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COMMENT

ABSTRACT A recent report from the UK House of Lords on *Science and Society* proposes that the public's understanding of science should not be construed on the 'deficit' model, but approached through improved 'dialogue'. This Comment suggests that this approach is insufficient in itself: what is required is the effective 'empowerment' of the public.

Keywords deficit, dialogue, empowerment, House of Lords report, public understanding

[This is the text, essentially as delivered, of a contribution to a plenary session on 'Science and Social Responsibility: Norms, Institutions, Audiences' which opened the 4S/EASST Conference in Vienna on 27 September 2000.]

Science and its Public: The Need for a 'Third Way'

David Dickson

Earlier this year, the Science and Technology Committee of Britain's House of Lords produced a long-awaited report on the relationship between science and society.¹ The very first paragraph sets the scene for why such a report was considered necessary. 'Society's relationship with science is in a critical phase', it says:

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 information technology – 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.

Two aspects of the report are particularly striking. The first is that, as everyone in this room is well aware, there is little particularly novel about the situation it describes. The historical record shows that scientific advance has almost always – and often legitimately so – been accompanied by public qualms. One can think back through the accidents at Three Mile Island and Bhopal to the early 1970s, when the issues triggering this

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feeling ranged from the chemical pollution of the environment by dioxins and PCBs to public concerns over the safety of nuclear power and the use of defoliants in Vietnam. For an earlier generation, the central issue was the use of science in the design and manufacture of nuclear weapons. And so on back to the Enlightenment itself.

In each historical situation, the issues may have been different. But the underlying focus of attention – the two-edged face of scientific progress – was very much the same. The key question today, of course, is not why there are tensions between science and society, but why governments and politicians feel it appropriate to address them and suggest solutions in the specific way that they currently do.

Perhaps the answer lies in the second striking aspect of the report, namely the way that its analysis avoids addressing a central factor in the debate, that of political power. The diagnosis of the current problem by the House of Lords Committee is that it is due primarily to a lack of awareness and understanding, whether this is the public's lack of awareness of the essentially beneficial nature of scientific progress – something for which it places much of the blame on the reporting of science-related issues in the mass media – or a lack of awareness by both scientists and politicians of the full nature of public concern.

The Committee's prescription is to go beyond conventional demands for increased efforts to promote the public understanding of science to recommend a new set of initiatives aimed at encouraging more openness in decision-making and greater dialogue between all the actors involved. The theory is that a combination of openness and dialogue will restore the basic trust in science that a modern high technology society requires.

Both, of course, are laudable objectives. The first in particular, as a journalist who has worked in Washington making full use of the possibilities created by the Freedom of Information Act, I particularly welcome. But do these suggestions go far enough? I suggest that they do not. For without additional attention to the political factors influencing, indeed frequently determining, the way the science is used in society, there is unlikely to be a resolution of the tensions created by the distrust that originates in the exclusion of individuals from decision-making. Significantly missing from a report written by a panel of politicians is the single, familiar phrase of an earlier British politician that summarizes this fact: 'knowledge is power'.²

Take, for example, the case of bovine spongiform encephalopathy (BSE), or 'mad cow disease' as it is more commonly known. The common perception, reflected in the quotation from the House of Lords report at the beginning of this Comment, is that the British public distrusts government science advisers because they lied in the early 1990s in assuring us that beef was safe to eat. What is frequently ignored is the public's (correct) perception that the lies originated in the influence of the beef industry over the Ministry of Agriculture, Food and Fisheries. They were not the result of either misbehaviour or excessive secrecy on the part of the scientific community itself.³

Or take the issue of genetically modified (GM) foods. It does not take much imagination here to see that the critical issue is not in the science – there is very little evidence so far that consuming GM foods is harmful, even if such danger theoretically exists – but the way that the science is being applied. It has been the exclusion of consumers from decisions about the use of genetically modified soya in staple foods, or of Third World farmers from the chance to choose whether to preserve seed from one season to the next, indeed often what seed to plant, that have generated the sharpest conflicts around the GM food issue. Monsanto has become the lightning rod for contemporary distrust of globalization and the power of multinationals in just the same way that, a generation earlier, Dow Chemicals did with its production of herbicides for use in Vietnam.

Perhaps the most tragic manifestation of the current distrust in multinational-controlled science lies in the current dispute in South Africa over whether HIV is the cause of AIDS. The unwillingness of President Mbeki to accept this scientific fact – and I use that phrase deliberately – even in the face of the best advice from his own biomedical and research community, has little directly to do with his grasp of the scientific issues, nor, I would argue, even the influence of so-called ‘AIDS dissidents’. It appears, and understandably so, to reflect the long-held and deep-seated mistrust held by South Africa’s former opposition leaders of the activities of foreign-based pharmaceutical companies. In particular, there is distrust of the way that such companies’ ownership of the intellectual property rights to the scientific advances in which new drugs – including those used in the treatment of AIDS – are based has allowed them to set the prices of such drugs in developing countries at levels designed to satisfy shareholders, not to meet those countries’ ability to pay.

No one in this room will require reminding of the complexities of the links between modern science and corporate power. At the most obvious level, just as the high technology industries spearheading the current phase of economic growth depend on the products of a healthy science base, so that science base – including in particular areas such as biomedicine and genetics – benefits directly from the health of the broader economy. And providing the conditions that secure such economic health is a key and legitimate goal of modern politics.

In this context, efforts to promote the public understanding of science clearly represent a bid to legitimize science-based growth strategies. A strong theme running through the House of Lords report is that a lack of sufficient appreciation of science carries an economic – and thus ultimately social – price, and that this is why both governments and industry have a responsibility to improve the situation. When it suggests greater openness and dialogue in the relationship between science and society, its main goal is to restore and promote this legitimacy – the ‘trust in science’ that it claims to be essential to a modern high-tech democracy.

Conversely, of course, any criticism of science is seen as a direct challenge to the paradigm that scientific progress leads inevitably to social progress. In one telling paragraph, for example, the report says that

resistance 'whether well-founded or misguided' on the part of the public 'may inhibit technological progress' – referring explicitly to genetically-modified food, therapeutic cloning, food irradiation, and the deep-sea disposal of offshore installations.⁴ The lesson seems clear: if you want to benefit from the achievements of science, stop protesting at the way that these achievements are being implemented. More graphically, those who continue to maintain such protests are frequently lumped into a massive, homogeneous 'anti-science' movement – often over their own denials of any such broader goal.

This is clearly not a healthy situation. Nor is it a particularly productive one, as the two sides in what is intended to be a dialogue appear to have different agendas, focus on different long-term goals, speak in different languages, and play the game according to different rules. In such a situation, dialogue as such is inadequate. If we remember that 'knowledge is power' – or, to translate it into the language of contemporary economists, that we are moving into a global knowledge economy in which access to and control over intellectual capital is as important as access to natural resources and financial capital has been in the past⁵ – then it is not surprising that fundamental conflicts arise over that knowledge. Or that such conflicts manifest themselves as the familiar disputes central to the troubled relationship between science and society.

All this points to the need for a new type of dialogue, one that acknowledges the true nature of such disputes, and allows space for creative criticism and politically-based challenges, rather than dismissing all such criticism and challenges as a manifestation of a lack of public 'awareness' – or even of a more general cultural malaise.

The required dialogue has two dimensions. One must be based on an appreciation of the positive social achievements that have been made possible by science. We may dispute some of the products of modern science. But I don't think that anyone in this room – and that goes even for those who might be lumped by their critics into the so-called 'anti-science' movements – would espouse the idea that the negative consequences of modern science outweigh its massive contributions to human health and well-being.

At the same time, however, we need a dialogue that accepts that there is a negative side to the applications of science, and that criticism is not only legitimate but healthy, indeed even essential. After all, no one in a true democracy tries to stifle public criticism of political leaders, or to argue that we need government-backed programmes in the public understanding of politics to re-build public trust in political institutions. Is science so different? The public is not stupid. It may get carried away at times, pursuing causes – such as the campaigns against therapeutic cloning or the uses of animal in research – that counter the ethos of the research community. But a democracy should thrive on debate around such issues, however heated this may get at times. It should not try to stifle it in a way that many scientists often indicate they would like to do

in the name of 'rational discourse', whether at the local, national or international level.

It is here that the media has an important function. We are all aware, I think, of the shortcomings of the narrow rôle into which some people attempt to channel the media in the 'public understanding of science' debate, namely as a conduit through which such 'rational discourse' can be transmitted from the scientific community to the public. This is a rôle that is actively encouraged by the scientific community and the corporate sector, often backed by government programmes. It is based on what Brian Wynne and others have criticized as the 'deficit' model of public understanding: all that is needed, this model suggests, is for someone to 'top up the tank' with accurate reporting of scientific discoveries, and much of the public distrust will evaporate.⁶ It leads directly to conclusions such as that in the House of Lords report that there should be an official complaints procedure to examine allegations of inaccurate scientific reporting.⁷ Who knows, we might even be fined for getting our facts wrong!

More recently, this 'deficit' model has been giving way to one that is closer to the 'dialogue' approach. In this model, scientists have a responsibility to listen and respond to public concerns, not merely a right to have their views transmitted via the media to a passive audience. This includes making scientists aware of the need to speak the language in which these concerns are expressed. It embraces a more inclusive rôle for the science journalist, one that encourages a greater pluralism in reporting on the significance of scientific results. But it still tends to imply that this rôle is essentially to construct a rational discourse around science.⁸

But neither of these two approaches goes far enough. What they lack is a dimension of *empowerment*, the idea that an effective science journalism is that one allows individuals to challenge the way that decisions about the development and applications of science are made. This is not just about making up for a deficit in public knowledge about science, or helping to construct a public dialogue around its potential impacts. It is also about providing individuals with a full awareness of the way that scientific knowledge is produced and applied so that they can make or endorse properly-informed decisions about both processes – not decisions based on the descriptions that those formally responsible for such decisions are keen to project.

Sadly, but perhaps predictably, such an approach to science journalism is not in favour, perhaps because it runs against the *zeitgeist* within which the 'public understanding of science' movement operates. In a culture dedicated to 'selling science', in all senses of the term, those who choose to look a gift-horse in the mouth find declining support. Look at what has happened to the coverage of magazine such as MIT's *Technology Review*, previously a bastion of healthy scepticism of science and technology, today hooked on the high-tech bandwagon. Or to magazines such as *New Scientist*, where a radical critique of science has too often become overshadowed by a desire to become integrated into the dominant currents of scientific culture. Or even, perhaps more conventionally, the

London *Times*, whose experienced and respected science correspondent was recently moved to the health desk, replaced by a young recruit able to report at length the latest concern of the British government – the danger that an asteroid might collide with the earth.

There is a process of ‘dumbing down’ here that, while enabling a form of dialogue to take place between science and its public – and encouraging a form of openness on the part of decision-makers – remains opaque to a genuine understanding of the processes by which science is developed and applied. Indeed, I would argue that, in many ways, the public understanding of science movement encourages an opaqueness that, while promoting the Enlightenment ideal of a rational discourse around science, also helps to screen the political basis of this rationality.

There are options. Many lie in the use of the Internet, whose great attraction is that the low cost of technical infrastructure and production costs allows, at least in principle, the possibility of greater independence from central control. If I am allowed a brief advertisement here, I would like to mention in passing one such project I am currently engaged in to communicate information about the application of science to Third World development.⁹ We had been tempted to call it ‘Global News on Science in Society’ – or GNOSIS for short – but found that that domain name had already been taken. Hopefully the website itself, under whatever name we eventually fix, will reflect a commitment to the idea that genuine progress can emerge from close scrutiny of the interaction between science and society, a goal to which all of us in this room are dedicated.

Notes

1. Select Committee on Science and Society, House of Lords, Session 1999–2000, 3rd report, *Science and Society* (London: HMSO, HL Paper 38, February 2000).
2. Francis Bacon, *Mediationes Sacrae* (1597), ‘Of Heresies’.
3. Since this address was delivered, the report of Lord Phillips’ public inquiry into the BSE crisis has been published: for details, see *Nature*, Vol. 408 (2 November 2000), 1, 3–5.
4. *Science and Society*, op. cit. note 1, 12, paragraph 1.11.
5. See David Dickson, *The New Politics of Science* (New York: Pantheon, 1984; Chicago, IL: The University of Chicago Press, 1986).
6. Brian Wynne first described this model in a seminar paper entitled ‘Knowledge, Interests and Utility’, delivered at a SPSG Workshop at Lancaster University in 1988; the first published discussion of the model can be found in John Ziman, ‘Public Understanding of Science’ and B. Wynne, ‘Knowledges in Context’, *Science, Technology & Human Values*, Vol. 16, No. 1 (Winter 1991), 99–105, 111–21; for further discussion, see Alan Irwin and B. Wynne (eds), *Misunderstanding Science? The Public Reconstruction of Science and Technology* (Cambridge: Cambridge University Press, 1996).
7. *Science and Society*, op. cit. note 1, 57, paragraph 7.31.
8. I am reminded here of a speech delivered yesterday [26 September 2000] by British Prime Minister Tony Blair to the Labour Party conference; full of phrases that correspond to the manager’s phrase, familiar in the corporate world, ‘I hear what you say’, with the subtext: ‘and I intend to ignore it’ (see *Financial Times* [27 September 2000], 4).
9. See <http://www.scidev.net>

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