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Constructing the scientific citizen: science and democracy in the biosciences

Alan Irwin

The relationship between science policy and public opinion has become a lively topic in the UK—especially with regard to the BSE crisis and genetically modified foods. A number of governmental publications have recently advocated greater public dialogue and engagement. In this general context, the paper explores the configuration of *scientific citizenship* and of the *scientific citizen* within policy and consultation processes. Building upon a detailed examination of one important social experiment—the Public Consultation on Developments in the Biosciences—the social construction of both science and public consultation is considered. With particular attention to the framing of issues for public debate, the constitution of audience and the construction of citizenship, the paper argues the need to move beyond mere sloganizing over science and democracy. The discussion concludes with a presentation of competing *technologies of community* and an assessment of their significance for the future practice of scientific citizenship.

The 1990s were a very significant period for science and public policy and, especially, for science/public relations in the UK. The BSE crisis built up steadily through the decade—and remained a focus of lively debate and policy activity at the start of the new century. By the late 1990s, another science/public issue threatened to eclipse even mad cow disease: environmental and food safety concerns over genetically modified organisms (GMOs). This paper examines the construction of science–citizen relations within late-1990s discussions over the biosciences.

While the British government's handling of the BSE crisis has been much criticized, the initial response to increasing public disquiet over GM foods suggested that little had been learnt. Certainly, Prime Minister Tony Blair seemed uncharacteristically out of touch with public sentiment on the issue. As one (generally Labour-supporting) tabloid newspaper put it in a February 1999 headline:

“THE PRIME MONSTER.

Fury as Blair says: I eat Frankenstein food and it's safe.”¹

The same front page article—illustrated by an artistic impression of Blair as the monster—went on to report that Blair was “frustrated” that the “potential benefits of GM food are being ignored in the escalating row.” The Prime Minister also revealed that he is happy to eat “Frankenstein food”—and indeed that he gives it to his children.

This last comment irresistibly reminded British readers of a former Conservative agriculture minister's public feeding of a beef burger to his daughter at an early phase in the “mad cow” crisis. The rather depressing implication seemed to be that, despite the widely

held view that science/public relations had been badly managed in the BSE case, very little had actually been learned at the highest political level. Once again, an uncertain field of science was being employed as the basis for categorical assurances over safety while public concerns were arrogantly dismissed as irrational and emotional.

However, this negative assessment of the late-1990s relationship between science, policy-making and the wider publics must be tempered with a broader view of the changing context for public understanding of science in the UK. For example, in 1997 the government's chief scientific adviser produced a set of principles for government departments concerning the use and presentation of scientific advice in policy making. The emphasis here was very much on openness and consultation. This suggested a considerable change from the previously confidential treatment of scientific advice within government—and indicated the chief scientist's personal commitment to improving the quality and public credibility of such advice.

In October 1998, the Royal Commission on Environmental Pollution (RCEP) produced its influential report on *Setting Environmental Standards*.² This broad-ranging review advocated much greater transparency and openness within decision-making. It also stressed the significance of public engagement and participation—with particular emphasis on public trust and the articulation of environmental and social values:

“Those directly affected by an environmental matter should always have the accepted right to make their views known before a decision is taken about it. Giving them that opportunity is also likely to improve the quality of decisions; drawing on a wider pool of knowledge and understanding (lay as well as professional) can give warning of obstacles that, unless removed or avoided, would impede effective implementation of a particular decision. . . .”³

The RCEP report highlighted the relationship between science and uncertainty, the importance of public confidence in scientific developments and also possible mechanisms of public deliberation. The report added weight to arguments for a more democratic and open treatment of science. In so doing, it also demonstrated an awareness of recent findings from social science (for example, concerning the significance of public trust in institutions and the centrality of ethical concerns within public risk assessments).

This twin phenomenon of a newly *harmonious relationship* between UK policy processes and social scientific research, and of a much *greater degree of openness* to public evaluations, was to feature even more strongly in the 2000 report on *Science and Society* from the House of Lords Select Committee on Science and Technology.⁴ As with the previous policy initiatives, the emphasis of the Lords report was on increased openness and transparency in the treatment of scientific advice, the recognition of scientific uncertainty, and the legitimacy of public values and concerns⁵. The House of Lords Select Committee began its report in the following terms:

“Society's relationship with science is in a critical phase. Science today is exciting, and full of opportunities. Yet public confidence in scientific advice to Government has been rocked by BSE; and many people are uneasy about the rapid advance of areas such as biotechnology and IT—even though for everyday purposes they take science and technology for granted. This crisis of confidence is of great importance both to British society and to British science.”⁶

The Lords report identified a “new mood for dialogue.” Direct engagement with the public over science-based policy making should no longer be an “optional add-on” but instead a “normal and integral part of the process.” The report certainly represents a move away from the deficit theory and towards genuine changes in the cultures and constitutions of key decision-making institutions. The report specifically advocated the opening of institutional

terms of reference and procedures to “more substantial influence and effective inputs from diverse groups.”⁷ As far as British policy debate is concerned, *Science and Society* takes us a long way from the more traditional portrayal of science/public relations as expressed, for example, in the Royal Society’s 1985 report on *Public Understanding of Science*.⁸

In July 2000, the chief scientific adviser proposed a new Code of Practice for scientific advisory committees that further emphasized transparency, the need for an inclusive approach and practical mechanisms for public dialogue. It was intended also that the output from Lord Justice Phillip’s inquiry into BSE and the House of Commons Science and Technology Select Committee inquiry into the scientific advisory system would feed into consultation over the new code. July 2000 also witnessed publication of the new white paper on science and innovation.⁹ This document once again emphasized public dialogue although, tellingly, in a chapter focusing on “Confident Consumers.”

All of this suggests that, despite the prime minister’s immediate response to the GM food issue, the UK government system is undergoing a significant period of review and reassessment in terms of its handling of scientific and public concerns. As part of this process, social scientific analyses have found a more attentive policy audience than has previously been the case in the UK.

Certainly, policy calls for a recognition of the fundamental nature of scientific uncertainty, of the significance of public trust and confidence, and of the need to move beyond the deficit portrayal of public responses can all be traced back to academic research over the last decade or so.¹⁰ It is also symptomatic of this new context for science/public relations that the published findings of the Economic and Social Research Council (ESRC) Global Environmental Change research program received a positive policy reception.

Thus, in the ESRC program’s October 1999 briefing on *The Politics of GM Food*, the emphasis was on “more effective ways of handling political decisions in the face of uncertainty” and “the central need for public involvement in issues that are inherently ethical in nature rather than purely scientific.”¹¹ For anyone who has followed science and technology policy debates in the UK over the last few decades, the congruence of official statements and social scientific findings seems remarkable indeed.

However, and as Tony Blair’s remarks on GM food remind us, it is probably more appropriate to view this new mood of dialogue and public engagement as a matter of debate and contention within government rather than as an irrevocable shift. It may well be that, on balance, “dialogue theory” currently has the upper hand over deficit theory. Nevertheless, there is still relatively little UK experience (especially for government) of moving from statements of general intent to practical applications. Equally, and as the 2000 white paper emphasizes, the economic pressures for continued science-based innovation are powerful within the UK.

The search is therefore on for an approach to public engagement that will permit rather than impede scientific and technological development in areas such as biotechnology and the biosciences. In such a situation, it is possible to predict likely constraints on the form and extent of public dialogue over science—especially if public discussion is seen to hinder innovation and economic competitiveness.

In this changing context, it becomes especially important to analyze the particular constructions that are being placed upon what we can term *scientific citizenship*. Does dialogue imply that public knowledges are given the same status as scientific understandings—or instead that familiar deficit notions of an uninformed public are recycled? Who, for example, gets to decide what counts as a legitimate problem for discussion? How are the *informative* (or information giving) and *consultative* (or information gathering) dimensions of participation to be balanced? What happens when public opinion is opposed to government policy—or, more likely, when certain shades of opinion are opposed but others are in favor? We also need to be

aware of arguments concerning the “special” character of science within public discussions. As Nelkin put the general issue in the mid-1970s:

“The complexity of public decisions seems to require highly specialized and esoteric knowledge, and those who control this knowledge have considerable power. Yet democratic ideology suggests that people must be able to influence policy decisions that affect their lives.”¹²

Rather than viewing science and democracy as fixed or opposing points, the argument in this paper is that we should examine the specific configurations of these concepts—and of “scientific citizens”—within contemporary debate. Put bluntly, *how is the scientific citizen being constructed within current policy and decision processes?* This question is especially important given the apparent academic and policy need to move beyond the mere advocacy of scientific democracy and towards a more considered treatment of the possible *forms* of such democracy and their implications for the wider publics.

In order to pursue this objective, one important governmental initiative will be considered as an example of the construction of both science and public consultation. We will be especially sensitive to the framing of issues for public debate, the constitution of the “audience” for such discussions, the characterizations of science (and of scientific fact) within the initiative and the implicit model of scientific citizenship being employed.

The UK’s Public Consultation on Developments in the Biosciences (PCDB) explicitly attempted an open and two-way approach to the public. Between 1997 and 1999, this government-led consultation aimed to build up a public assessment of the “biosciences” (including xenotransplantation, animal and human cloning, genetic modification of food, and genetic testing). In British terms, this represented a path-breaking exercise—and one intended to have wide consequences for the operation of national regulatory policy. Announced by the minister of science, commissioned by the UK Office of Science and Technology (OST), and conducted by one of Britain’s best-known market research companies (MORI, or Market & Opinion Research International), this was a high-profile and forward-looking consultation in a politically, and economically, sensitive area.

The discussion here is based upon published materials from the consultation but also the author’s direct experience as consultant to the qualitative phase of the exercise.¹³ This account, therefore, draws upon attendance at two advisory group meetings, extensive informal discussion with those engaged in the initiative and observation of three qualitative workshops.

1. Constructing scientific democracy

“The Public Consultation on the Biosciences was an initiative without precedent in the UK in terms of the numbers of people involved in both the qualitative and quantitative research, and in terms of the focus on a range of technologies grouped under the heading ‘the Biosciences.’ It was thus, in effect, an experiment on a large scale.”¹⁴

In November 1997, John Battle, Minister for Science, Energy and Industry, announced his intention to hold a public consultation exercise on bioscience issues. According to OST, Battle believed that the debate over biotechnology should be extended to include those without preconceived views. This also would allow a deeper exploration of the wider, including ethical, issues associated with developments in the biosciences. On that basis, the minister hosted a preparatory meeting with a range of interested parties in March 1998.¹⁵ At the meeting, Battle emphasized “the significance of developments in this area and the importance of broader

activity to encourage measured and inclusive debate on major scientific issues.” The main purpose of the exercise was to identify and explore public hopes and concerns and to feed these into the policy process.

The preparatory meeting involved those active in the biosciences and science communication, including representatives from the Wellcome Trust, Genewatch, the Church of Scotland, the Royal Society, and the Bio Industries Association. In response to Battle’s observation that there is no template for this kind of event, a range of suggestions and questions was put forward. These included (from the Church of Scotland) support for a small group and “bottom up” approach, (from Genewatch) the need to balance inputs from the natural and social sciences, and also to remedy the “dislocation between how people feel and the regulatory system,” (from the European Commission) the need to have “informed” rather than “emotive” debate, (from Greenpeace) the need to recognize that judgments are informed by personal values and emotions and that these are important components of the debate.

While the preparatory meeting was broadly in favor of the new initiative, it was already clear that various parties brought contrasting models of science and democracy to the discussion. Certainly, participants placed different degrees of emphasis on the need for debate to be scientifically informative and/or citizen consultative. At the same time, there appeared to be an agreement that the consultation should ensure that “shades of grey and areas of uncertainty were explored.” Equally, and as a member of the Green Alliance put it, it was necessary to have more clarity about the objective of the exercise. John Battle concluded the meeting by noting that this kind of discussion had been an experiment in itself.

Right from the start, however, it is important to set the consultation in the context of other science/public initiatives in the biosciences taking place in the late-1990s. One contemporaneous research project to have considered these issues from a public perspective was the *Uncertain World* report on genetically modified organisms, food and public attitudes in Britain prepared by the Centre for the Study of Environmental Change (CSEC) at Lancaster University.¹⁶ Sponsored by Unilever, and with input from the Green Alliance and other NGOs, this study was based on nine focus group discussions held in the latter part of 1996. The project highlighted public ambivalence towards GMOs in food products, but noted also the general sense of inevitability and fatalism regarding such technologies. The report observed peoples “mixed feelings about the integrity and adequacy of present patterns of government regulation, and in particular about official ‘scientific’ assurances of safety.”¹⁷

The Lancaster report concluded:

“Our suggestion is that the key need arising from this research is for urgent and imaginative ‘institutional’ experiment. . . . This should be aimed both at attuning industry and government better to public sensibilities, and at advancing public involvement in the crucial range of issues raised by the new commercial phase of GMO technology. The research gives grounds for concern that limitations in present arrangements, coupled to wider inadequacies in present UK regulatory culture overall, may be concealing from view public concerns of major significance for the future.”¹⁸

Immediately before the biosciences consultations, a second UK exercise took place—this time, with a practical and policy orientation that was even more explicit than that of the Lancaster study. *Citizen Foresight* addressed the future of the agriculture and food system.¹⁹ As described in a report by the London Centre for Governance, Innovation and Science, and The Genetics Forum, the methodology of this initiative in democratic policy-making was designed by an expert group with experience in genetics, food, policy-making and citizen participation.

The key feature of this new exercise was the random selection of 12 British citizens who came together for 10 weekly meetings (and some 30 hours) to listen to evidence, ask

questions, and draw conclusions. Members of the panel then chose the particular topics for discussion. Expert witnesses appeared at the direction of the panel. In that way, and within practical constraints, witnesses could “define for themselves what they regarded as relevant expertise.”²⁰ The members of the panel drew up their own conclusions—expressing areas of unanimous agreement but also minority views. Ownership of the results explicitly belonged to the citizens themselves.

The main conclusions of the citizens’ panel were that genetically modified crops are unnecessary, that all foods should be labeled as “GM” or “GM-free,” that agriculture should be transformed away from intensive methods towards low usage of pesticides and “artificial chemicals,” and that food distribution is “currently in the hands of too few supermarket companies.”

Against the background of such recent initiatives, an advisory group to the biosciences consultation was appointed in June 1998. Membership was drawn from the Women’s Institute, the supermarket chain Sainsbury’s, the editor of *Nature*, the Green Alliance, Wellcome Trust, Zeneca, the University of East London, and the Biotechnology and Biological Sciences Research Council (BBSRC). Both the constitution and status of this advisory group were matters of discussion at early meetings. For example, questions were raised about the exclusion of any organization directly opposed to developments in the biosciences. It was also agreed that the group should have an advisory rather than steering role within the consultation since, very importantly, the OST was to be in overall control of the process. It was accepted by the group that a code of collective responsibility should apply to all decisions.

In its first meetings, the advisory group was especially keen to explore the precise meaning of the unfamiliar term “biosciences.” At least one member queried the feasibility of maintaining such a broad coverage since there may be significantly different public perceptions relating, for example, to food or health. Certainly the two previous initiatives had been given a much more specific focus than the biosciences. Against this suggestion, it was argued that a focus on generic issues would make the results more “applicable.” This argument was reinforced by the notion that if the exercise concentrated on “principles underpinning accessibility and the use of information and the roles and remits of advisory and regulatory bodies” then it should be possible to work at the generic level.

Informal interviews within government suggest that employment of the term “biosciences” also facilitated the exercise being located in the Office of Science and Technology whereas “biotechnology,” for example, might be seen as the particular responsibility of another government department. Similar questions of departmental jurisdiction were seen to apply to an explicit focus on, for example, food or health. Certainly, members of the advisory group considered that the OST presented a more neutral stance on these issues than the Department of Trade and Industry (which was characterized as a sponsor of the biotechnology industry and therefore problematic in such a consultation). At the second meeting, it was agreed that biosciences should cover “genetics research and its applications.”

Immediately, therefore, we gain a sense of the institutional negotiations behind the consultation and its specific framing. Inevitably, such discussions excluded the publics whose views were considered to be central to the exercise.

The incoming minister for science, Lord Sainsbury, joined the third meeting of the advisory group in October 1998. By this point, a number of characteristics of the consultation clearly marked it apart from the *Uncertain World* or *Citizen Foresight* projects. As the minutes of the October meeting record it, Sainsbury expressed one of his overall priorities as being the “optimum use of scientific advice to inform decision-making, both by Government and the general population.” The minister also accepted that there was a general lack of faith in the Government’s use of science and in oversight processes.

“To remedy this Government has to ensure that not only are its systems appropriate, but that their existence and role are communicated. To restore public confidence in the Government’s use of scientific advice required people to understand the mechanisms used to arrive at decisions and accept that those were appropriate and based on sound principles.”²¹

This suggests a decidedly loaded presentation of the science/citizen relationship and one that assumes that better communication will resolve problems of public confidence. In response, a member of the advisory group stressed that it was important to avoid the “deficit model, which simply assumed that the provision of information would ensure public confidence.” Lord Sainsbury’s reply was that “many basic scientific facts ought to be agreed and that the information about the regulatory system was factual, which should mean that a large amount of information. . . could be agreed.” This drive to produce “facts” that could then unproblematically feed into the exercise was a major feature of the consultation—marking it apart both from citizen-led approaches (which aim to respond to expressed public needs) but also from sociological perspectives that suggest that the “facts” are never so unproblematic within contentious areas of debate.²²

By this point it was also clear that the consultation was to be very much focused on the UK’s system of bioscience regulation, oversight and control. As Sainsbury expressed it:

“Understanding people’s knowledge and expectations of the oversight and information systems was a necessary starting point to allow the identification of whether the systems themselves, or the way that their role is communicated, can be improved.”²³

Specifically, the public consultation would inform a larger governmental review of the regulatory structure for biotechnology and genetic modification. Thus, it was emphasized to the group at its fourth meeting that it was important for the new Ministerial Group on Biotechnology to be kept fully informed of developments—suggesting that the primary audience for the consultation was government itself. Chaired by the Minister for the Cabinet Office, the Ministerial Cabinet Committee on Biotechnology and Genetic Modification (MISC 6) announced its intention in December 1998 to:

“...address any gaps or unnecessary overlaps in our current framework and...consider other important questions such as whether our systems could be simplified and made more transparent, and the ways in which we consider ethical and stakeholder interests.”²⁴

In May 1999 a new strategic structure for biotechnology was duly announced—with the public consultation cited as one specific input to this.

Meanwhile, in October 1998, Lord Sainsbury established the following general aims for the initiative:

- What is the level and nature of people’s awareness of technological advances in the biosciences?
- What issues do people see arising from these developments in the biosciences and how important are these compared to other major scientific issues?
- What is the extent of people’s knowledge of the oversight and regulatory process in the United Kingdom and Europe?
- What issues do people believe should be taken into account in any oversight of developments in the biosciences?
- What information should be made available to the general public from the regulatory system and about advances in the biosciences?

Sainsbury justified the initiative in the following terms:

“The consultation sets the challenging task of seeking the public’s views and promoting informed debate. Our long-term aim is to encourage public confidence in the Government’s use of scientific information and know-how. Understanding what people expect of Government and science is crucial to meeting their needs. I hope that the consultation will help focus the policy-making process... it already seems that the OST consultation could be a more citizen-led and participatory initiative than any carried out on science and technology in the past.”²⁵

Once again the encouragement of public confidence features prominently. At the same time, the intention to make the exercise “citizen-led and participatory” is spelled out clearly. Nevertheless, it is very apparent that these questions were being generated by government rather than by members of the public or even the advisory group.²⁶ These centrally set questions were to shape the initiative and, especially, provide the basis for public questioning.

It was agreed at this time that the initiative should collect both qualitative and quantitative evidence. As generally characterized within the advisory group, it was important that the consultation should incorporate in-depth group discussions *and* statistically representative individual responses. Put slightly differently, the consultation was attempting to borrow from the previous experience of qualitative and focus group research—while also preserving the “scientific” validity and generalizability of its eventual conclusions. The consultation would thereby involve far more people than had the *Uncertain World* or *Citizen Foresight* studies.

Meanwhile, the link to the regulatory review process and the consequently tight timetable put the exercise under substantial pressure from the start. While in October 1998 discussions over the consultation were still at a preliminary stage, the plan was for the whole exercise to be completed by April/May 1999 in order to inform the policy review of biotechnology regulation. The advisory group saw the possibility that the consultation could very directly inform governmental activity as a major strength of the exercise (especially when compared to the two previous initiatives discussed in this section). However, the short time-scale was also a matter of some concern to members who felt this allowed insufficient scope for discussion and consideration.

OST recommended that the recently established People’s Panel should provide the sample for the initiative and that MORI, the company that runs the People’s Panel, should undertake the actual consultation. The People’s Panel is based on 5,000 adults selected as being “representative of the UK population in terms of age, gender, region and a wide range of other demographic indicators.”²⁷ The Panel had been recruited in the summer of 1998. The Social Research Division within MORI managed both the Panel and the OST consultation.

Certainly, decisions needed to be made and acted upon rapidly. Equally, the consultation had now moved from its initial unformed and open stage (as announced by John Battle) to a large-scale and “representative” exercise based upon a sophisticated social research methodology.

2. The public consultation

At the advisory group’s fourth meeting (also in October 1998), the two-pronged methodological approach was confirmed: qualitative discussion groups (or workshops) and a larger quantitative survey. However, when in December, and following the perceived success of the qualitative pilot study, the continued need for the quantitative survey was challenged, the justification was provided as follows by the OST chair of the advisory group: “...in order for the study to be taken seriously by ministers and other observers, a quantitative stage would be

essential. . .” This official requirement for quantitative data and the implied down-grading of qualitative research (at least in terms of political impact) represents a significant issue for public understanding of science research—and one that deserves further discussion and comparative analysis.

In addition, the particular requirement for ministerial credibility suggests a possible tension between the citizen-led and policy-informing intentions of the exercise. The institutional pressures to speak to government in a recognizable fashion were very apparent. The specifically *scientific* focus of the consultation on the biosciences was highly relevant to this aim since again it allowed public opinion to be expressed within the operational categories of government.

The qualitative phase of the research was eventually based on two-day workshops held in six venues around the UK. This involved some 120 members of the public. The quantitative work included over 1,100 members of the People’s Panel in interviews.

The workshops for the qualitative phase followed a carefully structured format. The first day covered:

- general awareness of the biosciences in the context of other areas of scientific and technological change;
- questions of influence and trust;
- a discussion of regulation—who is, and who should be, involved?; and
- public views on information (including questions of what should be made available to the public and how trustworthy and reliable this should be).

Within separate groups (or “syndicates”), participants were asked to consider specific topics: fertility and reproduction, genetic testing/screening, gene therapy, xenotransplantation, medicines, cloning, animals and microbes, plants and microbes. As part of these discussions, showcards and handouts were used to stimulate discussion and raise important issues.²⁸ Handouts aimed to provide factual information, while showcards were explicitly designed to encourage public debate and discussion.

The design and content of these materials was a topic of lively debate within the advisory group—especially with regard to their scientific accuracy and accessibility to a non-specialist audience. Stimulus materials were not only read by the Advisory Group and MORI, but also by the Department of Health. An established team of science writers prepared the materials. This discussion reflected Lord Sainsbury’s concern both to inform and collect public views—and, significantly, to orient discussion around officially recognized “scientific” issues.

The determination to map public views on to technically and institutionally defined issues represents a very important feature of the consultation. Viewed critically, this “pre-framing” of the agenda, as expressed in Lord Sainsbury’s five questions, restricts the possibilities for public responses to operate within their own terms of reference and frameworks. In illustration of this, there was little scope for members of the public to challenge whether any comparison across “scientific issues” is valid or, for example, whether the key issue is information or political empowerment with regard to science and technology. Qualitative research into environmental matters has previously suggested that public views of pollution do not stand apart from the wider constructions of everyday life and meaning.²⁹

Thus, one study of local responses to chemical hazards found that public assessments of risk were inseparable from a larger sense of social powerlessness and distrust in governmental institutions (and politicians of all kinds)³⁰. In such a loaded context, analytical distinctions between different scientifically defined issues (in this case, between chronic health problems and the risk of large scale explosion) become less important than wider social and personal concerns over welfare and quality of life. While the consultation separated the biosciences into particular topics, the possibility remains that this framing misses out on more pervasive

problems and anxieties. Equally, the construction of the exercise around issues likely to be unfamiliar to participants and then providing factual information to overcome their assumed ignorance, suggests a return to the deficit theory of public groups as operating in a knowledge vacuum.

This question of pre-framing the agenda represents a central issue for consultations of this kind, especially in emerging areas of scientific concern where researchers will inevitably find themselves both generating and collecting public views about topics that have not previously been considered—and doing so in an unavoidably artificial and decontextualized fashion. In the consultation's defense, and based on observation of three workshop sessions, members of the public demonstrated a high level of engagement and interest—especially given the standing start with which they began the discussions.

Certainly, members of the public were generally keen to take away information on the biosciences at the end of the first day of the workshops. Typically, they returned a week later with well-considered views (based partly on the materials provided but also on discussion with family and friends as well as careful attention to the media). Equally, the morning of the first day in each of the six workshop locations was unprompted in order to allow the wider expression of public views. It was also very clear to this observer that participants generally enjoyed their involvement—often expressing the view that all this was unfamiliar to them but that it had really made them think. The fact that public inputs might in some way inform government policy undoubtedly added a certain excitement and focus to the exercise.

Of course, these positive comments relate mainly to the qualitative phase of the exercise. Despite the careful design of the questionnaire in terms of drawing upon the qualitative stage and employing a limited number of open-ended questions both in the pilot and in the actual face-to-face interviews, interpretive flexibility is inevitably constrained in such a large-scale survey.³¹ Equally, the individual and non-deliberative nature of interview responses impedes the articulation of everyday context and the expression of more pervasive concerns. However, a quantitative approach does allow engagement with a much greater number of respondents than can be accommodated within a deliberative workshop. There may therefore be a trade-off here between interpretive flexibility and volume of respondents.

Handouts and showcards for the first day of the qualitative phase covered the full range of topics covered by the consultation. A few examples of showcards can be offered from the plants area:

- **Are genes good or bad?** “Genes are present in all living organisms. They do not have moral characteristics. They are merely chemical components.”
- **Is it natural?** “In a natural world, human beings would not fly in airplanes, send rockets to the moon, eat Pot Noodle. . . have governments, or live until they were 70, 80 or 90. So what is natural?”
- **Can the companies be trusted?** “Companies are people in work; this helps solve unemployment. Companies can make the investment and take the risks that are needed. That saves taxpayers money. They are entitled to any profit if they make agriculture more efficient.”

Day 2 of the qualitative workshops followed a week later. Once modifications had taken place following the pilot exercise, this entailed each of the syndicates proposing what they considered to be an ideal mechanism for regulating their allocated topics. In that way, the day was very much focused on issues of regulation and control from a public perspective. Three questions were presented to the participants concerning their proposed regulatory mechanism: How can it ensure trust in the process of regulation? How can it deal with scientific uncertainty? And how should the new mechanism take account of public views?

After completion of this qualitative research, the quantitative stage was organized around a detailed interview format. Following piloting and various suggestions from the advisory group, the interview addressed questions of public awareness of scientific developments, the significance and meaning of biology and genes, the beneficial (or otherwise) character of such developments, the reasons why developments were taking place, and the character of the regulatory process (including questions of trustworthiness and possible information sources). Specific questions included:

- “Thinking about major scientific discoveries or development, do any spring to mind?”
- “When I say genes, spelled g-e-n-e-s, what if anything springs to mind?”
- “Now thinking about biological developments again, what things, if any, do you think you would personally take into account if you were deciding whether a particular development was right or wrong?”
- “Would you say you have had too much information about biological developments and their regulation, too little or about the right amount?”
- “Which, if any, of the following types of people or institutions would you trust to provide you with honest and balanced information about biological developments and their regulation? And which, if any, would you not trust?”

The time-scale of the operation should be re-emphasized at this point. The qualitative phase (involving a total of 123 respondents) was conducted between December 5, 1998 and February 6, 1999. Piloting of the quantitative research (among 50 respondents) commenced on February 6, 1999 and 1,109 main-stage interviews were conducted between March 13 and April 4, 1999. The research results were published in May 1999. The speed at which all this took place clearly put the exercise under tremendous strain—as discussions within the advisory group suggested.

Indeed, such was the speed of the operation that the advisory group’s report—produced so as to coincide with delivery of the main findings—noted: “At the time of writing, the Advisory Group has not seen drafts of MORI’s final report, so cannot comment on the report itself. This is one of several points in the process at which the input of the Advisory Group was significantly constrained by a highly compressed timetable imposed by Government requirements.”³² Perhaps of greater significance for the initiative, and as the advisory group also observed, the timetable allowed little chance for reflection on the qualitative findings before moving into the quantitative phase (although the advisory group expressed itself “content” that sufficient discussion had taken place).

Despite being written before the final report, the advisory group singled out a number of the most successful elements of the exercise. These included the use of two-day workshops rather than 2–3 hour focus groups, the use of an in-depth qualitative phase to inform the framing of the quantitative phase, the focus on policy-making and the regulatory system, the “full transparency” of the process. The advisory group also recommended that “the Government recognise this type of consultation as a necessary, productive and continuing part of developing public policy in the biosciences. Further consultations should be conducted, focusing on particular topics.”

The advisory group’s report repeated many of the points that had emerged in its previous meetings. Returning to the original questions posed by Lord Sainsbury, strong reservations were expressed about “assessing the level and nature of people’s awareness of technological advances in the biosciences” given the broad scope of the exercise and the limited time available. Equally, the advisory group had reservations about gauging the relative importance of issues from the biosciences “compared to other major scientific issues”—and not least because of the relatively low level of awareness with which members of the public commenced their

discussions. Once again, reservation was expressed about the generic term “biosciences”: “A particular concern was that it brought together the medical and agricultural applications of biotechnology, and that people’s reactions to these applications were likely to be quite different.”

The final MORI report appeared in May 1999. Among its key findings were:

- “that the public believe advances in human health represent the biggest benefit to arise from scientific developments;”
- “the vast majority of people (97 percent) believe it is important that there are rules and regulations to control biological developments and scientific research;”
- “the main issues people say should be taken into account when determining whether a biological development is right or wrong are whether people will benefit from it and whether it is safe to use;” and
- “the thing that people most want in relation to the biosciences is more information on the rules and regulations.”

On May 21, 1999, the minister for the cabinet office presented the main results alongside the announcement of a new regulatory structure for the handling of biotechnology. The report was authored by MORI and published as three volumes—with the third consisting of 145 quantitative tables.

3. The framework of consultation

Here then we have a carefully conducted exploration of public attitudes towards the biosciences. Although the timetable was tight, the exercise was conducted skillfully and sensitively. The advisory group noted in its report “... we have every reason to commend the results of the consultation as substantial and credible. They deserve to be taken seriously by ministers, members of the public, and commentators.”

As noted above, the author attended three of the qualitative sessions. A lively public discussion was observed—and especially during the second day of the workshop format. In line with previous qualitative research, public groups expressed well-developed views on these topics (despite their initial unfamiliarity) once they had been given the opportunity to ponder and discuss them both inside and outside the workshop. Members of the public also appreciated the opportunity to develop their thinking about this unfamiliar topic and for their views to be taken seriously by government.

This paper is, however, less concerned with matters of good professional practice than with the overall structuring and framework of this exercise. On that basis, we must take special note of its institutional framing. This took a number of forms.

First, there was the construction of the “biosciences” as a generic category despite reservations among the advisory group that this might blur the issues and lead to the domination of certain public concerns over others (for example, GM foods, which became an issue of particular media attention from February 1999 onwards—just as the quantitative phase was commencing). Second, we have noted the institutional requirement both to inform members of the public about developments in the biosciences and to gather views (suggesting a deficit theory element within the exercise). Third, there was the particular orientation of the exercise towards regulatory policy and oversight—with significant consequences in terms of the necessary time scale but also for the steering of public responses. Fourth, we witnessed the perceived need for institutional credibility as provided by quantitative data rather than qualitative responses alone. Linked to this, considerable importance was attached to statistical representativeness—presumably since it would be inappropriate for public policy to be guided by the reflections of

a small group of citizens (a requirement that does not seem to be uniformly applied within the exercise of democracy).

One consequence of this institutional framing was that these participants appear as essentially *reactive* members of the public rather than as citizens in any more active sense of that term. Going further, this framing led to the consultation taking shape as a highly sophisticated exercise in *social research* rather than as a citizen jury or a direct discussion between government and citizens. While there was scope within the investigation for unprompted and spontaneous responses from the public, the overall format was very much shaped by the governmental sponsors, the advisory group and the MORI researchers. It was perhaps for this reason that the House of Lords Select Committee took a very critical view of the exercise. In a short section on the consultation, this author is cited as offering the view that lay participants were “engaged by the issues” and developed “rich understandings.” Nevertheless, the committee concludes: “This in itself does not justify the process. . . . Indeed, despite its name, we see the exercise as closer to market research than to public consultation.”³³

One major advantage of the highly structured nature of this exercise is that it facilitated the construction of public responses in such a way that they can “speak to” government and therefore allow practical engagement with national issues and priorities. The disadvantage is that, despite the significant spontaneous and unplanned element within the research, public concerns were accommodated within the scientific framing of the biosciences and of one (albeit important) agenda that may or may not be shared by members of the public. It was thus the case that the format of the exercise assumed that development of the biosciences in some form would indeed occur—leaving those with fundamental objections sidelined within discussion (as one participant pointed out at the end of a workshop).

The assumption from the start was that members of the public should respond to the questions generated by government and the advisory group rather than, for example, members of the government and officials being obliged to respond to public questioning. In that sense, this exercise insulated government from public scrutiny while claiming to be participatory. In this social research framework, direct engagement between citizens and, for example, the advisory group would constitute a form of bias.

The next feature of the consultation that deserves our attention is the social construction of *audience*. Despite the early rhetoric of being “citizen-led,” it is hard to resist the conclusion that the prime audience for this government initiative was government itself. From the selection of the biosciences to the particular concern with regulation, and from the formation of questions to the rigid timetable, this exercise in scientific citizenship was conducted with one particular institution in mind.

This point was very clear in the second meeting of the advisory group when one OST official stressed the high profile of the exercise since it had already been “referred to in Ministerial correspondence, select committees and Parliamentary questions.”³⁴ Of course, the construction of this particular audience by no means negates the value of the exercise. As noted above, the novelty of “ordinary citizens” speaking to government contributed greatly to the significance of the proceedings. However, it does emphasize the very limited degree to which this consultation could be described as “citizen-led.”

This observation suggests the practical significance of the *institutional location* of public consultation exercises. Inevitably, the organization of the biosciences initiative primarily by civil servants has consequences for priority setting and direction. In this case, location in OST brought both advantages and disadvantages as we have discussed.

Linked to these points, the exercise was very much *science centered* in its orientation.³⁵ The first phase of the exercise was trying to educate and inform as well as simply to listen. Much discussion took place within the advisory group concerning the technical objectivity,

accuracy and neutrality of the briefing materials. What seems especially noteworthy about the information provided is that, despite the advisory group's very apparent concern to maintain scientific accuracy, such statements inevitably combine social and scientific assumptions. This is very explicit in the examples offered above—and notably in the treatments of trust, the “natural” and the moral neutrality of genes.

Thus, even if one agrees with the statement that companies are “entitled to any profit if they make agriculture more efficient,” this can in no way be seen as a politically neutral assertion. Once again, and inevitably, social and cultural assumptions are embedded in the structure of the consultation. What seems noteworthy here is that a different approach to neutrality seems to have applied according to whether statements were construed as either factual (handouts) or non-factual (showcards). The apparent assumption within the exercise was that the “hard facts” could be separated from matters of judgment and opinion. However, the selection of what counts as hard fact represents an inevitable judgment on the part of the exercise's promoters. Furthermore, and seen from an outside perspective, this fact/value distinction can be viewed as an attempt to limit rather than enhance discussion of the core issues. Within the exercise, there was very little scope for such hard facts to be exposed to critical scrutiny or contestation by more critical social groups outside the immediate group of advisors.

These points about institutional framing extend also to the main *data analysis and presentation*. This is not a citizen-written report but rather the work of a professional organization seeking to represent the views of citizens (a very important distinction in terms of scientific citizenship).

In one example of this, the concept of “net beneficial score” is employed within the report. This is defined as the proportion saying something is beneficial to society, minus the proportion saying it is not. Thus, the development of new medicines receives a score of +56, transplants +50, and cures for disease +42. Cloning, meanwhile, scores –55, genetically modified food –44, and genetic modification of plants and animals –27.

Issues of trust are dealt with in similar aggregated fashion. Seventy-one percent of the British public indicated that they would trust their family doctor to make decisions on their behalf in the regulation of the biological sciences.³⁶ Thirteen percent said they would not trust general practitioners (GPs) in this way. The net trust figure is accordingly +58. This compares very well with the media (–57), industry/manufacturers (–59), retailers (–61) and environmental groups (+36).

There are certainly reasons to be skeptical about such “net” figures—and not least because of the static, decontextualized and one-dimensional treatment of both benefit and trust that is being offered. More generally, the very notion of “net” in this context suggests a broad, generalized and researcher-driven model of public attitudes.

Rather than trying to undermine a very innovative and important consultation exercise, the intention in this section has been to draw attention to its operational framework and working principles. The whole point is that assumptions concerning, on the one hand, the practical needs of policy and, on the other, the relationship between science and citizenship are unavoidable in such situations. The argument of this paper, however, is that rather than viewing these as unfortunate weaknesses, we need to acknowledge, explore and scrutinize their character and, as necessary, open them up to larger debate and inquiry.

4. Technologies of the biosciences, technologies of community

“New ‘experts of community’ have been born, who not only invent, operate and market these techniques to advertising agencies, producers, political parties and pressure groups, but who have also formalized their findings into theories and concepts.”³⁷

This study of the intricacies of one consultative exercise may appear to have taken us far from the wider debates over science and democracy with which this paper began. However, the argument of this paper is precisely that we need to move beyond general exhortation alone over such matters and instead explore the social processes, underlying assumptions and operational principles through which scientific citizenship is constructed in particular settings.

Inevitably, presentation in this manner has suggested a rather critical view of the exercise. However, it is in the character of such practical initiatives that particular compromises over both science and democracy must be arrived at—and that these should be open to subsequent reflection. In its combination of quantitative and qualitative evidence, breadth of coverage and responsiveness to public views, this initiative contained many of the key elements that other exercises might reasonably emulate.

In very specific terms, a number of practical points have emerged during this discussion that might be useful for future practice. These include: the importance of the *institutional location* for any exercise; the balance of *information and consultation*; the extent to which the *pre-framing* of consultation agenda (as in Lord Sainsbury's original questions around which the initiative was subsequently built) can affect the form and outcome of those discussions; the degree of *activity (or passivity)* that is accorded to citizen groups; and the significance of underlying *social and technical assumptions* (for example, about the coherence of the "biosciences" in terms of public assessment and evaluation).

Other practical points relate to the lingering retention of the deficit theory within this case—so that the need to "inform" public debate was implicitly premised on public ignorance about the wider issues—and the significance attached to quantitative measures rather than to the articulate and persuasive expression of public views. We also have suggested that the attempt to separate the "hard facts" from the "matters of judgment" within such debates is inevitably a problematic process—especially since it was difficult for the citizens in this consultation to seek alternative assessments or argue back in scientific terms. Finally, questions must be raised about the feasibility of addressing such complex and unfamiliar issues in an individual interview and according to a pre-determined format. Certainly, the apparent institutional drive towards quantitative evidence needs to be tempered with a sense of the appropriateness of building complex data sets upon what may be transitory and preliminary expressions of public opinion.

In more general terms, this initiative had much to say about the importance of science but rather less about the character of modern citizenship. Citizens played an important role in this initiative and participated energetically, but their contribution was ultimately refracted through the research process. Certainly, the "citizen-led and participatory" aspect of the exercise was highly restrictive and suggestive of an indirect form of citizen engagement.

Within the overall framework, and as the quotation at the beginning of this section suggests, "experts of community" became spokespeople for the wider publics.³⁸ Meanwhile, the active engagement of social researchers as intermediaries between government policy and the wider public served to give the consultation a very particular shape and character. One conclusion from this paper is that greater attention should be given to these public intermediaries and spokespeople within public understanding of science research and practice. Of course, such attention also would need to take account of the manner in which PUS researchers are themselves also constituted as spokespeople within debates.

Going further, it can be acknowledged that at least two frameworks for the relationship between science and citizenship have been in operation within this discussion. Since all such frameworks embody working assumptions and practical compromises, we can present these as competing "technologies of community."³⁹

In the first place, there is the approach described here in some detail that can be labeled a *social research* framing of science–citizen relations. Operating in a highly professional

and customer-responsive mode, this has sought to achieve both depth and representativeness across the population—and to encapsulate public views in a manner that is timely, relevant, and digestible to policy makers. As has been suggested, this model ties in closely with current institutional agenda and working practices—and has allowed the government's categorization of issues to form the basis for consultation.

It does not seem too fanciful to view this as a clean, clinical, and rational procedure—especially when compared to the messiness and unpredictability of environmental protests, consumer boycotts and press criticism. Within such a model, direct contact between institutional sponsors (in this case, OST and the advisory group) and members of the public is seen to constitute a form of bias.

Second, we have briefly identified what can be termed the *deliberative democracy* model of direct discussion and engagement (represented here by the *Citizen Foresight* project). This model is shaped at least partially by (selected) citizens themselves, and is based upon more restricted but also more intensive reflections. The second model carries close affinities to other established approaches including citizens' juries and consensus conferences.⁴⁰ This framing of the science–citizen relationship grants a more active role to members of the public in defining agenda and relevance. However, and as has been suggested, the link to policy concerns and practical outcomes has often been correspondingly weak in the British context.

In drawing attention to the “deliberative” model, it must be stated that this approach also suffers from various limitations. Thus, deliberative democracy experiments are typically small scale (for example, some 12 people were involved in Citizen Foresight but 123 people were involved in the qualitative stage alone of the MORI study) and are very dependent on the particular group of citizens selected. Equally, and while such an approach might claim to be flexible and unencumbered by a predetermined agenda, constraints must inevitably exist on how issues are presented and what gets covered within any particular exercise. There also is no guarantee that many of the issues identified in the biosciences consultation might not re-occur in a deliberative format (for example, the adoption of a science/centered approach or the steering of the exercise according to a preframed agenda).

To these two existing models can be added at least one other possibility: A *qualitative and localized* model that seeks to place public assessments within the contexts of their construction and to emphasize the relational, dynamic, and discursive character of public views and assessments. As has already been implied, this fits less easily into the operational frameworks of policy-making institutions—although it does have important policy implications in terms of the advocacy of greater contextual sensitivity and the establishment of more open and two-way knowledge relations.⁴¹ Importantly, representativeness within such research is less a matter of statistical significance than of success in identifying structural characteristics and pervasive themes and social processes.

Rather than seeking a perfect solution to the relationship between science and democracy, such models illustrate Michael's general argument that these activities feed back to the public “visions of itself.”⁴² It follows that rather than viewing either academic perspective or participatory style as a fixed and unchanging commitment, it is necessary to adopt a flexible and situationally appropriate approach to all models and technologies of community.

In that way, the relationship between science and democracy should not be about the search for universal solutions and institutional fixes, but rather the development of an open and critical discussion between researchers, policy makers, and citizens. It is the argument of this paper that those engaged in the public understanding of science have a potentially key role to play in informing, investigating, critiquing and challenging these processes. At this point also, the discussion of science and democracy moves from the level of sloganizing to an important focus for both social scientific and practical investigation and experimentation.

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