

Report of oral evidence session with Prof Steve Rayner (SR), Oxford University & Prof Alan Irwin (AI), Brunel University

This evidence was taken at a meeting of the working group on January 14th 2004 and was written up by the secretariat. It has been approved by Prof Raynor and Prof Irwin.

Introductory Statements

Professor Irwin stated that there was always a danger of assuming that technology happens first and that social implications come later. This was not a good model as social change was often going on hand in hand with technological change. Equally, this implied that technology was fixed with social responses being obliged to fit around this. He felt positive about the opportunity to contribute to the debate on nanotechnology and hoped that, given the lessons from the public dialogues on BSE and GM, new ways of handling the dialogue could be institutionalised. He argued that nanotechnology therefore represented a challenge to society in terms of developing more inclusive, flexible and deliberative mechanisms for dealing with social and technical change. Can we take this opportunity to learn from previous experience or will the same mistakes be made?

Professor Rayner sounded a more cautionary note, suggesting that the record of the introduction of a series of technological innovations from nuclear power to biotechnology indicated that lessons about how to engage the public properly on technological governance issues were seldom carried forward from one case to the next.

He noted that while there are powerful incentives to declare the arrival of a completely new technological field, such as GM and nanotechnology, these were usually clusters of innovations, some of which were already established. There is a danger in putting all of the eggs into one basket in that problems in one application can easily stigmatised the rest.

He felt that one of the major societal implications was potential lack of reversibility, i.e. that no steps should be taken that would eliminate future choices.

Public worries about nanotechnology seemed to be centred on personal or societal privacy and autonomy, especially where nanotechnology was seen as enabling advances in sensors, IT and potentially implants. In this respect he felt that biological applications were likely to prove more persistently controversial than other applications of nanotechnology.

Evidence

Professor Rayner was asked if it might be more useful if scientists were talking about nanotechnologies rather than nanotechnology to stress that it was an enabling technology in many areas rather than a single application. He felt that it would have been useful, but that it might be too late to change the public's understanding at this stage.

The role of Science and Technology Studies

Asked what we could learn from Science and Technology Studies (STS) to help understand about societal issues and technology, Professor Irwin suggested that we should proceed cautiously. He explained that there were many uncertainties as to how public attitudes will develop. In the 1970s, it might reasonably have been predicted that there would be a much stronger backlash against GM in the USA than Europe, but the opposite was true. Governance, democracy, control and trust were the common issues and some questions would always crop up regardless of the type of technology being discussed. However, social responses can also shift over time so that it is not possible to have a one-off consultation and then proceed on the assumption that public concerns have been 'dealt with'.

Professor Rayner suggested that a key lesson was that scientific assurances that "it's all OK" were unlikely to be sufficient to reassure the public once their concerns had been aroused. . This approach implied a deficit model of public understanding which was, unfortunately, still quite prevalent among the scientific community.

Professor Rayner described three "flavours" of the knowledge deficit model:

1. The public lack knowledge and technology must be explained to them. They will then understand it and accept it.
2. The public lack understanding of scientific processes and that science cannot offer definitive assurances of absolute safety. When people understand the processes, they will accept the technology.
3. The public do not trust the scientific and governmental agencies responsible for a new technology, if trust can be restored to those agencies then people will understand and accept it.

All three models seem to be invoked in this case as they had been had been in the GM Debate. However, they are inadequate ways of understanding the issues. By focussing on remedial "communication", they leave the underlying concerns about the adequacy of technological governance untouched.

Given that public understanding of nanotechnology was accepted as being low by any measure, Professors Rayner and Irwin were asked what the role of STS in the debate about nanotechnology might be.

Professor Irwin suggested that scientific institutions were often arrogant in criticising poor reporting and scientists have the urge to "put people right" over technical facts and fiction. Science communication should be about opening up the debate rather than seeking to close it down prematurely. Criticism of the public for not understanding 'the facts' might mask deeper questions concerning the pace and direction of technical change.

Given that there was inevitably a low level of public awareness over nanotechnology, Professors Irwin and Rayner were asked how scientists should engage in the debate without first trying to simply explain the technical issues. Professor Rayner suggested that a proactive and anticipatory process of ongoing technology assessment would be required. This would include discursive engagement with the public about what sort of society we want and which technological applications would be compatible with it,

rather than starting out with the technology itself. A wide cross section of organisations would need to be involved, representing the state, the market and NGOs (as the best currently available representatives of civil society). However, Professor Rayner also noted that such enthusiasm for engagement could simply create another layer of technique in the debate rather than have the direct outcome desired. None of the voices in the proposed three-way debate could claim to be totally authoritative, but the combination of all three was better.

Risk and Regulation

Professor Irwin felt that there were often “unknown unknowns” in such a scientific field but that policy institutions tended to play down such fundamental uncertainties – sometimes creating subsequent problems as unrecognised uncertainties began to emerge. However, the public typically had a wider perception of risk and tended to want to deal with it through strong but accountable regulatory bodies which could openly address areas of uncertainty. Although scientists typically knew that there were always future uncertainties, the expressed level of uncertainty often diminished as discussions moved away from the laboratory and into the policy arena.

Professor Rayner suggested that issues of consent, liability and trust were as important as probabilities of negative outcomes in understanding what ordinary people mean by risk. He re-emphasised that irreversibility of outcomes was a key aspect to consider. In particular, it behoves society to consider very carefully any action that would close down future options.

Given that some sort of regulation would inevitably be applied to some fields that used nanotechnology, Professor Rayner was asked how they could be properly implemented in a world where Globalization and the World Trade Organisation (WTO) prevailed. Professor Rayner agreed that Globalization was a major challenge to the democratic process. The WTO had deliberately rejected the idea that countries could exclude goods or technologies for cultural reasons out of concern that these would be used as trade barriers. Hence, the WTO only gives standing to scientifically demonstrated health and safety concerns. This effectively eliminates from consideration many legitimate concerns that people may have about the impact of new technologies on their values and ways of life.

As the UK is a relatively small country, it is unable to have an independent position on a global scale and the ability of individual nations to opt out of particular technological advances has all but gone.

Professor Rayner also called attention to the growing technology gap between rich and poor countries, which could be exacerbated by nanotechnologies.

Asked whether Etc’s recommended moratorium on nanotechnology was a viable regulatory option, he replied that he would be very cautious of a total moratorium but there might be room for restrictions on particular uses and applications.

Asked if potential public concerns over ethical, social, military, medical privacy and governance issues were generic to any form of new technology, or specific to nanotechnology, Professor Irwin said that at this moment they were mostly generic although specific concerns might subsequently develop. He added that it is too early

to talk of a 'public attitude' to nanotechnology. Instead, exercises in consultation would inevitably be constructing (or framing) such attitudes even as they sought to capture them.

Stakeholder Dialogue

Given that some form of stakeholder dialogue on nanotechnology was being recommended by a number of organisations, the Working Group asked for recommendations for further engagement.

Professor Rayner warned against overly formalised mechanisms for managing public engagement stating that, in the extreme, they could be seen as attempts to manipulate the debate. The GM Debate had, to some extent, suffered from this perception, even though much of the debate was good and handled well. Professor Irwin added that some forms of straightforward public consultation could be defended as they were useful tools for gathering information and intelligence. In the case of nanotechnology, the public debate should not be one sided and a certain amount of disagreement and contested debate should be expected. Professors Irwin and Rayner both emphasised that any such debate would have to be ongoing and that it would be a mistake to believe that a definitive debate could be conducted that would settle the issues once and for all. Additionally, using art and drama to explain concepts and possibilities should not be ruled out. A broad spectrum approach would be required that encouraged young people to think about nanotechnology and its potential applications.. Professor Irwin added that it was important to address the 'emotional' as well as apparently 'rational' elements of the discussion.