

Public Understanding of Science and the Policy Context in the United Kingdom

Josephine Anne Stein

Introduction

The Public Understanding of Science movement in the United Kingdom, dating from the mid 1980's, was closely associated with the promotion of an informed, democratic society as much as it was with the promotion of science as a "public good". More recent emphases on public consultation, particularly since the late 1990s, arose as declining public confidence in expert advice and authority more generally placed increasing strains upon traditional forms of science-related governance. Science policy and scientific advice to government, which had hitherto been constructed around expertise offered by a patriarchal and stable self-validating elite, began to face accelerating demands for more direct forms of democratic accountability and control.

At the formal, institutional level, the UK has a highly developed set of governmental, government-supported and independent organisations devoted to improving public awareness of science and technology. Academic research on and critiques of "traditional PUS" have also emerged from the UK, which have not only influenced intellectual currents far beyond its shores, but have influenced national policies. More consultative forms of PUS and dialogue with the public have become more common - but whether they influence policy is still an open question.

The Public Understanding of Science Movement

Although organised science communication through education, museums and promotional activities of the professional societies has been ongoing in the United Kingdom for centuries, the birth of the PUS movement in contemporary Britain can be ascribed to a report produced by The Royal Society in 1985 entitled "The Public Understanding of Science". This report, often referred to as the "Bodmer Report" after Sir Walter Bodmer, the chairman of the working party that produced the report, established a rationale for PUS and touched off a series of new or re-invigorated bodies and activities that are known collectively as the Public Understanding of Science movement.

The Public Understanding of Science movement arose from a perceived need in the scientific community to increase public knowledge of science in order both to improve the basic competence of the citizenry and to promote public support for government R&D expenditure. PUS was animated by observations of public "scientific illiteracy" as measured by surveys that revealed extensive public ignorance of specific "general knowledge"-level established scientific facts and theories. This ignorance, it was feared, indicated an inability of the citizenry to exercise responsible democratic influence over public issues increasingly based on science and its applications.

The Bodmer report was very much a product of Thatcherite Britain, in which public expenditure of all kinds had to be justified in terms of its contribution to national prosperity. The Royal Society, the UK's preeminent professional scientific society, responded to political pressures for public "accountability" by setting up the committee on PUS, with a mandate to examine the interface between scientific knowledge, the public, and the scientific enterprise (ie, the creation of new knowledge). The main conclusions of the Bodmer report are summarised in the UK National Profile section of this OPUS report. Suffice it to say here that the "bottom line" of the Bodmer report was that there being few public issues *without* some scientific content, public understanding of science was essential to the proper functioning of Britain as a democracy. The scientific community was called upon to simultaneously come to the aid of the ailing British economy -- and an ailing British democracy.

The Bodmer report came as a tonic to the British scientific community. Although cutbacks continued in public funding for research, scientists did receive a form of public approbation. The call for relevance and accountability struck a chord with both the public and the scientific community, and once sounded, the policies (and the funding priorities) followed. In a time of declining budgets, one couldn't afford *not* to subscribe to the new orthodoxy. Whether reluctantly or enthusiastically, the scientific community responded. PUS activities began to flower.

In specific terms, the Bodmer report laid the groundwork for a new body, the Committee on the Public Understanding of Science (COPUS), which was established jointly in 1986 by The Royal Society, the Royal Institution and the British Association for the Advancement of Science (BAAS). COPUS has provided a focal point for the expert-led PUS movement, coordinating a stream of activities. Both the Bodmer report and COPUS served as a catalyst for a more widespread and diffuse movement to promote science: the Public Understanding of Science movement.

Traditional or standard PUS activities have not acknowledged the public's less formal understanding of everyday phenomena; nor have they examined the public's capacity to absorb and deliberate on scientific theory and evidence when offered in a balanced and interactive format. The PUS movement drew criticism for its failure to acknowledge lay competence in absorbing and assessing scientific evidence in context, and for its

failure to recognise the ability of social movements and individuals to undertake their own research and form their own working models of, for example, reliability and risk. Wynne and Irwin's critiques¹ of the so-called 'deficit model' (the idea that PUS consists of experts conveying knowledge to an ignorant public) argued for valorising local, experiential or non-credentialled lay knowledge, while calling for greater reflexivity within the scientific community. However, even these critiques implicitly espouse a form of scientific rationality, formal or informal, as being the appropriate basis of sound decisionmaking in the real world. The debate centres more on credentialism than on how to reconcile scientific rationality with social values in public affairs.

Technology Foresight

The Technology Foresight exercise of 1994-1995 was a major consultation exercise designed to improve linkages between the research community and those using new knowledge, and to inform priorities for public R&D spending. Technology Foresight was explicitly expert- and producer-led, and participation was controlled throughout, with no significant public consultation element².

The failure of both Technology Foresight and standard PUS activities to achieve two-way directionality of information flow (ie, to include "scientists' understanding of the public") led to many other initiatives designed to achieve mutual understanding through interaction between scientists and the public, often with an explicit objective to influence policy. However, the bulk of PUS activities in the United Kingdom continue to fall under the rubric of the Public Understanding of Science movement as characterised by the deficit model. Many PUS activities have become more entertaining and more interactive, but retain more of the traditional "mission to explain" (a phrase often employed by the BBC) than a "mission to understand" in a mutual sense.

Mainstream British PUS

The PUS movement in the UK is underpinned by both implicit and explicit policies, most of which are framed at national level but with important policymaking powers and initiatives delegated downward through all administrative and organisational levels to that of the individual. It is impossible to do justice to the extensive British PUS movement in a short

¹ A. Irwin and B. Wynne, eds, *Misunderstanding Science? The public reconstruction of science and technology*, (Cambridge: Cambridge University Press, 1996).

² J.A. Stein, "Technology Foresight (UK)", in P. den Hertog, J.A. Stein, J. Schot and D. Gritzalis, *User Involvement in RTD: Concepts, Practices and Lessons* (Luxembourg: European Commission, 1996).

report, especially as so much activity is organised in "bottom-up" fashion by schools, universities, research institutes, companies, industrial and professional associations, museums, libraries, the media, the arts and letters, community associations, regional authorities and individuals. The following organisations are a *very* abbreviated list of *some* of the main actors:

- The Royal Society
- The British Association for the Advancement of Science (National Science Week)
- The Royal Institution
- The Office of Science and Technology and the Research Councils
- Science festivals (Festival of Science, England and Wales; International Science Festival, Scotland)

More information on each of these are contained in the UK National Profile section of the OPUS Report, as well as overviews of the main categories of actors in the "spaces" chapters.

PUS as an expression of British culture

The *First Global Cyberconference on Public Understanding of Science*, organised by Steve Fuller of the University of Durham with the support of the ESRC, ran from 25 February to 11 March 1988³. Thirty-five selected expert commentators from countries around the world were invited to make opening statements, after which the cyberconference was open for unmoderated electronic discussion. Although some have long regarded science itself as a cultural phenomenon, the cyberconference extended this idea to Public Understanding of Science as well; it is one example of the leadership position that the UK has achieved in PUS research.

The British Council, an organisation that promotes British culture, commissioned a six-week cyberconference *Towards a Democratic Science* in September - October 2000⁴. The "e-conference", as the organisers called it, covered a different topic each week:

- Perceptions of science
- Risk and uncertainty
- The need for regulation

³ www.dur.ac.uk/~dss0www1/

⁴ www.mailbase.ac.uk/lists/democraticscience-all/files/volume1.htm
www.mailbase.ac.uk/lists/democraticscience-all/files/volume2.htm

- Ethical responsibility
- Public consultation
- Consumer protection

and the results of each week's electronic discussions were summarised and posted to conference participants. While neither the content of the conference nor the conclusions were particularly original or surprising, what is striking is how Public Understanding of Science has come to occupy such a central position in British life that the British Council should choose to organise such a conference as an expression of British culture. And this was not an isolated exercise.

As a follow-up to the e-conference, the British Council sponsored an electronic *International Seminar on Democratic Science* involving scientific experts from 17 countries around the world. The week-long "e-seminar", which ran for the week of 12 March 2001. The UK is clearly eager to establish itself as a leader in world electronic discussion fora on PUS issues.

Public participation in policy debates

Some activities within the PUS movement have gradually evolved into more interactive exercises involving dialogue between experts and lay members of the public. Most examples can be considered experimental and are not embedded into policymaking structures. However, the Parliament has taken a strong interest in participatory methods, a necessary - though not sufficient - prerequisite for more influential forms of strong or direct democracy to develop in the UK. Some of the major activities are described briefly below and in more detail elsewhere in the OPUS report.

Consensus conferences

There have been two consensus conferences in the United Kingdom, both organised on a national basis. The first of these, on Plant Biotechnology in 1994, was sponsored by the Biotechnology and Biological Sciences Research Council and organised by the Science Museum. The second, on the management of nuclear waste, was sponsored by the Centre for Economic and Environmental Development in 1999. In both cases, the organisers were satisfied by the outcomes; the citizens' panels in both cases expressed both concerns over the applications of science and technology while supporting further research. In both cases, the House of Lords had conducted their own inquiries in these areas prior to the consensus conferences.

Studies, meetings, public consultations and opinion polling

Biotechnology is such a controversial topic in the United Kingdom that it is not surprising that so much PUS activity and public consultation exercises centre around issues such as human cloning⁵, genetic testing, genetically-modified food and agricultural practices such as feeding natural herbivores animal-derived products.

Although many variants of public understanding/public consultation exercises have been tried in the UK, most of them are carefully constructed and conducted according to parameters set by the organisers. Market research-led exercises and passive opinion polling are notoriously poor indicators of the public's capacity to understand complex, science-based issues. Experiments in deliberative polling have been carried out, and the broadcast media have developed successful formats where members of the public can challenge experts. Explicit efforts are made to balance the composition of expert steering groups and citizen panels, for example. But in almost all of these examples, the terms of reference, the methodologies employed, and the selection of the participants generally remains firmly in the control of the organisers.

Websites and Internet-based PUS activities

As more and more UK residents get access to the Internet, a flourishing business related to PUS is developing on-line. There are now so many Websites with science-related information that the Wellcome Trust Information Service operates a service that vets and catalogues relevant Internet Resources. It offers guidance to the public on how to assess the reliability of scientific information posted on the Web, and makes its own catalogue available through a searchable database known as *pUBLIC sciENCE commUNICATION*⁶.

PUS in Government and Parliament

Under the banner "Have Your Say", the Prime Minister's office launched an Internet-based consultation on "Scientific Advice and Public Confidence" in November 2000. The Website invited public feedback as input to the development of a new Code of Practice to apply to all scientific advisory bodies (released in December 2001). The 10 Downing Street Science forum Website⁷ provided links to some of the main S&T-related government departments and activities, and identified six specific issues for public feedback. One of these related directly to PUS itself: "How do you think the risks and benefits in science and technology might best be communicated?"

⁵ S. King, I. Muchimore et. al., *Public Perspectives on Human Cloning: A Social Research Study*, (London: The Wellcome Trust, 1998)

⁶ www.omni.ac.uk/psci-com/

⁷ www.number-10.gov.uk/default.asp?PageID=2846

The main stated objective of the exercise is in itself is a fitting encapsulation of the state of British Public Understanding of Science:

"The Government wants your views on how science is handled. We want to know whether you are concerned about current developments in science and what you think about the ways that the risks are controlled."

At the end of the Home Page, it said **"We want to know what you think.** Click here to join in the discussion."

Whether this initiative will lead to new public understanding of science, or new understanding of the public by scientists and government, remains to be seen. Whether it genuinely improves democratic processes for public "ownership" and "management" of science is an even more open question. It does, however, convey New Labour's strong predilection for public relations.

The Parliament:

The House of Lords Select Committee on Science and Technology undertook an inquiry into Science and Society, drawing upon not only the ESRC Programme but a great body of additional studies and PUS activities. The report⁸ took a comprehensive look at:

- Public attitudes and values
- Public understanding of science
- Communicating uncertainty and risk
- Engaging the public
- Science education in schools
- Science and the media

The Lords Committee heard or received written evidence from over 100 professional associations, S&T-based companies, agencies, research institutes, media companies, non-governmental organisations and individual experts. The House of Lords' report recognised the existing crisis in public confidence in S&T and science advisory systems. It endorsed earlier calls for openness in the UK scientific advisory system, and while vigorously supporting the need for independent advice, encouraged scientists to be explicit about their sponsorships and affiliations. The Lords acknowledged and supported the PUS movement, although the report significantly finds that "the crisis of trust has produced a new mood for dialogue." Traditional forms of

⁸ United Kingdom House of Lords, *Science and Society: 3rd Report*, (London: HMSO), 23 February 2000.

PUS, in other words, are no longer enough, according to one of the most elite and exclusive bodies in Britain.

In response to the House of Lords' report, the Parliamentary Office of Science and Technology (POST) undertook a review of public consultation initiatives in S&T-related areas, looking also at experience of consultation exercises in local government and health care. The POST report⁹ examined instances of deliberative polling, standing panels, focus groups, citizens' juries/panels, consensus conferences, stakeholder dialogues and internet dialogues. While the POST report found evidence of growing interest in engaging the public in dialogue, it also found that the quality and utility of such exercises were variable, concluding that well-organised deliberation, appropriate institutional culture and evidence-based discussion were most important to success.

Conclusions

At the same time that the United Kingdom has put enormous effort and resources into Public Understanding of Science activities and research into PUS, it has experienced one crisis after another in public confidence in science, technology and the ability of the government to support and regulate S&T-related industries in the public interest.

The Public Understanding of Science movement was intended to improve communication between scientists and citizens in a way that would strengthen the basis for informed citizenship and improve responsible governance. However, secularisation and post-modern scepticism characteristic of the late 20th century generally has led to a self-reinforcing dynamic in which scientists increasingly need to explain and justify their activities and conclusions to the public, while publics increasingly regard both the promotionalism and the content of the scientists' messages as suspect, requiring further explanation and justification. The decline in trust between scientists and the public is a natural outgrowth of this dynamic. But is this recognised as problematic?

It would appear that the UK has wound itself into an inescapable dilemma. The British public would appear to be very volatile at present, with mass protests on "countryside issues" in 1999 and on fuel prices in 2000 both catching everyone by surprise and immobilising much of the country, albeit for a short period of time. For vulnerable science-based industries, such as the beef industry, such expressions of public frustration can be catastrophic. Will more, and more "reliable", scientific information, serve to reassure the public, or will efforts to communicate merely arouse further public suspicions and lead to further consumer and citizen revolts?

⁹ Parliamentary Office of Science and Technology, *OPEN CHANNELS: Public dialogue in science and technology*, Report No. 153, March 2001.

Has the recent flourishing of public consultation exercises in S&T had identifiable influence on science-related policy? Will consensus conferences come to complement other types of expert-led science advice, or will they become regarded as costly exercises that merely broadly replicate the results of House of Lords inquiries? It may be too soon to say. However, there are some indications that the current interest in public dialogue may turn out to be a passing fancy. The POST Report on "Open Channels" was launched on the same day as a House of Commons S&T Committee Report on "The Scientific Advisory System", but at a separate event. One might infer that public consultation is fine but the decisionmaking process will remain firmly under the control of the policymakers on the basis of expert advice, as it has been "all along". Meanwhile, plans to massively increase investment in Public Understanding of Science activities arouse suspicion that the public will be presented with a surfeit of new museums and exhibitions. Investment of money from the National Lottery must be matched by other sources of funding and revenue, and is not intended to cover operating costs. Many people are asking what fate will befall all these new science centres, which may well go the way of the Millennium Dome. Are they merely a sponge to soak up both public and private funds for the benefit of a relatively small (and invariably underestimated) segment of the British population, and would they in reality cater to the "converted" at the expense of the "masses"? Is the balance between conveying knowledge and sheer entertainment appropriate?

What of public funding for research, one of the primary objectives of the PUS Movement? The election of New Labour in 1997 did not result in any significant changes to the structure of the national budget. Science, and academia, continued to suffer cuts. Only in the budget year 2001-2002 has the 20-year decline in research and academic funding been reversed. There have been small increases throughout the system since, but actual receipts of government funding have not always matched the figures given in the budget statements, especially since the war in Iraq. Recent world economic conditions, combined with the political sensitivities associated with increasing taxation levels do not bode well for most Western governments primary sources of income, and the UK is no exception. The political will to increase funding for education and science may have recovered, but if the tax base does not recover, political backing may be of only "academic" interest, while real-life academics and researchers themselves see little change.

Public Understanding of Science in the UK has become an issue of national importance, and it has become embedded into British culture. But, somewhere along the line, science itself would appear to have been forgotten.