kronick, Greenpeace

Participatory processes are likely to become increasingly important to NGOs, and will form one element of their communication portfolio. This is part of a wider cultural shift towards greater public representation at the decision making table. In order for the processes to be effective, they must be tactical and have clearly defined objectives from the outset.

People are good at judging even complex situations, provided that they have all of the necessary information. They should be given an opportunity to voice their interests and make judgements.

Industry

John Turner, BNFL

The science communications community can work with industry in clarifying the need for engaging with the public on science issues. This will help develop the business case for engagement and secure funding for projects, which can be expensive. In order to promote openness and develop trust, industry sponsored projects should be audience driven and not purely PR exercises. A common and appropriate language is needed to encourage informed dialogue and to be more socially inclusive.

Academia and Research Institutions

Professor Harold Thimbleby, UCL

Zoe Dunford, Institute of Food Research

Science policy in academia must develop to include science communication. At the same time, more research is needed into the best methods for science communication. Undergraduates and postgraduates should be given science communication training. More role models from ethnic minorities are needed to encourage young people from these groups to enter science. These efforts will require an input of funding.

Influencing government

Dr Gail Cardew, The Royal Institution

Dr Melanie Quin, ECSITE-UK

Professor Kathy Sykes, University of Bristol

Dr Fiona Barbagallo, The BA

The science communication community needs a better understanding of the structure of government and the needs of the different departments. A 'Who's Who' guide would be useful. In order to increase their influence, the community should publish its successes to government. Contact with a wide audience is likely to have the greatest impact, because ministers and other officials move regularly between government

departments. Different areas of the community should share good practice and resources to make this happen.

Working with the media

Rachael Buchanan, BBC science producer

Bob Ward, The Royal Society

Press releases about science should be tailored for the media. Their messages must be clear and must highlight uncertainties as well as potential applications. Press Officers play a key role in supporting scientists and ensuring the clarity of these press releases. Scientists, on the other hand, need media training that covers, among other things, the pros and cons of media involvement. Scientists must understand that journalists are independent and will make the final decisions about a story. Peer review and the status of research are also issues that must be dealt with by the media.

OST Science and Society programme

Dr Tony Whitehead and Dr Sarah Macnaughton, OST

In this session, the Office of Science and Technology (OST) requested input into a vision for its Science and Society programme. Government are committed to this programme, which incorporates three strands: public engagement, the scientific workforce and collaboration. The conference was also updated on the progress of the OST's Public Engagement in Science and Technology (PEST) programme.

Through engagement with publics, OST aims to raise awareness and support for science and innovation and increase confidence in the government's use and management of science. OST's engagement activities will not be a propaganda exercise. They intend to explain how decisions are made and find out what the publics' expectations and aspirations are. Although concentrating on the UK at first, OST acknowledges that a more global view is necessary for the future. In addition, different government departments should work together to assemble and assess information they have collected on engagement activities. OST also want to ensure that young people leave school equipped to engage with science as the active, informed citizens of the future. In particular, this means teaching young people more about risk, uncertainty and the scientific method.

Too many specialist scientific areas are still male dominated and not ethnically balanced. OST is therefore working to increase the involvement of women and ethnic minority groups in science and its governance. OST is also responsible for ensuring the overall supply of scientists and engineers for the UK economy and investment in this area has been prioritised by Gordon Brown. A recent report predicts that the EU will be short of 700,000 scientists by 2010. If this shortfall occurs, it will not be acceptable to bring in scientists from outside the EU.

At present, ideas for the OST's Science and Society vision include creating a common approach to science and society across all government departments, providing more education about risk, uncertainty and the scientific method, ensuring that all age groups are covered and piloting public input to science budget priorities in the 2006 spending review. Indicators will be put in place to measure success. Change is unlikely to be fast, but should be measurable over a 5 to 10 year period. Comments on the vision included the fact that it lacked focus on young people, that it should feature more adult education in science and that both quality and quantity issues in engagement should be tackled. Comments on possible indicators included measuring whether publics know the extent of their impact and whether public opinion has affected policy making.

Following last year's consultation process, the PEST programme is now underway. By the end of 2004, the Science in Society activities database will be producing useful data and guidelines for evaluating public participation activities will be available. Research into public engagement with and attitudes towards science is about to start and will report in January 2005. Data from this research and the activities database will be

combined to answer the question of whether activities are meeting the publics' needs and shaping priorities. The results of this 'needs' analysis will be ready for presentation at next year's conference. Media monitoring will be starting soon. Media monitoring aims to provide a media background for the evaluation of activities and to help the science communication community get the best from its media activities. The single OST grants scheme will be launched at the BA festival in September. This scheme will be reactive; OST will listen to the needs of the science communication community.

Political realities

Professor Judith Petts, University of Birmingham

Professor Brian Wynne, Lancaster University

Professor Jacqui Burgess, UCL

Presentations in this session explored the relationships between formal institutional decision making and public participation methods using three case studies: the GM debate, nanotechnology and radioactive waste management. The discussions highlighted some key aspects of deliberative engagement processes, the role of risk and uncertainty in public mistrust of science and the role of the media in public engagement activities.

The GM Nation debate was held in the summer of 2003 and used many methods to reach as wide an audience as possible. In total about 36,000 people took part. The government said that it was committed to listening to the publics' views and made a bold and sincere attempt at engagement in a contentious scientific issue. But the debate did not have a clear agenda at the outset and was not intended to make decisions, weigh up options, reach consensus, produce recommendations, or feed directly into government decisions. For these reasons the debate was not a truly deliberative process and participants questioned its value.

The design of good deliberative process requires 'creative cookery'. Each process should be designed to match its objectives, which must be clearly defined from the outset. The process should also be flexible enough to change during deliberations. In the GM Nation debate, the lack of clear objectives did not give facilitators scope to mould the debate as it moved forward. The Committee for Radioactive Waste Management (CoRWM) used experience from the GM Nation debate in planning its own public engagement programme. Although receiving advice on strategies for PSE from process experts, CoRWM committee members have wanted to learn about public engagement for themselves before committing themselves to a full programme.

Another key element of any engagement process is the extent to which it can be considered as representative and therefore legitimate by all parties. In the GM Nation debate, government was keen to reach the 'silent majority' (*ie* those not in active groups). One MP described those members of the public who participated as 'cranks' because they had bothered to inform themselves of the issues and attend the public

meetings. CoRWM is attempting to address this issue by developing a PSE programme which has both intensive, deliberative processes with people who are recruited through random stratified sampling and extensive public opinion polling. The challenge is to find ways that these different approaches can 'talk together' in assessing the options for managing radioactive waste.

Risk and uncertainty were discussed at length on both days of the conference. Brian Wynne gave a very clear description of different types of uncertainty:

- risk: when effects and their odds are known
- uncertainty: when effects are known, but the odds are unknown
- ignorance: relevant effects are unknown and consequences are unpredictable
- indeterminacy: research is inconclusive and dependent on a number of factors including social behaviour; consequences are unpredictable
- ambiguity: research gives different 'answers' to the same question, so what is (are) the issues? What is salient?

Whilst scientists will often be faced with a predicament brought about by the unknown, such ignorance does not indicate bad science. But it is denial of this scientific 'ignorance' by scientists and their institutions that is a key factor in public mistrust. One element of rebuilding this trust is to change the way science is taught in schools, universities and to wider publics. This will lead to a greater understanding of the inevitability of uncertainty and its excitement and necessity in driving research. A second element is to encourage scientists to acknowledge where the uncertainties and gaps in their knowledge lie rather than offering apparently 'cut and dried' answers. Scientists must accept the risks they take in doing this.

Where the consequences of science are unpredictable publics will inevitably mistrust the motivations driving the field. Therefore, engagement needs to take place earlier. Scientists need encouragement to articulate their responsibilities, assumptions, visions and inspirations. This will help to create robust and quality science that is sustainable. The field of nanotechnology, in which few commercial applications yet exist, could take on these lessons.

Discussion in this session focused on the role of the media in public engagement. Research has shown that while the media informs publics, it does not influence them or shape their attitudes. It can set the agenda for debate by highlighting topics or aspects of topics. But timing and clear objectives for media involvement are important. There was controversy over whether the science communication community should use popular, interactive media. Some thought it would not allow debates sufficient depth and complexity, while others saw a need to work with media professionals, including PR professionals, who are skilled at creative, visual communication.

Real life tales

Elizabeth Rivers, Independent facilitator
Richard Wilson, The Environment Council
Ela Pathak-Sen, NICE Citizens Council

In this session, speakers presented three examples of deliberative processes. The first two examples highlighted the importance of deliberative processes in the resolution of contentious issues. The third was an example of a deliberative process that aims to provide public input to decision making.

In the first example, facilitators brought together bikers and 'grannies' in Stratford-upon-Avon to resolve a conflict surrounding the bikers' wish to gather in large numbers in the city centre on summer weekends. After much groundwork and a series of meetings they reached consensus on the location of a new meeting place. In the second example, Richard Wilson summarised what the Environment Council has learnt from a number of public engagement processes. These findings are incorporated below.

Engagement gives a framework in which all parties' views can be considered, it builds trust between these parties and creates ownership of any decisions. Greater autonomy will lead to a greater feeling of ownership of its decisions. All of these aspects enable people to work willingly towards consensus. In the bikers vs 'grannies' example the police did not need to enforce the decision as most of the bikers moved willingly to the new location. The local council are unlikely to have reached the same decision as the consensus group and any decision it imposed would probably have been rejected. The size of the group debating an issue is crucial. It is essential not to exclude relevant groups, but the greater the number of participants the harder it is to ensure that everyone feels ownership of the process and outcomes. Size should not be used as a measure of success.

The NICE Citizens Council offered the third example of a deliberative process. The Council was set up in 2002 to make social value judgements to inform guidance issued by NICE. The Council consists of thirty individuals from diverse backgrounds who are paid £150 a day. In an unusual and unprecedented move to maintain public trust, Council members express their views at open meetings to which the media are invited. Transparency and privacy can be difficult to reconcile at open meetings. In private people are more likely to take risks and make themselves vulnerable; meetings of the Council discussing particularly sensitive material may have to take place behind closed doors.

All three examples highlight the importance of managing the expectations of funders and stakeholders. People need to be aware of why they are involved and, critically, whether their involvement will make a difference. For example, NICE will listen to the views of the Citizens Council, but may not use all of its recommendations. NICE may

simply respond to each recommendation or may commission research to understand a particular area better. The initiative has support from the top of the organisation, which is ready to embrace the change.

Reference

1. Arrow's Impossibility Theorem