



Science Communication Conference 19 & 20 May 2008

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Monday 19 May

Session 1 Conference plenary

Opening Remarks

Jim Al-Khalili, Professor of Public Engagement in Science, University of Surrey

Jim Al-Khalili welcomed those present to this Science Communication conference, the seventh organised by the BA. He explained that the conference had expanded, thanks to discussions with and advice from previous attenders and that external partners were now organising sessions with a range of styles and formats. He thanked DIUS and the Wellcome Trust for their support of the bursary scheme. The Wellcome Trust had also supported the drinks reception and additional support had been provided by BP.

The conference would include sessions ranging in format from plenary to parallel sessions and seminars. Feedback on the conference would be very welcome and online feedback forms would be sent to attenders after the conference.

Session 2 Conference plenary

Keynote address – Science as Culture

Lord Bragg of Wigton, writer and broadcaster

Chair: Jim Al-Khalili, Professor of Public Engagement in Science, University of Surrey

Melvyn Bragg made a wide-ranging and well-received keynote speech to the conference. His address included the notion that science is integral to our culture although it is often not regarded as such; considered the purpose of science with regard to economic competitiveness, 'pure' science and science in the media.

He noted that although the notion of science as culture is sometimes dismissed out of hand, science, engineering and technology are the waves on which our society surfs, having provided computers, e-mail, websites, in the internet, multi-purpose mobile phones, television, radio, electricity, combustion engines, vaccines and jets. In common parlance, however, 'culture' did not include science and the word had come to mean only 'The Arts'.

C.P. Snow's analysis of 'The Two Cultures' was to some extent born out of the class system of 1950s Cambridge, in which science was regarded as a 'trade' but since then society had moved on so that the Emeritus Professor of English at Oxford, John Carey, has edited a book on science. Bragg thought that the success of science had left the class argument behind.

He wondered why scientists should care, given that they already rule the way the world works. Bragg's view was that it was right for scientists to want a place in what he called the 'higher gossip' of the nation, because not being involved in that put them in danger of not engaging with and serving those to whom their work was directed.

Speaking from his own experience as a broadcaster, Bragg said that science did already have a voice in this 'higher gossip'. On *'In Our Time'* he had discussed many different scientific topics with academics of the highest distinction and the programme's internet message board received more contributions – often more involved, more informed and more argumentative – for science than for any other subject.

His interpretation of this was that many people wanted to understand science and that a very large minority took it for granted that science, history and literature belonged to the same spectrum. Despite this, worries about the common distinction between 'science' and 'culture' remained valid.

Bragg speculated that the British Association for the Advancement of Science might be itself to blame for this, as it was at a meeting of the BA in the 1830s that 'some ingenious gentleman proposed that, by analogy with artist they might form scientist'. Although the report of the meeting said that 'this was not generally palatable', the word took hold and the term 'natural philosopher' fell into disuse. Since then, 'artist' and 'scientist' had been used in opposition.

The damage done by this opposition was seen in schools and universities, where science was seen as a 'difficult subject' at which many did not feel 'good enough' to succeed, with a resulting decline in student numbers for maths, physics and chemistry with only biology bucking the trend. A 'Times' article had recently announced that 'long famous for its scientific research, Britain is fast becoming a nation of scientific illiterates'.

Bragg had some doubts about the validity of that analysis, but wondered whether, as was often said, it was the government's fault. Should not school teachers and university lecturers share the blame? And was the concern for numbers correct in any case? Only a few men had been involved in science between 1660 and 1720, when world changing wonders were discovered in Cambridge alone. He also observed that the reaction to his proposal of a television series auditing the influence of twentieth century science had shown him that this was viewed as having been essentially positive. Yet a Demos pamphlet quoted Robert Winston as saying 'the application of science has undoubtedly brought huge benefit to society... yet it has been perceived by others as a threat to human wellbeing'. He speculated that this unease with science could be a reason why anxious and intelligent young people would rather not join the club.

He also speculated that the decline in numbers of science students could be linked with the modern demand for instant gratification and a disease of ease, in which difficult subjects are dismissed in favour of easy ones. Fashion could be another factor, with being an 'artist' currently in vogue and the creative industries growing at 6 per cent a year, more than twice the national average.

Turning to consider competitive or commercial with 'pure' and collaborative research, Bragg noted that Michael Faraday, whose research into gases electrolysis and the notion of the field had made and were still making big impacts on our everyday lives, had argued that you had to think in terms of the natural world, not just in terms of Newtonian mechanics. Faraday's drive, as expressed by John Meurig Thomas, was 'looking at nature to see the manifestation of the Almighty' – uncommercial and uncompetitive.

Mentioning other examples of world-changing 'uncommercial' research such as the Curies' work on X-rays, Maxwell's theories and the double helix, Bragg finished his address with the thought that it was intolerably negligent of governments to neglect this area of our intellectual life and that Britain had punched above its weight in science because of an understanding that the singular obsession of natural philosophers could take us, literally, to new and better worlds.

Discussion

In the discussion that followed the keynote address, some of the main topics were the nature of the current educational system, its Gradgrind obsession with measurements, when it was best to specialise, scope for coming to the sciences later in life, the position of the humanities in the arts/science debate, and the scope for an integration of the arts and sciences and the sciences as creative subjects.

Bragg's view was that it would be a tragedy if the inspirational role of teachers was being squashed out of education by measurement and that the system also shouldn't hold people with aptitude back from following their interest, making them wait for others. He said that he had himself experienced no damascene moment in wanting to know more about science, but had realised that he was missing out on interesting things, and could get free seminars if he invited experts in science onto his radio shows. Once out of the more rigid educational system, it was

possible for people to discover all sorts of new things and interests, to discover knowledge, whether it would be classed as 'arts', 'humanities' or 'science'. He observed that the arts and sciences already overlapped in works such as John Carey's compilations of science writing and works by Dawkins and Darwin. Bragg quoted Evelyn Waugh who claimed that English education only fitted anyone to write well, although he also commented that the reason for Darwin's impact was the scientific truth of his work. He saw no divide between science and poetry, citing the mathematician Ian Stewart who had said that when he thought about maths he thought about colours and so on, like a poet might.

Session 3 Structured networking

Ben Craven, freelance science communicator

The first plenary session concluded with a speed networking event organised by the science communicator Ben Craven, who had devised a way of ensuring that everybody met five new people and each of them only once, using computational intensive method based on insights from the Schoolgirl Problem studied by Rev. Kirkman (1806-1895) as cited in 'The Lady's and Gentleman's Diary' in 1850:

"Fifteen young ladies of a school walk out three abreast for seven days in succession: it is required to arrange them daily so that no two shall walk abreast more than once."

Session 4 Conference Plenary

Overview of recent events in science communication

Chair: Roland Jackson, Chief Executive, the BA

Engaging to inspire and educate

John Holman, Director, National Science Learning Centre

John Holman told the conference about work currently going on as part of the STEM partnership to promote good attainment in and good engagement with science among young people – more young people doing well in science subjects and wanting to continue with them. A recent survey of 800 year 9 pupils showed that the majority thought science had a positive impact on society, but which around 25% would like to work in science, 33% thought that it was not for them.

The STEM partnership aimed to integrate maths and the sciences better within the classroom, making better cross-linkages between the subjects, and also to promote better links with technology and engineering outside the classroom. At present, there were a lot of initiatives with the same aims, but these were working largely independent of each other. The overriding concept of the partnership was to align these initiatives within a common framework of priorities, which were: to get the curriculum right; to get the educational infrastructure right; to get the right teachers (lead organisation: the Training and Development Agency for Schools); to provide excellent professional development for maths and science teachers (lead organisations: the National Centre for Excellence in the Teaching of Mathematics and the National Science Learning Centre); to enhance and enrich the STEM curriculum (lead organisations: SCORE (convened by The Royal Society), the Royal Academy of Engineering and Advisory Committee on Mathematics Education (ACME)); and to show the rich careers for which STEM qualifications equipped young people (lead organisation: the National STEM Careers Co-ordinator at Sheffield Hallam University).

It was hoped that the benefits of partnership working would include resources would be concentrated instead of dispersed; the sharing of expertise and information about what works; and being smarter about working with schools and colleges.

More information was available by contacting nicola@herncommunications.co.uk

Engaging to involve

Pippa Hyam, Director, Dialogue by Design

Pippa Hyam opened her overview of recent events by pointing to the huge amount of work that was going on in public engagement at the moment. Many projects were discussed later on in the conference as part of the 'engaging to involve' strand, including Sciencewise and Beacons for Excellence in Public Engagement. The launch of the Expert Resource Centre was also taking place shortly and there would be a talk on this extension to the Sciencewise programme the following day. In addition, there had been a large public consultation over proposals for hybrid and chimera embryos and stem cell research regulations and other public and private sector organisations such as the Sustainable Development Commission and water companies had undertaken significant public engagement projects.

Reflecting on the last year, Hyam thought that there was no doubt that engagement built public support and provided critical friends. From the projects with which she had been involved, she had learnt that the public's values were not derived from tabloid headlines but that there was a need to respect and understand deep-seated values people held. In her view, the public was beginning to feel that it could take control of the public process of science, despite it being easy for them to feel disenfranchised by the sophisticated nature of modern science. Good engagement could remove the fear.

Hyam thought the benefits of public engagement were clear – building relationships, understanding public values, building capacity – but there were more significant benefits, which included the retention of public legitimacy and maintaining science as a public good. There were often non-scientific implications to research and science did not take place in isolation. The post-war glory period of citizens blindly following scientists was behind us, as demonstrated by public disquiet over GM, BSE and MMR. But as had been noted in the very first issue of the Royal Society's 'Philosophical transactions', secrecy was at odds with science. The way to increase knowledge was by sharing it.

Learning to engage effectively involved knowing when a difference had been made, when you were getting it right, and helping to innovate. It was well worth reading reports on past engagement projects. Innovation was needed but it was important to get the language right. Past efforts to separate out the concept of involvement had been right but now the time was right to re-integrate involvement with informing and educating, and to push the boundaries. Emerging problems were in scaling up successful engagement projects to a larger scale. Should we? How would it work? How did it fit into stakeholder engagement? What promises were being made to the public, and were the enthusiastic left stranded? How much were the results of public engagement work embedded in policy-making or ignored?

Engaging through the media and PR

Katrina Nevin-Ridley, Head of Media, Wellcome Trust

Katrina Nevin-Ridley talked the conference through notable coverage of science stories in the media over the last year. Her first concern was that specialist correspondents should retain their places. The quality of science journalism and science PR was becoming recognised as an issue in its own right, as illustrated by an article in the 'Guardian' media section. It was headed 'science friction' and had discussed (in the context of the Telegraph's science correspondent being made redundant). Nevin-Ridley noted that specialists' coverage of science was consistently good, although not perfect, and that problems mostly occurred when the specialists were away on holiday.

There was a role for press officers to go the extra mile in helping science correspondents to write better stories – it wasn't about just sending out press releases and journalists to write them up and file them. However, science and journalism did occasionally collide, and Nevin-Ridley cited the

example of coverage of a paper delivered (at the BA Science Festival in 2007) by Professor Peter Hammond from the Institute of Child Health at UCL on facial features and genetic conditions. Professor Hammond was unhappy with the coverage, which he thought had taken some of his remarks out of context.

To some extent, Nevin-Ridley thought it was important to roll with the punches, but scientists also could be more canny at engaging with science correspondents. She cited Craig Venter (who had sought a patent on 'artificial life') was an example of someone who knew how to give science journalists what they wanted. He had also given a lecture at the RSA on 'Science and the Media' and was clearly a media player. However, in contrast James Watson had had his fingers burnt thanks to a remark he made in an interview with the 'Sunday Times' magazine in which he linked intelligence and race. Although the Sunday Times had not made anything of this, the Independent had spotted it and given it coverage, and the resulting media furore led to Watson cancelling his lecture tour. Despite this, Nevin-Ridley thought that scientists are beginning to feel more comfortable talking about their research.

She also commented on increasing collaboration taking place between press officer from different organisations. While Wellcome officers liked their organisation to receive its namecheck, they cared more about the quality, tone and accuracy of the resulting coverage, and increasing collaboration between press officers of different organisations had borne fruit in getting scientists to defend the Human Fertilisation and Embryology Bill. It was also pleasing that Fergus Walsh at the BBC and Mark Henderson at the 'Times' had retained the story as a science issue, rather than ceding it to the political desk as the Bill became more political.

Discussion

Roland Jackson kicked off the discussion by asking each of the three speakers to say what they thought was the single most interesting or impactful thing currently happening in their field. John Holman thought that moves to make teaching an all-Masters profession in 10 years' time (as it had previously become an all-graduate profession) was very significant. Pippa Hyam thought that the relationship between ethical debates and the sector's understanding of the public's values was very significant, particularly in bypassing the media to engage real people. Katrina Nevin-Ridley thought that the Human Fertilisation and Embryology Bill was so significant it was hard to think past it, but that encouraging scientists to feel comfortable engaging with others about their research came a close second.

Other topics covered in discussion included the balance between listening and persuading, where Pippa Hyam thought that her work was not about trying e.g. to turn people into geneticists, but to provide them with information so that they were able to discuss proposals such as those in the Human Fertilisation and Embryology Bill knowledgeably – vital if decision-makers were to understand the public's values and the acceptability of proposals to them. Robert Winston was concerned that Sciencewise was still consulting people about the Human Fertilisation and Embryology Bill and stem cells despite it having reached an advanced stage of parliamentary scrutiny, and was reassured by the government officials responsible for Sciencewise that earlier projects to engage the public in the development of policy on hybrid/chimera embryos had fed into the Bill in a timely fashion last year, but the ongoing engagement work they were now supporting was on attitudes to stem cell research more generally to help inform future research priorities.

In response to a question about engaging people with extreme views – who might be robustly anti-science – Pippa Hyam thought that in that case the correct methodology was important, that it was important to provide a safe place in which people could directly challenge each others' views. John Holman thought that in schools it was important for young people to understand how science works and that it creates provisional knowledge which is always most provisional at its leading edge. Pippa Hyam thought that leading edge science, where the 'facts' were still being discussed amongst the experts, was very difficult to take to the public.

There was also a brief discussion of the role of ethics in policy-making, where there was a tension

between separating ethical issues from science and those who wanted science to help determine the ethics. Both the 'science' and the ethical views of the public were factors in the decisions that were eventually made, but decision-makers took a range of factors into account and neither the science nor the ethics alone usually determined the end policy.

Session 5

Engaging to inspire and educate

Science festivals: engaging the public through large-scale events

Joanne Coleman, Manager of the BA Festival of Science, the BA
Dominic McDonald, Head of Public Programmes, Science Oxford

Chair: Annette Smith, Director of Regions, the BA

Joanne Coleman looked at why we hold Festivals and what makes them a crucial part of communicating science in the UK.

Key points were:

- The variety of events for a variety of audiences
- Giving people/organisations starting out in science communication the opportunity to do so without having to worry about logistics
- A Festival makes a bigger impact on a town/city than occasional stand alone events
- As part of the cultural programme of a city – placing science alongside music, art, food etc Festivals

Working with a variety of partners and collaborators adds breadth and value to a Festival and can also help fulfil aims/objectives/obligations of a variety of organisations. Possible partners/collaborators include:

- Universities
- Councils – local and county
- Regional Development Agencies
- Research Parks
- Business and industry
- Local community groups
- Arts, nature, theatre etc organisation

Dom McDonald talked about the different models that exist for Festivals, based on how and by whom they were organised and programmed. They ranged from 'Type red' which indicated an approach that involved one organisation doing all the planning, programming and delivery to 'Type blue' where planning, programming and delivery was shared by a wide number of organisations. Using as a case study the Oxfordshire Science Festival/Oxfordshire Science Week which has been through a variety of these models, Dom discussed the reasons why one model might be more suitable than another. These included

- Resource limitations
- the extent to which the Festival uses a single main venue or a variety of venues
- whether the Festival is organised by a single organisation or a number of partner organisations
- the extent to which there is a culture of change within the Festival organisation

As the third speaker Savita Custead was unwell on the day of the conference Dom McDonald ran through here presentation about a meeting of some of the UK science festival organisers. The

presentation touched on:

Dates for festivals – most take place during National Science Week or in October half term
Financial issues – charging entry fees, lack of NSEW funding, general access to funds, fragmented nature of funding.

Programming - high-profile “names” vs. local and cheap presenters

Key messages from the meeting were:

Science festivals want to be seen as a key mechanism for engaging large sections of the public. Science festivals do not see themselves in direct competition for audiences but do for publicity. Festivals have difficulty co-ordinating because of overlapping dates. Every single festival is different.

The outcome of the meeting was that there is a general feeling that the Festivals should be more in touch with each other, meeting either formally or informally once a year.

Discussions included the naming of the festival. The name science festival does not cover everything that a Festival encompasses e.g. science, technology, engineering and maths. Should the name reflect this breadth of content? It was thought by the panel that, although it is usually worth highlighting such distinctions in specific marketing material, it was best to keep the actual title of the event short and simple.

Someone also asked if the BA Festival this year was benefiting from an association with Liverpool Capital of Culture? Hopefully the PR and publicity machine of the Culture Company will help to promote the Festival in the next couple of months. It is difficult to know what the impacts will be on attendance, but it has certainly been a different experience being one of so many things going on during the year, as opposed to quite a major event in cities in previous years.

Engaging to involve

Case studies in science communication research

Mary Ebeling, Assistant Professor, Drexel University

John Forrester, Research Group Leader, Policy & Institutions Group, Stockholm Environment Institute

James Longhurst, Associate Dean and Professor of Environmental Science, University of the West of England

Chair: Steve Miller, Professor of Science Communication and Planetary Science, University College London

Specialists from the ESRC Science in Society Programme presented their findings on the relations between science and the wider society.

Mary Ebeling spoke about her research on how the uncertain financial futures of nanotech are communicated through the often overlooked relationships between people with an interest, such as entrepreneurial nanoscientists, investors, journalists and PR representatives.

She highlighted the importance of communicating the uncertainties that surround the health, safety and environmental implications of nanotech, and the roles of interested parties in efficiently and responsibly communicating the risks to the public. While there has been much research into the communication of risk to the public through popular media, there has been virtually no work on the communication of financial risk or critical, sociological examinations of financial journalism. Her research had focused on communications between stakeholders, how the nanotech market is

constructed, and publicly available nanotech market information such as from trade publications and company reports. She had found that the term 'nanotech' was seen as ill-defined and poorly understood; as a result many journalists avoided using it.

John Forrester spoke on bridging the divide between scientific expertise, policymaking and public knowledge in his talk entitled "Breaking down the Boundaries ... or just facilitating talking over the fence?" He showed how a suite of projects led him to explore the creation of 'new' knowledge as a result of stakeholder engagement through processes such as participatory mapping exercises. The aim was to combine natural and physical sciences expertise with social science and citizen knowledge, in order to create the foundation for a better understanding of the complex dynamic interactions between society and the environment. The key was in facilitation of good clear communication between all participants. Bringing together social science and learning theory – such as 'double loop learning' and 'social learning' – with good communication practice added greatly to this process.

James Longhurst talked about his project "Consultation for air quality in England: an analysis of local authority interaction with its stakeholders" presenting the methodology and the results of his survey. He first pointed out the importance of the local air quality review and assessment as one of the largest assessments of environment pollution ever undertaken in the UK and the "obligation" of local authorities to periodically consult and communicate with the stakeholders on their air quality findings and management.

He had undertaken a questionnaire survey of all English local authorities and looked more closely at selected case studies, using interviews to explore issues more deeply. Notable findings had included that there was little advice available on how to undertake consultation and most external air quality consultation was carried out with statutory consultees. Most consultations were based around websites and leaflets, which were poor methods of creating a two-way interaction. Consultation fatigue meant that authorities often received few responses to consultations. More information about the project is available at www.uwe.ac.uk

Discussion

Key messages emerging from the discussion that followed the presentations included the need for 'upstream' public engagement – i.e. in the early stages. This should include PR people and an open conversation between scientists, policy makers and the public, giving the public a voice even on challenging topics. It was noted that there is no one 'public' but that the public is made up of different groups.

Engaging through the media and PR

The responsibilities of being a press officer

Steve Palmer, Head of Press, Cancer Research UK
Jenny Gimpel, Media Relations Manager, University College London
Fiona MacRae, Science Reporter, Daily Mail

Chair: Katrina Nevin-Ridley, Head of Media, Wellcome Trust

Craig Brierley, Media Officer at Wellcome Trust and a committee member of Stempra, which had organised the event, welcomed those present and explained that this session was the first of two looking to develop guidance on best practice for press officers.

Jenny Gimpel spoke, giving some examples of stories she had worked on that illustrated some of the issues for press officers. Her conclusions were that it was important to be as open and honest as much as possible and to have integrity as a press officer. There was a need for great care in

deciding what to issue as a press release and to be able to justify it and think through the possible consequences of issuing – or not issuing – a press release. Common sense and checking with colleagues were good guides. She recommended negotiating releases with academics, giving them the final say on wording and preparing them for the media response – or lack of it – to their work.

In the first case study, the UCL press office had had to justify internally its decision to release a story on the impacts of a ban on smoking v. raising price. The economics paper in question had not been peer-reviewed, but had been given at a conference. It had been unpopular with UCL epidemiologists, because it suggested that bringing in a public smoking ban might increase children's exposure to smoking in the home – offering an argument to opponents of the ban. In the second case study, the source paper (a meta-analysis of health outcomes for those who found information on the internet before seeing their GP and those who didn't) turned out to have mistakes in the analysis so that the conclusions were – after a re-analysis – found to be reversed. The press office had had to justify its handling of the story when the error was discovered. The third case study involved a novel technique for micro-penis surgery. There had been doubts about whether the topic was too risqué to be picked up widely, whether the sample size was too small, or again, whether the fact the paper had been delivered at a conference rather than by a peer-reviewed journal would limit its appeal, but it was in fact picked up by a range of publications and although 'Nature' was troubled by the lack of peer review, 'New Scientist' had written a favourable article on the technique.

Steve Palmer outlined the differences between his work and Jenny's. His end user is a cancer patient and the Cancer Research press office also works for other cancer organisations. They have a duty to fight 'good stories' with facts, making more of their work reactive to other people's agendas. When they are working with researchers to draft a press release, they ask them how they would explain their work in the pub, and aim to emulate the succinct writing style of the tabloids. Palmer had asked some journalists' for their view of good and bad practice among press officers and presented a list:

Good practice was press releases with good quotes from more than one source, sufficiently long to put the research into context (c. 500-600 words). Bad practice was calling the journalist to ask if they had received a press release, misusing embargoes ('for immediate release' and leaking to Sunday papers were very unpopular) and not linking to or including the original paper.

Palmer also thought that it was important to prioritise press releases by their audience size and deadline, and that it was irresponsible to include only comparative and not also absolute risks. He avoided writing about Phase I clinical trials, was nervous about phase II and okay with phase III. He might issue a reactive release to respond to a story about a phase I clinical trial. In one instance, he had issued a very cautious phase I clinical trial press release (because of truly fantastic results) and the stories that had appeared were very responsible. He emphasised that press release claims needed to be substantiated by the original research paper - word would get round if you were unreliable – but overhyping was not as prevalent as it used to be an commercial PR / agencies were the worst offenders.

Fiona MacRae endorsed many of Steve Palmer's comments and added that it was vital for the press officers (and the academics) to be contactable when a press release was issued. Journalists on daily newspapers might have five stories to write that day and have a mountain of press releases to wade through, so they were not happy when they had to waste a lot of time tracking someone down. Time reasons also meant that she disliked complicated stories for Mondays being released late on Friday afternoon. She showed an example of a near perfect press release – and explained that what made it so good was that she had no questions after reading it. The structure was that the first paragraph contained the nub of the story, the second paragraph made the source clear, the third paragraph had a good, clear quote, and further down context and pithy notes were provided.

In the discussion, there was feedback that some participants had recently attended training in

writing press releases where they had been told to phone journalists had received press releases and also that they should be no more than 250-300 words. There was discussion of how best to co-ordinate efforts when more than one institution or organisation had been involved in the work. The general principle seemed to be that funders got first dibs but that it sometimes might depend on who had the most time. For quotes it was best to have a range of institutions mentioned, in any case, and an agreed sign-off process helped. On embargoes, Fiona MacRae thought that 'for immediate release' press releases were most welcome earlier in the day but the nature of news is that it is unplanned and therefore journalists must be able to react to it when it happens. It was agreed that journals publishing online without warning made it hard for the academics' institutions to issue embargoed press releases in advance. It was best to provide both a press office and academic contact on a release, but it was most important that the press office knew how to contact the academic.

Session 6

Engaging to inspire and educate

Science fairs and competitions

Sharmila Banerjee, National Coordinator Nuffield Science Bursaries Programme, Nuffield Foundation

Stuart Ellins, Chief Executive, Young Engineers

Annette Smith, Director of Regions, the BA

Chair: John Morton, Chief Executive, The Engineering and Technology Board

Sharmila Banerjee spoke about the DCSF's science and maths campaign, encouraging all students – not just those that were already interested – to continue to study STEM subjects and to consider STEM careers and take part in schemes such as the Nuffield Science Bursaries programme, which gives young people the chance to work on a project alongside practising STEM professionals. The programme is a learning experience and not just about work experience or work shadowing. Nuffield Students had won prizes at science competitions, but the impact of the scheme was also evaluated each year. Outcomes included increased self-confidence and understanding of how science is carried out. Young people who had participated were now taking part in outreach activities and inspiring more young people to follow in their footsteps.

Stuart Ellins gave an uplifting talk about the benefits to young people of taking part in the Young Engineer for Britain and the BA Crest Awards competitions among others. They had made links with potential employers, had the opportunity to represent themselves and their achievements locally, regionally and nationally and received help and advice from practising scientists and engineers. He gave examples of immensely talented young people who had benefited from the competitions and were now inspiring others.

Annette Smith gave details of the BA's plans to build on these competitions to reach more young people and enthuse them about science. Following on from the 2008 science fair that the BA had organised at the Centre for the Cell in Whitechapel, the BA has joined with ETB and Young Engineers as well as partners from across science and engineering to plan a much larger UK Young Scientists and Engineers Fair for 4-5 March 2009 at the Queen Elizabeth II conference centre in Westminster. They would be linking with Nuffield Bursaries, Young Engineers, the Crest Awards and others and inviting many school groups – including ones that had not traditionally been involved – to come along. It was hoped that this would be stepping stone to something even bigger and better with, eventually, the sort of buzz that surrounds the Madrid Science Fair or the Irish event. Smith asked for suggestions and comments on the plans, which were still being worked up. Time was short but she was sure it would be an enjoyable challenge.

In the following discussion, it was clear that many had fond memories of television programmes,

events and festivals they had attended in their youth and which had inspired them to continue with science or engineering. Suggestions for posters on the Tube, for presentations by real scientists, for cross-disciplinary projects and blogs or other web 2.0 projects were made for the UK Young Scientists and Engineers Fair. The festival would not be about collecting stickers and pencils from various stalls. There was some concern that a London venue would be difficult for those in the regions to get to and that the schools that would attend would be the usual suspects. Smith reassured those concerned that considerable thought had been given to the best, easiest to reach venue and that there would be some positive discrimination to ensure that new audiences were reached. Sharmila Banerjee said that there was a 20% limit on the number of independent schools that were able to take part in the Nuffield Bursaries scheme and new schools were given priority on placements. She encouraged those present to become project providers – and to persuade their colleagues to become project providers for the Nuffield Bursary Scheme. Details were available from the website.

Industry and STEM

Ian Duffy, Business Adviser, UK Social & Community Affairs, BP International Limited
Matthew Harrison, Director, Education Programmes, The Royal Academy of Engineering
Richard Hamer, Education & Graduate Recruitment Director, BAE systems

Chair: Colin Johnson OBE, Vice-President, the BA

The panel began proceedings by discussing industry's role in science and the reasons for industry to invest in STEM activities. STEM activity is essential for recruitment for the future of many industries, especially on a local level where opportunities might be scarce, for example for BAE Systems in Barrow in Furness, but is also part of the core responsibility of many companies. BP want to engage with the public so that they understand energy and climate change issues and work towards a more STEM literate community. With all of the STEM activities undertaken by the represented industries, there was a strong consensus that they needed to be specifically targeted and show significant results – value for money is considered to be very important.

Matthew Harrison went on to discuss the Barrow Engineering Project (BEP), a long term project which aimed to widen participation in engineering activities and ultimately inspire pupils to stay in the local area to pursue employment opportunities rather than move away. The project found that a single intervention or engineering experience was not enough to influence the pupils behaviour and that it was necessary to build engagement with engineering, working with existing structures such as the 14 – 19 Partnership or SEAs, over a long period of time. They found that industries working together to deliver different activities where decisions could be made locally, but funded nationally, worked extremely well, as well as making the project more cost effective, but equally that evaluating this process was extremely important.

Following the presentation from the panel, there were many questions from the audience on the planning and evaluation of the BEP and also how the panel reconciled the role of industry in getting pupils to do science and engineering as a subject with channeling them into the workforce. The panel felt that although there was the need to be open and transparent in their approach, there was no conflict of interest and that in fact the programme was helping students stay in education, broaden their employment prospects and also providing a “real world” perspective for their studies.

Engaging to involve

Public attitudes to science 2008: a survey guide

Suzanne King, Director, People Science and Policy
Ben Johnson, Director, Graphic Science

Chair: Saffron Townsend, Principal Science in Society Manager, Research Councils UK

Suzanne King gave an overview of the key findings of the recent Research Councils UK/ Department for Innovation, Universities and Skills (DIUS) survey, Public Attitudes to Science 2008. Suzanne's presentation highlighted, that attitudes towards science are generally positive and interest in science and scientific topics has increased since previous comparable research in 2000 and 2005. There is a mixed picture on changes relating to confusion about science, for example, there was a decrease in those who felt that *"Science & technology is too specialised for most people to understand"* however, no change on *"I cannot follow developments in science & technology because the speed of development is too fast"*.

There is a significant increase in the proportion who feel well informed about scientific developments, but sceptical about public consultation. Over three-quarters of those surveyed wanted more information direct from researchers at an early stage in the research process.

Suzanne also outlined how cluster analysis had been used to group the population into 5 broad attitudinal clusters according to their responses to 56 attitude statements. The five groups identified were the Confident, Sceptical Enthusiasts, The Less Confident, The Distrustful and The Indifferent, with each tending to have varying degrees of interest in and approaches to science within their every day lives.

Ben Johnson followed giving a short presentation outlining why identifying and understanding these attitudinal groups could prove useful for public engagement practitioners in identifying just how individuals and groups could be motivated to engage. The participants were then divided broadly into six sub-groups; Researchers; Science Centres/Museums; Schools; PR/Media/Communications; Public Engagement Practitioners; Public Engagement Manager. Each sub-group was given the opportunity to examine, in detail, one particular attitudinal group and discuss ideas of how they could be effectively engaged with science from their particular field of science communication. An interesting discussion followed and all key points were fed back to the rest of the participants in a short plenary session.

A copy of the full report and survey guide can be found at <http://www.rcuk.ac.uk/sis/pas.htm>

What can social science research do for science communication?

Laura Potts, Reader in Public Health and the Environment, York St John University
Derek Bell, Senior Lecturer, Newcastle University
Christian Heath, Professor, King's College London
Karen Bultitude, Senior Lecturer in Science Communication, University of the West of England

Laura Potts explained her work concerned with breast cancer and the importance of recent projects giving emphasis on building bridges between science and its public at national and international levels. She mentioned the importance of bringing different people together as well as the importance of listening and talking to each other. Why is it so hard to get all these people together? She pointed out the importance of good science communication and interdisciplinary work.

Derek Bell briefly explained how his project answered to what happens when an academic scientist and a non-scientist (member to the public) talk to each other one-to-one about environmental

issues:

- Each participant took part in a series of 6 exchanges discussing environmental issues with a member of the other group.
- In this format of communication differences in communication styles, personal character and willingness to talk were very different from one to another and clearly observable as well as very significant in the relationship between scientist and non-scientist.
- This format is important for developing the social skills, ability and to give scientists the opportunity to reach the non scientists.

Christian Heath briefly talked about social interaction and current research in areas including museum and galleries, theatres, science centres as a way to build bridges between scientists and non-scientists. He empathised the role of interaction, the importance of visiting a science centre and museums. The role of museums in learning science and in the field of public engagement with science is not as well recognised as it should be and that museums can reach who wouldn't have interested in science.

Karen Bultitude spoke about her experience as a science communication practitioner working directly with social researchers. Her main principle was that joint projects work best when science communicators and social researchers respect each other professionally and work together as equals, without one or other being recognised as the 'expert' or the 'novice'. She identified a number of challenges and opportunities from this perspective, including:

- Experimental scientists (and communicators with that background) coming to terms with the importance of qualitative information. However this can also be a challenge for policy makers, so the combination of the two perspectives may provide additional insight into the perspective of decision makers.
- Different vocabularies – with the example of "saturation" meaning one thing to a spectroscopist but something quite different to a social researcher.
- Difficulty of admitting lack of expertise – the professionals involved need to be confident to ask 'stupid' questions, and in fact this may prove entirely beneficial to the project.

Questions discussed included:

Why is it so hard to get scientists and non-scientists together?

Why is it so difficult to understand what scientists say/do?

What are the barriers for these two groups work together?

What do people think when they are in a scientific context? How do they respond?

- good communicators
- good communication
- communication as a tool for engaging the public and to build the bridge between these so different groups of scientists and non-scientists
- science centres, museums, etc... as a way to help the public to better understand the significance of science and give them access to science.

Engaging through the media and PR

Working towards a good practice guide for press officers

Speaker: Peter Cotgreave, Director of Public Affairs, The Royal Society

Chair: Katrina Nevin-Ridley, Head of Media, Wellcome Trust

Dr Peter Cotgreave, Director of Public Affairs at the Royal Society, set the scene for the discussion on developing a set of best practice guidelines for science press officers, reminding us to bear in mind who the guidelines were aimed at and how they would be likely to be implemented. Whilst recognising the potential need for such guidelines, Dr Cotgreave also warned of the potential pitfalls in developing them.

A mix of science press and PR people from organisations including universities, PR agencies and research funders began brainstorming guidelines, address such issues as press release and press office essentials and how to communicate research, particularly when it has a societal impact.

Stempra will use the outputs of this brainstorm to develop a set of guidelines, which it hopes to make freely available later in the year. Delegates who wish to receive a copy of the guidelines should email info@stempra.org.uk.

“Churnalism”: What's our response?

Nick Davies, Freelance writer

Richard Vize, Editor, Health Service Journal

Chair: Fiona Fox, Director, Science Media Centre

Nick outlined his reasons for writing his most recent book, Flat Earth News, an attempt to expose and explain the scale of falsehood, distortion and propaganda in the global media. Triggered by the global media misinformation about weapons of mass destruction in Iraq, Nick's investigation concluded that the new corporate owners of the media had enormously increased the output required of reporters, with the result that they no longer had the time to go out and find stories or make contacts or even to check facts but had been reduced to passive processors of second-hand material - 'churnalists'. Research commissioned for Flat Earth News found that 80% of 'home' news stories were constructed wholly, mainly or partially from news agency copy and from PR material. Nick argued that neither was a reliable source of truth. And since his research also showed that only 12% of the key facts in these stories were thoroughly checked, the news media were now structurally vulnerable to recycling false or distorted stories which had been designed to serve various commercial or political interests.

Richard highlighted the fact that the UK population held strong and often contradictory views on the highly emotive area of health and health policy. He went on to outline some of the healthcare misinformation stories that abounded in the media regarding the NHS. Ironically it tended to be the National Institute for Health and Clinical Excellence that gets lambasted over drugs issues rather than pharmaceutical companies which make them.

Discussion ensued about the role of contemporary science PRs and journalists. It was noted that nowadays journalists were expected to work within other areas of mass communication e.g. blogging, as well as their own specialist areas. It was concluded that the situation was likely to decline as multi-tasking continued to take place on an ever-increasing scale and the number of UK science correspondents continued to decrease.

Tuesday 20 May

Session 7 Conference Plenary

Keynote address

Speaker: Ian Pearson MP, Minister of State for Science and Innovation

Chair: David King, President, the BA

http://www.dius.gov.uk/speeches/pearson_SSC_200508.html

Ian Pearson set out that he wanted his speech to cover the Government's view of why broad public engagement with science is important, reflected on the substance and significance of some new and exciting initiatives and updated the conference on how the DIUS Science and Society strategy consultation was shaping up.

He reminded the conference that it was easier to excite people about science in this country than in others, because of the strong but underplayed record of achievement that the UK had in scientific research. In terms of productivity and per capita output, we led the entire G8 and the Government had increased the science budget by 17.4 per cent to almost £4 billion by 2011.

He thought that engagement mattered because, despite the confidence the public has in scientists' abilities, a decent grasp of scientific method was essential in these days of information overload. Also, a better-informed and engaged public – and civil service and Government – would demand better science and make better use of the best scientific evidence to inform policy.

He thought that the UK was leading the way in promoting a broad science and society agenda, using dynamic public engagement, citing the UK's science centres, museums and festivals. He took heart from the latest Public Attitudes to Science survey, which had shown that 82 per cent of people were amazed by the achievements of science (up from 75 per cent in 2000) and nearly 80 per cent believed people should take an interest in science, given its impact on their lives. It had also shown a real hunger for consultation on scientific decision-making and a wish to discuss research and all its societal and ethical implications.

The Minister went on to mention three related areas of activity that regarded proper dialogue as essential to effective engagement: Sciencewise and the Expert Resource Centre; how Government accessed scientific advice; and Beacons for Public Engagement.

Sciencewise had made high-quality, two-way conversations with the public a more regular feature of policy-making. Pearson was delighted that the Sciencewise Expert Resource Centre for Public Dialogue in Science and Innovation would be opened by Baroness Morgan, another DIUS minister, the following week.

There was a need for cultural change in the way government accessed scientific advice. The Council for Science and Technology had been asked to advise the Government on how to achieve better and more productive engagement between universities and government departments. Academics needed to be aware of the opportunities there were to contribute to policy-making, and Government and the civil service needed to ensure that those opportunities existed and were suitably valued.

The Beacons for Public Engagement had been launched with Pearson's help in January. They provided opportunities for university scientists to build understanding of their work beyond campus and to increase public trust – which was also being fostered by David King's ethical code for scientists.

Pearson said that the cultural integration and a more expansive view of science were central to the new Science and Society strategy, which set out the Government's ambition to develop a mature relationship between policy makers, the science community and society, including the media, educators and ordinary people. He thought that what was needed to improve science engagement was a common purpose and more sharing of best practice. He expected the consultation document to be posted on the DIUS website shortly and asked those present not just to respond in the traditional manner, but to help to generate more meaningful discussion.

He closed with three science engagement questions from the consultation.

First, how should the scientific and policy communities make science more interesting for the public? Second, how can the media provide more accurate and balanced information that helps to improve scientific literacy? And third, how do we communicate emerging scientific issues more effectively?

Discussion

The discussion and questions for the minister which followed was lively, with many wanting to have their say. Those who wanted more information about the work being undertaken by the Council for Science and Technology's work to advise the Government on how to promote more effective academia/government engagement were encouraged to speak to Karen Folkes at DIUS.

The Minister was challenged about whether there was enough support for social science research as part of the drive for better public engagement. He responded by stating his credentials as a social scientist (a degree and doctorate) and said that more money was going to the Economic and Social Research Council than previously. In addition, the Household Survey would be providing the world's best long-term dataset for social research. Meaning that would be very important for the future. While it was always possible to spend more money, he was confident that social science research was in a good place.

On whether the Government should provide support for researchers from overseas to improve their communication skills (current support through research councils is often limited to UK or EU nationals), Pearson said that the UK had an open economy and research community; attracting the best and brightest was important and in the UK's best long-term interest. He also commented that all scientists needed to think more about communication. It wasn't the preserve of a designated communicator, and all scientists needed to get out there to explain and justify their research.

Robert Winston asked how best scientific advice could be integrated across the whole of government – at which David King commented that he had not managed to persuade the Department for Culture, Media and Sport to appoint a chief scientific adviser. Ian Pearson commented that it was clear that more work at cultural integration was required and that it was important to make scientists, for example, want to join the Civil Service and to change the mindset that it was just for classicists or people with English degrees.

David King commented that public debates tend to evolve into a battle between two sides – e.g. for or against GM, or nuclear power. He was interested to hear how that might be avoided. He also posed a question about the deeper philosophy underlying government policy. The science budget had trebled in recent years because science was recognised as important for our economy and in the modern global economy it made sense to play to our strengths. But there was also a perception that more science meant more technology, more consumption and with an increasing population, how could we move to a more subtle position where the science and technology agenda was about more sustainable development?

In response, the Minister commented that the standard debating method was to divide into a proposition and an opposition – and our political system quite possibly contributed to a tendency for that to permeate public life. He agreed with David King that it would be good if deeper

engagement led to a deeper understanding of more of the layers of complexity in many of the subjects debated, leading to less reversion to extremes. He thought that this had been quite effective on topics such as stem cell research and nanotechnology.

He also commented that it was right, given the amount of money that was spent on science, to ask how it could contribute to solving big problems such as how to live more sustainably and to produce enough food for 9 billion people. However, he didn't think that this meant we had to give up all technology (he made an exception for Chelsea tractors, unless a zero carbon one could be built) but that we needed to find imaginative ways of delivering zero-carbon goods and a mature discussion of lifestyle.

Session 8 Conference plenary

Beacons for Public Engagement – engagement through another lens

Chair: Alan Thorpe, Chief Executive, Natural Environment Research Council

Alan Thorpe introduced himself and explained that he was representing all of the research councils, known collectively as RCUK, as their Champion for Science and Society. The Beacons initiative was funded by all of the research councils, HEFCE, SFC, HEFCW and the Wellcome Trust. Collectively they were spending £10million over four years on the initiative, demonstrating the importance they together placed on the area. The beacons were there, within universities, to do two things: to effect culture change within universities so that academics would start to have a picture of their role that had public engagement at the core and where reward for public engagement would be rewarded as part of academic life; and to undertake a set of co-ordinated activities in public engagement. The beacons had just started their work and we would be hearing about their plans and discussing them during the session and the subsequent breakout session. He said that it would be very important to hear the conference's comments at this early stage. He introduced the speakers and their topics briefly before handing over to Kathy Sykes.

National Co-ordinating Centre for Public Engagement

Kathy Sykes, Professor of Sciences and Society, University of Bristol and the NCCPE

Kathy Sykes began by thanking the conference for the opportunity to speak about the beacons and said that she hoped that the NCCPE and the beacons would be able to hear back and learn from the conference. She also set out briefly how the following breakout sessions would work.

Six beacons and the National Co-ordinating Centre for Public Engagement (NCCPE) had been set up with funding for four years. The individual beacons each had their own priorities for public engagement: Edinburgh's priority was to involve people in the key areas of research that are relevant to public policy. Cardiff was focusing on innovative community projects discussing health and wellbeing, and climate change and sustainability. London was a dynamic new partnership between UCL, the Southbank Centre and the British Museum. Norwich was creating a physical interface with UEA in the heart of the city, to provide clear and open access to their work, and both of Manchester and Newcastle were pioneering ways to reach out to and listen to their communities. Each beacon was collaborating with many local partners.

Sykes outlined the main roles of the NCCPE, which is made up collectively of the University of Bristol and the University of the West of England. It had the challenge of effecting culture change within all English, Welsh and Scottish universities – including staff and students – to make public engagement become a core part of what they did. It would be capturing and sharing good practice both among the beacons, the wider higher education sector and also from outside the sector, whether from the BBC, museums, science centres, or others with an interest in the co-production of knowledge. It would run workshops, events and conferences, also piggybacking on existing conferences such as this one, signposting existing or newly created resources and opportunities for funding or training, for help writing proposals or finding partner organisations.

It had highlighted evaluation and assessment of impact as one of the big areas for further work. It would be working with people from other sectors who had more experience of this, such as the Museums, Libraries and Archives sector, the BBC or social scientists. Its approach would be similar when looking at how to use new technologies, effect culture change or reach marginalised audiences.

It would also be lobbying government and funders to find ways of valuing HEIs and academics engaging with publics and support culture change in HEIs. It would also try to prove the value of the Beacon initiative, and encourage funders to consider extending the scheme to include more Beacons. Sykes said that the NCCPE was very keen to keep working with those who had bid to become a beacon and had been unsuccessful and to ensure that there was scope for future beacons to be developed. It wanted to create a charter for vice-chancellors to sign up to, committing them to changing the culture in their organisation.

Many of the existing activities taking place in higher education institutions already included public engagement aspects. It was important to balance power from within and outside the organisation so that those being engaged were empowered, and it was also crucially important to be listening as well as talking.

www.oakleighsurveys.co.uk

www.publicengagement.ac.uk

Session co-ordinated by Paul Manners, University of West of England

Reaching marginalised groups – Newcastle and Durham Beacon

Jackie Haq MBE, PEALS, Newcastle University/Newcastle and Durham Beacon

Jackie Haq introduced herself as a social scientist and erstwhile community activist whose remit was to develop a critical sociological understanding of participatory processes and public engagement, in PEALS (Policy, Ethics and Life Sciences), Newcastle University and to act as a 'critical friend' to Newcastle and Durham Beacon. She wanted to draw on her experiences, not to offer solutions or to be prescriptive but to contribute to the expertise that there was already in the room.

Rather than talk about the specifics of the Beacon's work, Haq drew on her experiences as an activist and academic to reflect on marginalisation. First she spoke about how universities look from the outside. In her experience they appeared remote and not even on communities' radar. Occasionally researchers from the university might come to a community, talk to people, write a paper and jet off to a conference to talk about their impression of the community, while community activists – with a better knowledge of the community – were too busy dealing with the day to day issues affecting people's lives to engage with a wider, academic audience. However, in one instance a local swimming pool was under threat of closure. The local sports science students wanted to help the community by providing information about the health benefits of swimming, but the community already understood the health benefits and was more concerned about the social benefits of the pool. They wanted to help in making the case that when the pool closed, there would be a knock-on effect on young people who would have nowhere to go. The mismatch of expectations led to feelings of frustration on both sides and with no preceding relationship of trust, the sports scientists' offer of help was turned down. The pool was closed and regardless of the expertise of all concerned, the final decision came down to finances and political will rather than academic information or community priorities.

In another instance, related to children's health and well-being, information on bedwetting was provided by a local health clinic – but the leaflets were entitled 'enuresis', which was not

recognised as bedwetting by those who would have benefited from the information in the leaflet. Haq worked as a health information worker with local people who produced relevant, informed, accessible health information literature on a range of topics including bedwetting and childhood infections. At that time there was a very low uptake of measles vaccinations, which the health professionals couldn't understand. Haq found on speaking to parents that they were concerned that if their child had already had measles (or was believed to have done so, having had a measles-type rash) a vaccination would harm the infant. However, these views had not been discussed with the health professionals. The solution was to bring parents and health professionals together to share their concerns underpinning decision-making. Parents heard that the vaccination would boost the child's immunity even if it had had measles – and that a measles-type rash might not have been due to measles in any case. A number of parents subsequently reported taking up the measles vaccine for their children.

Key to successful communication was not just getting the language right or having the right factual information but also understanding possible different interpretations of knowledge. The challenge was to recognise the cultural and social context of all participants – both scientists and the communities - in order to explore what the scientists and academics can learn from communities – and how that learning may be facilitated by community activists as well as the more traditional stance of 'handing down' knowledge.

Haq then referred to the processes of so-called engagement. She cited the example of long term community activists working to regenerate their estate. At first, a piecemeal approach was tried – but that had limited impact. Local residents recognised that a holistic, targeted approach was needed. They people set up an innovative, locally-led, strategic, community infrastructure, creating a partnership with key people and organisations. One of the key things that came out of this process was the difference between consultation and participation. Nowadays the buzzwords are public engagement and involvement or even knowledge transfer but despite the shift in language the power dynamics were, for the most part, the same, and Haq was very concerned that local people soon felt that they had been consulted to death and in four years time might feel they had been engaged to death. Her plea that day was to look at the processes used to engage people: 'participation' and 'involvement' all pointed to the co-production of knowledge and what could be called the 'democratisation of ideas' and knowledge production. It was one thing to increase accountability and transparency and to communicate science accurately, but how would you know that that had been effective? Structures needed to be in place to monitor, evaluate and mandate action in the short, medium and long term.

Returning to recent and current models of public engagement, Haq had brought copies of the PEALS (Policy, Ethics and Life Sciences) annual report to the conference. She could provide more copies if people emailed her. As a critical friend to the project, she wanted to look at the long-term impacts of public engagement, to look at co-inquiry processes with PEALS and beyond, to work with diverse groups across the region, to evaluate different modes of public engagement. Her feeling was that she needed to look at the processes, the practices and the outcomes of public engagement but just as importantly at the understanding of that engagement. Some of the questions she wanted to look at were: What are the hopes, expectations and fears of disengagement experienced by all of those involved? To what extent has the process moved from being a meeting of the 'engaged' and the 'engagers' to a coalition of co-enquirers? And how sustainable is public engagement? Should it be about long-term communication and participation?

Last year she had conducted a small-scale evaluation of a citizens' jury process. The people that had been involved had thoroughly enjoyed the process and it had been very productive, but what they had found was that although at the end of the process they had many ideas, so much more they wanted to look at, but no-one would fund them. What they had expressed after the process was a huge sense of frustration. So another question Haq wanted to pose was: Would public engagement with the sciences also meet with frustration in the long term?

To close, Haq returned to the topic of 'hard-to-reach groups'. Her experience of groups traditionally

described as 'hard-to-reach' was that they were hard-working, hard-pressed and any success they had was hard-won. Her experience was that the hard-to-reach groups were the politicians, the funders, trades unions and the universities. She was delighted with the Beacons initiative but warned that knowledge alone would not empower communities. Genuine participatory agenda-setting coupled with the co-production and democratisation of knowledge would be most effective when there were structures for continued accountability. The processes and context of engagement were as important as the content of any communication of science. Her final question for the conference was: How could scientists, universities and communicators committed to public engagement contribute to the longer-term, sustainable, productive and equitable relationships with communities?

Reaching Marginalised Groups – Manchester Beacon

Erinma Ochu, Director, Manchester Beacon for Public Engagement

Erinma Ochu explained that the Manchester and Salford Beacon wanted to link up the people of Manchester and Salford with the energy of those cities. The Beacon had many partners, including Manchester Metropolitan University, the University of Manchester the Museum of Science and Industry and Manchester United.

Manchester's public image included its reputation for football, music, canals, Coronation Street, but the Commonwealth Games, but also gun crime, unemployment. However, the Greater Manchester conurbation also had the fastest rising economy in the UK. The local universities were contributing to the growth in the economy but the communities closest to the universities weren't always benefiting and there were huge gaps in terms of education, health and well-being. The Beacon was trying to build on the kind of work that Jackie Haq had talked about to look at what the priorities were and how to engage people to draw on the untouched potential among local people.

The Beacon was trying to draw together people who cared passionately about these issues to identify priorities and develop mutual trust. The focus was very much on taking action on common goals and common outcomes. They were looking at sustainable goals and sustainable development. It was important to understand that people in full-time work might not be interested in attending lectures at the end of the day. They wanted to use the idea of science as culture to grab people's interest, to connect up to local science festivals and to use conversations to find out what did interest people. Initially they wanted to set up a network of about 60 champions across their partners.

The Manchester approach was to bring multiple perspectives to the table. They were using engagement as a process to find out what was already happening, to learn from the failures as well as the successes. The initiative was not about delivering new engagement activity, but co-ordinating existing activity – with the focus not on frameworks but on making a difference and having an impact. Within the universities they were looking at rewards for people who were engaging and working with them to decide what those rewards might look like – it might mean different things for different people.

Ochu thought that 'engagement' would mean something different to the Beacon in four years' time when, through participatory methods, people felt empowered to come to the table and take part. People would take on different roles, they wouldn't be interested in everything and sometimes effort would be required to make the work relevant to them. It wouldn't be that everyone was engaging with everything all of the time. Some would lead on topics and others would contribute their content at different points in the process. One of the Beacon's roles would be to find out how to support that. It would be important not just to listen once and then go off and do x,y,z but to have an ongoing relationship of trust. They were also considering how to make connections and were very keen to find out – perhaps from the breakout sessions to follow – what other beacons were doing so that Manchester could make links with them, for instance in training courses for academics in communicating with local people.

The Beacons were also considering what people would be engaged to – looking at things like enterprise, business development, citizenship, volunteering (for example, in museums) and moving into employment. Ochu also showed the conference a slide of a 'ladder of participation', moving up from the bottom via rungs of manipulation and therapy (both of which are non-participation), onwards through informing consulting, placating (which were tokenism) to partnership, delegated power and finally to citizen control (which last three represented degrees of citizen power). Which level were people being engaged at? Were projects moving towards citizen power? Were citizens holding budgets? Were real connections being made with benefits on both sides?

To close, she told the conference about Manchester's common-sense innovations. For frameworks, building on existing practice rather than (re-)developing a new one. Their approach was inclusive from the outset. It took time to build up trust, but the plan was to embed practice so that the approach would continue in four years' time, whether more funding was available or not.

Discussion

In the following keen discussion, the speakers asked about the challenge ahead of measuring the culture change in universities and whether and how baseline information was being gathered. She was also asked about how reward structures, such as the RAE, would change to recognise public engagement work. Other issues raised how those in universities could be persuaded to give up power to the local community and concerns and what the ultimate purpose of the Beacons was – was it better research outputs, more empowered citizens, or engagement in its own right?

In response, Kathy Sykes said that the NCCPE had identified gathering baseline data as its immediate priority and that external consultants had been appointed to do some quick work advising on what that might be. There was an e-survey for Beacons and others to participate in available at www.oakleighsurveys.co.uk

Alan Thorpe was keen for promotion criteria to change for academics, to recognise public engagement work as well as research and teaching. Jackie Haq said that Newcastle was setting up an interim steering group of 'everyday experts'. A key criterion was how the culture changed – the traditional focus on publication of peer-reviewed articles would not disappear. Kathy Sykes reported that a formal contribution had been made to the new Research Excellence Framework and that the NCCPE was lobbying all funders on recognising public engagement activities. Each beacon needed to be looking at its own HR processes and promotion criteria. Aston University was an example of good practice, where business engagement activities were recognised among promotion criteria.

On the question of universities giving up power to the local community, Erinma Ochu thought that it was less about institutions holding power but about persuading individuals who held power to give up it, and considering external drivers for change was a significant part of that. They needed to understand what was in it for them. A plus point was that academics tended to be used to working among a network of individuals, which was already a participatory model.

Jackie Haq thought that there were many different versions of what a successful Beacon might look like. One view was simply that it would secure more funding in four years' time. Another sign of success might be that it was no longer needed. Her own view was that it would involve more, better communication and partnership between the university and the community.

After the plenary session, discussions continued in the breakout sessions, in which groups of about 15 people were encouraged to discuss either the Beacons and the National Coordinating Centre for Public Engagement or how to engage marginalised groups. Groups were also encouraged to discuss their own related topic if that was what they preferred. The breakout sessions were facilitated and groups recorded their conclusions on posters which were returned to the organisers of the sessions for information.

Session 10

Engaging to inspire and educate

21st Century Science Centres/Learning Outside the Classroom

Penny Fidler, Director, Ecsite-uk

Peter Carne, Learning Outside the Classroom Manifesto Champion, Department of Children, Schools & Families

Chair: Steve Measure, Creative Science Consultancy (on behalf of Nick Winterbotham)

Penny Fidler overviewed Ecsite-uk's role as an affiliated member of ECSITE (the European Collaborative of Science Industry and Technology Exhibitions). There are 19.5 million visitors a year to Science Centres in the UK with Ecsite-uk having over 50 centres as members of their organisation. Secured funding for such centres is always a concern as recently highlighted in parliamentary debate, though there are positive signs in support of science centres as referred to in the recently published report *Inspiration, Engagement and Learning: the Value of Science Centres* (Ecsite-uk, 2008 available at <http://www.ecsite-uk.net/reports/downloads/inspiration-engagement-learning-the-value-of-science-discovery-centres-in-the-uk.pdf>)

In response to questions, Penny clarified how Science Centres support current STEM initiatives by working closely with STEMNET (for example). The topic of impact of science centres and related research was raised and Penny explained that Ecsite-uk are working closely with DIUS specifically on this topic, referred to in the previously referenced report.

In the second half of the session Peter Carne overviewed the Learning Outside the Classroom (LOtC) strategy and how this related to Science Communication. Coming from the DCSF with support from numerous organisations, the Manifesto for LOtC was launched in 2006 emphasising that it's not only about what we learn, but more importantly how and where we learn. Peter has been seconded to the DCSF to support the implementation of this strategy.

The *Out and About* package is going to be published in September 2008 including 'How to' Guidance and CPD modules for schools and colleges. A LOtC Quality Badge scheme is being developed to produce one quality 'assurance' badge for registering and recognising worthy LOtC experiences. Though this is an English initiative (from the DCSF) all details will be freely available enabling others to potentially apply this to activities further afield.

The monitoring and reviewing of the Quality Badge was questioned though Peter explained the development of a sustainable model to 'raise the quality bar' which also included a complaints procedure. Discussions clarified the dissemination approaches for this strategy, first focusing on those using LOtC (teachers, support workers etc) and then targeting providers. This is relevant at both Primary and Secondary levels though it does exclude PE, Sport and Work Experience activities since they are covered elsewhere. There was clarification as to how this relates to current QCA curriculum developments (the Big Picture) and the STEM directories, though the overarching message was to utilise the link between LOtC and these developments to further promote the worthy message. When questioned on how to involve **all** schools and young people, Peter concluded enthusiastically that the time is right for such an approach, given the Key Stage 3 changes, the new diplomas, a school's Self Evaluation Form which all can be supported through LOtC. The first LOtC annual conference is planned with input from Mick Walters (QCA) and Jim Knight (Minister of State for Schools and Learners).

Evaluating public engagement

Alan Worley, Project Manager, People Science and Policy Ltd

Mark Windale, Senior Lecturer, Centre for Science Education, Sheffield Hallam University

Chair: Vicky Jones, Business Innovation Directorate, EPSRC

Mark Windale outlined the Engineering a Better World, a project with the aim of providing a coherent and coordinated experience of engineering within and beyond the curriculum. Engineering a Better World was a 3 year project funded by Yorkshire Forward and EPSCR.

Alan Worley outlined the evaluation that has been done on the project and highlighted some key findings from the evaluation. The evaluation used evidence from before and after questionnaires and qualitative interviews to investigate the impact of the projects on student' perceptions of engineering and how different factors contribute to impact.

Discussion ensued about aspects of the management of the project, such as the decentralised delivery structure, and the effect of this on project outcomes. There was also debate about the practical challenges of evaluating such varied projects, and whether more homogenous project designs would prove easier to evaluate.

Engaging to involve

Reflections on sciencehorizons

Karen Folkes, Head of Public Engagement with Science and Technology, Department for Innovation, Universities and Skills
Ian Christie, Report Writer

Chair: Melanie Smallman, Director, thinklab

As a select group was present, the group each initially shared their reasons for attendance and what they hoped to get out of the meeting.

Karen Folkes spoke first, outlining the history, and next steps of the sciencehorizons programme. It had been the first mass public engagement exercise in the UK to focus on the potential future uses for science and technology, using a set of fictitious potential scenarios set in 2025. It had been run as the public engagement part of WIST, the government's Wider Implications of Science and Technology programme, which had run during 2007 and integrated the work of the Horizon Scanning Centre's stakeholder consultation to identify implications of new and emerging areas of science and technology, and the Sciencewise programme that explored the public's fears and aspirations about the future of science and technology. The results of sciencehorizons had helped to inform the development of the next phase of Sciencewise, the Expert Resource Centre, to be launched the following week. This would provide an online resource of information for different stakeholders in science and technology policy-making, for members of the public including how they might get involved and act as a portal to additional information and support.

Ian Christie set out the aims and design of sciencehorizons. Its primary aims were to discover the public's views, to inform policy and to identify priorities for further public engagement. Secondary aims had included widening public awareness, improving public confidence in science, increasing understanding of the value of public dialogue and how to engage large numbers of people in discussions, and to strengthen coherence and collaboration among science engagement practitioners. There had been three strands – a deliberative panel, facilitated group discussions and small group discussions. Scenarios had been grouped into one of four themes (mind and body; home and community; work and leisure; and people and planet) with four stories of a future situation per theme. In the deliberative panel strand, 31 people forming a cross-section of the public with little formal science or technology background, spent two days discussing the issues in a mix of small groups and plenary sessions. Feedback from participants was very positive.

Four issues had been raised in all the sciencehorizons stands: the question of trust in experts and decision-makers; the impact of 'testimonial knowledge on initial views'; anxieties about science

and technology; and ambivalence about emerging technologies. Issues for policy-makers included pervasive distrust, concern about the regulation of personal genetic information, public confusion about carbon credits and reluctance to accept a role in dealing with climate change, demand for clarity and urgency in government messages, and the clear popularity of deliberative processes.

The select group of those present became so absorbed by the discussion that the group forgot the time. Topics discussed covered the number of people that sciencehorizons had found it was best to engage with to get a good idea of the public's concerns and views, how those engaged had been kept in touch with subsequent policy-making and how to measure the degree to which the results of the sciencehorizons findings had influenced policy.

On the number of people who should be involved, one of the more surprising findings was that 31 people – the number that had taken part in the deliberative panels - might be enough. No different views or issues had emerged when more than 20 people were involved. This number might not be enough for an accurate quantitative representation of views, but it was enough for a qualitative assessment of what views a larger group were likely to hold. Karen Folkes reminded the group that the process wasn't about running a referendum and that the number of people you involved did need to adapt to what you wanted to get out of the process. If you wanted to be seen to be engaging on a large-scale, then of course more people would be required. It was also commented that social scientists and natural scientists tended to have different views: social scientists were happier with qualitative work, provided it was in line with the findings of other qualitative work, but natural scientists tended to require larger sample sizes that would give statistically significant answers.

sciencehorizons had been fairly good at going back to participants to tell them what use was being made of their contributions, but one of the aims of the Expert Resource Centre was to keep that going and to broaden the approach.

www.wist.dialoguebydesign.net

www.Sciencewise-erc.org.uk

Engaging in policy with the purpose of explaining science

Stephen Axford, Head of Science and Society, Department for Innovation, Universities & Skills

Nick Dusic, Director, Campaign for Science and Engineering

Ian Gibson MP for Norwich North

Anthony Whitehead, Head of Science in Government, Department for Innovation, Universities & Skills

Chair: Alok Jha, Science Correspondent, The Guardian

As part of this year's BA Science Communication Conference, science communicators, academics and journalists from across the country took part in the Newton's Apple workshop 'Engaging in Policy with the Purpose of Explaining Science'.

Questions covered ranged from, whether public opinion should be considered when making science policy decisions, to how Parliament balances public opinion with scientific evidence in current debates, such as that on Hybrid Embryos. The good work conducted by the Science Media Centre in providing accurate scientific information to the public was highlighted.

However, it was proposed that public confidence and understanding of science and its benefits could be increased by improving access to more balanced scientific information, perhaps with more specialist science journalists tackling science policy stories in place of the mainstream and policy journalists who currently tend to cover such issues. Public engagement with science was also seen as vital to society, especially since public money is involved in research. However, the audience believed that decisions over what type of science is funded should not be left to the

public.

Newton's Apple would like to thank the sponsors of the workshop, BioIndustry Association and the Royal Society of Chemistry.

For more information on Newton's Apple, and the Newton's Heirs programme, see the website: www.newtons-apple.org.uk

Engaging through the media and PR

Television as a means of Public Engagement

Martin Davidson, Head of Specialist Factual Commissioning, BBC

Sue Davidson, Commissioning Editor – Factual, Five

Peter Styring, Professor, University of Sheffield

Chair: Sue Nelson, writer and broadcaster, Boffin Media

The session started with the three speakers giving a rounded view of their experiences in television. Sue Davidson, a commissioning editor for FIVE started the proceedings. After a few clips from current FIVE science shows she gave an entertaining explanation of the type of audience that FIVE caters for (mainly male and in their 20's) and where they fit in with the other main channels remit of science programming. In her role she explained that although FIVE sought to show science with integrity and up-lifting stories, they also had to make sure there was an audience to watch it. With their demographic that meant science with tabloid style titles and showing the extreme cases in universally appealing subjects.

Martin Davidson from the BBC then took the floor and gave valuable insight into the differing BBC channels approaches to science. He confirmed the BBC's continuing support of science across all channels as part of their core programming. The newer channel 4 has given the opportunity to present conceptual and hot topic science in a less popularized style concentrating on the real science behind the ideas, while BBC 1 and 2 continue to produce the big landmark science shows and mainstream staples such as Horizon and the major wildlife epics. He described the need to find the place for science in BBC 3's scheduling to connect with the more youthful audience, and also highlighted the set of programmes being commissioned now to celebrate the year of science and Darwin year in 2009.

Peter Styring explained how he had fallen into television and programme making, and his top tips as a scientist for getting your ideas commissioned. His work has progressed from radio to television with the help of a senior media fellowship from EPSRC and his love of skiing which works as a useful example of many science processes. He highlighted the importance of maintaining relationships with local production teams and keeping dialogue on-going.

Discussion

Discussion session was lively with questions being asked about funding for programmes, the year of science programming, who should host science shows and how science was presented. It was noted that series or seasons rather than individual programmes with funding made finding production companies and commissioning easier. Scientists should be flexible with how they wish to portray their area of science and what is highlighted. FIVE and the BBC value scientists as presenters, but differed on their views of celebrity hosts for science shows. They do not talent scout, but are happy to screen test those interested in science presentation on television. The BBC is also looking into drama based on science fields after the success of series such as CSI.

Conference Plenary

Reaction Dynamics

Graeme Jones, Keele University

Graeme Jones led the plenary session through a laugh-out-loud session of music, dancing and audience participation in which we learnt how to dance like a molecule in infra-red and to explain the reaction dynamics of girl-meets-boy.

Closing remarks

Roland Jackson closed the conference with some thanks to those who had made the event possible, including the stakeholder group and the organisations that had run sessions, and the speakers and chairs of events. He also thanked those who had attended, those at the venue, the IET, who had helped to make everything run smoothly and Alice Taylor-Gee and her team who had organised the event.